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A Feasibility Study of Commercial Food Scrap Diversion for the City of Santa Barbara

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Recent reports indicate food scrap makes up approximately 20% of material from the City of Santa Barbara going into the Tajiguas landfill.ⁱ It is the single, largest waste stream for which there is no city wide recycling program. Due to the limitations on the capacity of the Tajiguas landfill, the City of Santa Barbara is considering options for increasing diversion of waste. One option is diversion of food scrap generated by the commercial sector in the City. The goal of this study is to provide information and recommendations to the City of Santa Barbara regarding a commercial food scrap diversion program.

Background Information

The Tajiguas Landfill, located 26 miles west of Santa Barbara and immediately north of Highway 101, is an 80-acre site located in a confined canyon, providing landfill disposal for the unincorporated areas of the south coast of Santa Barbara County, the City of Santa Barbara, Santa Ynez Valley, and the Cuyama Valley.

According to the August 2003 Santa Barbara County Waste Characterization Study, the City of Santa Barbara contributes 47% of the total waste disposed in the landfill. Tajiguas has recently been permitted for a volume expansion, which will increase its life by approximately 15 years.ⁱⁱ Through increased diversion, it may be possible to gain more than fifteen years of disposal at Tajiguas.

In 1989, the California Integrated Waste Management Act, AB 939, mandated that jurisdictions divert 50 % of their solid waste from the landfill by the year 2000.ⁱⁱⁱ The City of Santa Barbara has been successful in implementing recycling programs for a number of

different waste streams, reaching a 55% diversion level. However, in September 2002, the City Council set new, more aggressive waste diversion goals of 60% by 2005 and 70% by 2010. In order to meet these levels, consideration must be given to diverting other types of material. The largest individual contributions to the food scrap waste stream are made by businesses in the commercial sector, and the commercial sector has fewer generators than the residential sector. For these reasons, a program is being proposed to target the largest commercial food scrap generators.



Photograph of Tajiguas Landfill (courtesy of the County of Santa Barbara official website).

Scope of Project

This project provides information in four areas:

1. Identification of the largest commercial food scrap generators.
2. Food scrap generators' willingness to participate in a collection program, as well as, the benefits and constraints associated with participation.
3. Technology available for treating food scrap to produce compost and a cost analysis on the top treatment alternatives.
4. Analyses of the other existing recycling programs for achieving long range diversion goals.

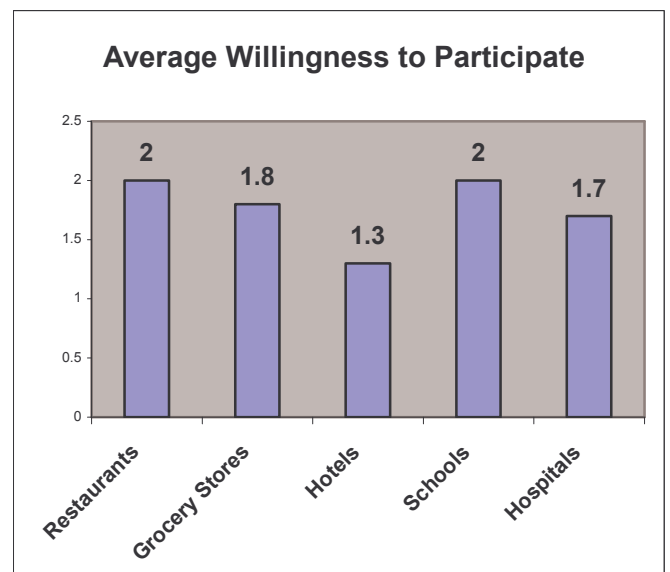
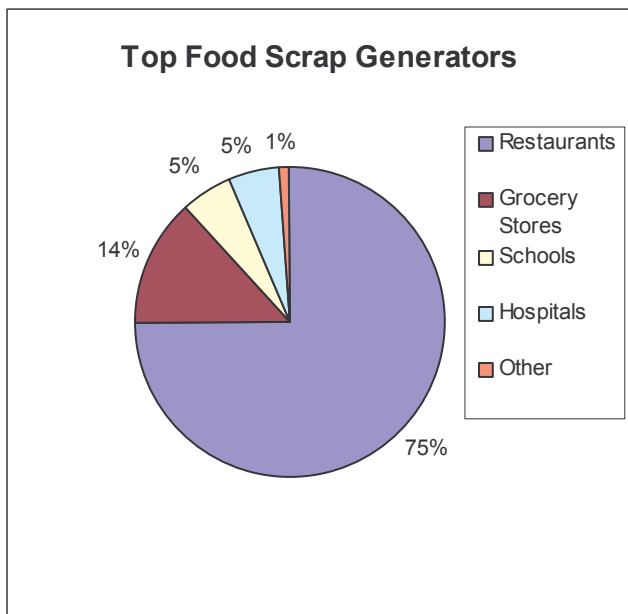
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Results

There are a number of cities in California that have implemented food scrap diversion programs in the past ten years. Lessons learned from these cities in developing a successful program for the City of Santa Barbara include: the programs have worked with the largest commercial food scrap generators first, 50% diversion of the commercial food scrap stream is a realistic goal, feeding humans with edible food scrap is a priority, haulers are given financial incentives to collect source separated food scrap, and pilot food scrap diversion programs are most successful when they are used as a learning tool for a long-term program.

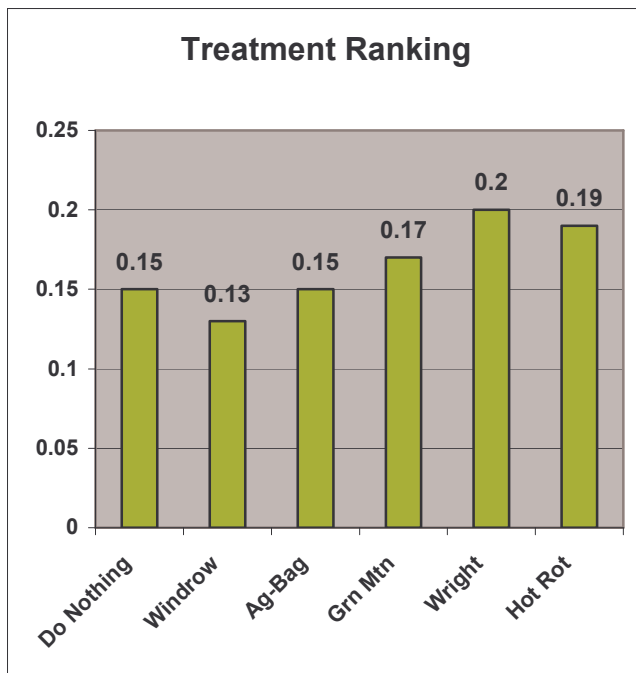
The study provided information on the waste generated from the commercial franchised sector of the City of Santa Barbara. The amount of food waste attributed to this sector was 10,624 tons in 2003. The study compiled a list of 529 major food scrap generators within the commercial sector and identified the top 20%. Results showed that by collecting from the top 20% food scrap generators (109 businesses), 50% of the commercial food waste stream would be captured. Targeting this waste stream for collection, would amount to collecting 17 tons per day, if collected 6 days per week.

willingness to participate in a food scrap diversion program, the potential benefits and challenges associated with participation, and the outreach and education necessary for successful implementation. The survey results indicated that the top three benefits associated with participation in a food scrap diversion program were the benefit to the environment, “it’s the right thing to do”, and reduced odor. The top obstacles reported were limited space, odor problems and vectors. These results indicate that odor is associated with both a benefit and an obstacle to participation. As such, it will be critical for the City to effectively address this issue. The survey results also show that restaurants and schools have the greatest willingness to participate in food scrap diversion program. These sectors expressed a need for outreach particularly in the form of bi-lingual (English and Spanish) printed materials and on-site staff training.



A survey was sent to all of the major food generators identified by the study. The survey aimed to assess the

The study considered composting technologies and evaluated the most feasible options. Wright Environmental’s in-vessel system ranked highest between the six alternatives for converting food scrap to compost. This aerated, continuously fed, in-vessel technology has high capital costs but these are offset by small land requirements, low environmental impacts, and demonstrated ability with food scrap. The second highest-ranking alternative was the agitated, aerated, and continuously fed system offered by Hot Rot. Although the Hot Rot equipment has some mechanical advantages in that it is both agitated and aerated, it lacks the demonstrated ability of the Wright Engineering equipment.



A cost analysis showed in-vessel treatment is a more economically feasible treatment of food scrap than the current method of landfilling food scrap or the common method of open-air windrow composting. Using a net present value calculation over a 15-year period, in-vessel treatment is 48% less expensive than landfilling. With additional screening and curing following the treatment process, in-vessel treatment technology produces a nutrient rich compost with a marketable value in the range of \$10-\$28/ton.

If a commercial food scrap program were implemented and successful in collecting 50% of the commercial food waste stream, this would result in a 2.7% increase in overall City diversion, bringing up the current 55% rate to 57.7%. In order for the City to increase diversion to the 70% goal, diversion of other commercial and residential waste streams must be increased. A model based on tipping fees provided by the study offers the City a tool for calculating the impacts of costs on waste diversion. Under the current structure, maximizing diversion of commingled recyclables is the most cost-effective approach, followed by food scrap diversion. However, to get the City to its 70% diversion goal by 2010, the City must divert between 50% and 70% of the other commercial and residential waste streams as well.

Key Results

1. Targeting the top 20% of generators is the most efficient way for the City to collect 50 % of the commercial food scrap.
2. Food scrap generators reported the top benefit as the environment and the top obstacle as limited space.
3. The highest-ranking treatment alternative was Wright Environmental in-vessel system.
4. The cost of treating food scrap to produce compost is \$25. /ton compared to \$48. /ton to landfill.
5. Commercial food scrap diversion results in a 2.7% increase in overall diversion.

Recommendations

The food scrap diversion study supports the following five recommendations:

1. The City of Santa Barbara should consider implementing a commercial food scrap diversion program. The review of existing treatment technology showed continuously fed, in-vessel systems are the best alternative for Santa Barbara. When capital, operating and maintenance costs are considered, an in-vessel system is more economically feasible than the current practice of disposing of food scrap in the landfill or composting it in open-air windrows. However, in determining the overall feasibility of this program it is recommended that a further cost benefit analysis be performed that includes collection, transportation charges, the costs of implementation of the new program, as well as the economic benefits of the compost produced.

2. If the City decides to move forward with a food scrap diversion program, based on the experience of other cities in California, it is recommended to begin with a pilot program that is viewed as a long term learning tool and evolves into a city-wide program. For the purposes of solid waste permitting, a pilot program may be presented as a research project and as such will face fewer permitting requirements.

3. Collection should be directed to the top 20% of the food scrap generators to achieve 50% diversion. Based on the integration of the willingness to participate, the City should target education facilities, for the initial food scrap collection efforts as well as restaurants and grocery stores. By focusing initial collection efforts on only a few sectors it will be possible to design a collection program that more effectively meets the specific constraints identified by these food scrap generators.



The Wright Environmental In-Vessel System.

4. Given the high importance placed by the California Integrated Waste Management Board on using food scraps to feed humans, in addition to the challenges that Santa Barbara faces with feeding homeless and low-income families, it is recommended that the City consider the ways to use food scraps to feed humans. Suggestions include providing education for food scrap generators about human re-use opportunities and liability protection under the Good Samaritan Act, and providing grant support to organizations trying to facilitate this process.

5. It is recommended that further work be done on the costs associated with each of the existing recycling

programs in order to assist in determining how to meet the 70% diversion goal in the most cost-effective way.

Recommendations

- 1. The City should consider implementing a commercial food scrap diversion program using a continuously fed in-vessel treatment to produce compost.**
- 2. A pilot program should be initiated and continued.**
- 3. Collection should be directed at the top 20% generators.**
- 4. Food scrap for human use should be a priority.**
- 5. The City should analyze the costs of the existing recycling programs to maximize diversion.**

Client



References

ⁱ Cascadia, *Waste Characterization Study County of Santa Barbara*. 2003.
ⁱⁱ County, S.B., *The Official Website of the County of Santa Barbara - Tajiguas Landfill*.
 2003, <http://www.countyofsb.org/pwd/swud/TE.htm>.
ⁱⁱⁱ County, S.B., *The Official Website of the County of Santa Barbara*.
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