M E M O R A N D U M

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METRO

DATE: September 24, 2001

TO: Smith and Bybee Lakes Wildlife Area Management Committee

FROM: Dennis O'Neil, Supervisor, Landfill and Environmental Management Program

RE: Future Operation, Maintenance, and Monitoring at St. Johns Landfill

This memorandum is in response to questions at your July meeting about how long operation, maintenance, and monitoring (OM&M) will last at St. Johns Landfill. I have summarized the OM&M requirements for each of the landfill's environmental protection systems. These requirements are found in the Oregon Department of Environmental Quality (DEQ) Solid Waste Disposal Site Closure Permit No.116; DEQ/EPA Title V Operating Permit No. 26-2310; DEQ General Permit, National Pollutant Discharge Elimination System Stormwater Discharge Permit No. 1200-COLS; and City of Portland Wastewater Discharge Permit 400.018.

We are trying to negotiate with DEQ to develop a new Closure Permit that includes a more detailed Memorandum of Agreement. It is our understanding that the Agreement will define the long-term responsibilities of Metro for the St. Johns Landfill. DEQ permits are typically for10 years and automatically renewable for additional 10-year periods.

Our current expectation is that St. Johns Landfill will require OM&M for at least 20 years. Below I discuss the OM&M time frame for each environment protection system of St. Johns Landfill.

Cover System

A 225-acre multi-layered cover system encloses the solid waste in St. Johns Landfill. This cover is made up of low-permeability compacted soil, a thin plastic membrane, a thin plastic drainage layer (side slopes only), 12 to 18 inches of a sand drainage layer, and an average of 12 inches of topsoil with vegetation.

Cover OM&M includes vegetation management such as mowing, reseeding, fertilizing, and the control of noxious, invasive weeds. Cover system OM&M also includes erosion control and repair; repair of membrane tears; and the repair of differential settlement resulting from waste decay or underground fires. Site staff currently does all of the mowing. Depending on the magnitude of the project, they either perform the above maintenance or contract out for the services.

As the vegetation becomes more established and natural to the area it is expected that maintenance will decrease over the next 10 to 15 years. However for safety and environmental protection the cover system cannot be allowed to degrade to the point of allowing water infiltration into the landfill, or significant gas leakage out of the landfill, for at least 20 years.

Gas and Condensate Collection System

Landfill gas contains nearly equal parts carbon dioxide and flammable, explosive methane as well as small amounts of many other substances, some hazardous. The gas is sucked out of the buried waste from 180 vertical wells and horizontal trenches through a 16-mile web of plastic pipe. At an on site motor blower flare facility it is burned in one or more flares or is compressed and piped to a lime plant for energy recovery. It is currently projected that gas quantities will remain marketable until 2006 with a potential to reach 2010.

A condensate collection system of 27 valve stations, five pump stations, two compressor stations, and many miles of underground pipe support the gas collection system. This system removes liquid that condenses in the gas pipes to prevent blockages that would stop gas flow.

The gas and condensate collection systems work together to ensure that the gas does not build up under the plastic cover, either lifting and damaging the cover system or leaking out to pollute the air. Both systems require ongoing, specialized maintenance and monitoring.

In May 2001 Metro received a federal operating permit which regulates not only flare emissions but also pollutants in raw gas leaking out of the landfill. This permit requires extensive monitoring, record keeping and reporting. This permit was mandated for St. Johns Landfill based on its size rather than on the quantity of air pollutants it produces.
Therefore, the permit remains active indefinitely, regardless of how little gas is produced.

As gas and condensate quantities diminish over the next 10 years the intensity of OM&M for the gas and condensate collection system may also decrease. However, even a scaled back system may need to be operational for at least 20 year in order to comply with the Title V permit.

Leachate Collection System

Leachate, which is water that comes in contact with solid waste, is collected in a landfill wet well and mixed with condensate from the gas system. The combined leachate and condensate are pumped into the City of Portland's sewer for treatment. The City of Portland regulates this wastewater under a permit that requires periodic monitoring, record keeping and reporting. Because of current contaminant levels in the leachate and condensate, the City may require on site pretreatment before it can be pumped to the City. Metro is currently investigating to determine the method and cost of bringing the contaminant levels of the leachate and condensate into compliance with the City's permit.

The cover system, which forms a roof over the solid waste, has prevented rain from infiltrating into the solid waste to become leachate. However, as Willamette and Columbia River levels rise each year, some groundwater enters the solid waste from below and becomes leachate. DEQ will require Metro to maintain and monitor the leachate collection system indefinitely. The City of Portland will require Metro to monitor and, if necessary, pre-treat the wastewater indefinitely.

Stormwater Collection System

Stormwater is channeled through ditches, sedimentation basins, and outfalls to the surrounding surface water. The aim of inspection and maintenance is to ensure that damage to the system does not lead to cover system erosion. Stormwater monitoring, record keeping, and reporting is required under a Federal NPPDES stormwater permit administered by the DEQ.

The length of the permit is five years; however, it is routinely renewed. We anticipate that St. Johns Landfill will be under a NPPDES permit indefinitely. However, with time the permit requirements may lessen.

Groundwater Monitoring

The DEQ closure permit requires that Metro monitor the rate and direction of contaminant migration from the solid waste, keep careful records, and report this information. This is accomplished by monitoring numerous groundwater wells and piezometers at the site, using sophisticated monitoring methods to ensure representative, meaningful data.

Extensive investigations by Metro have indicated that groundwater movement at the landfill is complex and that contaminant movement is slow. Thus, it is expected that groundwater monitoring will become more sophisticated, be ongoing, and continue for at least 20-years.

Perimeter Dike Maintenance

A part natural and part engineered dike surrounds the 14,000-foot perimeter of the buried waste in St. Johns Landfill. This dike physically separates the waste from surrounding surface water and filters contaminants from the waste. The action of the surrounding surface water eats away at most of this barrier/filter. In 2000, Metro repaired 1100 feet of the perimeter dike's outer bank. In 2001 Metro installed a cement/bentonite cutoff wall in a 1000-foot section where waste was buried close to surface water. Metro is currently developing a plan for long term monitoring, assessment, and repair of the remaining sections of the dike.

The City of Portland requires that the 1,100-foot bank repair be monitored and maintained until 2010. Because the dike erosion is a natural and ongoing process, it is expected that dike monitoring, evaluation, and repair will also be ongoing and extend beyond 2021.

I hope that the above information answers your questions about future operation, maintenance, and monitoring at St. Johns Landfill. Please contact me if your have further questions.

DO:gbc
cc: Terry Petersen, Director, Regional Environmental Management Dept.
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