

Briefing 2016-B0137

Report on the Plan to Stabilize Closed Landfills, required by Ordinance 17941, Section 55, Proviso P1

Metropolitan King County Council
Committee of the Whole
June 29, 2016

Council's Budget Proviso:

"Of this appropriation, \$50,000 shall not be expended or encumbered until the executive transmits a plan to stabilize post-closure ("retired") landfills to protect human health and the environment and a motion that accepts the report and the motion is passed by council. The motion shall reference the subject matter, the proviso's ordinance, ordinance section, and proviso number in both the title and body of the motion.

The plan shall include, but not be limited to, the required steps to achieve the level or stability necessary to complete and conclude monitoring and maintenance requirements, including:

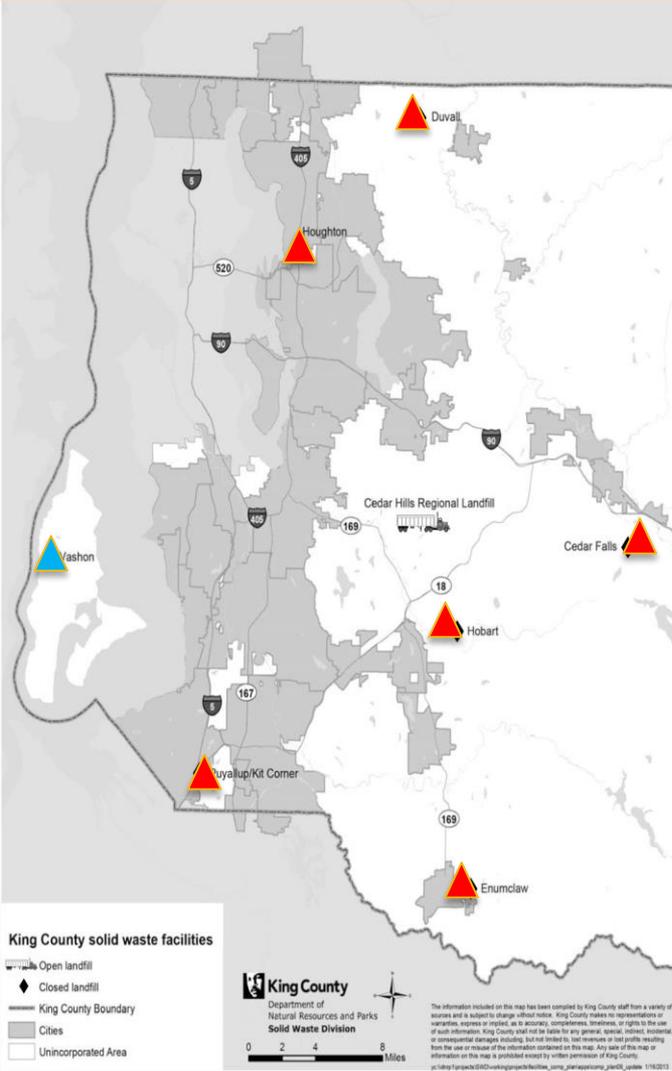
- A summary of the current status of each of the retired (closed) landfills;*
- Specific actions required to achieve environmental stability for each landfill;*
- A timeline for achieving environmental stability and projected conclusion of monitoring and maintenance responsibility;*
- A financial plan to support necessary actions, including any anticipated rate impacts; and*
- A summary of any lessons learned that may be applicable to the Cedar Hills landfill."*

The Executive transmitted the Report on the Plan to Stabilize Closed Landfills, dated January 29, 2016, as Attachment A to Proposed Motion 2016-0097.

Purpose of Review

Responsive to Council Ordinance 17941, Section 55, Proviso P1

- The Solid Waste Division is responsible for maintaining and monitoring seven closed landfills that ceased operations between the mid-1960s and 2002
- The Post-Closure Landfill Maintenance Fund, originally created in 1995, was intended for support of maintenance activities at closed landfills. The fund was anticipated to fully fund the work required to stabilize the closed landfills for which the Division is responsible.
- Proviso required a report on the status of closed landfills including: environmental stability of the landfills, assessment of ongoing maintenance costs and financial standing of the Post-Closure Landfill Maintenance Fund.



Projected minimum maintenance and monitoring post-closure periods:

Site	Year closed	Regulation	Planned Post-Closure Period
Puyallup/Kit Corner	Mid-1960's	Chapter 173-301 WAC	N/A
Houghton	1965	Chapter 173-301 WAC	N/A
Duvall	1981	Chapter 173-301 WAC	N/A
Cedar Falls	1989	Chapter 173-304 WAC	1985-2005
Enumclaw	1993	Chapter 173-304 WAC	1993-2013
Hobart	1994	Chapter 173-304 WAC	1994-2014
Vashon	2002	Chapter 173-351 WAC	2002-2032

Post-closure costs for ongoing operations for all seven landfills have averaged \$1.3 million per year over the last four years.

These costs generally focus on maintenance, monitoring, permits, project management, and electrical utility and electrical utility fees and costs.





Duvall Landfill

- 13-acres
- Closed in 1981 with clay and tree cover, a passive leachate collection system around the perimeter, and a flared, passive gas (no vacuum) monitoring system.
- No bottom liner.
- An emergency radio tower is located on the property.
- Groundwater treatment, groundwater and landfill gas monitoring, and a poplar tree landfill cover are all in place

Future post-closure actions under consideration at Duvall Landfill:

- Current plans are to evaluate and generally improve the environmental control systems. Evaluation may lead to capital projects budget requests to be included in the 2017/2018 biennium budget cycle, which would likely take approximately five years to complete after appropriation.
- Address low-level contaminants in an area prone to saturation.
- Improve the grass and tree cover to reduce water infiltration.
- Potential installation of a gas collection and control system, as passive flare is no longer sufficient.
- Evaluate landfill gas control system and leachate control system improvements for stabilization. Work to be completed by 2021.

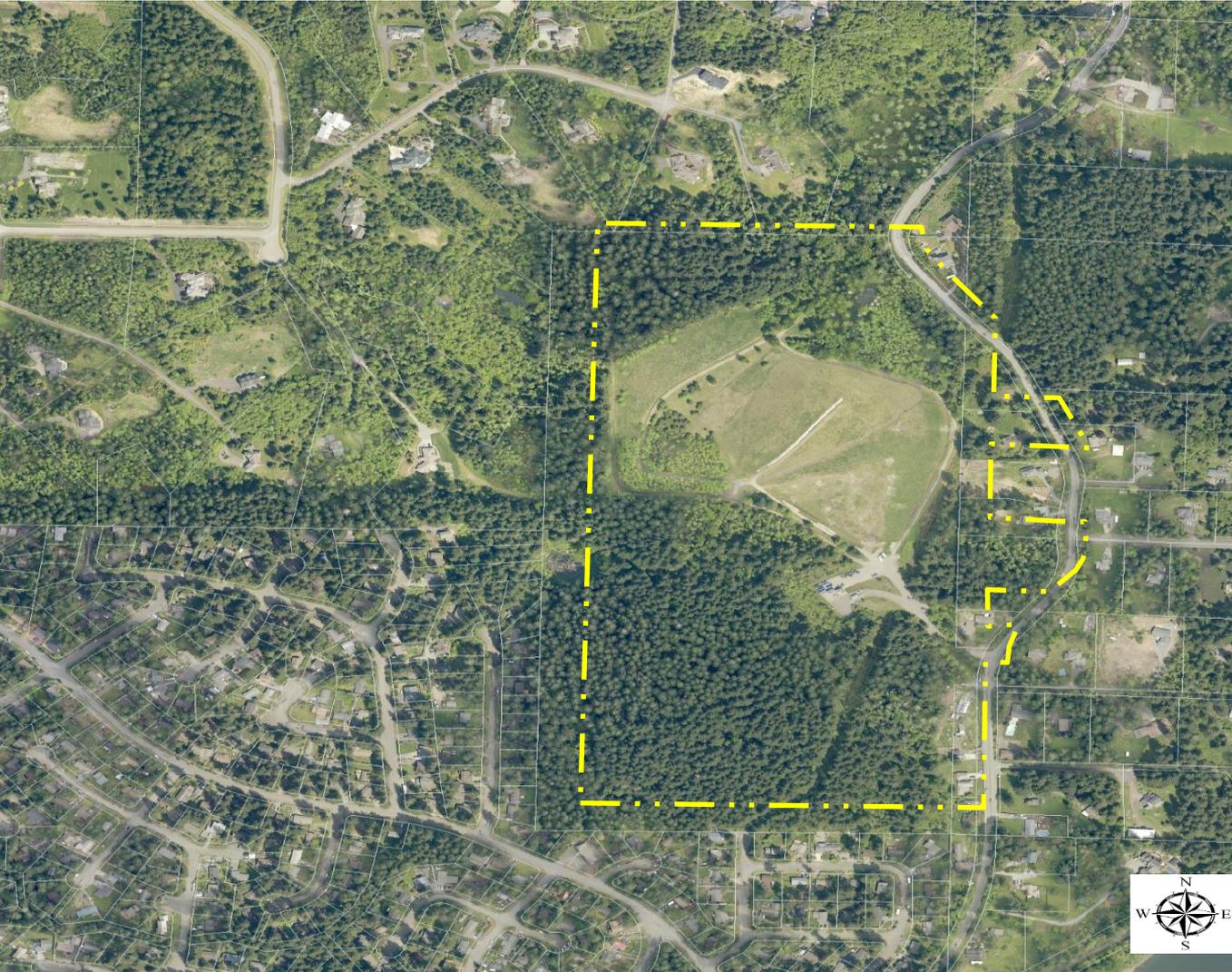


Houghton Landfill

- 16-acres
- Closed in the mid-sixties with a soil cover, but with no leachate or gas collection systems.
- An active gas collection and treatment system was installed in the mid 1990's.
- There is a soil cover, but no bottom liner. Groundwater and landfill gas monitoring are in place.
- In 1999, the division partnered with the City of Kirkland to construct ballfields on the closed landfill.

Future post-closure actions under consideration at Houghton Landfill:

- Current plans are to evaluate and generally improve the environmental control systems. Evaluation may lead to capital projects budget requests to be included in the 2017/2018 biennium budget cycle, which would likely take approximately five years to complete after appropriation.
- Evaluate further reduction in greenhouse gas emissions replacing activated carbon treatment with a bio-filter.
- Address low levels of contaminants in the groundwater.

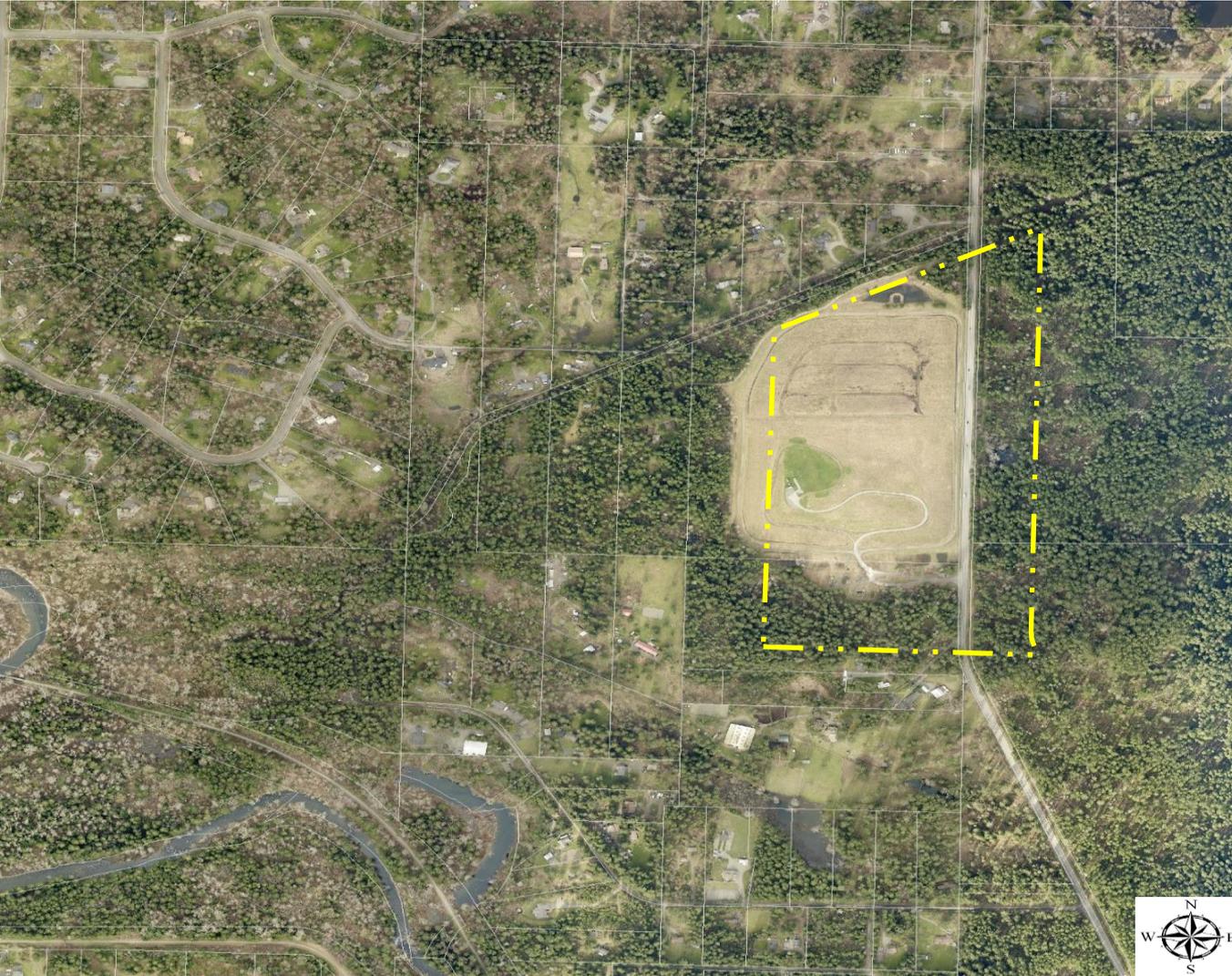


Cedar Falls Landfill

- 12-acres
- Closed in 1985 with a composite cover, gas collection and a bio-berm for gas treatment.
- There is no leachate system and no bottom liner.
- Groundwater, surface water, and landfill gas monitoring are in place.

Future post-closure actions under consideration at Cedar Falls Landfill:

- Install enhancements to improve gas collection on the northeast side of the landfill. Evaluation of enhancements is scheduled to be completed in 2017.
- Determine if improvements to the cover and landfill gas control and treatment systems will address a seasonal groundwater table that saturates a small portion of the landfill. This project is scheduled to be completed in 2017.
- Project to be completed in 2019, if 2017/2018 budget request is approved.

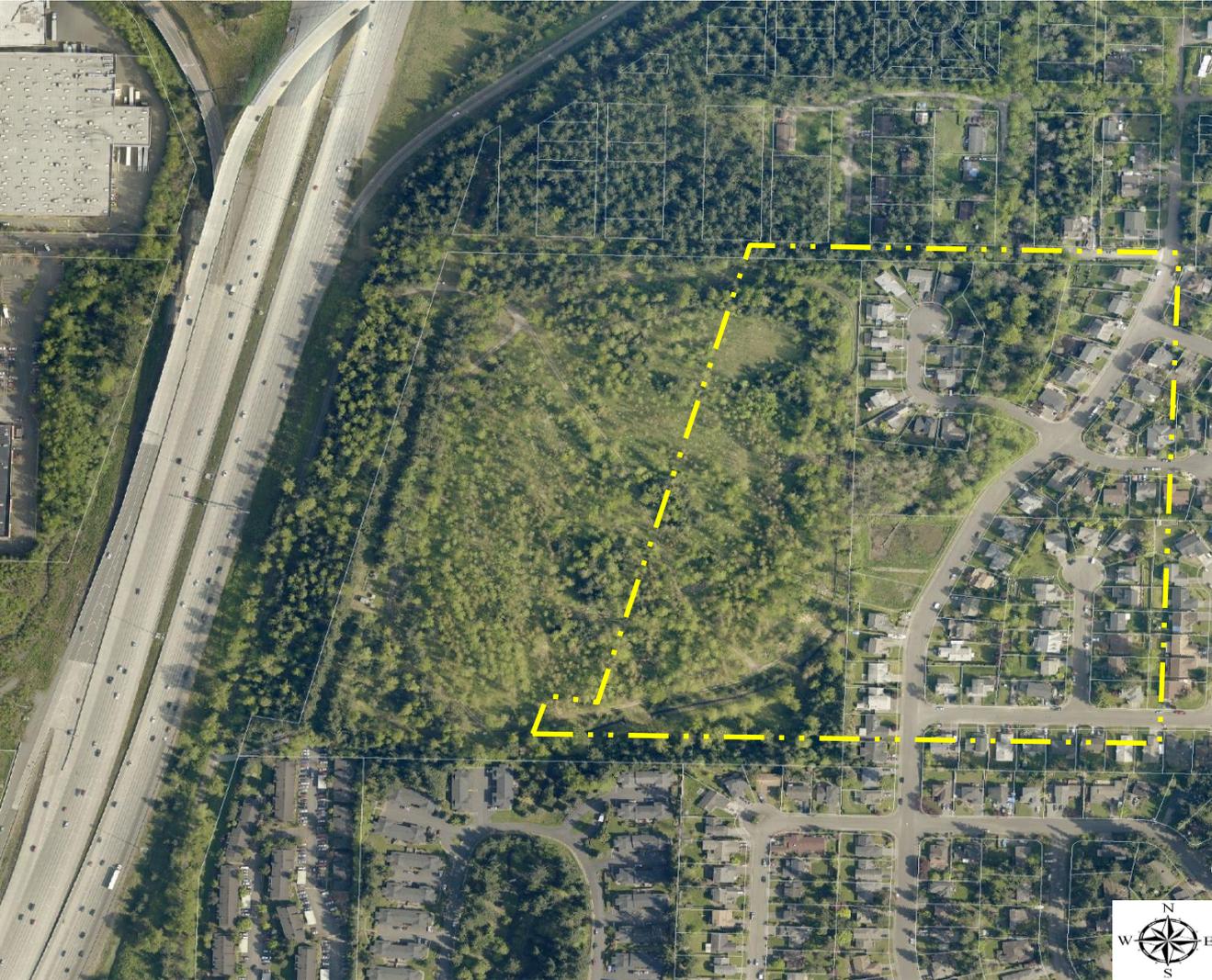


Hobart Landfill

- 35-acres
- Closed in 1994 with an engineered composite cover and an active flared gas collection system.
- A leachate containment and extraction system is installed.
- Leachate pumping was discontinued in 1995. Groundwater and landfill gas monitoring are in place.
- A model airplane community group uses the property to fly model planes.

Future post-closure actions under consideration at Hobart Landfill:

- Evaluate existing cutoff wall and groundwater extraction wells to determine performance in isolating groundwater beneath the waste from groundwater external to the waste.
- Install a new flare to better handle the decreasing levels of landfill gas. This project will be completed in early 2017.



Puyallup / Kit Corner Landfill

- 20-acres
- Closed in the mid-sixties with a soil and tree cover and no leachate or gas collection systems in place and no bottom liner.
- An active gas collection system using carbon treatment was installed, but was subsequently replaced with dispersion venting in 2014.
- An engineered grass and tree cover system was subsequently installed to enhance the cover performance.
- Groundwater treatment and monitoring and landfill gas monitoring are in place.

Future post-closure actions under consideration at Puyallup / Kit Corner Landfill:

- Current plans to evaluate the environmental control systems. Evaluation may lead to capital projects budget requests to be included in the 2017/2018 biennium budget cycle, which would likely take approximately five years to complete after appropriation.
- Monitor new groundwater treatment system to ensure continued decrease in groundwater impacts.



Enumclaw Landfill

- 39-acres
- Closed in 1993 with an engineered cap (clay liner, a synthetic membrane layer, geotextiles used to hold soil in place) and soil cover planted with grass and trees.
- An active gas collection system with a flare was installed at closure.
- There is no leachate system and no bottom liner.
- Stormwater control and groundwater, surface water, and landfill gas monitoring are in place.

Future post-closure actions under consideration at Enumclaw Landfill:

- Work with Public Health and Ecology on their request for an evaluation of the environmental control systems and a demonstration that there are no potential future risks that these systems will fail and result in impacts to the groundwater and air. This project will be completed in 2016 and steps will then be taken to authorize termination of post-closure.
- Install a new flare to better handle the decreasing levels of landfill gas. This project will be completed in 2016.



Vashon Landfill

- 24-acres
- Vashon Landfill closed in 1999 with an engineered composite liner, leachate collection (gravity pipes with an aeration pond), and gas collection with activated carbon filters.
- A portion of the landfill has a bottom liner.
- Stormwater drainage and groundwater, surface water, and landfill gas monitoring are in place.

Future post-closure actions under consideration at Vashon Landfill:

- Determine if improvements to the cover and landfill gas systems address impacts to groundwater. This project will be completed in 2016 with recommendations for needed improvements.
- Complete evaluation of bio-filter or smaller sized flare to reduce greenhouse gases. This evaluation will be completed in 2017.

Summary of Report Key Findings

Adopted county policy for maintenance of closed landfills per KCC 4A.200.710 E:

(3) *The fund shall be used for all costs associated with landfill post-closure maintenance operations at county owned landfills, and all operations and maintenance costs related to closed solid waste disposal sites or handling facilities that the solid waste division owns or for which the division has custodial responsibility.*

- The Report notes that the fund was anticipated to fully cover work required to stabilize the closed landfills for which the Division is responsible. However, the fund is nearly exhausted as the result of extended timelines required for landfills to reach stability, and evolving regulatory requirements. The Fund is now projected to be exhausted by 2021; there is currently no indication that closed landfills will be stabilized by that date.
- The 2015-2016 Adopted Budget includes a Financial Plan which provides for contributions of \$1,500,000 per year for 2017/18, and \$2,200,000 per year for 2019-2020.
- The 2015-2016 budget included funding for facility projects at four closed landfills, ranging from \$947,000 to \$2.3 million.

Additional Findings

- The Division has studies underway at the Vashon, Cedar Falls, Hobart, and Enumclaw landfills to determine what additional actions are needed for these landfills to reach a stable state.
- Remediation programs at closed landfills included in the 2015/2016 biennium budget include:
 - **Cedar Falls** Improvements currently in the 2015/2016 biennium budget at \$2,245,167.
 - **Enumclaw** Improvements currently in the 2015/2016 biennium budget at \$947,099.
 - **Hobart** Improvements currently in the 2015/2016 biennium budget at \$921,278.
 - **Vashon** Improvements currently in the 2015/2016 biennium budget at \$2,350,881.
- Projected total costs for actions at Duvall, Houghton, and Puyallup/Kit Corner are estimated to be \$4.5 million over the 2017-2018 biennium.

Additional Findings

- The 2015/2016 Adopted Financial Plan begins flat contributions to the Post Closure Maintenance Fund of \$1,500,000 per year for 2017/2018 and \$2,200,000 per year for 2019/2020.
- The effective per ton rate would be \$1.79, \$1.70, \$2.52, and \$2.41 for years 2017 through 2020.
- Beginning in 2021, contributions of \$0.31 per ton would fund the currently anticipated needs for custodial landfill monitoring, maintenance, and other projects.

Recommendations

- Continue to partner with Public Health and Ecology to define the process for terminating post-closure and/or implementing monitoring efficiencies while systems are reaching stability.
- Complete planned improvements and evaluations to determine whether additional funding is needed to improve performance of engineering control systems at Cedar Falls, Hobart and Vashon landfills.
- Request budget for similar projects at Duvall, Puyallup/Kit-Corner and Houghton in the 2017/2018 biennial budget.
- Continue to evaluate secondary uses at the closed landfills that could generate revenue, such as recreational activities and selective logging.
- Investigate whether or not individual cells at Cedar Hills that were closed under earlier regulations could have separate post-closure plans compliant with those earlier regulations.

Questions?

Related Performance Audit – Landfill Reserve Fund:

- **Performance Audit of Solid Waste Transfer Station Capital Projects** (Report No. 2011-03)
- **Recommendation 3**
 - “The Solid Waste Division, in cooperation with the Executive Finance Committee, should review the feasibility of a new investment strategy for the Landfill Reserve Fund.
 - “... part of the Landfill Reserve Fund (LRF) balance has an investment horizon extending to the year 2058. Nevertheless, the fund is invested in the same investment pool as other funds, whose overall liquidity objectives and needs are shorter term, for example, less than one year. It may be to the benefit of the Landfill Reserve Fund to have an alternative investment strategy. As an example, increasing the real (before inflation) rate of return on the LRF balance by a full one-percent could result in lowering the tipping fee by \$.87 per ton in 2012. At the estimated 826,000 tons of waste for 2012, this would translate into a savings to rate payers of \$717,000.
 - “Our understanding is that the Executive Finance Committee would consider a request from SWD for an alternative investment approach. SWD has informed us that they have already begun discussions.”

Solid Waste & Emergency Preparedness

- **Solid Waste Division provides critical emergency response services during natural disasters.**
- **Council & Executive may choose to waive fees for emergency disposal of debris from wind storms, floods and seismic events (Examples: 2009-0037, 2009-0059 and 2009-0063)**
- **Emergency preparedness is a significant factor in design of new transfer facilities – which must not only “survive” a natural disaster but must be functional shortly thereafter. New transfer stations are also designed with 3 days of emergency waste storage to facilitate disaster response.**
- **Division Staff and heavy equipment may be called upon for support of other regional responders.**