Yard Waste

Overview

Nebraska Department of Environmental Quality (NDEQ) Title 132 regulations defines "yard waste" as

> "grass and leaves. For the purposes of composting, yard waste shall mean grass and leaves in combination with chipped trees and branches and other organic material collected as the result of the care of ornamental plants, lawns, shrubbery, vines and gardens."

The Lincoln Municipal Code (LMC) Section 8.32.010 defines "lawn waste" as "grass cuttings or clippings and leaves." Future papers, as part of the Solid Waste Plan 2040 will discuss other types of organic waste management, some of which may have synergies with yard waste composting. For purposes of this paper the term yard waste will be used, unless specific referencing those aspects related to the LMC.

Nebraska Revised Statutes Section 13-2039 (part of Nebraska's Integrated Solid Waste Management Act) bans yard waste from landfills, but provides the following exceptions:

> "(a) A landfill may accept yard waste without condition from December 1 through March 31 of each year.
>
> (b) A landfill may accept yard waste year-round if such yard waste:
>
> (i) Will be used for the production and recovery of methane gas for use as fuel (A) with the approval of the department and (B) at a landfill operating as a solid waste management facility with a permit issued pursuant to the department's rules and regulations; or
>
> (ii) Has been separated at its source from other solid waste and will be used for the purpose of soil conditioning or composting."

Currently the City's Bluff Road Landfill does not have NDEQ approval to accept yard waste on a year-round basis. The City would be eligible to apply for such approval when the landfill gas power generation facilities, currently under design/construction by Lincoln Electric System, are complete in 2013.

Seasonal yard waste bans have created the need for separate collection and management systems for those individuals that choose to collect and "bag" their yard waste for off-site management.

Current Programs

As part of lawn maintenance residents and business decide how to manage their yard waste. The most common options utilized in the Planning Area currently include:

1. Leaving it on the lawn (e.g., mulching mower);
2. Collecting it and reusing it for compost or mulch on their property;
3. Collecting it and transporting it (self haul) to local composting or receiving facilities; and,
4. Collecting it and contracting for hauling by lawn services or professional waste haulers to a compost site or disposal facility.

From an overall source reduction strategy options 1 and 2 are the most preferred.

Leaving it lay on the turf has many agronomic advantages. However, letting it lay may not always be an option for areas with large volumes of leaves or when regular mowing is not performed. Backyard or onsite composting can be conducted by residents and certain businesses on their own property. By composting these materials onsite, Planning Area homeowners and businesses can significantly reduce the amount of yard waste that needs to be transported and manage (composted or disposed) off-site. This practice can also save them money by avoiding hauling and management costs.

In response to Nebraska's seasonal ban, the City constructed a large scale (13 acre) commercial composting facility adjacent to the Bluff Road Landfill, and provided separate material receiving and handling facilities at the City's N. 48th Street Transfer Station. Commercial refuse haulers and commercial lawn maintenance companies hauling yard wastes can deliver clean yard waste to the composting facility. Brush and tree waste, which is free of soil and other debris, may also be taken to this facility. Households and smaller yard waste haulers must deliver material to the N. 48th Street Transfer Station site. Yard waste and other compostable waste delivered to the North 48th Street site are taken to the Bluff Road site for further processing and composting. Finished compost is available to the general public through area landscapers, garden centers and contractors and is marketed as LinGro Compost. The City grinds and chips wood at both North 48th Street and Bluff Road facilities and the material is currently used in the compost and landfill operations. The yard waste management and composting program is funded by user drop-off (tipping) fees, the Occupation Tax, grant funds from NDEQ and from sales of LinGro Compost.

Independent waste haulers generally provide a menu of services to residents and businesses related to yard waste. Optional yard waste collection services are available through various waste haulers or recycling contractors which includes yard waste (grass and leaves) collection (typically April 1st until December 1st) and fall only leaf collection (typically October and November). While LMC requires waste haulers operating within the three mile corporate limits of the City to have a license to collect, haul and convey garbage, there is an exemption to the permitting requirements for firms collecting hauling and conveying lawn waste. In the Planning Area private haulers will collect and transport the grass and leaves to composting facilities for a fee; once collected they can also haul them to certain landfills outside of Lancaster County for disposal.

The City promotes waste reduction, diversion and composting of yard waste through the Public Works and its Recycling and Solid Waste Operation website http://lincoln.ne.gov/city/pworks/waste/sldwaste/recycle/programs/yardwaste/ as well as educational information provided in the *Lincoln-Lancaster County's Official 2012 Waste Reduction & Recycling Guide*, which is also available through the Solid Waste Operations website. Additionally the City provides several "Backyard Composting Workshops" annually, free of charge to residents and promotes thoughtful use of lawn and garden chemicals through its educational programs.

Generation and Diversion

Approximately eight percent of the total MSW generation in the Planning Area is estimated to be yard waste. Of the total yard waste collected for management 65 percent is currently estimated to be managed by composting (through the City's composting site). The NDEQ's 2008 Nebraska Waste Characterization Study included a waste sort and characterization at the Bluff Road Landfill. This study estimated that approximately three percent of the material disposed of at the Bluff Road Landfill was yard waste; based on fiscal year 2011 disposal rates this is equivalent to slightly more than 8,000 tons per year. The City's composting operations processed an average of 14,800 tons of yard waste and 4,600 tons of wood waste per year over

the past five years. The facility produces approximately 4,600 tons of wood chips per year and over the last 5 fiscal years has distributed an average of about 8,900 cubic yards of finished compost. The villages of Bennet, Davey, Firth, Hickman, and Panama, operate yard waste and brush collection areas while Roca and Waverly operate brush only collection areas for their residents.

City Solid Waste Operations estimates that over the life of their composting and wood waste grinding programs (FY92-93 through FY10-11) approximately 256,000 tons of yard waste has been composted and approximately 111,000 tons of wood waste has been ground into wood chips. This has reduced the amount of landfill space consumed by approximately 1.3 million cubic yards and represents an extension of the life of the Bluff Road Landfill by 2.5 years.

Program (Facility/System) Options

A key decision as it relates to the Solid Waste Plan 2040 is whether or not the City will exclude yard waste from the Bluff Road Landfill, and if so by what means and to what extent. Currently yard waste is only banned from the landfill from April 1st until December 1st.

Basic program options include:

1. Allow year round disposal in the Bluff Road Landfill.
2. Continue current seasonal bans, coupled with existing or enhanced City composting facility.
3. Ban all yard waste from the landfill year round.

None of these options preclude source reduction programs which discourage generation and promote leaving it on the lawn and/or reuse on the site where it is generated. The planning process also provides the opportunity to review the definition of “lawn waste” (LMC Section 8.32.010) and whether it should be expanded to include other organic material (e.g., garden and flower bed waste).

One argued benefit of accepting it at the landfill year round (Option 1) is that it is readily degradable and can be used to generate landfill gas, which can be used to produce saleable energy. Currently three landfills in Nebraska (Douglas County, Butler County, and South Sioux City) accept yard waste year round; these all have landfill gas recovery systems and sell landfill gas to produce energy. The obvious arguments against this approach are the resulting air emissions, a portion of which will vent to the atmosphere and the volume it will consume in the landfill. If all of the yard waste currently sent to the City’s compost operations were redirected to the landfill it would shorten the overall life of the landfill by approximately one year.

Option 2 is consider the status quo, but may or may not be enhanced by increase source reduction efforts. One additional enhancement that will be addressed in a future evaluation is organic waste composting; it may be possible to include other materials with yard waste in an enhanced composting operation. One observed short-coming of the current approach is that some households save their yard waste until December and then include these materials with their household garbage, thus avoiding paying for separate yard waste collection services and circumventing the intent of the state’s ban (minimizing landfilling). The number of households doing this is not known.

Another key decision will be the level of City’s continued involvement in managing this banned waste type. For purpose of this analysis, it was assumed that there would be no change to the current City policy stated in the LPlan 2040 of “public ownership, operation and financing of disposal and selected integrated solid waste management services will continue during the planning period.”

Option 3 effectively forces any collected yard waste to a composting facility (City or private) or to disposal site outside Lancaster County. Not everyone is willing to practice source reduction and stop collecting yard waste, and it is important to recognize that not all residents or businesses have the desire, space, or need to utilize or compost collected yard waste on their property. As such, some level of continued off-site management is anticipated in the future, even if it is banned from disposal in Lancaster County.

From an overall program perspective, if the City's goal is to emphasize source reduction and minimize landfill disposal the following options might be considered:

- Ban all yard waste from the landfill year round.
- Support programs to leave it on the lawn and reuse it on the site where it is generated.
- Re-evaluate City policy of providing collection and management alternatives for yard waste at remote locations.

Composting of yard waste off-site is not a source reduction option but is considered a form of recycling. In general source reduction strategies for yard waste are focused on reduction at the source (e.g., "Don't Bag It", "Let It Lie", backyard composting and mulch), but generally recognize the need for remote composting facilities (recycling) as non-disposal management options.

Options Evaluation

Consistent with the guiding evaluation criteria developed for use in the Solid Waste Plan 2040, yard waste programs have been evaluated based on the following considerations of: waste reduction/diversion; technical requirements; environmental impacts; economic impacts; and, implementation viability. These evaluations are presented in Table 2.

Relationship to Guiding Principles and Goals

As it relates to the Guiding Principles and Goals of the Solid Waste Plan 2040, promoting expanding yard waste management programs would be applicable as further noted below:

- **Emphasize the waste management hierarchy**: management of yard wastes is directly related to the waste management hierarchy in that it places maximum emphasis on reduce, reuse, and recycle (composting) to avoid or minimize waste collection and disposal in the City's landfill.
- **Encourage public/private partnerships**: current curbside collection of yard waste is voluntary, subscription based through private haulers and essentially places the direct financial burden on the generator to pay for management of yard waste transported off-site. Current practice relies on public (City) ownership, operation and financing of commercial composting operations, wood grinding, and the North 48th Street drop-off site as part of its integrated solid waste management services.
- **Ensure system capacity:** increased source reduction programs for yard wastes could help delay or eliminate the need for additional infrastructure to manage yard waste throughout the planning period. If increased yard waste collection occurs the capacity to process such material will likely need to increase. Allowing year round disposal in the landfill will reduce the life of the Bluff Road Landfill by approximately one year but may increase the energy sales; this would require further evaluation.
- **Engage the community:** Increased source reduction and changes in management practices (e.g., Don't Bag It, Let It Lie or onsite composting) will require an engaged community because it ultimately seeks to change the current management/disposal

Table 2 – Options Evaluation

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
Waste Reduction/ Diversion	This is not a source reduction method, but would be considered an energy recovery method; such a method would count against a numeric diversion goal. Yard waste is readily degradable and can be used to generate landfill gas, which can be used to produce energy. Energy market is established but energy market demand would need to be further evaluated. The economic incentives for source reduction that currently exist as a result of a separate collection fees would be diminished or eliminated.	This is not a source reduction method. Programs that manage yard waste off-site (not in a landfill) are forms of recycling. Options for reducing the quantities managed through collection and central composting facility would be consistent and compatible with those discussed in separate technical papers on source reduction and zero waste.	This could provide the greatest incentive to source reduction. 3 percent of the municipal solid waste currently received at the Bluff Road Landfill is estimated to be yard waste; such a ban should reduce this quantity. Programs that manage yard waste off-site (not in a landfill) are forms of recycling. This could also result in greater quantities of yard waste being composted locally as well as exported to out of County landfill(s). Current LMC regulations do not regulate the collection of yard waste nor do they restrict export.

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Technical Requirements	If all of the yard waste currently sent to the City's compost operations were redirected to the Bluff Road Landfill it would shorten the overall life of the landfill by approximately one year. The Bluff Road Landfill accepted yard waste in the early 1990s, prior to the state ban, and would be capable of managing such material.	The existing commercial composting area adjacent to the Bluff Road Landfill is currently close to capacity; expanded City composting operations is anticipated to require modifying the current management system (e.g., pre-grinding incoming materials), expansion of the composting area, or alternate areas for management in the County. The current and optional programs for yard waste are considered compatible with other solid waste management programs (public and private). The current commercial composting program, supported by educational efforts, is considered highly reliable, effective, flexible and compatible with other City operations. Yard waste compost is sold as a recovered material, but currently supply exceeds private sector demands; the remaining compost is utilized within City operations.	By revising the LMC definition of "lawn waste" and instituting a ban, the quantities received at the Bluff Road landfill would be reduced; the life of the landfill would be extended, but by less than 1 year. A certain amount of risk and uncertainty would exist if a total ban on landfilling were implemented (e.g., improper management, illegal dumping, open burning, public opposition). Education is a critical aspect of backyard or onsite composting and source reduction efforts. Yard waste compost is sold as a recovered material, but currently supply exceeds private sector demands; the remaining compost is utilized within City operations.

Evaluation Criteria	Allow Year Round Disposal in Bluff Road Landfill	Continue Current Seasonal Bans, Coupled with Existing or Enhanced City Composting	Ban All Yard Waste from the Landfill Year Round
Environmental Impacts	Anaerobic digestion in a landfill will result in landfill gas generation, a portion of which will vent to the atmosphere as greenhouse gas (methane) emissions. If yard waste is co-collected with garbage the number of vehicles driving through a neighborhood may be reduced.	Yard waste and resulting compost products are not considered a hazardous or toxic waste and do not require disposal in a sanitary landfill. The addition of compost to the clay soils in Lincoln and Lancaster County has the benefit of making soils healthier by adding organic matter and decreasing the soils bulk density, thus allowing for greater water retention and infiltration and a reduction in fertilizer requirements. This reduces the required use of water and the amount of water that runs off lawns into storm sewers. Health and safety issues associated with yard waste management are considered minimal but increase with increased degrees of handling.	Programs to leave yard waste on the lawn are viewed as having the lowest environmental impact because they benefit the lawn and do not require the expenditure of resources (material and energy) to collect and manage, and as such should have the lowest levels of potential air emissions. It cannot be stated for certain that a ban at the City's landfill will result in all yard waste being diverted from disposal. Uncontrolled anaerobic composting operations have the greatest potential to generate greenhouse gases as well as odors; anaerobic conditions can exist in improperly managed composting operations.

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Economic Impacts	Capturing greenhouse gas emissions yard waste may pose challenges and add cost to operations. Residents may not need to pay a separate collection fee for yard waste collection. However, if generators set out large volumes of yard waste, waste haulers may require added fees. Economic impacts to waste haulers may require further evaluation of the costs and benefits resulting from changes in current services provided.	Presently residents who choose to have their yard waste managed off-site pay, directly or indirectly, to have it collected, transported and managed at remote locations; currently those who do not collect it or who choose to manage it on their own property do not experience any significant costs. The expansion of the City's existing commercial composting operation will require capital investments for expanded management areas to effectively manage larger quantities of yard waste. At present, yard waste management is not viewed as a tool for potential economic development. The economic implication of reducing or increasing the quantities managed at the City's commercial composting site would require further evaluation; increases may result in a certain economy of scale benefit, but again would require a capital expenditure to increase handling capacity.	Assuming such banned yard waste would go to the City's composting operation, the expansion of the City's existing commercial composting operation will require capital investments for expanded management areas to effectively manage larger quantities of yard waste. Presently residents who choose to have their yard waste managed off-site pay, directly or indirectly, to have it collected, transported and managed at remote locations.

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Implementation Viability	Allowing year round disposal would require modifications to the landfill's permit and possibly an expansion of the current landfill gas recovery system (this system will ultimately be expanded as the landfill grows in size). The social and political acceptability of allowing year round disposal would require further assessment.	The City is viewed as having adequate land adjacent to its existing operation to allow expansion; the implications of such expansion on future use of such land would require further evaluation and may be addressed in considering options for future landfill needs. If the quantity of organic material accepted at the current City facility increase significantly additional NDEQ permitting may be required.	Changes to current programs, such as bans would require changes to the LMC. The social and political acceptability of bans would require further assessment. While the City has currently adopted a policy of providing management options for waste banned from the landfill and managing the post-collection composting operations, significant changes to the current program may change the role of the City or other parties.

ethos by including lifestyle and societal changes. Public education to engage the community will be important to sustaining existing programs and to increase source reduction program participation.

- **Embrace sustainable principles:** Reduction in the quantity of yard waste generated (source reduction) and reducing the requirement for off-site management are consistent with sustainability principles in emphasizing minimizing safety, environmental and social impacts and maximizing economic benefits. Recycling/composting and energy recovery would be alternatives of a lesser priority.

Summary

Nebraska statutes ban yard waste from landfills from April 1 until December 1st of each year, but provide certain exceptions that would allow the City to accept it in their landfill on a year round basis. Seasonal yard waste bans have created the need for separate collection and management systems for those individuals that choose to collect and "bag" their yard waste for off-site management. From an overall source reduction strategy leaving it on the lawn (e.g., mulching mower) and collecting it and reusing it for compost or mulch on the site where it was generated are the most preferred options.

Leaving it lay on the turf has many agronomic advantages. However, letting it lay may not always be an option for areas with large volumes of leaves or when regular mowing is not performed. Composting of yard waste off-site is not a source reduction option but is considered a form of recycling. In response to Nebraska's seasonal ban, the City constructed a large scale (13 acre) commercial composting facility adjacent to the Bluff Road Landfill, and provided separate material receiving and handling facilities at the City's N. 48th Street Transfer Station site.

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