

Tualatin Valley Water District Sustainability Plan

November, 2006

Section 1 **Introduction**

Over four years ago, the Tualatin Valley Water District (TVWD) embarked on a path to become a “sustainable” water utility. For us, that meant examining our policies, products and procedures and exploring ways to increase our positive effect on society, the environment and the economy, while decreasing our negative impacts. This is often referred to as the Triple Bottom Line or Three Legged Stool, both of which have been useful metaphors for us. We have looked for “low-hanging fruit” - areas where we can make quick, inexpensive changes that further our goals, as well as stretch goals that require more effort, but produce a bigger gain, as well. Guided by the Board’s adopted Sustainability Goals, we have engaged in a number of efforts to produce these successful “early wins,” detailed in Section 2 and Appendix I.

Over the past 18 months, we have also conducted a sustainability planning process that has built awareness among our management and staff of economic, environmental and social issues that can best be addressed through the development and execution of a Strategic Sustainability Plan. The adoption of a Strategic Sustainability Plan will provide us with both a broad vision of our District as a sustainable organization in the future, and a step-by-step action plan that will move us toward achieving our vision. The Plan is intended to be periodically updated as action plan milestones are accomplished and as changes in the economy, environment and/or social conditions warrant. It is intended that the Plan serve as an overarching framework guiding the direction of some District programs, such as Water Conservation, while serving as a philosophical touchstone for other programs. In addition, the implementation of the plan will indirectly benefit the District and its customers by serving as a model for other organizations’ sustainability efforts and by better serving our voters and customers.

This document is divided as follows:

- **Section 1** contains background information, outlines some of the forces that make sustainability a high priority for the District, summarizes the Board’s current Sustainability Goals, and reviews the Natural Step guidelines.
- **Section 2** provides highlights of the District’s sustainability efforts to date.
- **Section 3** explains the planning process used by the District to get to its current status.
- **Section 4** summarizes the District’s baseline assessment of its economic, environmental and social impacts, including its Process Mapping work.
- **Section 5** proposes a Sustainability Vision and Action Plan for the District.
- **Appendix I** details the many sustainable actions the District currently has in place.
- **Appendix II** details the data gleaned from the Process Mapping portion of the baseline sustainability assessment completed last year.
- **Appendix III** identifies issues and challenges for each of five key areas.

1.1 Importance of Sustainability to TVWD

In the broadest sense, being sustainable means living and working in ways that allow the earth's natural systems to remain intact and continuously provide the life-sustaining services, energy and materials that we require to live. It means fostering and maintaining a healthy, robust, equitable and sustainable economy that is capable of providing economic support within our community. And it means living and working in a society that supports basic human requirements such as health care, social and economic equity, and the personal and family relationship needs of people. Being sustainable is much more comprehensive than being "green". Being "green" implies actions that are taken to minimize adverse environmental impacts of an operation and/or utilizing natural systems. This generally doesn't incorporate economic and social considerations. Because sustainability addresses all three of the most important aspects of human life, like a three legged stool, it provides a much more stable platform for aiding the long-term survival of humankind.

1.2 Outside Forces Impacting the District

A number of environmental, economic and social realities in today's world have led the District to develop a Sustainability Plan. A few of the current realities that are impacting and will continue to impact the District are listed below.

- *Climate Change and Population Growth.* Nine of the hottest years in the past several centuries have occurred in the last 15 years. Based on information from recent regional studies, it appears that climate change will bring longer hotter summers and warmer winters with less snow pack and more intense periods of rainfall. For Pacific Northwest utilities, this means many things. With warmer and hotter summers, watershed fire danger will likely increase. Given our customers' current usage habits and the continued growth of the Portland metro area (according to Metro, the greater Portland area will need to provide for an additional 1,000,000 people by the year 2030), summer irrigation demand may increase and could strain supply storage in the Bull Run and Joint Water Commission systems. Options for adopting sustainable actions to reduce per capita demand, increase the diversity of water supply and storage, and better manage watersheds must be considered now.
- *Endangered Species Issues.* In addition to the impacts of climate change and population growth, reduced fish stocks in Northwest streams and rivers have resulted in legislation that continues to constrain water agencies' ability to take water from streams by imposing conditions on exercising water rights. This reality only adds urgency to undertaking sustainable actions like those needed to address climate change.
- *Diminishing Fossil Fuel, Geopolitical Risk of Supply Disruption and CO₂ Emissions contributing to climate change.* Although the District is not a large consumer of fossil fuel in comparison to all fuel users in the metro area, these realities argue for the District to do its part by exploring the use of alternative fuels and vehicles, and reducing consumption of petroleum-based fuels by fleet and commuting drivers.

- *Changing Regulation and Technology.* As technology advances, the ability exists to detect increasingly smaller units of contaminants. Future regulations are likely to require the removal of even more from our water than is currently required. Customers are increasingly concerned about their health and that of the environment. As we continue to ensure the health of the water system, we will need to inform and educate our customers and the community in general regarding these changes and how we are addressing them.
- *Affordability of Goods and Services.* In many areas of the United States including our District, the cost of housing, fuel and other goods and services has escalated rapidly over the past five years. TVWD constantly monitors the part that its water bill plays in household expenditures and must continue to be efficient with its revenues and ensure that its customers continue to receive the highest value possible for their rate dollars.

Because realities like these are now at our doorstep and becoming sustainable is so fundamentally appealing (and, indeed, necessary), many governmental organizations and businesses worldwide have adopted sustainability programs aimed at aligning their organizations' actions in support of sustainable outcomes. Organizations from Nike and Norm Thompson to the US Army and Hot Lips Pizza have embraced sustainability. TVWD also supports this broad definition of sustainability and has adopted Board-driven sustainability goals and funded positions and District-wide programs aimed at achieving its goals.

1.3 2006 TVWD Board Sustainability Goals

TVWD's Board of Directors adopted these Sustainability Goals in August, 2006.

- Continue the purchase of green power electrical energy sufficient to offset 75% of the District's electricity needs at its headquarters office location and all outlying pump stations and other facilities. Increase participation to 100% offset in February, 2007.
- Complete a "Backcasting" process as part of developing a Sustainability Plan that will outline concrete targets for making improvements in District sustainability.
- Develop District policies and procedures using criteria that reflect sustainable economic, social and environmental practices and that consider long term costs and benefits to the community.
- Reduce the District's fleet emissions and dependence on petroleum-based fuels as a preliminary step, and continue to monitor the use of alternatively fueled vehicles for acceptability.
- Continuously look for opportunities to purchase materials and supplies that reduce cost and are in line with the sustainable practices of the District.
- Reach out to other water providers to leverage opportunities to promote more sustainable practices through collaboration.

1.4 Natural Step System Conditions

The Natural Step framework is a practical tool for reviewing decisions in terms of sustainability. Our efforts at TVWD are loosely built on the four scientific Natural Step System Conditions that describe the circumstances necessary for a sustainable world. They are summarized here, as they have been comprehensively utilized in our Process Mapping, Capital Improvement Plan Sustainability rankings and other areas of our Sustainability work.

In a sustainable society, nature is not subject to systematically increasing:

- 1. Concentrations of substances extracted from the Earth's crust;*
- 2. Concentrations of substances produced by society; or*
- 3. Degradation by physical means.*
- 4. And, in that society. . .
the ability for humans to meet their needs is not systematically undermined.*

We keep these conditions in mind as we work on increasing the sustainability of our operations at the District.





















Section 2 Sustainability Highlights 2003 - Present

Since the District's last Sustainability Report, written in November 2003, TVWD has been hard at work engaging in sustainable behavior and projects throughout the District to gain some "early wins." Activities have addressed economic, environmental and social issues, and ideas and participants continue to come from all parts of the organization. Below are some of the more innovative and effective sustainable actions the District has taken in the past few years. Each project usually addresses more than one "leg" of the sustainability stool, as indicated in the columns to the right.

These and many more sustainable activities are detailed in Appendix I, following this report.

HIGHLIGHTS OF TVWD SUSTAINABLE PROJECTS

MAJOR IMPACTS

	Environmental	Economic	Social
In July of 2006, the District received a Leadership in Energy and Environmental Design (LEED) certification at the Silver level, for its Headquarters Building Expansion, becoming only the 18th organization in Oregon to achieve any type of LEED certification, and the eighth to receive Silver. Because we attained the Silver level, we received an OR Dept of Energy Business Energy Tax Credit of over \$42,000 to partially offset project costs.			
Tualatin Valley Water District has successfully used 100% postconsumer waste (PCW) recycled paper for its bill stock for over a year, saving an estimated 150 trees, 64,000 gallons of water, 108 million BTUs of energy, 7,000 lbs. of solid waste and 14,000 lbs. of greenhouse gases each year.			
In 2005, TVWD Information Technology staff created an online account services and payment system to reduce resources used and improve customer convenience. From July 2005 through June 2006, TVWD issued over 436,000 bills, 31% of which were paid by electronic means. And almost 2% of our customers are now notified of their bills online, as well, saving many additional resources.			
Our pump stations, which bring water to customers at higher elevations, continue to be retrofitted as appropriate with Variable Frequency Drives (VFDs) that are more efficient and use less electricity than conventional drives. Eight of our 44 pumps are VFDs, with two more scheduled for installation this year.			
In planning for our 2005-07 Budget, a process was developed to rank our Capital Improvement Plan projects using sustainability criteria.			
Our Human Resources department suggested an Employee Recycling Benefit, allowing employees to bring in recyclable items they are not able to recycle at home. At our newly created Employee Recycling Center, light bulbs, cell phones, shoes, Styrofoam, and many more items find a more appropriate resting place than the local dump.			
We purchased a Ford Escape Hybrid for our Conservation Technician to drive when he conducts onsite water audits to help commercial customers reduce their water usage. Estimated at over 30 mpg, we expect to save at least \$300 each year in gas costs.			
We obtained funding for and produced an Intro to Sustainability DVD and handbook for other organizations looking to become more sustainable. This piece shows our journey toward sustainability to date, and gives other agencies and businesses ideas for getting started, themselves.			

Section 3 Sustainability Plan Development Process

3.1 ABCD Process

TVWD uses many tools to assess and improve its sustainability. One of these tools is sometimes known as the ABCD process. This process consists of four parts:

Awareness training. Awareness of sustainability issues by District employees is key in enlisting their aid to help the District identify opportunities to become more sustainable.

- Initially, a Natural Step trainer presented basic sustainability training to all of our employees in March, 2005. Our Sustainability Coordinator and Green Team continue to present periodic reminders and educational pieces at All-employee meetings and in the employee newsletter. A 26-minute DVD is now presented at new employee orientations to outline the District's focus on sustainability and expectations of employees.

Baseline sustainability assessment. Understanding the status of the District's sustainability issues is essential to the creation of a Vision and Action Plan. To do this, we have begun to assess our current status as outlined below. There is still more to do in this area as we move forward.

- *Process Mapping.* The entire staff met several times in 19 different work groups to complete a Process Mapping exercise, portions of which are included in Appendix II. We first outlined what activities are undertaken every day by each employee, summarizing tasks as possible. Each group then listed what physical materials were used in the process, identifying over 400 items. We rated each material against the Natural Step System Conditions and came up with a ranking of how important each was for the District to examine. This ranking took into account such attributes as a material's toxicity, whether it was extracted from the earth, its cost, the number of alternatives available, and other considerations. We synthesized these materials into five key areas (shown in the chart in Section 4 below) and identified issues, challenges and current solutions in each area (detailed in Appendix III).
- *Sustainability Metrics.* Some measures have been followed for many years; others are new to the District. When the Direct Action Plan is approved, appropriate indicators will be identified, tracked and reported upon by the appropriate department, and included in periodic updates to measure District progress in sustainability.

Creation of a long-term vision. A clear vision and objectives are essential to the success of our sustainability efforts.

- The Sustainability Steering Committee met in June, 2006 for a half-day workshop to develop a sense of what is important in our particular quest to become more sustainable. We came up with examples that signify a fully sustainable organization and are using those to move to the fourth step. Results of this workshop are synthesized in Section 5.

Direct action steps: short term, intermediate, longer term. Working backward from our vision and goals, we create a roadmap and timeline describing how to get where we want to go.

- We are currently developing these steps. This plan is contained in Section 5, shown in a "Backcasting" format where our goals, final target, and intermediate steps are detailed. This plan will be reviewed and revised as we move forward and conditions change.

Section 4 Baseline Assessment Results

4.1 Process flow chart

One of the products of our baseline assessment was the identification of the basic inflow and outflow elements of TVWD’s overall operation. In addition, we developed detailed process flow charts for each of the 19 primary work process of the District. The inputs and outputs shown in the chart below are common to both field operations and office support services.



For each key area shown on this chart, there exist issues and challenges, as well as solutions already in process. Water, likely our most important input, involves issues of source, usage, cost, quality and more. Energy, Transportation and Materials are concerned with much the same issues. The People input area includes such concerns as skill level, compensation and benefits, and job satisfaction. The Communications area entails looking at a broader picture than just TVWD, providing leadership and partnering with other organizations to increase our impact.

Output challenges include efficient distribution and minimization of water lost to leaks, evaporation, etc., as well as reuse or disposal of wastewater and stormwater. Energy and Transportation require examination of emissions, possible spillage issues and end of life disposal. The area of Materials encompasses issues of recycled content and final disposal of products, among others. People “output” might be defined in terms of absenteeism, turnover, and workforce planning. And Communications includes ensuring all of our employees are sending out a message of sustainability in the way we deal with our customers, colleagues and the public.

Many of these issues are already being addressed to some extent, but there will be continual opportunities to improve in all of these areas.

Section 5 Sustainability Vision and Action Plan

5.1 TVWD's Draft Vision of Sustainability

Unlike our mission statement, our vision statement is not necessarily true in the present, but is our image of the future. It is primarily an internal statement. Our vision is our dream, our aspiration, our "hope to accomplish." We want to develop a compelling vision of the future which our employees will enthusiastically embrace – because the vision is worthy, and because it challenges them to grow. The following is our proposed District vision:

TVWD will provide high quality water and maintain best-in-class customer service to its community in a manner that protects the earth's environment, supports a strong economy and promotes a robust community.

In achieving this vision, TVWD will:

- Partner with its customers and public, non-profit and private organizations to achieve significant advances in sustainability.
- Be a recognized leader in sustainability in the water industry and influential in guiding the development of others' sustainability policies and practices.
- Develop and integrate forward looking, practical and measurable sustainable actions into existing TVWD programs and processes.

5.2 Direct Action Plan

Armed with this vision, identified though the A, B and C parts of the process described in Sections 3 and 4, we are now ready to make formal the actions that will make the vision a reality.

In each of the five key areas we have already:

- Set goals, incorporating what can be characterized as “quick wins” – items we can see ourselves accomplishing quickly and easily; and “big wins” – stretch goals that we believe will really make an impact in the larger community.
- Looked into the future to picture what TVWD would look like at Full Sustainability for each goal. That picture will likely be modified later depending on such things as partnering opportunities, advancements in technology, changes in political direction, and environmental necessity.
- Used the Natural Step concept of Backcasting. We worked backward to estimate what actions we would have to take now, and at various points further in the future, for us to reach those goals. Again, these steps will be modified as we see what actually occurs.

The following five pages show our current goals and our plan to reach each goal.

Proposed actions supporting full sustainability A

Key Area	Goal	1 Year	2 Years	5 Years	10 Years	Responsible Department
Water	Reduce customers' peak summer water usage	Promote & incentivize water efficient landscaping. Look at peaking factor and set numeric goals for future.	Provide interactive 'Water Budget' Calculator on website & promote its use.	Reach District peaking factor goals		OCIR / Finance
	Promote the creation of an integrated watershed management group	Discuss @ RWPC - assess interest. Use Tualatin Basin Supply Partners group as vehicle?	Promote total watershed solutions through integrated group.			Administration / OCIR
	Maintain 100% compliance with current and future water quality standards	Maintain consistent regulatory compliance and produce customer reports to educate public re: water quality.	Maintain consistent regulatory compliance and produce customer reports to educate public re: water quality.	Maintain consistent regulatory compliance and produce customer reports to educate public re: water quality.	Maintain consistent regulatory compliance and produce customer reports to educate public re: water quality.	Customer Service (Water Quality)
	Match water source quality and quantity with water use requirements		Educate customers on and support green building techniques. Support LEED standards for residential homes. Create brochures that include stormwater uses, downspout disconnect programs, etc.	Explore Point of Use treatment, neighborhood rainwater catchment systems or other new technologies in appropriate new developments or other settings.		OCIR

B

Proposed actions supporting full sustainability

Key Area	Goal	1 Year	2 Years	5 Years	10 Years	Responsible Department
Energy and Transportation	Become carbon neutral	Offset 100% of District electrical energy from "Green Tags". Investigate options for renewable onsite electrical generation. Investigate solar footprint of District buildings. Calculate total carbon footprint of District.	Calculate Greenhouse Gas Emissions at 1990 level and 2005 level. Create written plan to reduce GHG emissions. Explore carbon credits.	Implement strategies to reduce GHG emissions per written plan.		Finance
	Minimize fleet petroleum use and emissions	Reduce petroleum usage by 10% from 2006 levels.	Reduce fleet petroleum usage and convert to most efficient non-petroleum fuel. Purchase hybrid or other flexible fuel vehicles as vehicles are replaced.	Reduce gas fleet usage of petroleum and convert to most efficient non-petroleum fuel as vehicles are replaced.		Operations
	Minimize commuter petroleum use and emissions	Investigate and incentivize carpool/vanpool options for employee commuting	Investigate employee telecommuting and satellite reporting stations			Finance / Administration
	Extract and use all available energy from District processes		Assess potential energy extraction sources.			Engineering (Distribution)

Proposed actions supporting full sustainability C

Key Area	Goal	1 Year	2 Years	5 Years	10 Years	Responsible Department
Materials	Eliminate all waste from District operations	Complete inventory of all waste produced by District.	Reduce waste from 2006 levels by 50%	Reduce waste from 2006 levels by 75%	Reduce waste from 2006 levels by 90%	Operations (Building & Grounds)
	Maximize purchase of recycled and recyclable materials	Research and establish price preference for goods that are reusable or recyclable or are made with renewable or recycled materials.	Purchase goods that are reusable or recyclable and are made with renewable or recycled materials as much as possible.	Purchase goods that are reusable or recyclable and are made with renewable or recycled materials as much as possible.	Purchase goods that are reusable or recyclable and are made with renewable or recycled materials as much as possible.	Finance
	Minimize employees' exposure to hazardous substances used in District operations	Implement Chemical Reference online resource for employees. Establish procurement process for new chemicals.	Produce written plan for reusing or recycling all materials, including chemicals	Utilize no persistent, bioaccumulative and toxic (PBT) chemicals	Send no chemicals to Metro Hazardous Waste site	Customer Service (Safety)
	Purchase from environmentally and socially responsible producers and vendors as much as possible	Institute purchasing policies that require responsible producers and vendors for all appropriate products	Educate all District purchasers in purchasing policies			

Proposed actions supporting full sustainability D

Key Area	Goal	1 Year	2 Years	5 Years	10 Years	Responsible Department
People - Employees	Acquire, develop and maintain a high quality, trained and motivated workforce	Ongoing reassessment of wage and benefit package	Ongoing reassessment of wage and benefit package	Ongoing reassessment of wage and benefit package	Ongoing reassessment of wage and benefit package	Administration (HR)
			Adopt a District workforce plan	Implementation and ongoing update of workforce plan	Implementation and ongoing update of workforce plan	Administration (HR)
People - Customers	Provide high-quality, affordable water to customers	Maximize efficiency of operations	Maximize efficiency of operations	Maximize efficiency of operations	Maximize efficiency of operations	Finance
		Ongoing review and modification of affordability issues and assistance programs	Ongoing review and modification of affordability issues and assistance programs	Ongoing review and modification of affordability issues and assistance programs	Ongoing review and modification of affordability issues and assistance programs	Finance

E
Proposed actions supporting full sustainability

Key Area	Goal	1 Year	2 Years	5 Years	10 Years	Responsible Department
Communications	Actively promote Sustainability in the Community-commercial	Promote Sustainability DVD in BIG communications. Offer DVD and booklet at business water audits	Provide additional sustainability program assistance to commercial & industrial customers as needed.	Provide additional sustainability program assistance to commercial & industrial customers as needed.	Provide additional sustainability program assistance to commercial & industrial customers as needed.	Finance / OCIR / Customer Service
	Actively promote Sustainability in the Community-residential	Provide "household sustainability" info to customers by adapting DVD booklet for residences. Create household sustainability checklist. Partner w/OR Energy Trust on home energy assessments.	Continue to partner w/OET and others to promote sustainability as water conservation is promoted.	Continue to partner w/OET and others to promote sustainability as water conservation is promoted.	Continue to partner w/OET and others to promote sustainability as water conservation is promoted.	Finance / OCIR / Customer Service
	Collaborate with other entities on sustainability programs	Partner with the City of Portland, CWS, Tualatin River Watershed Council and others already engaged in sustainable actions.	Identify and partner with other entities such as City of Beaverton, Beaverton Chamber of Commerce, Westside Economic Alliance who have not done as much in sustainability.			Administration / Finance
	Promote modification of any legal requirements that may impede sustainability	Identify what partnership opportunities are available for promoting sustainable policies or legislative changes	Work with established groups to support sustainable efforts. Develop coalitions as needed to work on state and regional sustainability initiatives.			OCIR / Finance / Administration

5.3 Recommendations, Next Steps

This conceptual plan is just the beginning – of our planning as well as our actions. We have much more to do just to begin work on the preceding goals. Although no one can predict the future, our goal is to suggest directions that will provide for the long-term sustainability and vitality of TVWD and our community, rather than offer “quick-fix” solutions. We encourage all involved to look beyond what is now in place and realize that just because it is that way now doesn’t mean it has to stay that way. To continue with our plan, we will take the following steps:

1. We will assign each goal to an appropriate work group or department within TVWD.
2. The assigned group will develop a more detailed action plan and timeline for the goal.
3. This group will work with the Sustainability Coordinator to develop indicators that will track progress toward that goal.
4. One person (the assigned department’s manager or his/her designee) will be responsible for following the progress of each goal and reporting that progress to the Sustainability Steering Committee at designated intervals.

As the responsible groups further investigate and implement their goals and objectives, appropriate paths will likely become clearer. At this point, much of our work is still identifying the opportunities that will have the most impact and are most apt to be successful for our organization.

Creating and implementing a plan such as this requires a continuing commitment. So in addition to project objectives, we will formalize these concepts as District priorities by including sustainability language in purchasing documents, Requests for Proposals, and other policies and procedures as they are identified.

This plan will be reviewed and revised periodically by the Sustainability Steering Committee. District progress will be communicated to staff, the Board and the public through a Sustainability Report prepared by the Sustainability Coordinator. The schedule of these reviews and reports will be determined by the Sustainability Steering Committee in the coming year, as the plan unfolds.

Throughout its history, TVWD has been a responsible employer and community agency. We take pride in our record, while acknowledging the challenges of ever-increasing rules and expectations. Over the last several years, we have begun an important journey toward further improving our business practices and operating in ways that meet or exceed our customers’ needs and expectations while minimizing our negative impact on society and the environment. Though we are currently choosing to operate in a sustainable manner, in the future it will be a necessity, not an option.

As we move forward under this plan and learn from our experiences, we will continue to revise and modify the actions we have identified to reflect our long-term cultural commitment to sustainability. By improving the sustainability of our agency through the goals and actions in this Sustainability Plan, we also intend to become a catalyst for change in other organizations. To achieve a truly sustainable future, many people and organizations will need to examine and ultimately change not only their actions, but the way they think about what they do. We look forward to being in the forefront of this exciting new paradigm.

Appendix I Details of Sustainable Accomplishments

In the November, 2003 Sustainability Report, several goals were set out for staff to address in following years. What follows are those eight goal areas with achievements in each area.

1. Continue to pursue sustainable projects

Identify sustainable projects that save money or don't require much investment of money or time to achieve results. Also identify at least one "Big Win" each year – a project that will make a significant positive difference environmentally, socially, or in the way our community or colleagues perceive us.

The District continues to participate in countless sustainable activities each day, many of which are listed in Section 2. Employees are constantly suggesting new products or processes to pursue. A few of TVWD's projects are listed below.

A brainstorm of our Human Resources Manager, TVWD employees are now able to bring in items for recycling that they are unable to recycle at home. As public servants, District employees may not receive any benefits that are not also available to the public. Therefore, TVWD could not allow employees to bring in recyclables without taking them from the public also, which our facilities are not equipped for. By creating an **Employee Recycling Benefit** as part of the staff benefit package, workers may now bring in everything from batteries to electronics to tennis shoes and the items are sent out for reuse when possible, or at least recycling. An **Employee Recycling Center** was established to provide a convenient outside drop off location for employees as they arrived for work. The TVWD Board was fully supportive of this plan, approving it unanimously in September of 2005. To date, the District has sent over 30 electronic items to Earth Protection Services, Inc. (EPSI), covering EPSI recycling fees for employees, and has collected items from motor oil to pallets to Styrofoam to lawnmowers. All items recycled are sent to reputable collectors who keep as much material as possible within United States boundaries.

The District has a long history of participating in its community. Three acres of land adjoining District headquarters **property was loaned** to Tualatin Hills Parks and Recreation District (THPRD) for use as sports fields until TVWD has need of it. TVWD **shares its fuel tank** with THPRD fleet vehicles, eliminating the need for them to install a separate tank, and keeping costs down for both organizations. And THPRD chips up some of TVWD's tree debris for use on trails – a beneficial partnership for both groups. A team of employees **picks up litter** along streets in the neighborhood.

And, of course, we exist to be involved with our customers. For four years, TVWD has given money to Care to Share, a Washington County non-profit, to screen and provide District customers with **water bill financial relief** when emergencies arise. The **District Conservation Program**, established almost 15 years ago, is dedicated to **reducing excess customer water usage** through **rebates** on water efficient fixtures and appliances, **give away items** such as faucet aerators, shower timers and leak kits, and free advice in the form of **educational publications, audits and workshops**. Conservation Program members are very active with the Regional Water Providers' Consortium, and can always be found at **local and regional events**, touting the benefits of sustainability and of water conservation, in particular!

With over 100 employees commuting an average of almost 30 miles round trip each day, TVWD is responsible for around 3,000 miles of travel before anyone even walks in the door. That commuting likely produces

around 3,000 lbs. of CO2 each day, as well as other harmful air pollutants. Employees as a whole pay close to \$450 each day for the approximately 150 gallons of gas used to get to and from work. TVWD employees participated in the 2006 Westside Transportation Alliance **Carefree Commuter Challenge** in July, 2006. The event was designed to encourage residents and employees in Washington County to commute by bicycle, motorcycle, carpool, walking, etc. instead of driving alone. Close to twenty employees participated in the challenge, commuting on a regular basis and greatly reducing the almost 3,000 commuter miles traveled daily by TVWD employees. To further mitigate any negative effects on the environment, the District also provides free TriMet passes for MAX and bus travel, operates an alternative 9/80 work schedule, allowing employees to eliminate commuting one day every two weeks, and adjusted its hours of operation to keep employees off the roads at heaviest commuting times.

Field Operations staff recently purchased a Ford Escape Hybrid for use by the new Conservation Technician. Mileage is estimated to be over 30 miles per gallon, while still providing enough space for transporting business water auditing equipment.

2. Achieve LEED™ certification for building expansion

Continue to monitor construction progress and work toward accumulating the maximum points possible with this project, with the goal of attaining Silver certification.

In July of 2006, after four years of planning, remodeling, new construction, and commissioning, the District received its **Leadership in Energy and Environmental Design (LEED) certification at the Silver level**, becoming only the 18th organization in Oregon to achieve any type of LEED certification, and the eighth to receive Silver. While a few points were easy to come by, many were very challenging. The project was especially difficult because it involved 15,500 sq. ft. of new construction and the remodel of virtually all of the existing 25,160 sq. ft. building. It also required all operations and customer services to remain fully functional throughout the construction.

One exciting aspect of our remodeling project is the **Rainstore system**. The system collects water from the 6,500 sq. ft. new wing of our building, filters out large debris, and stores the water in an underground 40,000-gallon tank. This is used to flush toilets and is available for the minimal irrigation needs of the facility. During its first year of operation (during which the tank never fully filled because of drier weather) the system accommodated approximately 60% of the building’s flushing needs. The second year was even better, meeting almost 2/3 of the building’s non-potable water needs.

One of the innovative water conservation technologies being studied at TVWD is an **Evapotranspiration (ET) Controller Irrigation System**. An electronic controller in the District Demonstration Garden receives ET data (the amount of water that transpires through plants and evaporates from soil) so no watering is done unless needed. This provides a positive example of customer options for reducing excess water usage. The Conservation Department is also conducting a weather-based irrigation system pilot program with several of our commercial customers to introduce them to the technology and assist them in significantly reducing water usage. TVWD provides equipment and training, and the customer agrees to keep the system for at least two additional years if they save 20% or more water, making the partnership beneficial for all involved.

- Elements of 2003 Sustainability Plan**
1. **Sustainable Projects**
 2. **LEED™ Certification**
 3. **Purchasing Revisions**
 4. **Backcasting**
 5. **Sustainability Management System**
 6. **CIP Integration**
 7. **Operations Integration**
 8. **Regional and National Leadership**

3. Purchasing policy revisions

Sustainability Coordinator and Purchasing and Inventory Management staff work to identify attributes to request or require when seeking bids or proposals.

Our Purchasing Department is well in tune with the premises of sustainability. Whenever possible, office products, kitchen supplies and other items contain a **high percentage of recycled material**. Food brought in for meetings is served **family-style** instead of in individual plastic ‘clam shells’. Participants make their sandwich or take their food from a common reusable tray. One of our staff has even gotten Safeway to put condiments in hollowed out green peppers instead of the usual disposable plastic bowls. These vegetable ‘bowls’ can then be rinsed out and composted in our onsite **composting bins** if not eaten!

Reusable items such as silverware, cups, glasses, plates, kitchen towels, and refillable writing instruments are commonly purchased instead of disposables. We purchased a **Ford Escape Hybrid** for our Conservation Technician to drive when he conducts **onsite water audits** to help commercial customers reduce their water usage. **Biodiesel and Ultra Low Sulfur Diesel** are being studied by our Field Operations Department.

TVWD’s Board of Commissioners initiated a **Bidder Integrity Policy**, which requires suppliers of pipe, hydrants and fixtures (our major purchases) to be free of current OSHA and EPA claims in order to sell to TVWD. This shows vendors that TVWD is paying attention to the way they operate their organizations, and that price is not the only consideration. **Preference is always given to Oregon suppliers** and other **sustainability criteria are included in Requests for Proposals** as appropriate for the product or service required.

Though many printers said it couldn’t be done, Tualatin Valley Water District has successfully used **100% postconsumer waste (PCW) recycled paper for its bill stock** for nearly a year. These bills go through precise machinery at several stages in their processing, and thorough testing was required to ensure the paper would meet the exacting standards required. Annually, the District saves more than 150 trees, 64,000 gallons of water, 7,000 pounds of solid waste, 100 million BTUs of energy and 14,000 pounds of greenhouse gases by using this paper. In 2005, TVWD Information Technology staff also created an **online billing and payment system** to reduce resources used and, for some, customer travel time. In the Nov/Dec 2005 billing period, TVWD issued over 70,000 bills, 34% of which were paid by electronic means.

The District uses approximately 4 million kWh of energy annually, which has held steady over the last two years, even though our customer base and our Headquarters building have expanded. This is due in large part to our energy conservation efforts. Our LEED certified Headquarters building incorporated many **energy efficient technologies** in the areas of lighting and HVAC, decreasing by 26% our kWh usage per square foot. Our pump stations, which bring water to customers at higher elevations, continue to be retrofitted with **Variable Frequency Drives** that are more efficient and use less electricity than conventional drives. And since we do still use a lot of electricity, we purchase **Green Tags** to partially offset the negative effects of electric production. The District began offsetting 25% of total usage (~1 million kWh) in 2004, and increased that to 75% (almost 3 million kWh) in February, 2006.

4. “Backcasting” process

The Sustainability Steering Committee and others participate in this means of developing a shared vision for our journey toward sustainability. Backcasting (as opposed to forecasting) is a process of looking far into the future to see where we want to end up, then working backward to develop the steps to get us there. It involves envisioning a successful future scenario of sustainable District operations, and then asking, “What can we do today to reach that result?”

Five District staff went through a series of Natural Step workshops in 2004 to learn how to implement **Process Mapping and Backcasting** at the District. In January, 2005, the workshop participants began to put these processes into action. All employees attended a half-day session to gain a background in sustainability and The Natural Step. The staff then divided into 19 work groups based upon their daily tasks, and workshop participants met with each group to identify what the group does, what resources it consumes, and what waste it produces.

A second set of meetings by work group revealed the frequency of usage, cost and degree of influence the District has over the purchase of these items, and areas staff thought could be investigated for improved sustainability. Though time-consuming these meetings have already yielded employees suggestions for ways to reduce the use of resources, increase operational efficiency, and reduce costs. Many of those ideas have been implemented, though the actual process is not over. It is rare to have the opportunity to meet with every employee in an organization, and the District is taking full advantage of our access to **employee input and suggestions**, soliciting information regarding working relationships and efficiencies as well as resource data.

5. Sustainability Management System

Establish a Sustainability Steering Committee to:

- a. Establish sustainability **goals** for the District
- b. Establish **indicators** that will track our progress toward these goals
- c. Obtain **baseline data** for the indicators
- d. Establish **targets** for indicators, at least in terms of the desired trend direction
- e. Outline **actions** needed to reach each target

This document is the current manifestation of our Sustainability Management System. As outlined in Section 3, we have outlined our current processes, procedures and the products we use. Our Sustainability Steering Committee has refined this document and presented it to the TVWD Board of Commissioners for its approval. This Plan establishes our goals, targets and actions needed to reach those goals. Based on the Action Items listed, we will gather baseline data and continue to track indicators that will indicate our progress toward our goals.

6. CIP Analysis Integration

Create environmental, social and economic criteria to consciously and consistently consider when developing our Capital Improvement Plan each biennium.

In planning for our 2005-07 Budget, a process was developed to rank our **Capital Improvement Plan** projects using sustainability criteria. Criteria were developed based on Natural Step and Triple Bottom line concepts and a weighting and scoring guide was created to help evaluators from TVWD’s Engineering and Finance Departments score each project and review the resulting rankings. Projects were discussed and aspects and modifications considered that might not otherwise have been taken into account. Each time this process is employed it will be refined to reflect the sustainable goals and values of the District.

7. Integration of sustainability into regular business planning process

Introduce sustainability criteria into annual and biennial planning and budgeting, purchasing decisions, investment strategies, and other District planning processes.

To mobilize and involve employees in sustainability efforts at all levels of the organization, the Tualatin Valley Water District has established two different groups: **the Sustainability Steering Committee** and the **Green Team**. With the District's **Sustainability Coordinator**, these two groups work in tandem to drive progress toward sustainability at the District.

The **Green Team** is a grassroots employee effort that brings staff together to educate District employees about cost-effectively protecting the environment and benefiting society by their actions. The group brings information and speakers to TVWD employees, and proposes and encourages policies and practices that minimize or eliminate TVWD's damage to the environment.

The **Sustainability Steering Committee**, a high-level, cross-functional strategy group, concentrates on issues of policy and changes in procedures. Because the committee is comprised of all District Managers, as well as ten additional staff from across the District, significant changes may be achieved with minimal bureaucracy.

8. Identify and achieve regional and national goals, leadership in industry, influencing of policy

Push for changes in public policy and incentives as appropriate. Share our processes, procedures, forms, policies, successes and lessons learned with larger groups of people – businesses, other government entities, water districts, AWWA and other associations (regionally and nationally) – leading the way to a sustainable future.

Many tours of TVWD's Silver LEED certified Headquarters Building have been given to groups ranging from kindergarteners to AWWA's Customer Service/IT Conference participants (international attendance) to Washington County Commissioners and Oregon's Secretary of State, Bill Bradbury. By making sustainable aspects of the building (such as the Demonstration Bathroom and Rainstore Mechanical Room) accessible, visitors can see sustainability at work and envision ways to apply the same principles at their home or business.

Our Demonstration Garden provides valuable ideas for residential and commercial outdoor water conservation and is an important community green space for community residents. Initially developed over ten years ago, the Garden is now being redesigned to showcase the use of soil amendments to reduce water consumption, the proper use of the right plants in the right place to reduce water needs and the use of appropriate irrigation methods to minimize water use.

In November 2005, Sustainability Coordinator Cheryl Welch participated in a Triple Bottom Line (TBL) workshop sponsored by the American Water Works Association Research Foundation (AwwaRF) and Australia's Commonwealth Scientific and Industrial Research Organisation (CSIRO). The workshop was designed to help develop a TBL reporting guidebook for water and wastewater utilities in the United States. The District was asked to participate because of its leadership in sustainability and was able to provide insight to the organizations from a smaller water district perspective.

The District's latest educational effort is a **Sustainability Video**, produced in answer to the many businesses, organizations and water agencies that have asked about our particular path toward sustainability. The video/DVD covers such topics as why sustainability is important, what TVWD has accomplished so far, what has helped us along the way, and highlights of our LEED building. The piece, accompanied by a detailed booklet, is being distributed free of charge to area organizations looking to start their own sustainability journey. TVWD's **Speakers' Bureau** is available to make presentations or the piece can be sent on its own.

In addition to the items highlighted above, the District also engages in the following:

Energy conservation/use of renewable energy

- LEED features (motion sensors, compact fluorescents throughout building and in outdoor lighting, programmable HVAC system)
- Participation with PGE's E-manager program that shows electricity usage in 15 minute intervals and alerts staff regarding anomalies and areas for energy reduction
- Reduced electricity usage by turning off lights & computers when not in use – physical prompts (cards to attach to computers) and email reminders given to employees

Alternative transportation (employee commute trips, customer trips and/or company operations)

- LEED features (carpool spaces, bike storage, employee showers)
- Free Tri Met passes for all staff members annually
- Challenge, encourage & recognize employees who use alternative transportation – did this especially during building expansion
- 9/80 work schedule w/early start to keep vehicles off road
- Reduced vehicle idling promoted in shop yard
- Alternative sites for bill payment available to reduce transportation needed

Water efficiency

- Customer bathroom with half flush toilet, educational signage & water conservation items
- Infrastructure demand reduced through water conservation programs to encourage water efficiency among residential, business, industrial and government customers
 - Rebates, education, water-saving devices, water audits, leak detection, workshops
- Tanks drained through distribution system prior to cleaning to reduce water drained to sewer

Waste reduction/pollution prevention

- Periodic Waste Audits of District trash conducted to determine recycling effectiveness
- Reuse or recycling of packing peanuts, air bags, CDs/DVDs, floppy disks, printer/toner cartridges, cell phones, telephone books, metal (copper, aluminum, iron, tin), light and corrugated cardboard, plastic bottles, yogurt-type plastic containers, paper, newspaper, glass, plastic bags, light bulbs, motor oil, batteries, uniforms, tennis shoes, block Styrofoam, electronics, wood pallets, lawnmowers
- Oil and water separator used for run off from wash rack & fueling station
- Waste oil burned in shop furnace
- Online phone book promoted – reduced District need for phone books from 60 to 10
- Printed-one-side paper used for draft copies or made into scratch pads
- Bark bags used for soil retention, to decrease erosion, and to reduce silt near storm drains
- Water diversion equipment made from discarded bike shop inner tubes and sand
- Silt fences installed around debris piles and spoils moved to less vulnerable areas
- Diffusers used to disperse flushed water from hydrants to prevent erosion
- Dilute hypochlorine solution used at pump stations instead of gaseous chlorine
- Directional boring utilized for laying pipe instead of trenching when possible
- Spoils from construction covered with straw, hay or jute matting
- Ascorbic acid used in flushing process instead of sodium bisulfate
- Food grade lubricants and cleansers utilized to prevent water contamination
- Lead-free and toluene free paints used for locating services
- Rubber stamp used for incoming payables instead of paper form
- All District employee and customer forms now online – printed only as needed

- Greenbar computer reports decreased by developing automatic electronic archiving system – currently using about 10% of former usage, heading toward total elimination of greenbar
- Magazines and documents routed instead of ordering or printing copies for all readers
- High velocity zonal hydrant flushing utilized to reduce chlorine needed for disinfection
- Functional hydrant & meter parts reused to repair other hydrants and meters

Sustainable purchasing

- 100% Post Consumer Waste (PCW) recycled bill stock, copy paper, letterhead
- Duplexing copiers purchased for common areas
- Recycled janitorial paper products (some @ 100% PCW) purchased
- Re-refined motor oil used in fleet vehicles
- Rechargeable batteries used in digital cameras, cell phones and many other situations
- Energy Star computers and equipment purchased

Promoting a sustainable built environment

- Achieved LEEDTM Silver Certification, including the following elements:
 - Installed Rainstore water catchment system
 - Reduced heat islands to minimize impact on human and wildlife habitat
 - Eliminated light escaping from building site to reduce impact on nocturnal environment
 - Limited use of potable water for landscape irrigation
 - Maximized water efficiency within building
 - Achieved increasing levels of energy performance above prerequisite standards
 - Included commissioning to ensure building was designed, constructed, and calibrated to operate as intended
 - Recycled or reused 95% of construction waste
 - Used recycled or rapidly renewable products whenever possible
 - Used materials manufactured locally whenever possible
 - Used low-emitting materials such as carpet, paint, adhesives and composite wood
 - Ensured high indoor air quality through construction process and monitoring
 - Building is used as an example and teaching tool for others, tours given often

Encouraging adoption of sustainable practices among customers, suppliers and/or peers

- Sustainability Coordinator has made presentations to American Public Works Assn., Oregon Municipal Finance Officers Assn., Bull Run Water Mgrs, American Water Works Assn., Finance Officers Group of Washington and Clackamas Counties, Natural Step and others

Community service and civic involvement

- Underground storage tanks used when possible to minimize environmental impact and maintain natural look of area
- Employees allowed company time to participate in SMART (Start Making a Reader Today) Reading Program
- Bike racks provided for customers and employees
- Annual employee-supported holiday donations coordinated for local non-profit groups
- Conservation programs, educational fairs, and other community events attended
- Minority/Women owned and Emerging Small Business status taken into account in purchasing
- Green Team Resource book available for employee use

Promoting social equity

- Continuing education reimbursement provided to employees
- Education and training opportunities provided on- and off-site

- Employee suggestion rewards offered to foster creativity
- Alternative “9/80” work schedule employed, giving employees every other Friday off
- Earlier work hours to keep employees off the road during heaviest commuter times
- Myriad of benefits offered to employees: vacation, sick and comp time, health/dental/vision/life/disability insurance, PERS & 401K, Section 125 options
- Employee Assistance Program in place for employees
- Clothes allowance for field staff with mandatory uniforms that allows for personal preferences
- Sustainability Steering Committee and Wellness, Safety, Green Team and Employee committees comprised of employees from throughout the organization to encourage participation in decision making processes

Sustainable Food Systems

- ‘Family-style’ meeting lunches served instead of individual servings
- Coffee grounds, fruit & vegetable scraps, tea bags, etc. composted on-site

Summary

We have found that continual education, especially from different angles, by different people, and using different media, words and examples is essential to involving as many people as possible and embedding sustainability into District culture. It is important to prepare and present a solid business case, taking into account the economic, as well as social and environmental, aspects of any initiative. Many barriers can be overcome with education and holistic thinking – we may spend more economically in one area, but we are saving in another. Seeking and utilizing input from all employees gets the buy-in necessary to effect positive change. And tweaking current processes and procedures instead of adding new ones is always preferable.

Tualatin Valley Water District has far to go to achieve full sustainability, but the District has made many great, and often unique, strides in the last few years. It is exhilarating to see sustainability becoming not just what we do but who we are.

Appendix II Process Mapping Results

Nineteen Work Groups were convened, with the following work processes identified:

Accounting

- Accounts Payable
- Accounts Receivable
- Payroll

Administration

- Info In/Paper Out
- Archiving/Records Keeping
- Catering/Meetings (in house)
- Travel/Lodging Arrangements
- Document Distribution
- Outgoing Mail
- Copying/Faxing

Billing

- Meter/Hydrant Sales & Services
- Billing/Collections
- Account maintenance/adjustment
- Quality Control & Service
- Software usage/changes
- Communication (IGAs, public, TVWD staff)

Building & Grounds

- HVAC - Electrical/ mechanical
- Event set-up, furniture moving & Storing
- Misc. equipment, office repairs/ fabrication
- Janitorial, maitn- supplies, recycle
- Roof & Gutter Maint
- Painting
- Reservoir Maintenance
- Site Maintenance
- Customer leak/ grounds repair
- Equipment repairs
- Contractor coordination

Construction Crew

- Construction Upgrades
- Hydrant install - Relocates, new
- Main breaks/Service Leaks
- Service/BO install
- Valve Install
- Vaults

Customer Services

- Payments and collections
- Account maintenance
- Cashiering, cash handling
- Customer Inquiries

Distribution

- Monitoring
- Locating
- Rounds
- Repairs/Maintenance
- Telemetry Upgrades
- Security/Construction Upgrades
- Contract Administration (subcontractors)
- Meetings/Trainings

Engineering

- Construction Inspections
- Backflow
- GPS
- Customer Service/Problem Solving/Emergencies
- Hydrant Permits
- Fireflow tests
- Mapping
- Water Line Upgrades
- Engineering (Overview planning, JWC, etc.)
- Meter sales
- Plan review
- GIS
- Archiving
- Graphics services
- Mail services
- Customer service support (fill-in)
- Annexations

Field Customer Service

- Repairs/Work Orders
- General Customer Calls
- Testing Small Meters
- Installations
- Routing/Mapping new services

Finance & Purchasing

- Inventory Control
- Purchasing
- Yard and Warehouse Maintenance
- Surplus and Scrap Disposal
- Financial Planning, Budgeting and Special Projects
- Sustainability Planning
- Other Support to TVWD Organizations

Fleet

- Preventive Maintenance
- Coordinate Fuel System
- Ordering Parts/supplies
- Fabrications
- Paint
- Outfitting new vehicles
- Small equipment maint.
- Emergency repairs

Human Resources

- Recruitment
- Performance Issues
- Events
- Benefits
- Documents/Paperwork
- Travel
- Use of technology

IT/G4 (Computers, Printers and Phone System)

- Design Networks
- Design Programs
- Automate Processes
- Design Processes (e.g. online billing)
- Purchasing
- Hardware Support - Upgrades and New Systems
- Development of Systems

Maintenance Crew

- Sub-division service installs
- Installs - service,hydrants,sample stations, blow offs
- Leak Repair - non- emergency
- Large meter drop/change outs

Meter Readers

- Meter Reading

Office of Community and Intergovernmental Relations

- Events
- Items ordered
- Correspondence
- Verbal communication- phone
- Verbal communication - in-person
- Electronic communication (website, phone message, email)
- Rebates
- Audits
- Desktop Research
- In-person Gatherings

Safety & Emergency Ops

- Program development
- Monitoring standards - federal, local, district
- Conduct meetings/training
- Maintain district records
- Conduct job site inspections/ building
- Implement programs
- Conduct training exercises / design
- Incident reports
- Capital improvement program
- Accident/ damage investigation (incident)
- Networking, partnerships, professional organizations
- Project coordination
- Ensuring emergency preparedness (Audit/test)
- Maintaining communication system
- Access control
- Vendor relations/purchasing & contract administration
- Settlement negotiations
- Incident Command System

Valve crew

- Mapping/locating
- Flushing
- Valve repairs
- Hydrant Maintenance and Installation
- Overlays/Road projects
- Vehicle Maintenance
- Meetings/Training

Water Quality

- Sampling
- On-line Meter Maintenance
- Portable Meter Maintenance
- Recordkeeping
- Flushing
- Customer Relations
- Meter and Sampling Station Installation
- Planning and Research
- Ordering Equipment and Supplies
- Reporting
- Special Projects

Sample of one process divided into substeps with inputs and outputs identified:

Meter Reading

INPUTS	Process: Meter Reading	OUTPUTS
	SubSteps	
computer ltron cradle/charger/unit paper (GB) printer electricity phone	Load Routes receive phone request printed copy of request	filed by Pete for 6 mo. then waste paper
paper printer	Print out cycles print copy of map, if needed sort requests into efficient order	wastepaper (2 GB copies) filed, then waste paper
vehicle fuel Personal Protective Equipment batteries paint wood stakes	Drive drive to site use locator to find service line paint markings	batteries vehicle emissions tires paint cans - recycled
phone vehicle fuel	Read meter talk to contractor if issues arise (might just show contractor location if raining and paint won't stay)	
paint paper door hangers	Door hangers, marking meter lids/curbs file requests sheets (with notes) for three months, then recycle paint markings	waste paper paint cans - recycled paint emissions (VOCs)
	Vehicle inspection & cleaning file requests sheets (with notes) for three months, then recycle	

Sustainable/efficient procedures of note already in place:

- Double up in vehicles when possible
- Working on electronic archiving of reports, plans, maps

New sustainable/efficient opportunities:

- Use 8.5x11 instead of Green Bar - use less paper
- Notify people in other ways besides door hangers

Below is a partial listing of inputs identified by District work groups. Inputs are ranked in the right column based on Natural Step System Conditions, cost, frequency of the activity and the degree of influence we have over purchasing another product.

TVWD - Work Groups		"The Natural Step" System Conditions						Cost	Subtotal	Frequency of Activity	Degree of Influence	Multiplied	RANKING
Work Group	Input	Extraction	Persistency	Toxicity	Biodiversity	Efficiency	Equity						
SafetyEmer	ear plugs	5	5	5	5	4	5	3	32	5	5	800	1
Maint	ear plugs	5	5	5	5	4	5	2	31	5	5	775	2
Const	blades	5	4	2	4	4	4	3	26	5	5	650	3
Fleet	filters	5	5	3	5	3	3	1	25	5	5	625	4
SafetyEmer	Safety glasses	5	5	5	5	4	5	2	31	5	4	620	5
Valve	markers	5	5	5	5	4	5	1	30	4	5	600	6
Eng	mechanical pencils	5	5	5	5	4	5	1	30	4	5	600	6
Eng	pens	5	5	5	5	4	5	1	30	4	5	600	6
OCIR	pens	5	5	5	5	4	5	1	30	4	5	600	6
Valve	Tape measure	5	5	5	5	4	5	1	30	4	5	600	6
Fleet	Tires	5	5	5	5	5	3	2	30	4	5	600	6
BldgGrnd	Blades (Plastic)	5	5	4	5	5	3	2	29	4	5	580	12
Const	batteries	5	5	4	5	5	3	1	28	4	5	560	13
Valve	batteries	5	5	4	5	5	3	1	28	4	5	560	13
Eng	CDs	5	5	4	5	5	3	1	28	4	5	560	13
CustSvc	air freshener	3	3	4	4	4	3	1	22	5	5	550	16
BldgGrnd	garbage bags	5	5	5	5	4	5	2	31	4	4	496	17
Fleet	lubricants	5	5	5	5	5	3	3	31	4	4	496	17
Valve	PVC	5	5	5	5	4	5	2	31	4	4	496	17
Fleet	Transmission Fluid	5	5	5	5	5	3	3	31	4	4	496	17
SafetyEmer	raingear	5	5	5	5	4	5	4	33	3	5	495	21
SafetyEmer	gloves-latex	5	5	5	5	4	5	1	30	4	4	480	22
Fleet	Light bulbs	4	5	4	5	2	3	1	24	4	5	480	22
District	Travel-commuter	5	5	4	5	5	4	4	32	5	3	480	22
FinPurch	air freshener	3	3	4	4	4	3	2	23	4	5	460	25
FinPurch	markers	5	5	5	5	4	5	1	30	3	5	450	26
FinPurch	mechanical pencils	5	5	5	5	4	5	1	30	3	5	450	26
Valve	pens	5	5	5	5	4	5	1	30	3	5	450	26
Admin	Utensils-plastic	5	5	5	5	4	5	1	30	3	5	450	26
Fleet	gasoline	5	5	5	5	5	3	1	29	5	3	435	30
MtrRdr	batteries	5	5	4	5	5	3	1	28	3	5	420	31
Valve	Buckets	5	5	4	5	5	3	1	28	3	5	420	31
IT-G4	CDs	5	5	4	5	5	3	1	28	3	5	420	31
OCIR	CDs	5	5	4	5	5	3	1	28	3	5	420	31
Fleet	Sparkplugs	5	5	3	5	3	3	3	27	3	5	405	35
CustSvc	fan/heater	5	5	3	5	3	3	2	26	3	5	390	36
FCS	leak kits	5	5	3	5	3	3	2	26	5	3	390	36
Eng	Measuring tape	5	5	3	5	3	3	2	26	3	5	390	36
SafetyEmer	rubber boots	5	5	5	5	5	3	4	32	3	4	384	39
CustSvc	Kleenex	1	1	2	2	4	3	2	15	5	5	375	40
CustSvc	Paper	2	1	2	3	3	2	2	15	5	5	375	40
CustSvc	paper clips	5	5	3	5	3	3	1	25	3	5	375	40
BldgGrnd	belts	5	5	4	5	5	3	4	31	3	4	372	43
SafetyEmer	plastic barricades	5	5	5	5	4	5	2	31	3	4	372	43
Const	safety glasses	5	5	5	5	4	5	2	31	3	4	372	43
SafetyEmer	safety vests	5	5	5	5	4	5	2	31	3	4	372	43
Fleet	Brakes Pads and Shoes	5	4	3	3	3	3	3	24	3	5	360	47
OCIR	drip gauge	5	5	5	5	4	5	1	30	3	4	360	47
Valve	O' rings	5	5	5	5	4	5	1	30	4	3	360	47
Valve	propane	5	5	5	5	5	3	2	30	3	4	360	47

TVWD - Work Groups		"The Natural Step" System Conditions						Cost	Subtotal	Frequency of Activity	Degree of Influence	Multiplied	RANKING
Work Group	Input	Extraction	Persistency	Toxicity	Biodiversity	Efficiency	Equity						
Const	bleach	4	3	5	4	3	3	1	23	3	5	345	51
Const	gloves-leather	1	3	3	3	3	3	1	17	5	4	340	52
SafetyEmer	gloves-leather	1	3	3	3	3	3	1	17	5	4	340	52
Maint	rain gear	5	5	5	5	4	5	4	33	2	5	330	54
Fleet	fuses	5	5	5	5	4	5	3	32	2	5	320	55
CustSvc	sanitizing wipes	2	1	3	3	3	3	1	16	4	5	320	55
Valve	Sand	5	5	1	4	1	3	2	21	3	5	315	57
Valve	small tools	5	5	3	5	3	3	2	26	3	4	312	58
Valve	Valve cans (boxes), C.I. and	5	5	3	5	3	3	2	26	4	3	312	58
Admin	Containers, Food, Plastic	5	5	5	5	4	5	2	31	2	5	310	60
SafetyEmer	dust masks	5	5	5	5	4	5	2	31	2	5	310	60
FinPurch	Paper	5	5	5	5	4	5	2	31	2	5	310	60
Fleet	belts	5	5	4	5	5	3	3	30	2	5	300	63
Const	cold patch	5	5	4	5	2	2	2	25	4	3	300	63
CustSvc	correction tape	5	5	5	5	4	5	1	30	2	5	300	63
Const	diesel	5	5	5	5	5	3	2	30	5	2	300	63
Maint	diesel	5	5	5	5	5	3	2	30	5	2	300	63
OCIR	foam core	5	5	5	5	5	3	2	30	2	5	300	63
HR	frames	2	3	4	3	3	3	2	20	3	5	300	63
Valve	fuel	5	5	5	5	5	3	2	30	5	2	300	63
MtrRdr	gasoline	5	5	5	5	5	3	2	30	5	2	300	63
BldgGrnd	Light bulbs	4	5	3	5	2	3	3	25	3	4	300	63
CustSvc	markers	5	5	5	5	4	5	1	30	2	5	300	63
Eng	markers	5	5	5	5	4	5	1	30	2	5	300	63
Const	mechanical pencils	5	5	5	5	4	5	1	30	2	5	300	63
WQ	mechanical pencils	5	5	5	5	4	5	1	30	2	5	300	63
WQ	Office Supplies-plastic	5	5	5	5	4	5	1	30	2	5	300	63
CustSvc	Paper	2	1	2	3	3	2	2	15	4	5	300	63
CustSvc	Paper	2	1	2	3	3	2	2	15	5	4	300	63
CustSvc	Paper	2	1	2	3	3	2	2	15	5	4	300	63
CustSvc	Paper	2	1	2	3	3	2	2	15	4	5	300	63
CustSvc	Paper	2	1	2	3	3	2	2	15	5	4	300	63
CustSvc	Paper	2	1	2	3	3	2	2	15	5	4	300	63
BldgGrnd	paper products	2	1	2	3	3	2	2	15	5	4	300	63
Fleet	Penetrating oil	5	5	5	5	5	3	2	30	2	5	300	63
Acct	pens	5	5	5	5	4	5	1	30	2	5	300	63
Const	pens	5	5	5	5	4	5	1	30	2	5	300	63
SafetyEmer	pens	5	5	5	5	4	5	1	30	2	5	300	63
Valve	rubber	5	5	5	5	5	3	2	30	2	5	300	63
CustSvc	scotch tape	5	5	5	5	4	5	1	30	2	5	300	63
Eng	scotch tape	5	5	5	5	4	5	1	30	2	5	300	63
Valve	Stencils	5	5	5	5	4	5	1	30	2	5	300	63
Admin	Tapes	5	5	5	5	4	5	1	30	2	5	300	63
Admin	Toner	5	5	5	5	4	5	1	30	2	5	300	63
OCIR	zip lock bags	5	5	5	5	4	5	1	30	2	5	300	63
Valve	Mineral oil	5	5	5	5	5	3	1	29	2	5	290	96
CustSvc	rubber bands	5	5	5	5	5	3	1	29	2	5	290	96
SafetyEmer	hard hats	5	5	5	5	4	5	3	32	3	3	288	98
District	Travel-air	5	5	4	5	5	4	4	32	3	3	288	98
BldgGrnd	batteries	5	5	4	5	5	3	1	28	2	5	280	100
Distn	batteries	5	5	4	5	5	3	1	28	2	5	280	100
Eng	Batteries	5	5	4	5	5	3	1	28	2	5	280	100
Maint	batteries	5	5	4	5	5	3	1	28	2	5	280	100
WQ	batteries	5	5	4	5	5	3	1	28	2	5	280	100
CustSvc	CDs	5	5	4	5	5	3	1	28	2	5	280	100
Const	gloves-fabric	1	2	2	2	3	3	1	14	5	4	280	100
Eng	wood pencils	1	2	1	3	3	3	1	14	4	5	280	100

Appendix III Issues and Challenges in Key Areas

1. Water

- Amount used & growth trends
- Cost
- Sources: Bull Run, etc.
- Quality or purity measure
- Current efficiency measures
- Output issues:
 - Product distributed
 - Product “lost” (evaporation, etc.)
- End of life disposal: storm drains, ground disbursement, etc.

2. Energy and Transportation

- Electricity
 - Amount used & growth trend
 - Cost
 - Source composition: renewable, fossil fuel, etc
 - Current efficiency measures
- Fuel
 - Amount used & growth trend
 - Cost
 - Source composition: renewable, fossil fuel, etc.
 - Current efficiency measures
- Output issues:
 - Emissions: climate change, other air purity issues
 - Heat loss
 - Liquid fuel loss: spillage, evaporation, end-of-life disposal

Issues and Challenges in Key Areas, continued

3. Materials

- Types:
 - Chemicals
 - Metals
 - Piping
 - Tanks
 - Building/infrastructure related
 - Wood
 - Electronics
 - Paper
 - Plastics
 - Misc. supplies
- Amount used & growth trends
- Costs
- Output issues:
 - Percent used in final product
 - Amount recycled or other by-products
- Amount sent to landfill

4. People

- Number employed
- Skill levels required
- Compensation and benefits
 - Costs
 - Vs. “Human Needs” (to be defined; i.e., living wage? Portland area cost of living?)
- Employee productivity
- On-going training/education costs
- Job satisfaction level (to be defined)
- People “loss”
 - Absenteeism
 - Turnover

5. Communications

- Leadership in promoting sustainability to community outside TVWD
- Sustainability in bigger picture than water provider (watershed)
- Collaboration/partnering with others
- Sustainability focus obvious in all communication we send out