

Sicka Waste: Community Composting Proposal

Composting Project Objectives

The overall objective of this project is to demonstrate the viability of in-vessel composting and let it serve as an educational and outreach opportunity to Sitka. Given the small-scale nature of the project, while it will save money and generate income, it is not expected to be a fully-fledged business but rather a pilot project. The intent is the next stage of the project would develop a large scale composting facility that could be operated through Stragier Sanitation, City of Sitka, local business owner or community organization. For the project in question, the large part of the initial start-up infrastructure will be funded by grants.

Short Term:

- (1) Develop a pilot project that demonstrates the viability of in-vessel composting
- (2) Raise local awareness of the value and opportunities of composting through education in schools and public outreach

Long Term:

- (1) Develop a large scale composting system, either in-vessel or windrows to accommodate significantly larger volumes of compost.
- (2) Use regional models for in-vessel (Haines) and windrow (Gustavus) as guidance
- (3) Reduce solid waste costs to Sitka residents
- (4) Reduce the volume of waste that is transported long distances to landfill
- (5) Reduce the environmental costs of waste, shipping, and landfilling
- (6) Utilize waste streams for a growing local product use (e.g. fertilizer, top soil, etc.)
- (7) Potential to divert millions of pounds of fish waste into high quality marketable product

Sitka: Prime for Compost

Sitka, Alaska is uniquely positioned in the world, sitting in the middle of the Tongass National Forest, the largest in the United States and rich in history and culture. Yet its geographic location does offer challenges. Environmental considerations require landfilling off-island to protect a shallow water table and the risk of leachate contaminating into the ocean, a primary area of economic and subsistence use. *The citizens of Sitka send approximately 16 million pounds of solid waste 1,100 miles to a landfill in eastern Washington. The cost of solid waste to the residents is approximately \$1.8 million dollars per year, with the majority of that cost (\$1,176,000) attributed to shipping and landfilling cost. The average cost per pound of waste collection, shipping and landfilling is roughly 11 cents. For every 1% of total solid waste that is not shipped, the community saves \$18,000.* In the long term, composting that could handle fish waste would be highly valued as upwards of ten million pounds of fish waste are collected by local fish processors and dumped in outside waters. By looking at waste streams as assets rather than as expenses is an important change in paradigm. The opportunity to tie locally produced

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compost into local food production, a growing effort within Sitka, is also an important consideration.

Community Based Support

Sicka Waste is a community-based group formed at the October 2011 Health Summit in Sitka. The summit brought together community leaders to develop three community projects that could improve the health and overall vitality of Sitka. The Summit has a successful track record of developing such projects as the Fish to Schools program, which provides local fish in school lunches. With over [redacted] participants and tens of ideas, composting was voted as the highest priority project to pursue. Following the summit, Sicka Waste formed as a working group to develop a drop-off composting site that could be implemented by October 2012. The group itself represents different interests in the community including staff from the City of Sitka, University of Alaska, hospitals, artists, teachers, manual laborers, nonprofit and social workers, among others. A number of the group are directly involved in composting, some going so far as to voluntarily collect food waste from local restaurants for compost at community gardens. Since its inception, facilitated meetings and research have informed the group to determine the most suitable option for composting location, management, and technology.

Community support for composting and waste reduction is not new to Sitka. In 1989/1990 the Solid Waste Implementation Team (SWIT) formed similarly by an interested group of community members. The team set forth to develop a broad based solid waste plan for Sitka and has continued to meet regularly with city staff since that time. Klaudia Lecesse, co-leader of the current Sicka Waste group, has remained involved with SWIT since its beginnings. Recycle Sitka, an enterprise fund developed by the City of Sitka formed and has since become an income generating entity, saving thousands of pounds of material from being landfilled while providing the City additional funding. In 2008 the Sitka Global Warming Group presented the Climate Action Plan to the City of Sitka assembly and that document was voted on unanimously providing a roadmap of how to handle the full spectrum of carbon reduction measures. Included in that plan are actions directed at composting school lunch waste, community-wide composting, and [redacted]. While the City of Sitka as not formally adopted/developed composting programs, there is interest at the city level to implement with community initiative.

Composting Site Location

Blatchley Middle School (BMS) is the most ideal location for an on-site small to medium scale composting. The pilot project would integrate handling compost from larger sources such as the school, City of Sitka public works, department, restaurants, brewery, and hospital. The site's strengths lie in currently being a drop off location for compost at a community garden it could serve as a central location for composting. The BMS site has already received preliminary approval from both the school principal and city staff as a good location.

The Recycling Center is a second alternative particularly to engage and educate local residents about waste and composting opportunities. At least initially, a smaller size composter seems more appropriate. The site is already a drop-off center for recycling materials and seems a logical location. The Recycling Center is managed by Norm Campbell, who is interested in composting. This site however has layout and space limitations, it would require greater vigilance as residents

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would need to drop-off proper compostables and this may require an initial drop-off that could attract bears.

In-Vessel Composting Technology

After studying a number of low and high tech composting options that are available, the Earth Tub was deemed as the best alternative to use. The Earth Tub produced by Green Mountain Technologies is ideal for small-scale applications such as a drop-off pilot project. Earth Tubs have been used by a wide variety of clients including schools, hospitals, cities and universities (see Appendix for sample client list). The Earth Tub is manufactured by Green Mountain Technologies; a reputable firm located just outside of Seattle, WA, and has been in the composting business since 1992.

One of the main strengths of in-vessel composters is that they are fully contained and ensure safety with bears and proper moisture and odor control. In conversations with the staff of City of Sitka, they preferred a contained system that would not create liability or nuisances to the surrounding community, thereby reducing interest in a windrow type system. Windrows should be considered a viable option for large-scale composting.



Product Specifications

- Tub Vessel Height 48"
 - Overall Height 68"
 - Overall Diameter 90"
 - Foam Insulation R-12
 - Shipping Weight 450 lbs
 - Volume 3 cubic yards
 - Mixing Auger 12" Diameter Stainless Steel Auger
 - Motor 3 Ph 2 hp 230/460V
 - Aeration Blower 80 CFM 100 watt
 - Power Usage ~1080 KWH per year
 - Liquid Drain 1" drain on biofilter
 - Processing Capacity 80-300 pounds per day
- (See Appendix for further product specifications)

Management Process

Parties Responsible

Norm Campbell: Overall Project Oversight

- As an extension of his work with Recycle Sitka and the Community Schools program, Norm will ensure that the composting site is being managed regularly and help put the

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necessary controls for a safe, well-managed site. Also Norm will help develop and manage the process of taking school compost

Jud Kirkness: Compost Chef

- Both as a city employee and volunteer Jud will be on the ground guaranteeing that inputs are being delivered or picked up as well as

Sicka Waste Group: Volunteer Management, Education, Grant Assistance, Public Support, Media Outreach, Workshops

- Of the 15+ regularly

Blatchley Middle School Teachers

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Earth Tub

Based on both the manufacturer and current Earth Tub users recommendations, would alternate on a two-week schedule, between filling one Earth Tub and then the other, allowing for greater efficiency and effective management. Green Mountain Technologies and current users recommend using two Earth Tubs rather than just one in order to optimally manage a composting project. Because the Earth Tub needs to sit for two-week increments to properly heat the composting material, having two tubs allows for managing the site more efficiently and avoids building up piles of waiting food waste (and associated nuisances). Once the Earth Tub finishes its two-week sitting rotation it needs to rest for 30 days, covered by a tarp outside of the tub. Following the 30 days, the compost is ready to be used or sold.

Processes:

Step 1: Fill Tub #1 (approximately 2 weeks given 200 pounds/day of material loading)

Step 2: Allow Tub # 1 to Rest and Start to Fill Tub #2

Step 3: Empty Tub #1 and Allow to Rest in Tarp Covered Pile. Start to Fill Tub #1. Allow Tub #2 to Rest.

Step 4: Continue to Alternate between Filling Tubs, Manage Covered Compost

Composting Inputs and Outputs

Input Sources and Collection

- 60 pounds per day (Blatchley Middle School)
- XXX per day (or week) from local restaurants (Jud Kirkness)
- 150 tons of wood chips/year (City of Sitka)
- XXX in spent grain (Baranof Brewing)

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- XXXX in green material (City of Sitka/overburden site)

Composting Inputs	Weight (lbs.)
Daily input	200
Bi-weekly	2800
Weight after composting (75% less)	700

Composting Numbers over the Year-By Season

XX

Project Costs

- \$19,950 + shipping (2 Earth Tub Package #1)
- Electricity costs \$150/year (\$100/ machine verified by Chris Brewton at City Electric Dept.)
- Electricity Hookup \$1,000-\$2,000
- Manage compost 1 hour x 4 times/week x \$20/hour
- Administration: Oversee project; monitor costs and community education

Initial Project Costs	Upfront Costs
Two Earth Tubs	\$18,475
Shipping Costs for Earth Tubs	\$2,500
Electronic pH and Moisture Meter	\$125
Electronic Scale (up to 500 lbs.)	\$400

Ongoing Project Costs	Annual Costs
Management	\$4,160
Maintenance	XXXXX
Replacement Parts	\$
Electricity	\$100/year
Total Ongoing Costs	XXXX

(1 hour x 4 days/week x \$20/hr.)

**will have addt'l set of all parts

Project Income and Waste Diversion Savings

Project Income	Weight (lbs.)	# of 5-gallons	\$ Price/Bucket	Income
5-gallon bucket of compost		1	\$5	\$5
Batch (every two weeks)	700	28	\$5	\$140
Annual Output	18200	728	\$5	\$3,640

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Waste Diversion Savings	Weight (lbs.)
Daily Waste Diversion	200
Annual Diversion	72,800
Annual Diversion Savings	\$8,008 (weight x 11 cents/lb.)

**200 pounds per day x 7 x 52 = 72,800 lbs/yr = \$8,008 annual savings*

Income	\$3,640
Savings from Waste Diversion	\$8,008
Total Annual Value	\$11,648

Project Management Alternatives:

- **Community Schools:** Include management of the composting project in the oversight of the Recycling Center. Composted soil from the project could be sold through Community Schools via teachers and/or parents to pay for the project as well as fundraising activities
- **Blatchley Middle School:** Have a classroom or two (e.g. Mr. Peterson's class) involved in weekly management of the compost, monitoring and educational opportunities
- **Business Operator:** Give third party (e.g. Jud Kirkness) a combination of finished material and/or money to complete the work
- **Cooperative Membership:** Offer a membership program that allows community members/organizations to drop off compost in return for finished product
- **Stragier Sanitation:** Include management of the site into Stragier Sanitation's contract
- **City of Sitka:** City staff members manage the composting site and/or contribute grass clippings, wood chips, and other materials

Other Considerations:

- Sell topsoil and/or give to City (City spends \$10,000-\$14,000/yr. on fertilizer). The City currently spends about \$12/ft³ on topsoil.
- Consider selling material once larger scale project to Spenard's, True Value, Garden Ventures

Public Outreach

- Public Relations: Klaudia Leccese – co-leader of Sicka Waste and liaison to city officials, assembly, and others as needed.

Education

- Community and School Education: Sicka Waste team (Tracy Gagnon, Elise Pepple, Bob Gorman, Kerry MacLane, Shiela Finkenbinder, Tom Hart)
- Future program alternatives
 - UAS Extension: Master composter program—40 hour training (Bob Gorman)
 - Compost building workshops

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- Compost bins giveaway

Funding Sources

(1) Local Matching Funds (2) Technical Assistance (3) Grant Funding (4) In-Kind Donations

Local Matching Funds

1. Solicit in-kind funding (e.g. \$100-500) from large waste sources: schools, restaurants, SEARHC, City of Sitka

Technical Assistance

- Natural Resources Conservation Service (NRCS) can provide technical design assistance once (1) location (2) inputs (3) equipment, and (4) staff are determined.
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical>

Grants

USDA Rural Development

USDA Solid Waste Management Plan, \$40,000-\$258,000, Grant Deadline: 12/31/2011,
<http://www.rurdev.usda.gov/UWP-solidwastemanagement.htm>
<http://www.rurdev.usda.gov/SupportDocuments/Application%20Guide%20TAT%20SWM2012.pdf>
Water and Waste Grant (WWG) - Facility or equipment money

Predevelopment and Planning Grant (PPG) – Money for planning your facility.

Special Evaluation Assistance for Rural Communities

Community Food Projects Competitive Grant

http://www.csrees.usda.gov/funding/rfas/community_food.html
http://www.csrees.usda.gov/funding/rfas/pdfs/12_community_food.pdf

Households Grants (SEARCH) – Also money for planning your facility.¹

Contact: Keith Perkins, keith.perkins@ak.usda.gov, Phone: 907 747-3506

Environmental Protection Agency (EPA)

Joseph Sarcone, EPA Rural Sanitation Program Coordinator 907.271.1316
sarcone.joseph@epa.gov

Solid Waste Management Assistance 66.808 Grant, Deadline: 12/31/2011, \$5,000-\$750,000, To promote use of integrated solid waste management systems to solve municipal solid waste generation and management problems at local, regional and national levels. Funds allowed for

¹ Zender Group. <http://www.zendergroup.org/docs/usda.pdf>

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training, education, surveys, studies and demonstrations. No construction or acquisition of land is allowed with these funds. Cap is \$250,000. Contact: EPA Grants and Administration Division, Telephone: (202) 2609266

<https://www.cfda.gov/?s=program&mode=form&tab=step1&id=237b7727052d291e8b73c0f93eddb403>

EPA Community Action for a Renewed Environment (CARE) Program, \$75,000-\$300,000

<http://www.epa.gov/air/grants/rfp-epa-oar-io-11-08.pdf>

Region 10 contact: Dan Phalen, phalen.dan@epa.gov, Phone: 206 553-8578

Address places, sectors or innovative projects_

Be based on a regional, state, tribal or other strategic plan_

Address problems that are multimedia (e.g., water, air, hazardous waste, etc.) in nature or fill a critical gap in the protection of human health and the environment_

Demonstrate state, local and/or other stakeholder participation_ and/or

Identify opportunities for leveraging other sources of funding.

Projects may be funded for up to four years. They are generally funded in the \$10,000 to \$50,000 range.

Federal Interagency: *Federal Environmental Justice Demonstration Project*: Danny Gogal, Environmental Justice Office, EPA, www.epa.gov/swerosps/ej/ Phone: 202 564-2576

Rasmussen Foundation

Alaska Department of Environmental Conservation (DEC)

Some discretionary funding available. No deadlines. Juneau Contact: Ed Emswiler, Phone: 9074655353, Website: www.state.ak.us/dec/deh/sw/main/sw_index.html

Municipal Water, Sewerage, and Solid Waste Matching Grant Program: Makes matching grants available to communities on a competitive basis. Deadline is in August each year and funds become available in the following year. This program's annual offering has declined significantly in the last five years. Solid waste projects generally do not score as high as water and sewer projects that have human health. Contact: Mike Lewis, Phone: 9072697616, mike_lewis@dec.state.ak.us . Website: <http://www.dec.state.ak.us/water/munigrant/index.htm>

Denali Commission

Solid Waste Management Grant Program: Provides grant funding for researching improvement options for handling local municipal solid waste. The grant cap is \$100,000 under most of the recent program. New RFPs are issued every 612 months as money becomes available. Contact: Cindy Roberts, Program Manager, croberts@denali.gov, Phone: (907) 2713018. *Discretionary Funding*:

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Some discretionary funding and/or federal earmarks are possible for desirable projects. Webpage: <http://www.denali.gov/index.cfm>, Phone: (888) 4804321.

Captain Planet Foundation

\$2,500 Grant deadline: 1/15/2011 <http://captainplanetfoundation.org/>

Dr. Scholls Foundation

\$5,000-\$25,000 Grant deadline: Between November 1st to March 1st,
<http://www.drschollfoundation.com/>

AK Food Coalition

AK Marketplace

Alaska Community Foundation

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Alaska Public Interest Research Group

Food Research and Action Center (FRAC)

In-kind donations: Site location, Transportation and Volunteer time

Further Considerations

- Speed of making compost in all four seasons
- Winter storage
- Carbon sources (e.g. wood chips) import vs. export
- How to redirect city staff time to money saving/making activities

Appendix

Site Locations

Blatchley Middle School

Pros	Cons
Location already used for composting (e.g. grass clippings, spent grains, etc.)	Potentially higher cost of management to city (dependent on cost analysis of savings)
Possible central composting for all schools	Not as publicly visible to community
Strong tie-in to composting education at schools	Higher volume requires end use considerations (i.e. more work needed to develop business plan)
Manage waste from schools, restaurants, hospitals	

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More easily supported by city	
Recycling Center	
Pros	Cons
Location already a drop-off center for recycling and logical addition of compost	Greater vigilance of composting
Greater potential educational outreach of waste issues to Sitka community	Potential issue with bears requires ensuring good management of compost
Space is available at the recycling center that could be used for compost	Need to consider leachate or other environmental considerations
Recycling center managed by Norm Campbell who is interested in composting/waste reduction	Potential to turn people off to compost if not managed properly

Earth Tub Client List

Select List of Organizations Using EarthTubs: Davis Food Coop, University of California Santa Cruz, Moore Recycling Associates, City of Thousand Oaks Public Works Department, National Park Service, Connecticut Department of Recycling, University of Georgia, County of Kauai, Iowa State University, University of Montana, University of North Carolina, Columbia University, Oregon State University, Breitenbush Hot Springs, City of Eugene, Lane Community College, and Newberg School District

Earth Tub Evaluation

Earth Tub Evaluation from Seattle’s King County School District and Business Pilot

“All five of the originally installed EarthTubs are still in use. Users of this system have generally become quite attached to their EarthTubs and have been impressed with the amount of food waste that can be added to their system, the appearance of the system, and the fact that the biofilter works well for keeping odors down. The biggest problem schools dealt with on the Earth Tubs has been the need to get a school district electrician to come to their site and connect the system. Businesses generally did not have that level of bureaucracy to deal with.

Operational hurdles discovered with the Earth Tubs stemmed from the need to make sure basic composting concepts were understood. Numerous educational techniques were employed including monthly e-mailed “Compost Hints” discussing these concepts, technical assistance site visits and instruction, and 3 yearly half-day Earth Tub Summits. The EarthTub Summits have been quite popular and drew other EarthTub operators, entities investigating their own use of EarthTubs, and interested educators, students, and solid waste professionals from 4 counties, as well as the King County pilot program participants. A large part of each EarthTub Summit has been the communication and networking opportunities provided by bringing EarthTub operators together to ask questions and learn from innovations that each operator makes. The summits have all been held at participants’ facilities so they were able to show off their system and talk about their site specific issues while attendees got to see real life applications.

All five Earth Tubs users are generally happy with their systems. One system is temporarily disconnected due to extensive remodeling of the facility, and another is under-used because the planned expansion of the school program has not occurred within the expected time frame. Yet the users continue to express enthusiasm about their EarthTubs and their potential for the future.” See website for more info:

http://your.kingcounty.gov/solidwaste/garbage-recycling/documents/Onsite_food_pilot_final-report.pdf

EARTH TUB DESCRIPTION OF OPERATIONS

Four basic steps to operate Earth Tub:

(1) An organic “recipe” (i.e., a mixture of food waste and wood chips) is loaded into the Earth Tub through the loading hatch in the lid.

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(2) The operator turns on the internal auger mixer, which thoroughly mixes and shreds the material as the operator rotates the lid.

(3) Once the active composting cycle is complete (approximately 3-4 weeks), the auger discharges the compost through a side door of the vessel. In order to remove all the compost, shoveling will be required.

(4) This compost can be used directly as mulch or can be cured (stand in a pile) for 30 days before being used as a soil amendment. Screening will make the finished product even finer!

1. Food Scrap Loading - The first step is to make sure that the kitchen waste is collected for composting with as little contamination from plastics, etc. as possible. Hard foods such as pineapples, stale loaves of bread, etc., should be chopped up prior to disposing in the Earth Tub. Because food scraps are wet, a dry bulking agent such as wood shavings must be added to create a balanced compost recipe.

2. Mixing and Shredding

Once the new material has been added, you are ready to begin mixing. The powered auger system has been designed to take the work out of turning over your compost pile. The mixing process is accomplished by slowly turning the powered auger/lid assembly in a counter-clockwise direction for one complete rotation, then moving the auger to the center and rotating clockwise. A complete mix should take approximately 10 minutes, and should be performed at least two times per week.

3. The Active Composting “Baking” Phase

Thermophilic composting at temperatures above 115 F occurs rapidly in the insulated Tub. The food waste becomes soft or “baked” at this temperature and is easily shredded by the notched auger. Continue adding material until the tub is full to the top of the auger screw. When the Earth Tub has been loaded to its capacity, no additional food waste should be added for approximately 14 days. During this time, the operator should mix the material at least once per week.

4. Unloading and Curing the Compost

Once the compost has finished active composting, it is ready to be unloaded. The Earth Tub should not be completely emptied, a small amount of compost remains and serves as a bulking agent and microbial starter for the next cycle. Here is a list of the steps for unloading the Earth Tub.

- Place a tarp or low wheelbarrow on the ground below the outside of the two discharge doors.
- Turn on the auger and push the compost out of the side doors. This will remove about 1/2 of the compost. Shoveling will be required to completely empty the Earth Tub.
- The compost could be used directly as thin mulch on the surface of the soil.
- To cure the compost, it should be placed outside in a pile for approximately 30 days.
- The compost can be screened to produce a finer compost product and remove any course-bulking agent

Larger Scale Composter Options: Both Engineering Compost Systems and Renewable Carbon Management are two suppliers that stand out for larger scale composters.

- **A-C Equipment Services Corp:** John Vitas, jvitas@a-cequipment.com, Milwaukee WI
- **Biosystem Solutions:** http://www.biosystemsolutions.com/solutions/composting_systems.html
- **Engineered Compost Systems (ECS):** <http://www.compostsystems.com/> \$400,000-500,000 + Mixer, conveyor, controls \$140,000 for a total system cost of \$540,000-640,000. This does not include permits, civil engineering, ECS equipment installation, construction, surface water and leachate and treatment, access roads and storage pads, lights, utilities, buildings, pre-processing design, taxes

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- **Renewable Carbon Management (RCS):** www.composter.com RCS would require \$1,100,000 for startup costs
- **Wright Environmental Management:** Claims largest in vessel provider in world (not quite sure about that), http://www.wrightenvironmental.com/index_nonflash.html

Future Site Locations for Windrows

- Sawmill Cove Industrial Cove Settling Tanks
- Granite Creek
- Waste Water Treatment Plant on Alice Island

Debt Financing

USDA Rural Development

Direct Loan Program: Very low interest loans payable over 40-year period. Can include equipment purchase. Can include 1st year operating expense. Typical amount: No cap.

Guaranteed Loan: Helps secure bank loans by guaranteeing loan. For Technical Assistance grants apply between Oct.1 – Dec. 31. No deadline for other programs, but apply early. Need Application form for all programs. Contact: Debby Retherford: www.usda.gov/rus/water/tatg.htm, Phone: 9077617705

EPA Carbon Footprint Document

[http://www.epa.gov/region10/pdf/climate/wccmmf/Reducing GHGs through Recycling and Composting.pdf](http://www.epa.gov/region10/pdf/climate/wccmmf/Reducing_GHG%20through_Recycling_and_Composting.pdf)

http://www.epa.gov/region10/pdf/grants/EPA-R10-RCC-2011_Final_06282011.pdf

<http://www.deq.state.or.us/lq/consumptionbasedghg.htm>