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From: Elaine Stewart *EMS*

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Subject: Parks and REM meeting re water control structure and landfill

I met with REM and Parks staff to address any concerns surrounding the planned installation of a water control structure at Smith and Bybee lakes. Discussion focussed on two areas, bank erosion and leachate. Attendees included those cc'd above.

Bank erosion

Maintaining the integrity of the St. Johns Landfill's perimeter is a mutual objective of REM and Parks. Bank erosion has already occurred in several sections, including a 1,000-foot stretch along the North Slough that was stabilized last summer. REM is concerned that increased water velocity in the North Slough's water level as a result of opening the lakes will cause more rapid erosion of the landfill bank.

The ability to adjust the new structure's opening, including during high-flow periods, is one of the design criteria provided to Ducks Unlimited. Adjusting the opening would allow limited control over water velocity during floods. Logistical difficulties in predicting peak flows and having staff on site at those times will confound attempts to manage water flow through the structure. In case of emergency, the new structure could be closed and the lakes cut off from the slough. The box culvert used for fish passage will remain open, however, it will be only five feet wide; for comparison, the existing culvert is five feet in diameter.

The group acknowledged that bank stabilization could be regarded as an additional cost of the project. Bank erosion may occur regardless of the project since the banks are inherently unstable, but a more dynamic water regime may accelerate the process. REM confirmed that sufficient funds are available

to repair all of the remaining North Slough bank sections if it ever became necessary. It is likely that bank failures would occur in discrete sections and not all at once. REM monitors the landfill perimeter annually, performing visual inspections and measuring cross-sections of the North and Columbia sloughs. In the event bank failure is imminent along the North Slough, we have the ability to curtail flow through the proposed structure, allowing time for bank repairs.

Conclusion: REM will continue to monitor for bank erosion and make repairs as needed; Parks supports REM's efforts to maintain the integrity of the landfill perimeter bank. With the new water control structure, Parks staff will expand its list of water management objectives to include minimizing high water velocities in the North Slough where feasible.

Leachate

A citizen has vigorously expressed concern that opening the lakes will result in contamination of the lakes with leachate from the landfill. REM monitors groundwater for leachate (more precisely, landfill-related contaminants) and submits the data to DEQ. REM does not specifically monitor surface water in the lakes and slough to detect contaminants related to the landfill; they cannot be distinguished from other background contamination. REM does sample lakes and slough surface water six times per year for a broad suite of parameters. Using a very conservative assumption (i.e., high estimate of contamination), only 0.05 percent of the contaminants in the North Slough may come from the landfill.

Installing the new water control structure will not change leachate's (or contaminants') rate of movement through the landfill bank. Contaminants move through the bank at different rates, depending on their chemical interaction with the bank silts. This has nothing to do with the water control structure, unless the structure contributes to additional or accelerated erosion. The existing bank is composed of fine silts and serves as a good barrier to chemical migration between the slough and the landfill.

When the lakes are opened to the slough and ultimately to the Willamette River, the monitoring data will show differences. Most of the water entering the lakes will be Willamette River water, so the lakes will begin to resemble the river more closely. The influx of Willamette River water will further dilute any contaminants that are in the lakes and slough water (from the landfill and elsewhere). REM will continue monitoring surface water six times per year.

REM and Parks expect water quality to improve when the lakes become an open system again, and water quality in surrounding sloughs and rivers will also continue improving. Fewer seeps have been observed along the landfill perimeter bank since the cover was installed. Combined sewer overflows have been nearly eliminated on the Columbia Slough, and overflows into the Willamette River are on their way out.

The citizen concern regarding leachate includes a belief that contaminated sediments in the North Slough will be transported into the lakes and will pollute them. However, sediment sampling of the

lakes, North Slough and Columbia Slough has failed to detect differences among the sites. Also, a study of the lakes' sediment history prior to any dams on the lakes' sloughs indicated that they were in a long-term equilibrium state, with neither net deposition nor net loss.

Finally, the presence of contaminants does not directly translate into biological effects. The effects depend on the contaminant, water and sediment chemistry, uptake and metabolic processes of plants and animals, bioaccumulation, etc. At this time, REM does not monitor the effects of contaminants. These effects will be addressed through a risk assessment, which may be several years out. Until then, REM will continue monitoring surface- and groundwater and sediments, and reporting to DEQ.

Conclusion: Contaminants from the landfill, if they are entering the North Slough, are a very small fraction of total contamination in the North Slough and cannot be distinguished from background pollution. REM will continue monitoring and working with DEQ to accomplish a risk assessment that will provide more information on possible effects of landfill-related contaminants on humans and wildlife. Bank erosion might accelerate movement of contaminants out of the landfill, and REM and Parks will work together to track and remediate any problems, as described in the previous section.