3.5 Waste Management

Introduction

Waste Management in the Cowichan Valley Regional District

Waste management has traditionally meant the safe disposal of solid waste (garbage and recyclables) and liquid waste (sewage). The Cowichan Valley Regional District has set itself a long-term goal of Zero Waste, which means that it needs to start managing its waste streams very differently, as well as looking at reducing and recycling waste as well as recovering resources from its waste streams.

This is consistent with steps being taken by other Regional Districts in the province, and the provincial government is encouraging all local governments to consider approaches such as Integrated Resource Recovery that look at liquid and solid "waste" not as something to be disposed of, but something to value as a potential source for other purposes, such as district heating or a waste-to-energy facility.

Measuring Waste Management

Solid waste management is measured in terms of volumes of garbage and recyclables disposed of at regional facilities. Liquid waste management is a measure of the ability to appropriately treat this waste stream so that it does not result in water quality or health issues.

Solid Waste

Solid waste management is a Regional District responsibility. Currently, solid waste is collected and sent to regional facilities such as Bings Creek, Meade Creek and Peerless Road.

The Bings Creek Solid Waste Management Complex is the regional transfer station for the consolidation of the majority of the region's residual solid waste. Bings Creek receives waste from residential and commercial collection services, as well as from the Meade Creek and Peerless Road Recycling Drop-off depots. From Bings Creek, the waste is compacted and placed in transport trailers for shipment to the final disposal location (currently Rabanco in Washington State).

When the local garbage incinerator was closed down in the mid-1990s, the region started shipping solid waste to the Cache Creek landfill on the Lower Mainland. In 2007, the region started exporting garbage to Washington State instead. Recent provincial restrictions on out-of-province garbage shipments may compel the region to explore options closer to home, such as temporarily using the Hartland Landfill in the Capital Regional District.

Indicator and Measures

The region established a Zero Waste initiative in 2002, both as a challenge and a principle for developing a sustainable economy. The initiative focuses on reducing the region's environmental footprint by minimizing the amount of waste that must be land-filled through reduction, reuse and recycling. Ways to move towards the Zero Waste goal are set out in the region's Solid Waste Management Plan.[180]

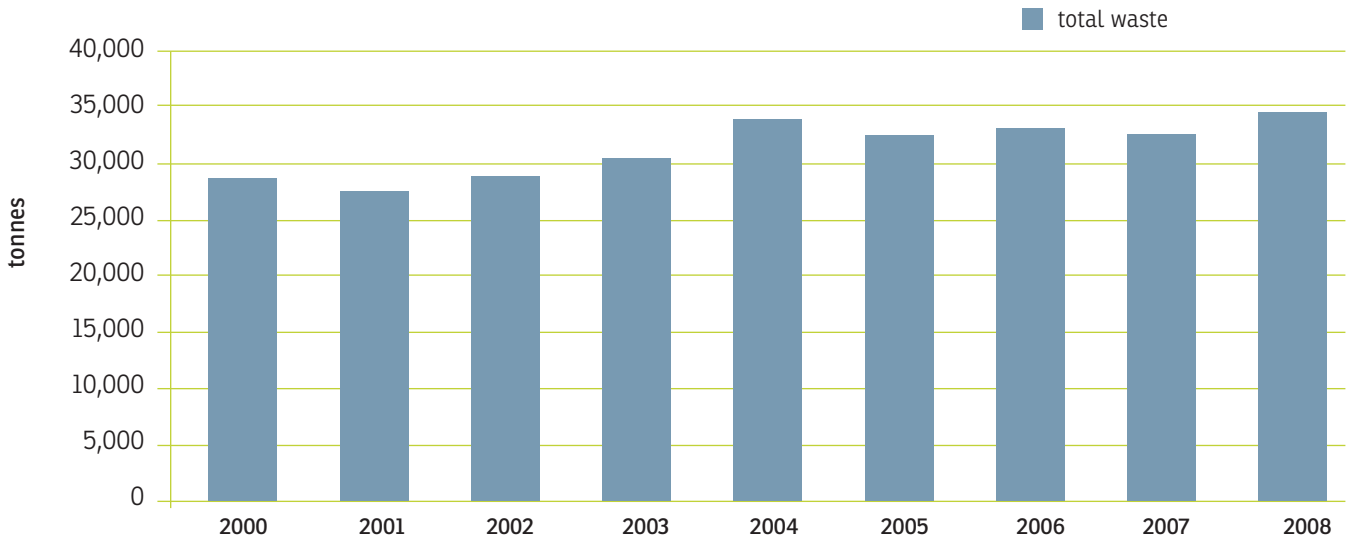
Solid waste can be measured as the total and per capita volume of waste disposed of, as well as the total and per capita volume of recyclables brought to CVRD facilities. However, this does not include information on organic waste that is composted or burned, garbage that is left by the roadside (illegal tipping), or bottles and cans brought to depots for refund.

Findings

Waste disposal

Total waste disposal has increased over the past decade, from about 28,000 tonnes in 2000 to 33,000 tonnes in 2008 (Figure 3.28).

FIGURE 3.28: Total waste disposal, CVRD 2000–2008

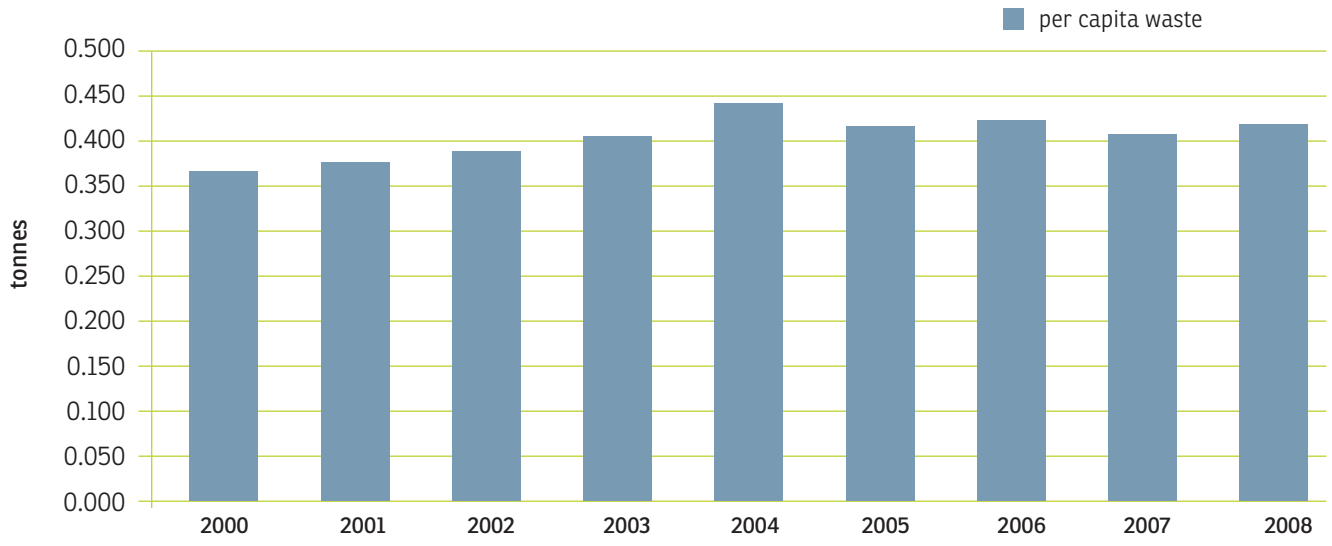


Source: CVRD Annual Monitoring Report, 2007.

180 CVRD Engineering Services, Solid Waste Management Plan, Amendment No. 3, 2006.

However, the regional population has also grown during this period. While the per capita amount of waste disposal has increased overall since 2000, it has declined somewhat since the middle of the decade (Figure 3.29), perhaps in response to greater recycling rates and greater awareness of the need to reduce waste.

FIGURE 3.29: Per capita waste disposal, CVRD 2000–2008



Source: CVRD Annual Monitoring Report, 2007.

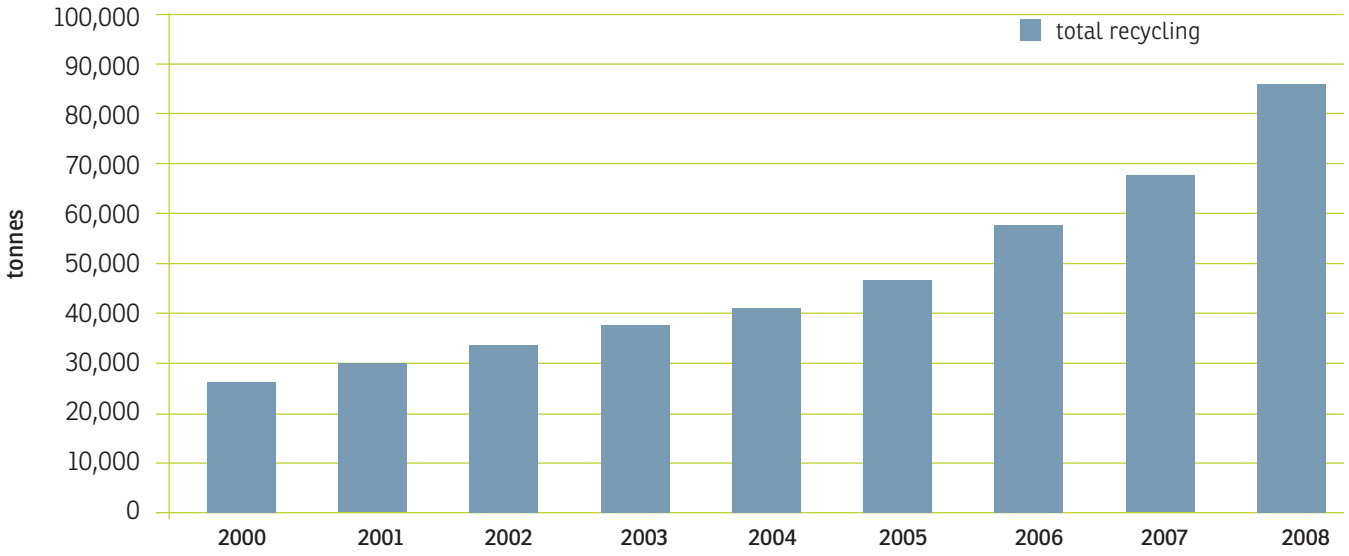
Waste disposal volumes are also affected by the economic climate; for example, during times of increased construction, more construction waste will be brought to landfills.

Recycling

Recycling programs are part the Regional District's Zero Waste initiative. Recycling programs, and the rate of participation, have increased very considerably over the past decade, from about 26,000 tonnes in 2000 to nearly 86,000 tonnes in 2008 (Figure 3.30). Residents and businesses can recycle paper (newspaper and mixed paper), metal containers and aluminum foil, a variety of plastics, and corrugated cardboard through the Blue Box program. Regional recycling participation rates reached a historic high of 75% per person in 2007, but declined slightly in 2008 to 71.9%.[181]

181 CVRD, 2010.

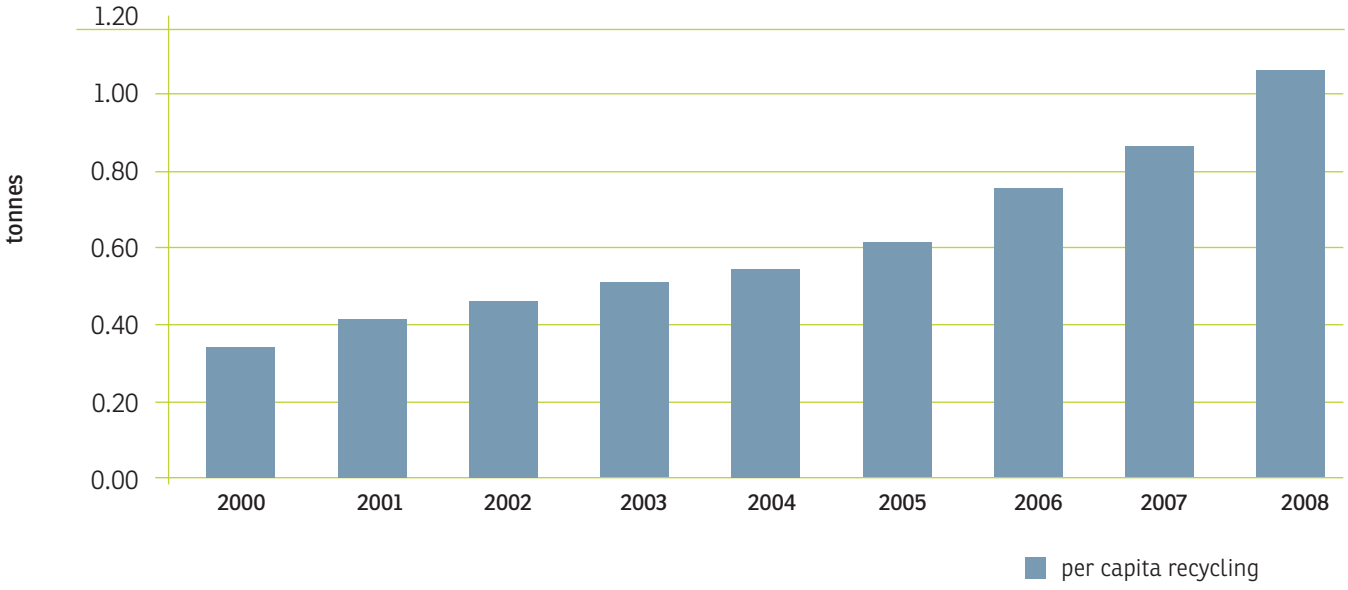
FIGURE 3.30: Total recycling, CVRD 2000–2008



Source: CVRD Annual Monitoring Report, 2007.

Per capita recycling rates have also seen a steady increase, from 0.34 tonnes per capita in 2000 to 1.06 tonnes per capita in 2008 (Figure 3.31).

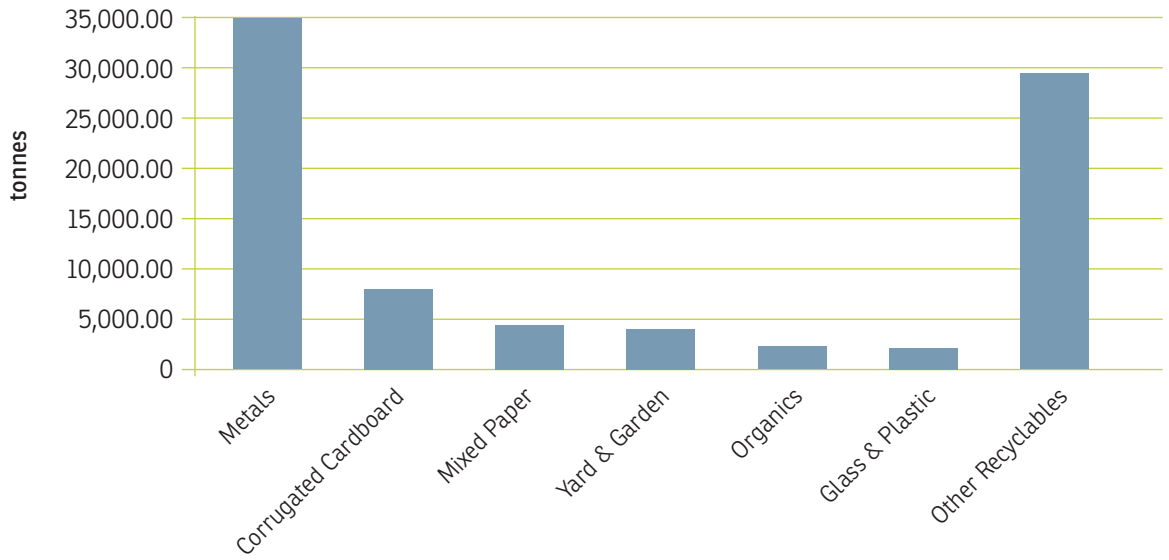
FIGURE 3.31: Per capita recycling, CVRD 2000–2008



Source: CVRD Annual Monitoring Report, 2007.

Metals are by far the largest category of recycled materials by weight (Figure 3.32).

FIGURE 3.32: Recycled materials by weight



Source: CVRD Annual Monitoring Report, 2007.

Higher recycling rates are very laudable. However, it should be noted that the combined volume of waste and recycled materials has doubled from 0.71 tonnes per capita in 2000 to 1.48 tonnes per capita in 2008, so the overall amount of "stuff" that residents are disposing of has increased considerably.

The Cowichan Recyclists offer businesses year-round pickup of recyclable materials – using a bicycle.

Organic Waste

Organic waste makes up about 3% of the waste stream. While this is a small proportion, organic waste is increasingly being recognized as a valuable resource both for composting and for waste-to-energy through anaerobic digestion.

In 2006 the Town of Ladysmith introduced curbside organic waste pickup. The organic waste is converted to compost at a plant in Nanaimo.

The CVRD has several initiatives planned, including the introduction of residential food waste collection, the addition of new products (such as electronic waste) to recycling programs, the development of a new regional recycling depot, better enforcement of existing diversion bylaws, and increased education and communication with residents and the private sector. The goal is to achieve 50% reduction in per capita waste disposal rates over the 1990 levels.[182]

Liquid Waste

Liquid waste (sewage) in the Cowichan Region is managed through a combination of local government treatment plants, private wastewater treatment systems and septic fields serving individual homes or small clusters of homes. Any of these can cause problems for water quality and ecosystem health if they are not well managed. Private septic systems are especially challenging to monitor and enforce, as their performance cannot be measured on an ongoing basis, and because failing septic systems are often not recognized until they result in downstream problems.

The CVRD currently manages 15 sewer systems, with different requirements for each system. There are four classes of treatment:

> Class A treatment applies anytime there is a drinking water well nearby (within 300 m of the disposal field);

> Class B is similar (high level of treatment) but with lower standards for nitrate levels if there is room to remediate in the ground (thereby posing no threat to drinking water);

> Classes C & D apply where there is a lower risk of contamination to the water supply (this depends on the receiving environment).

182 Ibid.

In situations where the sewer discharges into a body of water (e.g., the Joint Utilities Treatment facility, which serves the City of Duncan, North Cowichan, Cowichan Bay, Eagle Heights and portions of Cowichan Tribes, discharges into the Cowichan River) the treatment standards are much higher. More information on water quality related to septic and sewage is included in Section 2.6.

CVRD-operated systems range in size from 40 homes to 800. In addition to its own systems, the CVRD routinely takes over privately run systems (package plants) that are failing, and then brings them up to provincial standards. The CVRD typically takes over two to three package plants a year. The CVRD has now adopted a policy that requires all new private package plants be built to standard, and then turned over to the CVRD for operation.

In 1998, a South Sector Liquid Waste Management Plan was conducted to address a variety of issues:

> Wastewater contamination at Shawnigan Lake and the Mill Bay foreshore;

> Elevated coliforms in surface water sources;

> Elevated nitrates in groundwater;

> Nutrient loading (nitrogen and phosphorus) leading to eutrophication[183] in some surface waters;

> Concerns about Saanich Inlet water quality raised by the Saanich Inlet Study; and

> Increased pressure on the treatment and disposal of liquid waste resulting from population growth.

In 1999, the CVRD prepared a Central Sector Liquid Waste Management Plan to address:

> Replacement of the Cowichan Bay treatment plant; and

> Reduction of the phosphorus load to the Cowichan River.

The plan also looked at a source control program to reduce the discharge of inappropriate waste to the sewer systems.

One aspect of liquid waste management that is being adopted or is under review by other local governments in British Columbia and elsewhere is an approach that utilizes the resources (notably heat, energy and soil amendments) from liquid waste. This is described by the provincial government in their Integrated Resource Recovery approach.[184] To date, this approach has not been implemented in the Cowichan Region.

183 Excessive nutrients in a lake or other body of water, usually caused by runoff of nutrients (animal waste, fertilizers, sewage) from the land.

184 www.cd.gov.bc.ca/lgd/infra/resources_from_waste.htm

Indicator and Measures

The Ministry of Environment monitors larger treatment plants to ensure that they meet provincial standards. Smaller systems (septic systems for less than 15 homes, or under 22,730 litres[185] per day flow) are monitored by the Vancouver Island Health Authority (VIHA).

Many operators of private wastewater systems do not routinely sample their effluent, even though this is a requirement from the Ministry of Environment.[186] The CVRD does not keep track of private wastewater systems. Unless a problem arises, there is no way to track the day-to-day functioning of these systems (where a water system shows higher-than-normal levels of nitrates and phosphates, VIHA can go after the water system operator, but has no way to address how the wastewater plant is being operated.) The Ministry of Environment can charge a plant operator under groundwater protection legislation, but this is a reactive rather than preventive approach.[187] An additional "unknown" is how many septic fields are below the water table during the winter (and therefore ineffective at treating effluent), for example around Cowichan Lake.

Findings

Discharges from local government treatment systems have created health concerns from time to time. Nutrient loading is a big issue. In the Cowichan River, there are two sewage treatment plant discharges (Town of Lake Cowichan and North Cowichan/Duncan sewage lagoons). There is evidence of increasing nutrient levels downstream of North Cowichan/Duncan, despite significant improvements to the discharge.[188] The quality of discharge coming from the North Cowichan/Duncan sewage lagoons has improved significantly in recent years (80% reduction in phosphorus) as a result of a new phosphorus removal system that was constructed to reduce the amount of phosphorus discharged to the Cowichan River. Typical phosphorus loadings have been reduced from an average of 4.5 ppm to less than 1 ppm.[189]

185 5,000 gallons

186 Louise Knodel-Joy, Sr. Engineering Technologist, Water Management, CVRD, personal communication, 2009.

187 Ron Cook, Public Health Inspector, Vancouver Island Health Authority, personal communication, 2009.

188 Deb Epps, Environmental Impact Assessment Biologist, BC Ministry of Environment, personal communication, 2009

189 From North Cowichan website: www.northcowichan.bc.ca/siteengine/ActivePage.asp?PageID=154 . This page includes figures about the population served by these sewage lagoons..

The greatest concerns relating to liquid waste arise from the private septic fields. As noted in Section 2.6, leaking septic fields can harm water quality, as shown by the examples of evidence in the Cowichan/Koksilah systems and Shawnigan Lake. Management plans for Quamichan[190], Fuller and Shawnigan Lakes include strategies to get houses off septic systems.[191] The major concern is that there is no day-to-day monitoring of septic fields, and problems are only identified (if at all) when a concern is raised and VIHA is asked to investigate.

Summary

The CVRD has set a long-term goal of Zero Waste, with a more immediate goal of achieving a 50% per capita reduction in the disposal of solid waste (over 1990 levels) and has an extensive recycling program to support this. The volume of recyclables has risen significantly in the past ten years, both in terms of total volume and per capita volumes. At the same time, however, total and per capita volumes of solid waste (garbage) have also increased, indicating that while people are recycling more, they are also buying (and disposing of) more "stuff".

Results for liquid waste management indicate that the CVRD is working to take over, and bring up to provincial standard, more of the smaller treatment plants, thus addressing some of the issues related to leaking septic fields. However, there remain many septic fields that continue to contribute to water quality issues in the region.

190 www.quamichanlake.ca/sites/default/files/QuamichanWatershedManagementPlanFinal-October2009.pdf

191 Deb Epps, December 2009.

Missing Information

Information on the composition of the solid waste stream (e.g., electronics, plastics, construction waste) was not available. This data would provide more information on the major sources of solid waste, and direction on where to look for further ways to eliminate, reduce or recycle waste from these sources.

With respect to liquid waste, the CVRD does not keep track of private wastewater systems. Unless a problem arises, there is no way to track the day-to-day functioning of these systems (where a water system shows higher-than-normal levels of nitrates and phosphates, VIHA can investigate, but does not have the authority to address how the wastewater plant is being operated). The Ministry of Environment can charge a plant operator under groundwater protection legislation, but this is a reactive rather than preventive approach. An additional "unknown" is how many septic fields are below the water table during the winter (and therefore ineffective at treating effluent), for example around Cowichan Lake.

References

BC Ministry of Community and Rural Development. 2009. Resources from Waste: A Guide to Integrated Resource Recovery. Available from www.cd.gov.bc.ca/lgd/infra/resources_from_waste.htm

CVRD. 2007. Solid Waste Management Plan. Annual Monitoring Report.

CVRD. 2010. Recycling and Waste Management Annual Progress Report. www.cvrd.bc.ca/documents/Engineering%20Services/Solid%20Waste/Planning/2008AnnualSWReport.PDF

Dayton and Knight. 1999. Central Sector Liquid Waste Management Plan. Report Prepared for the CVRD. www.cvrd.bc.ca/documents/Engineering%20Services/Utilities/Liquid%20Waste%20Management%20Planning/central%20sector%20liquid%20waste%20management%20plan.pdf

Stanley Consulting Group. 1998. South Sector Liquid Waste Management Plan. Report Prepared for the CVRD. www.cvrd.bc.ca/documents/Engineering%20Services/Utilities/Liquid%20Waste%20Management%20Planning/SSLWMP-JUNE07.PDF