Climate Change Response 2010 Performance

Solid Waste Division (SWD)
Climate Team Report Addendum

December 20, 2011

Solid Waste Division Management Team (SWDMT)

Kevin Kiernan, Director
Terri Hansen, Assistant Director
Ann Berrysmith, Finance and Administration Manager
Jeff Gaisford, Recycling and Environmental Services Manager
Debra Hillary, Human Resource Service Delivery Manager
Victor Okereke, Engineering Services Manager
Thea Severn, Planning and Communications Manager
Dean Voelker, Operations Manager
Diane Yates, Intergovernmental Relations Liaison

SWDMT Sponsors

Jeff Gaisford
Thea Severn

Climate Team Co-Leads

Josh Marx, Recycling and Environmental Services
Kathy Wright, Planning and Communications

Climate Team Members

Terri Barker, Engineering Services
Nori Catabay, Recycling and Environmental Services
Clinton Christine, Operations
Lisa Huntley, Planning and Communications
Victor Medina, Operations
Ken Stephenson, Operations
Dwin Ugwoaba, Engineering Services

Performance Measures Advisor

Lucy Auster, Project Manager

Report Contents

Background and Purpose

Background

The first Solid Waste Division (SWD) Climate Team Report, Responding to Climate Change, was published in 2010 and identified current division actions that may affect the climate or address potential effects of climate changes on our facilities or operations. That report did not include targets, goals, or data to measure the effectiveness of these actions in terms of climate change response, but stated the next step for the team was to help SWD establish targets, goals, and measurements, and to collect data in 2010-2011 to determine whether we are achieving our goals.

The Solid Waste Division Management Team approved continued division climate change response efforts in 2011 to implement the following four team recommendations contained in the report, dependant upon available resources.

- Identify, establish and clearly define performance measures, targets, and milestones for division climate response actions
- Create a system to measure and monitor outcomes for division climate response actions
- Identify funding or resource needs and recommend possible sources to SWDMT in order to:
  - Accomplish Climate Team objectives
  - Take advantage of opportunities to implement division mitigation or adaptive strategies
- Communicate SWD Climate Response Action Information through the use of:
  - SWD and DNRP Annual Climate Reports
  - Web Pages
  - Division-wide newsletters

Purpose

This report provides the performance measures, targets and 2010 results for seven of the actions included in the 2010 report. During 2011 some members of the team worked with other division staff to identify currently collected data that could be used to determine the success of actions described in the 2010 report. Climate change response performance measures were selected based on the available data. Updated summary pages for each of these actions are included in this report which include the performance information. Several other actions undertaken by the division in 2011 to address climate change are also highlighted.

GHG Countywide Inventory Project

The division co-led a countywide project to inventory community greenhouse gas emissions. The project counted emissions using two methods and produced a measurement framework to track emissions for use in the future. The information gleaned in the project updates previous estimates, helps to track and measure goals, and identifies sources of emissions that King County and the broader community can influence to mitigate the effects of climate change.

The first method used was the traditional "geographic or production" accounting approach, which counts direct emissions occurring within King County's boundary and electricity occurring outside King County. Using this method, 23 million metric tons of emissions were counted and compared to the 2003 inventory, indicating both an estimated 5% increase in emissions at a time when population rose approximately 6% and that the waste sector contribution to emissions remained less than 1% of the total countywide emissions.

The second method was a new ground breaking "consumption" approach, which counts all emissions resulting from the "final demand" of residents, governments and business investment in King County, regardless of where those emissions occur. Emissions are counted from goods and services produced and consumed in the county as well as those consumed within the county, but produced outside the county. However, emissions from goods and services produced in the county, but consumed outside the county are not counted.

This new method estimated more than 55 million metric tons of emissions, considerably increasing emissions attributable to our region and more than doubling those counted in the traditional inventory. This new approach draws attention to upstream emissions occurring as a result of the "consumption" of food, goods and services, further emphasizing the significance of waste reduction and recycling efforts such as collection, product stewardship, sustainable consumption and green building.

Leadership Training

The climate team provided training for about forty members of the Solid Waste Division Leadership Team to create a common understanding of current climate change efforts. The Leadership Team members were presented with an introduction to climate science, a summary of the regional impacts of climate change, current county climate policy and directives, an overview of what other departments and divisions are doing and were brought up to date on the activities of the climate team and the contents of the report.

Climate Change Website

The Recycling and Environmental Services (RES) section developed a series of public web pages to help visitors understand the connections between "stuff" and climate change and what can be done to minimize impacts. The site highlights the fact that products and services that we all purchase, use and throw away have a significant impact on the climate. These web pages also help visitors learn more about what SWD and other King County agencies are doing to address climate change.

Greenhouse gas emissions result from the significant energy required during all stages of a product's life, beginning with resource extraction and farming, then manufacturing and processing, transportation and use, and finally disposal. These emissions can be reduced by purchasing decisions that reduce or prevent the use of materials, product "end of life" decisions to reuse or recycle, and the division's waste management and facilities operation decisions and practices such as landfill methane capture and energy conversion.

Every day we are faced with many consumption decisions. Each decision has a broader impact on the climate. By understanding the connection between materials, waste and climate change, we can make smarter consumption decisions that will help reduce climate impacts.

http://your.kingcounty.gov/solidwaste/climate/index.asp

2010 Performance Summaries

The following pages address the division's actions responding to climate change and their results. The division tracks the results of seven climate change responses. A one page summary of each of these actions is presented below. Results are presented as either indicators or performance measures. SWD distinguishes between performance measures and indicators based on the degree of the division's influence over outcomes. Indicators are measures of conditions in the community that are affected by SWD programs, but also by many other things. Performance measures demonstrate the extent to which SWD programs are achieving their stated targets of accomplishment.

Buffer / Vegetation Planting at Closed Landfills

Objective:

Lead Staff: *Anne Holmes/Isabel McClure*

Reduce emissions and fuel consumption by reducing infiltration of water and the need for off-site handling and to maximize sink potential at closed landfills.

Description:

Tree planting on the combined 33 acres of land at the Duvall and Puyallup/Kit Corner closed landfills began in 1999. Washington Conservation Corps (WCC) and Community Work Program (CWP) crews began planting poplars in 1999 to establish a vegetative cover. In 2004, these crews and Parks Division employees began maintaining the cover with infill planting of conifers. The vegetation creates a "sink" by capturing carbon dioxide through the process of photosynthesis; converting it into organic compounds using the energy from sunlight. Parks Division and Facilities Management Division employees as well as the WCC and CWP crews maintain the trees to improve survival rates. Conifers will continue to be planted to increase year round interception.

Performance

Measure **Metric tons of carbon dioxide equivalent (MTCO2E) sequestered through buffer/vegetation planting at closed landfills.**

Year	Phase	Target	Result	Expectations
2011	Implementing	769 MTCO2E sequestered		
Status:			Notes: *Cumulative target total through 12/31/11 is 3,264 MTCO2E sequestered*	
2010	Completed	620 MTCO2E sequestered	620 MTCO2E sequestered	Achieved
Status: *Cumulative total through December 2010 is 2,171 MTCO2E sequestered*			Notes:	

Milestones

Major Milestones	Status	Qtr - Yr
300 conifers planted at the Duvall closed landfill and 200 conifers planted at the Puyallup closed landfill	Complete	Q4-09
500 conifers planted at the Duvall closed landfill and 300 conifers planted at the Puyallup/Kit Corner closed landfill	Complete	Q4-10
200 conifers planted at Duvall closed landfill and 70 conifers, 150 deciduous and 300 shrubs planted at the Puyallup/Kit Corner closed landfill	On Schedule	Q4-11

Landfill Gas Controls (Cedar Hills Regional Landfill)

Objective:

Lead Staff: *Mizanur Rahman*

Maximize collection and utilization of the approximately 14 million cubic feet of landfill gas generated daily in the Cedar Hills Regional Landfill (CHRLF) by preventing fugitive (escaping) gas emissions and supplying landfill gas to the Bio Energy (Washington), LLC (BEW) gas-to-energy plant.

Description:

Cedar Hills Regional Landfill operates and maintains a state-of-the-art landfill gas control system. The division gas crew monitors gas flow rates and gas compositions at five gas flare inlet and outlet points daily, the 530 gas extraction well points biweekly, and 62 migration gas probes monthly. In addition, the crew quarterly monitors nearly 260 acres for surface emissions in eight closed areas. The crew also monitors odor throughout the CHRLF site and perimeter roads twice daily and the surrounding neighborhood daily/weekdays. A Supervisory Control and Data Acquisition (SCADA) system is used to record the gas data. CHRLF regularly reports monitoring results in monthly deviation reports, quarterly surface emissions reports, and in multiple bi-annual and annual emissions compliance reports.

Performance

Measure **Percent of completed landfill surface emissions monitoring actions that demonstrate compliance with permit standards for landfill gas surface emissions for the Cedar Hills Regional Landfill.**

Year	Phase	Target	Result	Expectations
2011	Operational	100%		
Status:			Notes:	
2010	Operational	100%	100%	Achieved
Status:			Notes:	

Milestones

Major Milestones	Status	Qtr - Yr
Complete gas collection pipeline for new areas	Ongoing	
Complete the gas delivery system for Bio Energy Washington	Complete	Q4-09
Complete Phase 1 flare rehabilitation (2 flares)	Complete	Q3-10
Complete Cedar Hills Regional Landfill 2010 Greenhouse Gas Report	Complete	Q3-11
Complete Phase 2 flare rehabilitation (2 flares)	On Schedule	Q4-11
Complete control automation of the flare station and gas delivery	Extended	Q1-12

Landfill Gas-to-Energy (Cedar Hills Regional Landfill)

Objective:

Lead Staff: *Mizanur Rahman*

Maximize the amount of high quality gas (methane content > 45%; Nitrogen content < 10%) landfill gas collected from the Cedar Hills Regional Landfill Well Field and made available for use as a renewable energy resource.

Description:

The Solid Waste Division collects and supplies landfill gas generated by decomposing garbage at Cedar Hills Regional Landfill to an on-site gas-to-energy plant developed and operated by Bio Energy (Washington), LLC (BEW). The plant converts the landfill gas to clean-burning natural gas. BEW expects the plant to supply renewable energy in the form of either high BTU natural gas or electricity through Puget Sound Energy (PSE) to the residents of the Seattle area for the next twenty plus years. BEW, with full capacity operation, will be able to deliver about 5 to 6 million cubic feet of high BTU gas every day to PSE. This amount of gas is enough to provide heating services to about 24,000 homes.

Performance

Measure **Standard Cubic Feet (SCF) of high quality landfill gas (methane content > 45%; Nitrogen content < 10%) available for delivery to the Landfill Gas-to-Energy facility as a percentage of LFG collected from the Cedar Hills Regional Landfill Well Field annually.**

Year	Phase	Target	Result	Expectations
2011	Operational	100% of LFG collected		
Status:			Notes:	
2010	Operational	100% of LFG collected	100%	Achieved
Status:	*BEW purchased a total of 1,987,303 MMBTU of landfill gas from CHRLF in 2010, equivalent to approximately 3.78 billion scf, and began commercial operation on October 30, 2010.*		Notes: *4,941,729,3231 SCF of LFG, as measured at North Flare Station, was collected from the CHRLF field and available for delivery to LFGTE facility in 2010. Landfill gas purchased from CHRLF is measured in MMBTUs.*	

Milestones

Major Milestones	Status	Qtr - Yr
Building Permit Received 2/25/09	Complete	Q1-09
Occupancy permit received 3/29/10	Complete	Q1-10
BEW performed sound mitigation activities	Complete	Q1-10
Test facility equipment and operating systems, and deliver a limited quantity of gas to the adjacent natural gas pipeline	Complete	Q3-10
100 percent commercial operation of gas facility	Complete	Q4-10

Organics Recycling Collection

Objective:

Lead Staff: *Gerty Coville*

Increase county single family household participation in curbside collection of yardwaste, food, and food-soiled paper recycling by improving awareness of climate, environmental and cost benefits.

Description:

The organics recycling collection program expanded the county's established and very successful residential yardwaste curbside collection program by adding food scraps and food soiled paper collection service. The organics recycling collection program encourages diverting food scraps and food soiled paper, combined with yardwaste, from garbage to composting. Compost improves soil and plant health, and sequesters carbon when applied to residential and commercial landscapes. The program includes collection infrastructure development, in addition to education, outreach and promotion through partnerships.

Performance

Indicator **Metric tons of carbon dioxide equivalent (MTCO2E) emissions reduced as a result of single family organics collection and composting.**

Year	Phase	Target	Result	Expectations
2011	Operational	100% of yard waste recycled; 14% of single family food scraps recycled expressed in MTCO2E		
Status:		Notes:		
2010	Operational	100% of yard waste recycled; 14% of single family food scraps recycled expressed in MTCO2E	95% of yardwaste recycled; 12% of SF foodscraps = 12,831 MTCO2E	Below
Status:		Notes:	*Reductions will continue to increase as participation in food waste programs increases.*	

Milestones

Major Milestones	Status	Qtr - Yr
100 percent curbside food scrap collection available to single family King County service area garbage customers.	Complete	Q1-09
Incorporate climate change messaging into campaign Key Messaging	Ongoing	Q4-11
Produce the second Organics Waste Characterization Study with analysis of GHG Q1-10 impacts	On Schedule	Q1-12

Recycling Education Program

Objective:

Lead Staff: *Jeff Gaisford*

Facilitate significant public behavior changes that reduce climate change impacts by increasing recycling and reducing consumption, waste and pollution.

Description:

Educational and promotional programs incorporate climate change information to increase awareness of the impacts of individual consumption and disposal decisions for the purpose of influence recycling and purchasing behavior that will reduce GHG emissions.

- **Link-Up facilitates partnerships to develop new infrastructure project uses for recycled materials, thus reducing GHG emissions resulting from raw material production**
- **EcoConsumer uses a multi-media approach to increase awareness of consumer purchasing decision impacts on the climate**
- **Master Recycler Composter uses volunteer outreach to motivate people to divert organic waste entering the landfill to reduce and sequester GHG emissions**
- **Green Schools assists schools and districts to initiate and continue practices that recycle, conserve, and reduce waste**
- **School EcoConnection Workshops teach secondary school children about solid waste connection to climate change**
- **Recycle More promotes curbside recycling to reduce climate change impacts**

Performance

Indicator **Metric tons of carbon dioxide equivalent (MTCO2E) emissions reduced as a result of single-family (SF) curbside collection and recycling.**

Year	Phase	Target	Result	Expectations
2011	Operational	55% SF recycling rate		
Status:			Notes: *Per Matt K Edit*	
2010	Operational	55% single-family recycling rate	54% single-family recycling rate = 188,977 MTCO2E	Below
Status:			Notes: *Per Matt K Edit*	

Milestones

Major Milestones	Status	Qtr - Yr
Facilitated recycled asphalt shingles (RAS) pilot paving project partnership	Complete	Q4-09
Developed Climate Change web pages	Complete	Q2-11
Potential for RAS use in HMA on a permissive basis TBD by Roads	On Schedule	Q4-12
Include climate change messages during training and school assemblies	On Schedule	Ongoing
Include climate change messages in public presentations and publications	On Schedule	Ongoing

Reduce Energy Use at Stations and Landfills

Objective:

Lead Staff: *Dean Voelker/Beth Humphreys*

Use design features, new technology, engineering controls, and employee observation, innovation, and collaboration to reduce energy consumption and greenhouse gas emissions, and create savings in operational costs.

Description:

The countywide Energy Plan requires that county agencies, by the year 2012, reduce energy use by 10 percent compared to energy used in 2008. SWD is using design features, technological solutions, engineering controls, and employee innovation and collaboration to reduce energy use at division facilities. Examples include solar panels to supply power, rain-water tanks to capture water for floor wash-downs and toilets, nightlights to replace standard lights for nighttime safety, minimizing run times for aerator pumps, and automatic shut-off switches for garbage compactors.

Performance

Measure **Million British Thermal Units (MMBTUs) used at King County's eight transfer stations and the Cedar Hills Regional Landfill.**

Year	Phase	Target	Result	Expectations
2012		29,277 MMBTU		
Status:			Notes:	
2011	Implementing	29,876 MMBTU		
Status:			Notes:	
2010	Implementing	30,526MMBTU	29,896 MMBTU	Achieved
Status:			Notes: *5.9% decrease from base year*	
2009	Implementing	31,175 MMBTU	31,746 MMBTU	Below
Status:			Notes: *2.2% decrease from base year*	
2008	Implementing	31,825 MMBTU	34,912 MMBTU	Below
Status:			Notes: *7.5% increase above base year. Shoreline Transfer Station opened February 2008*	
2007			32,474 MMBTU	Achieved
Status:			Notes: *Base year for Energy Planning Goals*	

Milestones

Major Milestones	Status	Qtr - Yr
Ensure that all systems at the new Bow Lake Recycling and Transfer Station are operating as designed and that appropriate staff is trained to efficiently and effectively operate them.	Pending	Q3-12
Meet the Energy Plan goal of 10 percent reduction in energy use by 2012.	On Schedule	Q4-12

Reduce Vehicle and Equipment Impacts

Objective:

Lead Staff: *Dean Voelker*

Minimize environmental impacts and reduce GHG emissions, while operating an efficient fleet of vehicles and equipment.

Description:

SWD strives to reduce the emissions and total impact of its fleet. Strategies include establishing policies and allocating resources to purchase and maintain fuel efficient and environmentally preferable vehicles and equipment. Examples include retrofitting older vehicles to maintain EPA compliance by installing diesel catalytic converters, using biodiesel made from renewable resources, and transitioning to compactors at the transfer stations capable of compressing larger quantities of waste into each load, reducing truck trips to the landfill.

Performance

Indicator **Percent of preventive maintenance checks performed on King County Solid Waste Division small, over the road, and construction vehicles completed per original equipment manufacturer requirements.**

Year	Phase	Target	Result	Expectations
2011	Operational	100 percent		
Status:			Notes:	
2010	Operational	100 percent	100 Percent	Achieved
Status:	*Designed a new tipping system at the Cedar Hills landfill that significantly reduced the time to unload garbage and made major savings in equipment repair and tire damage.*		Notes:	

Milestones

Major Milestones	Status	Qtr - Yr
Purchased five Class 8 trucks model year 2009 with Diesel Particulate Filters compliant with Tier III emissions	Complete	Q3-09
Bow Lake SSI (Shredding Systems, Inc. Wilsonville, Oregon) compactors in use late 2011or 2012	On Schedule	Q4-11