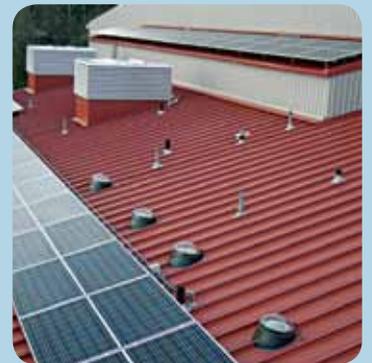


Responding to Climate Change

2009-2010

Solid Waste Division
Climate Team Report



King County

Department of
Natural Resources and Parks
Solid Waste Division

Solid Waste Division

Solid Waste Division Management Team

Kevin Kiernan, Director
Terri Hansen, Assistant Director
Ann Berrysmith, Finance and Administration Manager
Jeff Gaisford, Recycling and Environmental Services Manager
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Dean Voelker, Interim - Assistant Operations Manager

SWDMT Sponsors

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Climate Team Co-Leads

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

Climate Team Members

Terri Barker, Engineering Services
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Beth Humphreys, Recycling and Environmental Services
Lisa Huntley, Planning and Communications
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Ken Stephenson, Finance and Administration

Team Objective

The Solid Waste Division (SWD) Climate Team will facilitate the implementation of SWD greenhouse gas (GHG) emission mitigation strategies and climate change adaptive strategies and help to make climate change considerations part of SWD institutional thinking.

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Background

Climate Change is the term used to describe changes in long-term trends in average weather patterns, including the frequency, duration, and intensity of wind and snow storms, cold weather and heat waves, drought, and flooding. The Solid Waste Division (SWD) formed a climate team in 2009 to provide leadership and to coordinate responses to climate change within SWD and with the Department of Natural Resources and Parks (DNRP) Climate Team.

Beginning with an executive order in March 2006, King County committed to reducing greenhouse gas (GHG) emissions and preparing for anticipated affects of climate change. Planning for climate change requires consideration of both how our actions may cause GHG emissions and how climate changes may affect our facilities and operations. In addition to an intergovernmental team focusing on climate change, DNRP and other county departments began forming climate teams and looking at their operations through a 'climate change lens'.

Both the King County 2007 Climate Plan and the 2008 Comprehensive Plan called for the county to collaborate with other local governments and established a goal to reduce the amount of GHG emissions by at least 80 percent below 2007 levels by the year 2050, as well as reduce operational GHG emissions by at least 6 percent below 2000 levels by 2010. While these plans established a broad policy framework for reducing GHGs and responding to climate change, SWD is responsible for developing strategies that address climate change related to solid waste management within the King County service area.

GHG emissions are generated by the production, distribution, and consumption of goods and services, as well as the resultant garbage and recyclables (solid waste). The GHG emission generated by solid waste and the systems used to manage it may come from waste decomposition in landfills, operation of vehicles and equipment, and energy expended for facility operation. The SWD's role, in the transfer and disposal of county garbage and recyclables, presents many opportunities to directly and indirectly affect GHG emissions reduction, sustainable consumption, and waste reduction. The division strives to minimize climate change impacts through operational practices, policies, planning, engineering, recycling, environmental services, and communications programs.

The SWD Climate Team is facilitating the implementation of division GHG emission mitigation strategies and climate change adaptive strategies, and helping to make climate change considerations part of SWD institutional thinking. Sponsorship of the SWD Climate Team by the Division management team demonstrates an understanding that through commitment to thoughtful, coordinated planning and programs, the Division can reduce its own carbon footprint, minimize cost and environmental harm through adaptive strategies, and support the GHG emission reductions by its customers.

Purpose

This report is the result of the first step taken by the SWD Climate Team to capture and summarize existing ongoing programmatic and project specific actions that address climate change currently underway within the Solid Waste Division. The purpose of this report is to describe how these actions, undertaken with primary objectives other than climate change, also respond to climate change. These actions may address climate change directly related to SWD operations or facilities, or indirectly through influencing the actions of others outside SWD, such as other governmental agencies or the public. This report does not include targets, goals, or data to measure the effectiveness of these actions in terms of climate change response. The next step for the team is to help SWD establish targets, goals, and measurements, and to collect data in 2010-2011 to report outcomes.

The actions described in this report are grouped by “Target Group” and “Intended Outcome”.

Division climate responses focus on three distinct “Target Groups”:

- SWD responses focus on actions where the outcomes are within SWD control, such as reducing vehicle and equipment impacts
- King County responses focus on leading efforts where the outcomes are shared or controlled by other parts of county government, such as the Countywide Green Building Team
- External responses influence changes to outcomes controlled by residents, businesses, and institutions throughout King County, such as organics recycling collection

Actions may focus the “Intended Outcome” on either preparing for anticipated affects of climate change or reducing emissions through mitigation, adaptation, sequestration, or a combination of these.

- Mitigation actions focus on reducing greenhouse gas emissions
- Adaptation actions prepare for or minimize the expected effects of climate change
- Sequestration actions store atmospheric carbon dioxide either through biological (e.g., plants and trees) or geological processes (e.g., storage in underground reservoirs)

This report contains:

- A list of current SWD climate response actions
- Highlights of specific actions of unique significance or interest
- Recommendations for 2010-2011 focus of SWD Climate Team efforts to enhance SWD’s ability to both meet county goals and contribute to meeting regional goals
- A list of basic climate change terms

Inventory of Current Response Actions

The following list of current division actions is sorted by both the “Target Group” and the “Intended Outcome”.

THE SOLID WASTE DIVISION CONTACT

Mitigation

- Landfill Gas ControlsDean Voelker
- Landfill Gas-to-Energy (Cedar Hills Regional Landfill) Mizanur Rahman
- Reduce Energy Use at Stations and LandfillsDean Voelker
- Reduce Vehicle and Equipment ImpactsDean Voelker

Mitigation and Adaptation

- New Transfer Station Design. Neil Fujii
- New Transfer Station Siting Neil Fujii

Sequestration

- Buffer / Vegetation Planting at Closed Landfills. Isabel McClure
- Cedar Falls Mulch Berms Anne Holmes/Isabel McClure

KING COUNTY GOVERNMENT CONTACT

Mitigation

- Consumption / Product Inventory Accounting Josh Marx

Mitigation and Adaptation

- Countywide Green Building Team Beth Humphreys

EXTERNAL CONTACT

Mitigation

- Product StewardshipLauren Cole
- Recycling Education Program. Jeff Gaisford
- Solid Waste Collection Fee and Service Incentives Bill Reed

Mitigation and Sequestration

- Organics Recycling Collection.Gerty Coville

Climate Response Highlights

During 2009 the Solid Waste Division undertook many actions to respond to climate change. One-page summary descriptions of these actions are included beginning on page 9 of this report and provide more detailed information. Following are highlights of these efforts.

SWD Division Climate Team

The division held its first climate team meeting in June 2009 with participation from across the division and the support of management team sponsors. The Climate Team developed a comprehensive list and compiled information about all of the things the division is currently doing to address climate

change concerns. In most cases these actions are also consistent with other environmental and economic goals. The team's information has improved coordination across sections, established a climate change resource library and database, and created a common understanding of current climate change efforts. The team has improved the division's ability to both track climate response efforts and provide information efficiently to the department and others when requested.

Landfill Gas Controls

The Cedar Hills Regional Landfill (CHRLF) operates and maintains a state-of-the-art landfill gas control system to maximize collection and utilization of the approximately 14 million cubic feet of landfill gas, currently generated daily by the landfill. This is accomplished by preventing fugitive (escaping) gas emissions and supplying landfill gas through a delivery system, completed in late 2009, to the Bio Energy (Washington), LLC (BEW) gas-to-energy plant. The Division gas crew monitors gas flow rates, composition, migration, and surface emissions. The monitoring indicates no migration of methane gas, surface emissions far below the allowable 500 parts per million (ppm), and a gas burn efficiency rate consistently over 99 percent, surpassing the minimum allowable 98 percent permit requirement. The CHRLF gas control system is compliant with and exceeds Clean Air Act, Title V regulatory requirements.

Reduce Energy Use at Stations and Landfills

Design features, technological solutions, and employee actions are reducing energy consumption and greenhouse gas emissions, and creating operational cost savings at the landfills and stations. In May 2009 for example, as a result of a collaboration between operations and engineering employees, Cedar Hills Regional Landfill began synchronizing all eight aerator pumps for the leachate ponds to provide proper aeration while minimizing run time. In just eight months of synchronized operation, the average monthly energy consumption by the aerators was reduced about 50 percent, resulting in a \$45,000 savings in the energy bill for 2009.

Reduce Vehicle and Equipment Impacts

In 2009 the division purchased five new Class 8 trucks with diesel particulate filters compliant with EPA Tier III emissions standards. The division also replaced two less efficient 1993 terminal tractors (trailer movers) with two 2009 terminal tractors with cleaner burning EPA Tier III engines, and eliminated two older less efficient sedans from the fleet, resulting in an increased use of existing hybrid cars, which are more fuel efficient and produce fewer GHG emissions. In addition, compactors at the new Bow Lake Transfer and Recycling Station, when placed into service in 2012, are expected to increase load efficiency and reduce the number of truck trips from the transfer station to the landfill by about one third.

Countywide Green Building Team

Buildings contribute significantly to greenhouse gas emissions. The Countywide Green Building Team, lead by division staff, encourages energy efficiency and the use of recycled, local, and lower-emitting materials. The team developed the Sustainable Infrastructure Scorecard, now required for all King County capital projects over \$750,000 that, by their size and scope, are disqualified from attaining Leadership in Energy and Environmental Design (LEED) certification. Project managers track project GHG emissions as part of the record keeping for the scorecard. These records increase the available data for assessing the success of GHG emission reduction strategies.

Product Stewardship

Product stewardship is a management strategy for conserving resources and minimizing waste throughout the lifecycle of a product by encouraging environmentally friendly product design, reuse, and recycling, and by shifting responsibility for product management and end-of-life costs from government and ratepayers to producers and users. In 2009, more than 7,449 tons of materials from King County were recycled through the public - private collaborative efforts of E-Cycle WA. And the King County Take-It-Back Network of private businesses, organizations, and retail stores collected and recycled 157,189 fluorescent bulbs and tubes, in addition to 76,851 televisions, computers, and monitors.

Organics Recycling Collection

The organics collection program added food scraps and food soiled paper collection, combining it with the established and very successful curbside collection of yard waste. The organics recycling collection program encourages diverting food scraps, food soiled paper, and yard waste away from disposal into composting. Compost improves soil and plant health, and sequesters carbon when applied to residential and commercial landscapes. Collection service for combined food scrap, food soiled paper, and yard waste recycling is now available to nearly 100 percent of King County single-family residents with curbside garbage service. The total for single family combined organics collected in 2009 in the King County service area was 137,439 tons.

Climate Team Recommendations for 2010-2011

The first task for the Climate Team was to identify current division actions that may affect the climate or address potential effects of climate changes on our facilities or operations. The next step is to identify specific climate related goals and determine whether we are achieving our goals. Therefore, the following Climate Team recommendations were approved by SWDMT for continued division climate change response efforts. The implementation of these recommendations is dependant upon available resources.

- 1 Identify, establish and clearly define performance measures, targets, and milestones for division climate response actions.
- 2 Create a system to measure and monitor outcomes for division climate response actions.
- 3 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
- 4 Communicate SWD Climate Response Action Information through the use of:
 - SWD and DNRP Annual Climate Reports
 - Web Pages
 - Division-wide newsletters

Terms

Adaptation: Actions that prepare for or minimize the effects of climate change.

Carbon (C): A naturally abundant nonmetallic element in all organic and many inorganic compounds, exists freely as graphite and diamond, and as a constituent of coal, limestone, and petroleum, capable of chemical self-bonding to form an enormous number of chemically, biologically, and commercially important molecules.

Carbon Dioxide (CO₂): A colorless, odorless, incombustible greenhouse gas, formed during respiration, combustion, and organic decomposition, and used in food refrigeration, carbonated beverages, fire extinguishers, and aerosols.

Carbon Dioxide Equivalent (CO₂e): The emissions of a gas, by weight, multiplied by its global warming potential (GWP)

Climate Change: Changes in long-term trends in the climate (average weather of a region), including frequency and intensity of storms, cold spells, and heat waves.

Emissions: The release of gases into the atmosphere.

Global Warming: The progressive gradual rise of the earth's average surface temperature, thought to be partially caused by increased concentrations of GHGs in the atmosphere.

Global Warming Potential (GWP): A system of multipliers devised to enable comparison of the cumulative global warming effects of different gases.

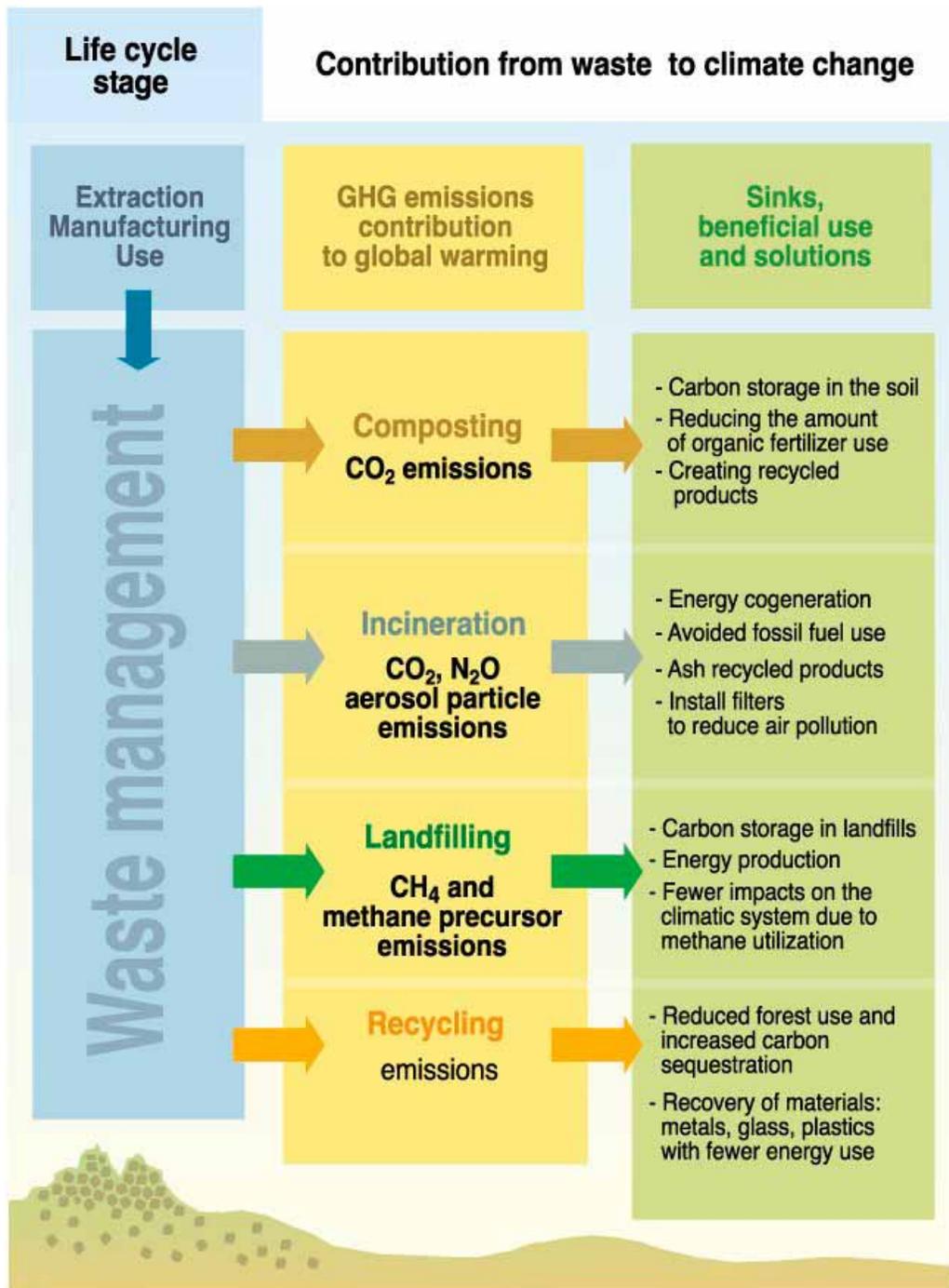
Greenhouse Effect: The insulating effect of atmospheric greenhouse gasses that keeps the Earth's temperature about 60°F warmer than it would be otherwise.

Greenhouse Gases (GHG): Any gas that contributes to the "greenhouse effect" such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide, chlorofluorocarbons (CFC-12), chlorodifluoromethane (HCFC-22), perfluoroethane, and sulfur hexafluoride.

Mitigation: Actions that reduce the severity of climate change by reducing greenhouse gas emissions.

Sequestration: Actions that remove or store atmospheric CO₂, either through biological (e.g., plants and trees) or geological processes (e.g., storage in underground reservoirs).

Sink: Any process, activity, or mechanism which removes a greenhouse gas, an aerosol, or a precursor of a greenhouse gas from the atmosphere. Forests and other vegetation are considered sinks because they remove carbon dioxide through photosynthesis.



Contribution from waste to climate change. (2004). In UNEP/GRID-Arendal Maps and Graphics Library. Retrieved 17:32, September 7, 2010 from <http://maps.grida.no/go/graphic/contribution-from-waste-to-climate-change>.

Current Climate Response Action Summaries

The following pages provide one-page summaries containing additional information about each of the division actions listed in the Inventory of Current Response Actions found on page four.

The focus of the following actions are: The Solid Waste Division

Landfill Gas Controls

Mitigation

Contact: Dean Voelker

Objective:

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. 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.

Current Status:

The CHRLF gas control system meets or exceeds the requirements of the Clean Air Act, Title V Operating Permit, issued by the Puget Sound Clean Air Agency (PSCAA). Lower Explosive Limit (LEL) monitoring indicates no migration of methane gas, surface emissions far below the allowable 500 parts per million (ppm), and a gas burn (destruction) efficiency rate consistently over 99 percent, above the permitted 98 percent requirement.



Gas Well Monitoring Point

Major Milestones	Qtr - Yr	Status
Complete gas collection pipeline for new areas		Ongoing
Complete the gas delivery system for Bio Energy Washington	Q4-09	Complete
Complete Phase 1 flare rehabilitation (2 flares)	Q3-10	On Schedule
Complete control automation of the flare station and gas delivery	Q4-10	On Schedule
Complete Phase 2 flare rehabilitation (2 flares)	Q4-11	On Schedule

For Additional Information:

Climate Team Lead, Dwin Ugwoaba

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

Contact: Mizanur Rahman

Objective:

Reduce SWD carbon footprint/emissions and sell landfill gas for use as a renewable energy source and to generate revenue benefiting King County ratepayers.

Description:

Pipeline quality gas (natural gas) and on-site usable energy is produced from landfill gas generated by decomposing garbage at Cedar Hills Regional Landfill. The landfill gas that is now converted to clean-burning natural gas was once wasted, burned by the landfill flares which remains on standby for back-up flaring only. The developer, Bio Energy Washington (BEW), expects the plant to supply renewable energy in the form of natural gas to the residents of the Seattle area for the next twenty plus years; delivering about 5.5 million cubic feet of gas per day, which is enough to provide heating services to about 24,000 homes.

Current Status:

BEW completed major construction on the facility in March 2009. During the start-up phase, the facility's equipment, process system, and environmental control system, including noise abatement measures, were evaluated. Adjustments were made to meet permit requirements and gas was delivered at a limited rate to the pipeline. BEW obtained the certificate of occupancy on March 29, 2010 and an announcement of the start date for commercial operation is expected during the third quarter of 2010.



Gas-to-Energy at Cedar Hills Landfill

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

For Additional Information:

<http://your.kingcounty.gov/solidwaste/facilities/landfill-gas.asp>

Climate Team Lead, Lisa Huntley

Reduce Energy Use at Stations and Landfills

Contact: Dean Voelker

Objective:

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.

Current Status:

Implementing physical changes which result in energy savings as opportunities are identified for projects such as installing night lights at Algona and syncornizing the aerator pumps in the landfill leachate ponds.



Solar Panels at Shoreline Transfer Station

Major Milestones	Qtr - Yr	Status
Install SCADA (Supervisory Control and Data Acquisition) at transfer stations for capture and comparison of usage data.	Q4-10	On Schedule
Resource Conservation Management operational parameters established for solar power and water usage.	Q4-10	On Schedule
Meet the Energy Plan goal of 10 percent reduction in energy use by 2012.	Q4-12	On Schedule

For Additional Information:

Climate Team Lead, Beth Humphreys

Reduce Vehicle and Equipment Impacts

Contact: Dean Voelker

Objective:

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 the 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 trips to the landfill.

Current Status:

Compactors are currently being used at the Enumclaw, Vashon, and Shoreline stations and will be used at the Bow Lake station; SWD fleet continues to use biodiesel (5% blend); vehicle and equipment emissions are currently EPA compliant; and 12 vehicles, powered with hybrid technology, have been purchased to date.



Truck Maintenance by Shop Mechanic

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

For Additional Information:

Climate Team Lead, Ken Stephenson

Contact: Neil Fujii

Objective:

Design and construct new recycling and transfer facilities to address potential impacts of climate change while providing efficient and cost-effective services to customers.

Description:

SWD is modernizing the transfer system by designing and constructing new recycling and transfer facilities to accommodate a growing population, industry changes, and anticipated affects of climate change. Facilities are designed for energy efficiency and capacity to endure and respond to potential climate change impacts, such as heavier snow loads. The design criteria for the required Gold or the highest LEED certification appropriate for the project are used. The Shoreline Recycling and Transfer Station, which opened in 2008, received the Platinum (highest) LEED certification, and includes many design features to address climate change (see also Reduce Energy Use at Stations and Landfills). Four transfer station construction projects are either underway (Bow Lake), in the early stages of design (Factoria), or siting (Northeast County and South County).

Current Status:

Phase 1 site prep work for Bow Lake is 80 percent complete. The facility master plan for Factoria is under development, and design and permitting is in the preliminary stage.



Bow Lake Design from Southeast Corner

Major Milestones	Qtr - Yr	Status
Phase 1 Bow Lake site work construction 100 percent complete	Q2-10	Complete
Phase 2 Bow Lake contractor selection for site facilities construction	Q2-10	Complete
Factoria Station design and permitting.	Ongoing	Underway
Develop Factoria Transfer Station Facility Master Plan	Q4-10	On Schedule
North County and South County stations design and permitting scheduled for 2011 into 2013	Q3-11	On Schedule

For Additional Information:

<http://your.kingcounty.gov/solidwaste/facilities/bowlake>

Climate Team Lead, Terri Barker

New Transfer Station Siting

Contact: Neil Fujii

Objective:

Site transfer stations strategically around the county for customer use, selecting sites that minimize or eliminate negative impacts to the natural environment and using site location and conditions to increase/optimize energy efficiency and reduce GHG emissions.

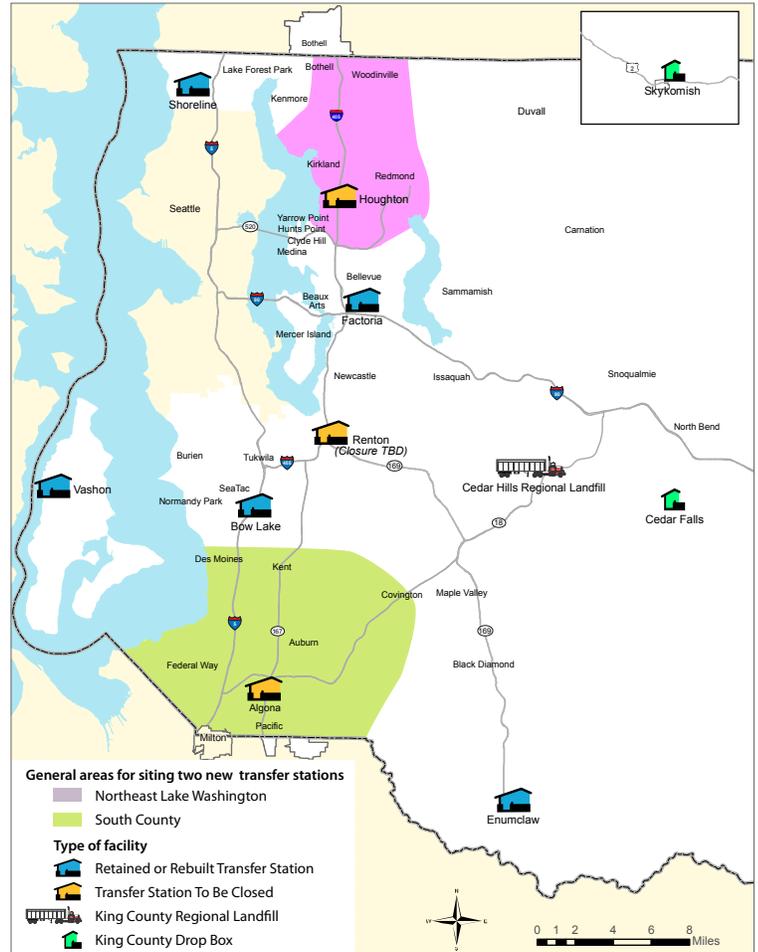
Description:

The siting process for determining the location of new recycling and transfer stations is complex.

While the driving force for siting these stations is based on local area service needs, a major goal of the siting process is to select sites that are environmentally acceptable and feasible from an engineering perspective and that allow impacts to the natural and built environment to be reduced, eliminated, or mitigated. Many aspects such as geology, soil, groundwater tables, flooding hazard, slope, proximity to surface water, and site capacity are factored into the siting process.

Current Status:

The siting processes for two new recycling and transfer stations is expected to begin in late 2010. One new station will serve northeast King County, replacing Houghton, and the other will serve south King County, replacing Algona.



Map of Northeast and South Station Service Areas

Major Milestones	Qtr - Yr	Status
Preliminary identification of potential sites	Q1-11	On Schedule
Form Citizen Advisory Committee and develop site screening criteria	Q1-11	On Schedule
Site identification and screening	Q2-11	On Schedule

For Additional Information:

http://your.kingcounty.gov/solidwaste/about/planning/documents/Milestone_report-4_app_F.pdf

Climate Team Lead, Terri Barker

Contact: Isabel McClure

Objective:

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. In addition, vegetation enhances the existing cover by improving the soils and increasing evaporation and rain interception, resulting in less water infiltration. Decreasing water infiltration reduces the production of leachate, the liquid that is created when water leaches from refuse. Very diluted leachate is generated and collected at Duvall and transported to Cedar Hills Regional Landfill for disposal into the leachate pond, to prevent potential stormwater contamination. 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.

Current Status: Planting of 18,000 poplars is complete. To date, 1,600 conifers have been planted; 700 at the Duvall landfill and 900 at the Puyallup/Kit Corner landfill. Eight hundred conifers will be planted in 2010; 500 at Duvall and 300 at Puyallup/Kit Corner



Vegetation Cover at Duvall Closed Landfill

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

For Additional Information:

Climate Team Lead, Terri Barker

Cedar Falls Mulch Berms

Contact: Anne Holmes/Isabel McClure

Objective:

Reduce landfill gas emissions from the Cedar Falls closed landfill.

Description:

A landfill gas collection system was installed in 1990 as part of the Cedar Falls landfill closure. This passive gas collection system consists of vertical wells, horizontal collection and conveyance pipes, and compost-mulch venting berms. The berms, horizontal mounds, small hills, ridges, or raised linear banks of compost-mulch, act as biological scrubbers to remove odors and minimize landfill gas emissions.

Current Status:

The berms are in place and have been maintained for a number of years. An environmental study will begin in late 2010 to determine the need for environmental system maintenance, upgrades or modifications.



Mulch Berms

Major Milestones	Qtr - Yr	Status
Initiate Phase I environmental systems review evaluation	Q4-10	On Schedule

For Additional Information:

Climate Team Lead, Terri Barker

The focus of the following actions are: King County Government

Consumption / Product Inventory Accounting

Mitigation

Contact: Josh Marx

Objective:

Acquire data through a county-wide consumption inventory to support waste reduction and recycling strategies to reduce GHG emissions.

Description:

The green house gas (GHG) consumption inventory supplements traditional GHG inventories by measuring emissions resulting from consumption of goods and services by county residents, businesses and institutions. The consumption inventory focuses on the impacts of materials management, and the energy to produce, manufacture and transport them to the user. Materials ultimately enter the solid waste system as waste or recyclables. Resulting information from the inventory will support a greater emphasis on waste prevention and recycling programs as viable and effective climate change strategies.



Shipping Containers of Consumer Products

Current Status:

Grant funding and partnerships with the City of Seattle and Puget Sound Clean Air are established. The project is expected to begin during the third quarter of 2010.

Major Milestones	Qtr - Yr	Status
Secure \$70,000 Dept. of Ecology (DOE) Energy Efficiency and Conservation Block Grant (EECBG) funds to support project	Q1-10	Complete
Project kick-off	Q3-10	On Schedule
Track consumption inventory efforts of other jurisdictions	Q4-10	On Schedule

For Additional Information:

<http://kingcounty.gov/environment/dnrp/newsroom/newsreleases/2010/april/0420Greenhouse-gas.aspx>

Climate Team Lead, Josh Marx

Contact: Beth Humphreys

Objective:

Increase the use of green building strategies in county owned and operated buildings to reduce GHG emissions.

Description:

The built environment is responsible for a large percentage of greenhouse gas emissions in the county. In the Puget Sound region, about 22 percent of the greenhouse gas emissions that contribute to global climate change are attributed to the building sector. Additional environmental impacts include contaminated storm water generated by continued creation of hard surfaces, and burdens on existing landfill space from construction and demolition debris generation. The Countywide Green Building Team promotes and educates county staff about green building techniques and strategies that can reduce greenhouse gas emissions. The team, staffed by SWD, consists of representatives from county agencies that are working on capital improvement projects. Team members help to distribute information about green building strategies that can reduce greenhouse gas emissions both during construction and for ongoing operations.



Energy Efficient Greenbridge Development

Current Status:

SWD is leading the Green Building Team’s effort to provide education and outreach to county employees in using the Sustainable Infrastructure Scorecard and Guidelines, and the Operations and Maintenance Guidelines.

Major Milestones	Qtr - Yr	Status
Complete draft Green Operation and Maintenance Guidelines	Q2-09	Complete
Complete Sustainable Infrastructure Scorecard and Guidelines	Q4-09	Complete
Deliver trainings on the Sustainable Infrastructure Scorecard and Guidelines	Ongoing	Underway
Transmit the 2009 Green Building Program Annual Report to Council	Q2-10	Complete
Work with several projects to implement the Green O & M Guidelines	Ongoing	On Schedule
Increase GHG Accounting in CIP projects	Ongoing	On Schedule

For Additional Information:

<http://your.kingcounty.gov/solidwaste/greenbuilding/program/green-building-team.asp>

Climate Team Lead, Beth Humphreys

The focus of the following actions are: External

Product Stewardship

Mitigation

Contact: Lauren Cole

Objective:

Reduce energy consumption, emissions, and pollution by increasing reuse and recycling.

Description:

Product stewardship is a management strategy for conserving resources and minimizing waste throughout the life cycle of a product by encouraging environmentally friendly product design and shifting the cost and responsibility for end-of-life product management from ratepayers and government to product producers and users. E-Cycle WA, a public and private sector partnership, provides for responsible recycling of computers, monitors and TVs at no cost to households, small businesses, school districts, small governments, and charities at authorized collection sites. KC TIBN, a network of private businesses, organizations, and retail stores, collects and provides reuse and recycling options for electronic products. These products contain both recyclable materials and toxic substances, which require special waste handling. In addition, the program encourages the responsible use of fluorescent bulbs to decrease energy consumption and GHG emissions, and recycling them to reduce controlled waste entering the landfill.



Electronics Collection

Current Status:

Legislation requiring manufacturers to take back mercury was adopted by the 2010 legislation. The division continues to work collaboratively with businesses, government, nonprofits, and environmental groups to leverage limited resources and create partnerships that bring regional product stewardship programs and policies to King County. Due in part to these efforts, 7,449 tons of electronic materials were recycled, and 157,189 fluorescent bulbs and tubes as well as 76,851 televisions, computers, and monitors were collected and recycled in King County in 2009.

Major Milestones	Qtr - Yr	Status
Establish E-Cycle Washington	Q1-09	Complete
At least one collection site in all cities/counties of > 10,000 population.	Q3-09	Complete
Introduce legislation requiring manufacturers of mercury-containing lighting to take back and recycle their products.	Q1-10	Complete

For Additional Information:

<http://your.kingcounty.gov/solidwaste/about/product-stewardship/index.asp>

Climate Team Lead, Josh Marx

Recycling Education Program

Contact: Jeff Gaisford

Objective:

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



School EcoConnection Workshop

Current Status:

Link-Up: Recycled Asphalt Shingles (RAS) were used in a pilot paving project, RAS use in Hot Mix Asphalt (HMA) road paving TBD in 2012; EcoConsumer: climate change messages were included in over 50 paid media events; Green Schools: 25 schools began collecting food scraps; Recycle More: grassroots education and outreach helped to increase recycling in Snoqualmie, Kent, and Federal Way; all programs continue in 2010.

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

For Additional Information:

[Annual Report](#) and [Comp Plan](#) and <http://your.kingcounty.gov/solidwaste/about/index.asp>

Climate Team Lead, Josh Marx

Solid Waste Collection Fee and Service Incentives

Contact: Bill Reed

Objective:

Reduce waste generation and disposal to reduce GHG emissions.

Description:

The solid waste collection fee and service structure provides financial incentives for residents and businesses to reduce waste generation and disposal, and increase use of recyclables and organics collection services. Fee incentives include collection fees based upon the number and/or size of containers, unlimited recycling included in residential garbage fees, and organics collection services priced lower than garbage collection. Additional incentives include organics and recycling collection embedded in garbage fees, standardized collection containers with adequate capacity, different collection frequencies, volume-based non-residential garbage rate collection fees, and King County transfer station fees, that discourage disposal and encourage separating targeted recyclables.

Current Status:

Garbage collection fees, for most county residents, include unlimited recycling service and decrease when they recycle more and reduce the size / number of garbage containers. In some cities the fees include organics collection for single family residents, which is recommended as the minimum standard countywide in the Draft 2009 Comprehensive Solid Waste Management Plan. Fees for businesses in some cities include recycling services, though state law currently prevents this option in unincorporated areas.



Efficient Collection Systems

Major Milestones	Qtr - Yr	Status
Coordination with the Washington Utilities & Transportation Commission and certificated solid waste haulers resulting in basic solid waste collection fees changed to include a universal service charge to all customers for residential organics collection in unincorporated areas.	Q4-12	On Schedule
Technical assistance provided to cities to incorporate minimum collection standards into new contracts when old contracts expire or are renegotiated.	Ongoing	On Schedule

For Additional Information:

[Comp Plan](#) and <http://your.kingcounty.gov/solidwaste/about/planning/documents-planning.asp>

Climate Team Lead, Josh Marx

Contact: Gerty Coville

Objective:

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. Composting minimizes methane gas generation because organics are managed aerobically during the composting process. Compost also 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.



Food and Yard Waste Collected for Composting

Current Status:

Multi-media advertising and one-on-one education at farmers’ markets and community events raised awareness and popularized participation in the new residential curbside food scrap and food soiled paper recycling collection service. Recycling tools offered by retail partners at discounted prices, free samples of compostable food scrap recycling bags available online by request, community outreach, and garbage haulers facilitate residential participation.

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

For Additional Information:

<http://your.kingcounty.gov/solidwaste/garbage-recycling/documents/Organics-Study-2009-final-report.pdf>

Climate Team Lead, Josh Marx



2009-2010
Solid Waste Division
Climate Team Report

This material will be provided
in alternate formats upon request

King County Solid Waste Division
206-296-4466,
1-800-325-6165, ext. 6-4466,
TTY Relay: 711,
<http://your.kingcounty.gov/solidwaste>



King County

Department of
Natural Resources and Parks
Solid Waste Division