

# Guide to Providing Manure Management Education to Small Farm and Livestock Operations



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## Table of Contents

Acknowledgements .....	3
I. Introduction .....	4
II. Background .....	5
III. Why Manure Management? .....	7
IV. What are the Regulations? .....	7
V. Key components of a Manure Management Education Project .....	7
Start with a Plan .....	7
Advisory Committee .....	8
Educational Resources .....	8
VI. Organizing a Workshop .....	11
Venue Development.....	11
Timing .....	12
Outreach and Promotion .....	13
Workshop Presentations .....	14
Workshop Details .....	14
VII. Providing Technical Assistance .....	16
On-Farm Visits .....	16
Direct Contact in Conjunction with Workshops.....	16
Responses to Inquiries.....	17
Follow-up Phone Calls .....	17
VIII. Lessons Learned .....	18
IX. Conclusion .....	19
X. APPENDICES.....	20
Appendix A: Manure Management Workshops.....	21
Appendix B: Sample Workshop Flier.....	25
Appendix C: Promotional Article for County 4-H Newsletter .....	26
Appendix D: Workshop Flier for Special Workshop with Rutgers Cooperative Extension .....	27
Appendix E: Posting on Town of Chester, NH Website.....	28
Appendix F: Announcement on Equinesite.com .....	29
Appendix G: Sample Press Release .....	30
Appendix H: Sample Newspaper Ad.....	31
Appendix I: Workshop Survey .....	32

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This guide, along with NERC's [Manure Management for Small and Hobby Farms](#), and other manure management resources are available for download at the Northeast Recycling Council, Inc. [website](#). For more information contact NERC at [info@nerc.org](mailto:info@nerc.org).

This document addresses manure management guidance for small farms and livestock operations. Specific state and local regulations for manure management are not included and should be consulted prior to implementing a manure management education project.

## I. Introduction

The Northeast Recycling Council, Inc. (NERC) is a nonprofit organization that strives to advance an environmentally sustainable economy by promoting source and toxicity reduction, recycling, composting, and the purchasing of environmentally preferable products and services. NERC was awarded funding from the U.S. Department of Agriculture Rural Development Solid Waste Management Grant program to develop a Manure Management Education Project. The goal of the project was to decrease water pollution and enhance solid waste management by promoting the proper management of manure on small and hobby farms.

Small and hobby farms and livestock operations — farms with minimal acreage and a few animals for recreation or for side income — are often owned by people who have little or no farming experience. This sector is rapidly growing and accounts for a high percentage of farms around the Northeast. Due to insufficient knowledge, manure management is frequently overlooked as a stewardship responsibility. Small livestock operations may remain unknown to agricultural agents because they do not require permitting.

Over-spreading manure on a small lot of land or improperly storing or applying manure can easily overload the soil with nutrients or biological contaminants, leading to water pollution from run-off

and leaching, as well as odor and parasite problems. In addition, disposal of manure is costly to livestock owners and can unnecessarily take up valuable landfill space. State solid waste management officials have reported that some hobby farmers are bagging the manure and self-transporting it to the landfill for disposal.

This *Guide to Providing Manure Management Education to Small Farm and Livestock Operations* is designed for agricultural specialists, waste management personnel, and others that provide technical assistance to the farming community. It is intended to provide a framework for developing and implementing a manure education program based on the experiences that NERC has gained through its successful two-year effort. The *Guide* includes a detailed overview of the key components of the Manure Management Education Project, including educational resources and workshop implementation.

Through the various components of its Manure Management Education Project—[Manure Management Handbook](#), [Quick Reference Guide](#), free manure management workshops, and technical assistance, NERC worked to provide small farm and livestock owners with the tools to understand and adopt best management practices for handling and using manure.

“The fairest thing in nature, a flower, still has its roots in earth and manure.”  
- D. H. Lawrence

## II. Background

According to the United States Department of Agriculture 2007 Census of Agriculture, almost 300,000 new farms have begun operation since the last census was conducted in 2000. In comparison to all farms across the nation, these new farms tend to have “more diversified production, fewer acres, lower sales, and younger operators who also work off-farm.” According to the census, the majority of farms are smaller operations. Between 2002 and 2007, the number of farms with sales of less than \$2,500 increased by 74,000.

More than 36 percent of farms are classified as “residential/lifestyle farms”—having sales of less than \$250,000 and operators with a primary occupation other than farming.” Another 21 percent are operated by individuals who are retired.<sup>1</sup> The majority of farms in New Hampshire (72% of 4,166 farms), New Jersey (67% of 10,327 farms), and Vermont (59% of 6984 farms) had farm sales less than \$9,999.<sup>2</sup>

The definition of small farms is broad. This project started out with the goal to work with “hobby farms.” However, it received interest from a wide variety of “small” farm operations of varying sizes including commercial scale and hobby farm operations. Additionally, many farmers do not like the term “hobby farm” and many horse owners do not like being called “farmers.” A small farm could have 10 beef cows, 150 dairy

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1. “Census of Agriculture Show Growing Diversity in U.S. Farming.” USDA News Release, Feb. 4, 2009.

2. Based on 2007 Agricultural Census Data.

### Goals of Manure Management

- ▶ Utilize manure nutrients for enhancing soil.
- ▶ Protect health and safety of the public and livestock.
- ▶ Prevent surface and ground water contamination.

cows, 30 sheep, or 10 horses depending on its location. Manure management and its challenges also vary widely—from land application by dairy farmers with sufficient land to horse-boarding operations that place their manure in a dumpster to have it hauled away.

Small farms can be a significant source of water pollution. Most of these operations do not fall under the EPA Concentrated Animal Feeding Operation guidelines and its stringent nutrient management planning requirements.<sup>3</sup> Typically these operations are minimally regulated at the state and local level and fall under the radar of agricultural specialists.

An increasing number of small livestock operations are located in suburban and urbanizing areas; close to high density residential developments and water resources. The amount of land per animal unit is typically very small, often

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3. This project focused solely on “pasture based operations.” Those working with small farm operations that may meet the definition of an “animal feeding operation (AFO),” where animals are kept and raised in confined situations or Concentrated Animal Feeding Operations (CAFO) need to check the regulatory requirements for these operations, regardless of the farm size. Operations that discharge manure or wastewater into ditches, streams, or other waterways can be defined as CAFO.

leading to problems associated with improper manure storage, handling, and use. Moreover, many small livestock operators are inexperienced with the requirements of manure management and do not know where to find information. Many do not understand the environmental consequences of poor manure management. Small livestock operations may also face other challenges that larger farm operations typically do not, such as limited equipment resources.

The growing number of horse-boarding operations is a particular concern in terms of manure management. In New Jersey there are upwards of 49,000 horses in 7,600 equine facilities.<sup>4</sup> There are an estimated 35,000 horses in New Hampshire.<sup>5</sup> Nationwide there are nearly 2 million horse owners with more than 9 million horses.<sup>6</sup> A 1,000-pound horse can generate eight to ten tons of manure annually, as much as two cubic feet per day, including bedding.<sup>7</sup> An estimated 3.9 million tons of horse manure is generated in the Northeast on an annual basis.<sup>8</sup> Equine facilities vary in size from just a few horses to 50 or more. Operators often have little

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4. "The end game of horse care: A USDA program educates owners on managing manure." Guy Steuck, *The Mid-Atlantic Horse*, Lancaster Farming. January 2008.

5. *Manure Management Brochure*, Rockingham County Conservation District.

6. "The Equine Industry," *The Northeast Pasture Research and Extension Consortium*, Gary Bergmann VP and General Manager Stonegate Standardbred Farms, Inc.

7. "Good Neighbor Guide for Horse-Keeping: Manure Management," New Hampshire Department of Agriculture.

8. *Environmental Impacts of Equine Operations*, Research Project, Rutgers University, and the New Jersey Agricultural Experiment Station.

experience in manure management and primarily focus on the recreational usage of horses. Thus, unlike other livestock operations they have limited desire or ability to utilize the manure. Many such operations spend thousands of dollars to dispose of manure each year. Often the manure is stockpiled in some out-of-sight location - almost certainly resulting in problems such as water contamination and irate neighbors.

Manure management education for small livestock operations has not been a priority for state agricultural agencies and other entities that provide technical assistance to farmers. In part, this is because small farms, whether commercial or hobby, house few animals and as a result may fall under regulatory thresholds. Priority is usually given to larger farms that are more heavily regulated to ensure that they comply with state and federal requirements. Staffing for agricultural technical assistance is extremely limited due to state and federal budgets. As the number of small livestock operations keeps growing this makes it even more difficult to offer assistance.

Nonetheless, the need for manure management education for small farms is vital. Continuing trends toward smaller, more diverse farms will only increase the need. NERC's project also proved that farmers and livestock owners want to do the right thing and learn how to better manage the manure generated through their operation.

### III. Why Manure Management?

It is vital that any manure management project focus on the importance of managing manure properly. Manure can be a valuable resource if well managed. If improperly managed, manure can be a source of water pollution, odor, flies, parasites, and other nuisances. It can contaminate drinking water, harm wildlife, and reduce property values.

Manure management is an important factor in the health of livestock. Mud

and manure can cause abscesses, thrush, rain scald, and other diseases in livestock. Dried manure produces molds that contribute to respiratory problems in horses and cattle.

By adopting simple and low cost best management practices for storing, handling, managing, and utilizing manure, the environment and the health of farm animals will benefit.

### IV. What are the Regulations?

In conducting outreach on manure management, it is important to convey the message that livestock owners must take responsibility for the manure generated by their animals in order to prevent water pollution, odors, and other nuisances. Federal and state laws prohibit discharging animal wastes into water. State regulatory requirements for manure management differ, from voluntary “best management practices” to strict requirements for set-backs, storage, land application, and more.

The NERC project specifically tailored its *Manure Management Handbook* and presentations to contain specifics on

state regulations in each of the states that participated in the project.

Be sure to consult with the State Agriculture Department for specific information on state regulations that may apply to manure management and recommended best management practices. If organizing a manure management project, but unfamiliar with state and local regulations regarding manure storage and handling, the Agricultural Extension Service can be very helpful. Local health departments or boards should be consulted for ordinances that may apply to storage and containment, such as design and set-backs.

### V. Key components of a Manure Management Education Project

#### Start with a Plan

The key to manure management is to have the proper balance of manure generation and usage. To understand how to achieve this balance, manure management education should encourage farmers and livestock owners to develop a manure management plan.

A basic written plan that incorporates the principals of best management practices for managing and using manure is a valuable tool for all livestock farms, no matter how many animals stocked.

*The manure management plan should include the following components:*

- Development of a basic farm map that identifies existing and potential pollution sources or problems on the farm, drainage patterns, waterways, manure storage site, etc.
- Quantity of manure and bedding generated annually from all livestock on the farm.
- Manure handling and collection methods and equipment used, including manure handling from barns, stalls, paddocks, and pastures.
- Size and location of storage and/or composting facilities.
- Methods used to prevent drainage through storage areas, paddocks, and pastures.

### **Advisory Committee**

A project Advisory Committee may be helpful to provide input and guidance into the project. This is especially true if project organizers are not from the agricultural community or if the project is to cover a wide geographical area. Members of NERC's Advisory Committee included representatives of the state Department of Agriculture, state Department of Environment, and Conservation Districts. The involvement

### **Educational Resources**

Small farms may have a diversity of animals, thus the educational materials developed through the project should be designed to benefit farm operations with any type of farm animal—horses, cows, goats, sheep, llamas, pigs, chickens, and rabbits. Moreover, it is important that manure management education be comprehensive. That is, it must be emphasized that manure management encompasses a wide range of activities, including pasture and paddock

A stalled horse requires removal of 60 to 70 pounds of waste per day.

This equals 12 to 13 tons of waste per stall, with about 9 tons being manure, 3.5 tons urine, and the remainder bedding.

The annual stall waste from one horse fills a 12-foot x 12-foot stall about 6 feet deep.

Source: "Agricultural Management Practices for Commercial Equine Operations," Rutgers University

- Nutrient analysis of manure prior to application (if land applying).
- Soil analysis for lands on which raw or composted manure will be applied.
- Utilization records: land application, compost monitoring, or off-site uses.

of Advisory Committee members varied state-to-state. Their role proved most valuable in helping to suggest potential locations for workshops and in promoting the workshops and the availability of project educational resources. In one state, an agricultural specialist with the Conservation District also spoke at several of the workshops; in another, three Advisory Committee members spoke at one workshop.

management, manure storage, and manure utilization.

Used on the farm, manure can provide nutrients needed for forage or crop production; used off-farm, manure supplies nutrient resources to crop or organic farmers, gardeners, soil producers, and others. A worthwhile goal of manure management education is to present tools to help livestock

owners turn manure into an asset, instead of a problem.

Another important component of manure management education is the relationship between water and manure. Everyone can relate to the importance of clean water, however many livestock owners do not realize the many ways that manure can contaminate water.

Many of the NERC workshop attendees stated that one of the most valuable

things they learned was the role of proper manure management to prevent runoff and water contamination.

A hard copy of the *Manure Management Handbook* was provided to all workshop attendees. Additionally, the *Handbook* was included on a *CD Resource Toolkit* distributed to workshop attendees. The *Toolkit* contained a number of other resources described below. All materials were posted on the [NERC website](#) for free download.

### [Manure Management Handbook for Hobby Farms \(Handbook\)](#)

The *Handbook* provides an overview of manure management, from storage to composting. It includes information from a range of resources and experts on acceptable manure management practices, including the United States

Department of Agriculture, Cornell Extension, and Rutgers University Cooperative Extension. The *Handbook* also includes information about state-specific regulations.

### Handbook contents:

- Farm Stewardship:
  - Why Manure Management?
  - The Path to Best Management Practices for Manure
  - Manure Management and Utilization Plan
  - Manure Management Regulations
- What's To Manage:
  - How much manure is generated?
  - Stall waste and bedding considerations, including tips on reducing bedding usage and alternatives (such as rubber mats)
- Pasture and Paddock Management:
  - Smart grazing strategies (rotational grazing, sacrifice pad, etc.) and how this relates to manure management
  - The importance of regular removal of manure from concentrated areas
  - Use of grassy buffers; and managing runoff
- Manure Containment:
  - Hauling and storage, including storage size needed, location, structures, and pads
  - The importance of containment covering and types of covers
  - Recommended setbacks
  - Equipment
  - Leachate or seepage
  - Limiting nuisances
- Manure Management Options

- Land application
  - An overview of manure nutrients and the role of a nutrient management plans
  - A discussion of the three basics steps to consider before land application of manure: “know your soil, know your manure, and know your crop nutrient needs”
  - A discussion of the importance of applying only the amount of manure that the soil and crops need; and the dangers of over application.
- Composting
  - Basic elements of composting
  - Compost recipe (manure and bedding)
  - Optimum size of containers or piles, location, set-backs
  - Methods of composting (bins, sheds, piles, and windrows)
  - General guidelines for composting
  - Tools and equipment needed
  - Monitoring the compost
  - Curing
  - Finished compost utilization.
- Offsite uses of manure: golf courses, soil producers, and others
- The importance of appearance and marketing.
- Animal manure basics
- Garden uses for manure

[Quick Guide to Developing a Manure Management Plan \(Quick Guide\)](#)

The *Quick Guide* incorporated a variety of reference charts for “quick information” including:

- Manure and bedding generation calculations
- Manure management storage assessment
- A comparison chart of manure management options
- Land application (including manure nutrient information)
- A reference list of nutrient management calculators
- Optimum conditions for successful composting
- Characteristics of various raw materials for composting
- Average carbon-to nitrogen estimations of selected materials
- Compost Trouble-shooting
- Farm Plan template
- Compost monitoring template
- Manure management at a glance—a month-by-month look
- Glossary of manure management terms
- Sample farm maps

[Manure Generation Calculator](#)

This easy-to-use spreadsheet calculator allows livestock owners to insert livestock units and calculate the

estimated amount of manure and bedding each will generate. The goal of the *Quick Guide* and *Calculator* was to provide basic tools to assist with determining how much

manure a farm produces, storage needs, how much can be safely land-applied on the farm, composting techniques and troubleshooting, and farm plan templates and examples.

*Additional resources included in the Toolkit:*

- [Post & Plank Structure for Manure Storage](#)
- [Comprehensive Nutrient Management Plan](#)
- [Nutrient Management–SIMPLIFIED!](#)
- [Composting for Small Livestock Operations](#)
- [Composting Design Guide for Small Farms](#)
- [State specific resources and regulatory information](#)

Additional resources included in the *Toolkit* are several technical articles developed by Agricultural Extension Service, Rutgers, and other agencies. These articles were chosen because of their pertinence to small farmers and to supplement specific information

contained in the *Manure Management Handbook*. Permission was sought and received by the authors to include the resources. State specific information ranged from a “*Best Management Guide for Horse Keeping*” to new state regulations on manure management.

## VI. Organizing a Workshop

Twenty workshops were offered through NERC’s project: six workshops were held in New Hampshire, eight in New Jersey, and six in Vermont. See Appendix A for a list of the workshops. The workshops included information and guidance about:

- The impacts of improper manure management
- An overview of best manure management practices
- State regulations
- Pasture management and how it relates to manure management
- Proper siting, storage, and covering of manure
- Odor control; parasite prevention and control
- Land application and compost basics
- Off-farm uses of manure and manure marketing

### Basic Compost Recipe

- ▶ One part manure
- ▶ Two parts bedding or other carbon source
- ▶ Moisture
- ▶ Aeration
- ▶ Containment and cover

### Venue Development

There are many options for workshop locations. “Scoping trips” were conducted to visit and secure potential venues and to meet with Advisory Committee members to discuss the workshop agenda, promotional

opportunities for the workshops, and specific state information to include in the *Handbook* and *Toolkit*. The criteria for securing venues included: 1) convenient location; 2) space and seating for at least 15 - 20 people; 3)



availability in the evening or weekend; and 4) no cost.

The following types of locations were successfully used for workshops:

- USDA or other agricultural offices
- Feed stores, tack shops, etc.
- Town offices, libraries
- Farms and horse stable operations
- Farm museums
- Other scheduled agricultural events (such as Sheep and Wool Festival)

Workshops at tack shops and feed stores were sometimes held in storage areas. Typically heat is not available in these spaces, so the time of year needs to be taken into consideration. Hay bales proved to be excellent benches. Additionally, if a PowerPoint

presentation is to be offered, be sure that the location will have an outlet available, an extension cord, table for the laptop and projector, and a screen (paper on stacked hay bales can be rigged up).

### Timing

Workshop success varied widely and did not seem to be affected by the times of the year or days of the week. But, it is important to plan the workshops around typical farming schedules. In New Jersey workshops were held in late March; in New Hampshire workshops were held in early May, with two additional workshops held in early November and in January; and in Vermont workshops were held in early November.

workshops typically at 2 p.m., although two were held in the morning at 11 and one at 3:00 p.m. Workshops lasted around two hours; workshops that included multiple presenters ran somewhat longer. Questions and discussion were encouraged throughout the workshop.

Evening workshops were typically held at 6:30 or 7:00 p.m. and Saturday

Refreshments were served. Attendees were encouraged to stay afterward to ask additional questions and to discuss specific issues they may have with managing manure in their operation.

## Outreach and Promotion

Fliers were developed for each workshop and distributed via mail and email for posting and distribution. See Appendix B for a sample flier. Fliers were sent to:

- Feed stores
- Veterinarians
- Horse boarding operations
- Farms
- Agricultural and livestock agencies and organizations, contacts and listservs where available
- Workshop venue hosts and co-sponsors

For example, NERC developed a promotional article (see Appendix C) for the County 4-H newsletter, distributed to all 4-H members in the County. For the workshop held with Rutgers Cooperative Extension a separate flier (see Appendix D) was sent to their mailing list of approximately 400 individuals. One venue host distributed fliers at open house event which occurred before the workshop.

A web announcement (see Appendix E) was developed and sent to co-sponsors for posting. Co-sponsors were also asked to send out email announcements to their listservs, as available. A bulletin (see Appendix F) was placed on [www.Equinesite.com](http://www.Equinesite.com). The New Hampshire Department of Agriculture ran event briefs on the workshops for several weeks in their weekly Markets Bulletin. This Bulletin is sent to some 8,000 New Hampshire farmers and livestock owners. Calendar listings were posted with the Farm Bureau

News and local and state event calendars. A number of articles to promote the availability of manure management materials on NERC's website and to promote the workshops were developed for NERC's Email Bulletin which is distributed to approximately 600 people.

Press releases (see Appendix G for sample) and calendar listings were sent to all local newspapers prior to the events. Ads (see Appendix H for sample) were placed in local newspapers prior to some of the workshops.

Pre-registration was requested in order to estimate the number of *Toolkits* needed and refreshments required. A local telephone number was secured in most instances, provided by workshop co-sponsors. Registrations were also accepted via email and phone through the NERC office.

Based upon observation and results from surveys completed by workshop attendees, three types of outreach were most effective:

- 1) Holding the workshop in conjunction with another event, such as multiple speakers on issues of concern to horse owners.

- 2) Working with a host or co-sponsor who will diligently distribute and post fliers.
- 3) Emailing and mailing fliers.

Interestingly a significant portion of attendees heard about the workshops via “word of mouth.” This included friends, veterinarians, feed stores, and others.

### Workshop Presentations

A [PowerPoint presentation](#) was used at most of the workshops. In the instances where workshop numbers were below 10 (three times) a discussion and review

of the *Handbook* was held with attendees instead of using the PowerPoint presentation.

Several different presentations were developed:

- A general presentation with one or two slides addressing specific regulations in each of the three participating states.
- Specifics on horse manure management for workshops targeting horse owners.
- A focus on manure handling systems (for a Northeast Animal-Power Field Days workshop, see below).
- Composting and application of farm-based nutrients (for a Northeast Animal-Power Field Days workshop).

### Workshop Details

Through the NERC project 440 people attended workshops in three states. Twenty workshops were offered during the course of the 18 month project. Workshop attendance ranged from zero (one event) to 70, with an average

attendance of 22 people. More than 100 towns were represented at the events, with travel to the workshops ranging from zero miles (farm hosts) to more than 100 miles. On average workshop attendees traveled 16 miles.

A range of workshop venues was offered:

- A special countywide “Equine Management Workshop” was held on a Monday at 6:00 p.m. at the Ware Agricultural Building (New Jersey). The Workshop was co-sponsored by Rutgers Cooperative Extension and covered a range of topics, including an overview of animal agriculture on small farms, manure management, and New Jersey’s proposed Animal Waste Management Rules. The workshop was very successful, with 70 people participating from towns throughout Salem County.

Presenters included Dr. Carey Williams from Rutgers University and Dr. Michael Westendorf and Monique Purcell, Project Advisory Committee members. The workshop was well publicized by both NERC and the Extension. People in attendance reported being interested in hearing from the variety of speakers offered and to also learn more about the proposed New Jersey Manure Management Regulations.

- Another particularly well attended workshop was co-sponsored by a local feed store on a Friday evening. Twenty-seven people attended. The feed store had posted the flier and actively distributed it to customers.
- One workshop was held at a grange in conjunction with the regular meeting of the county 4-H Livestock Group. Approximately 35 families were represented at the workshop, with 45 children/young adults and 25 parents attending. Events were also held at feed stores.
- In Vermont, several workshops were held as a part of established events. One such event was the Northeast Animal-Power Field Days, an event dedicated to working draft animal enterprises. Ten people attended the first workshop and 15 people attended the second. The event offers an extensive number of workshops and demonstrations, as well as a large exhibit area. This provided a great opportunity for networking with livestock owners. NERC staff spoke with all interested vendors and distributed *Handbooks* and *Toolkits* to them. Copies of the *Handbook* and *Toolkit* were displayed at the NRCS table and a compost table (with a sign). More than 125 copies of each were distributed at the event.
- Workshops were also held in conjunction with the New Hampshire Horse Council and the Green Mountain Horse Association. These workshops were geared toward horse owners. One particularly well attended workshop (27 people) was held at a tack shop on a Saturday



afternoon. The tack shop owner has a large clientele and worked very hard to assist in promoting the event.

- A workshop at an equine veterinary clinic was very well attended, with 24 people participating. Attendees at this workshop were particularly lively and engaging. The workshop, targeting horse owners, lasted for 2.5 hours and involved a great deal of discussion on a variety of manure management issues. The veterinarian owner of the center was very popular with her clients and promoted the workshop heavily. She also agreed to distribute extra CDs and *Guides* to people who could not attend but had expressed interest.
- Workshops were held at two working farm museums. One included a walkthrough of the museum's manure management system prior to the workshop. At both an opportunity was provided for museum staff to discuss their manure management systems.
- At several of the workshops representatives from an in-vessel composting unit company also spoke. At one workshop, a demonstration of

a mobile in-vessel composting unit was held. At two workshops a sales representative from NewerSpreader spoke briefly and demonstrated his manure spreader.

- A New Hampshire workshop held on a very cold day in late January, co-sponsored by the Rockingham County Conservation District and the Town of Chester Conservation Commission was very successful with 29 people in attendance. The town assisted with promotion by

distributing a flier and posting an announcement on the Town website. Additionally, the Conservation District is well known for its informative workshops.

- A workshop was also conducted at the Northeast Organic Farming Association of Vermont (NOFA-VT). This popular agricultural conference brings in some 1,400 farmers from around New England. Thirty-nine people attended the manure management workshop.

Additional observations:

Several participants attended multiple workshops. Some brought friends or spouses with them when they attended for a second time. One woman attended three workshops, bringing different people each time.

Many attendees expressed their appreciation for the *Handbook* and CD Resource Kit. Follow-up phone calls to workshop attendees indicated that they

found the workshops and materials to be helpful.

The workshops at one of the Town Offices and a tack shop were not well attended. Other than outreach conducted by NERC the workshop hosts did no additional promotion. No fliers were posted or on the counters in either location. This would certainly explain the lack of attendance.

## VII. Providing Technical Assistance

Technical assistance was provided through four avenues: on-farm visits, direct contact with farmers before or following workshops and at one tabling event, responses to inquiries, and follow-up phone calls to workshop attendees.

### On-Farm Visits

Six on-farm visits were made. Suggestions were provided regarding various issues: covering of manure piles, proper composting, the need to

move a manure pile out of sight of neighbors, optimum usage of land for rotational grazing, and use of a sacrifice or exercise pen.

### Direct Contact in Conjunction with Workshops

Following the workshops more than 50 people asked questions regarding

issues they were having in their operations. Most were answered in-

person; several were followed up with emails and telephone calls as well.

NERC sponsored a booth and gave out 150 Manure Management Handbooks and Toolkits at the 20th Annual Vermont Sheep and Wool Festival on at the Champlain Valley Expo, Essex Junction.

### Responses to Inquiries

Several emails, phone calls, and a letter were received from farmers and others in states that were not part of the project or from people who could not attend the workshops. All contacts were provided with the *CD Resource Toolkit* and additional information requested.<sup>9</sup>

### Follow-up Phone Calls

All workshop attendees were asked to complete a survey (see Appendix I) in which they were asked to provide their name if they wanted follow-up technical assistance. More than 100 attendees provided their name. NERC staff sent out 45 emails and made 25 phone calls. Twenty responses were received with follow-up advice provided.

Technical assistance was provided on a range of issues:

- Numerous questions about what to do with piles of manure or barns full of manure.
- When to use manure on gardens.
- Numerous questions on composting: methods, troubleshooting, recipes,

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<sup>9</sup> This included two emails from horse owners in Massachusetts requesting the project resources and asking specific questions on manure management; a Connecticut town public works department wanting the resources for distribution; and, a young man from Pennsylvania requesting the resources.

Having a booth at the festival proved to be a great way to talk with people and answer specific questions they had on manure management at their farms. NERC staff spoke with booth vendors at the event about manure management and distributed *Handbooks* and *Toolkits*.

construction of bins, and compost uses.

- How to deal with parasite issues and fly infestation issues.
- Funding sources for building a compost structure for horse manure.
- How to plan a new farm for best management practices in manure.
- Numerous questions about land application of manure and spreading manure on pasture land.
- The best way to utilize different types of manure and how to figure out nutrient content.

NERC originally intended to provide technical assistance to farmers via telephone and email, with NERC making follow-up contact after the workshops. However, this proved to be difficult and time consuming as farmers are rarely reachable via phone call and infrequently return email.

Farmers tend to be very busy even in the winter. It seemed best to encourage workshop attendees to stay after the workshops to ask questions and discuss issues. The farmers were already present and were willing to spend a few extra minutes. Indeed, most of the workshops proved to be quite the “social event” with attendees chatting amongst themselves following the event.

The on-farm visits were an excellent

way to view small farms first hand and be able to see any problems or potential problems. Unfortunately budget limitations made numerous visits too

costly; the visits were nonetheless valuable in both informing NERC staff and the farm hosts.

## VIII. Lessons Learned

- Agricultural specialists in each state were contacted in advance of the workshop development. However, assistance by agricultural specialists in venue development and workshop involvement varied greatly from state-to-state. In one state, in particular, the assistance was instrumental in achieving high attendance at the workshops.
- In another state where agricultural specialists specifically stated that they would not be involved, NERC sought the assistance of the state Horse Council and Small and Beginner Farmers Network to co-sponsor the events and assist in promotion. These groups proved to be very influential with their members and helped to make the workshops a success. Additionally, for several of the venues, town Conservation Commissions were particularly active and agreed to assist with promotion for the events.
- Attendance sheets and surveys were distributed at all workshops. 440 people attended workshops; 179 surveys were completed (41 percent). Workshop attendance ranged from zero (one event) to 70, with an average attendance of 22 people. More than 100 towns were represented at the events, with travel to the workshops ranging from zero miles (venue hosts) to more than 100 miles. On average workshop attendees traveled 16 miles. Attendees heard about the workshops primarily from the fliers

- (44 responses), “word of mouth” (37 responses), and ads in local newspapers (34 responses). Depending on the workshop, a significant number of attendees also reported hearing about the events through the New Hampshire Market Bulletin and local hosts, such as the New Hampshire Horse Council or feed stores.
- When asked about current manure management practices almost all respondents reported that they do not cover their manure storage areas. Fifty-eight percent (92 out of 160 responses) of survey respondents stated that they had problems or concerns about manure management system.
  - Most attendees had previously learned something about manure management, primarily from personal research and other farmers. About one-quarter of the respondents had consulted an agricultural or other agency regarding manure management. When asked about additional resources that would be helpful, many respondents suggested Web-based resources or bulletins. Fifty-six respondents said that they prefer information in electronic form; 67 said print form; and 16 said that either was fine. Interestingly, in the 2007 Agricultural Census, 57 percent of farmers now report having internet access.<sup>10</sup>

<sup>10</sup> USDA News Release, “Census of Agriculture Show Growing Diversity in U.S. Farming,” Feb. 4, 2009.

## IX. Conclusion

The increasing number of small farm and livestock operations and the potential environmental impact from mismanagement of manure generated from these operations is indicative of the importance of manure management education. This guidance document provides the tools necessary for developing an education project that

unites proper manure management with composting and other critical waste management concerns. Our water, environment, and the future of small livestock operations depend on taking action now to provide livestock owners with the resources and knowledge to adopt cost effective manure management practices.



## **X. APPENDICES**

Appendix A: Manure Management Workshops

Appendix B: Sample Workshop Flier

Appendix C: Promotional Article for County 4-H Newsletter

Appendix D: Workshop Flier for Special Workshop with Rutgers Cooperative Extension

Appendix E: Posting on Town of Chester, NH Website

Appendix F: Announcement on Equinesite.com

Appendix G: Sample Press Release

Appendix H: Sample Newspaper Ad

Appendix I: Workshop Survey

## Appendix A: Manure Management Workshops

### New Jersey<sup>11</sup>

Monday, March 24<sup>th</sup>, 6:30 pm, Ware Agricultural Building, Mannington  
County-wide “Equine Management Workshop” held with Rutgers New Jersey Agricultural Experiment Station. Workshop covered a range of topics, including an overview of animal agriculture on small farms, manure management, and New Jersey’s proposed Animal Waste Management Rules.

Attendance: 70

Tuesday, March 25<sup>th</sup>, 6:30 pm, Lower Alloways Creek Town Offices

Attendance: 1; Technical assistance provided on composting manure.

Wednesday, March 26<sup>th</sup>, 3:00 pm, Salem County Utilities Authority, Alloway/Quinton  
Special workshop targeting health department officials and recycling coordinators.

Attendance: 9

Wednesday, March 26<sup>th</sup>, 6:30 pm, Oldsman Town Offices

Attendance: 10

Thursday, March 27<sup>th</sup>, 7:00 pm, Elmer Grange, Elmer

“Manure Management Basics for All Types of Livestock” workshop, held in conjunction with the Salem County 4-H Livestock Group.

Attendance: 45 children/young adults & 25 parents

Friday, March 28<sup>th</sup>, 6:30 pm, Cedar Lane Feed, Upper Pittsgrove

Attendance: 27

Saturday, March 29<sup>th</sup>, 10:00 am, Cowtown Cowboy Outfitters, Pilesgrove

Attendance: 0

Saturday, March 29<sup>th</sup>, 1:00 pm, Dolbow Farm, Mannington

Attendance: 6

**Total Attendance: 193**

**Surveys Completed: 60**

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<sup>11</sup> All workshops were conducted in 2008, with the exception of the Chester, New Hampshire workshop which was held in 2009.

## **New Hampshire**

Saturday, May 17<sup>th</sup>, 11:00 am, Newton Town Hall, Newton

Co-sponsored by the New Hampshire Horse Council and the Newton Conservation Commission.

Attendance: 19

Saturday, May 17<sup>th</sup>, 3:00 pm, Griffinbrook, Ltd., Candia.

Co-sponsored by the New Hampshire Horse Council and the Candia Conservation Commission. Featured presentations by the Horse Council; “NewerSpreader” manure spreader representative; a mobile composting unit vendor.

Attendance: 40

Monday, May 19<sup>th</sup>, 6:30 pm, Canterbury Town Hall, Canterbury

Co-sponsored by the New Hampshire Horse Council and the Canterbury Conservation Commission.

Attendance: 38

Tuesday, May 20<sup>th</sup>, 6:30 pm, Remick Museum, Tamworth

Co-sponsored by the Carroll County Small and Beginner Farmer Network. Featured a special presentation by Remick Farm and a tour of their manure management system.

Attendance: 28

Saturday, November 1<sup>st</sup>, 2:00 pm, The Cheshire Horse, Swanzey

Co-sponsored by the New Hampshire Horse Council. A small scale, in-vessel compost unit was demonstrated in conjunction with the workshop.

Attendance: 19

Saturday, January 31, 2:00 pm, Town Hall, Chester

Co-sponsored by the Rockingham County Conservation District and the Town of Chester Conservation Commission.

Attendance: 29

**Total Attendance: 173**

**Surveys Completed: 77**

## Vermont

### Saturday, September 27<sup>th</sup> Northeast Animal Power Field Days, Tunbridge

Three-day event is a gathering of resource people, equipment dealers, educators, craftspeople, and practitioners who provide essential assistance to people interested in draft animals and renewable land-use practices.

Workshop 1—“Manure Handling Systems”: storage, manure management plans for small farms, utilization overview.

Attendance: 10

Workshop 2—“Nutrient Management, Composting, and Application” expansion of Workshop 1, covering composting and land application of on-farm nutrients.

Attendance: 15

### Friday, October 3<sup>rd</sup>, Green Mountain Horse Association (GMHA), South Woodstock

A special workshop designed for horse owners. Held in conjunction with the GMHA Fall Foliage Ride. Co-sponsored by the Vermont Association of Conservation Districts, the Ottauquechee Natural Resources Conservation District, the Southern Windham/Windsor County Solid Waste Management District, the Vermont Agency of Agriculture, and the Vermont Department of Environmental Conservation Compost Center.

Attendance: 9

### Wednesday, November 5<sup>th</sup> at 6:30 pm, Winchester Stables, Newfane

Attendance: 4

### Saturday, November 8<sup>th</sup> at 2:00 pm, Evergreen Equine in West Windsor

A special workshop designed for horse owners.

Attendance: 24

### Thursday, November 13<sup>th</sup> at 6:30 pm, Billings Farm & Museum, Woodstock

Co-sponsored by the Ottauquechee Natural Resources Conservation District, Greater Upper Valley Solid Waste Management District, and Billings Farm

Attendance: 10

**Total Attendance: 72**

**Surveys Completed: 42**

Additional Engagements:

September 6th & 7th, 2008, 20th Annual Vermont Sheep and Wool Festival

Champlain Valley Expo, Essex Jct.

Booth, Handbook and CD Toolkit distribution, and technical assistance provided.

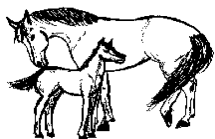
February 15th, 2009, Northeast Organic Farming Association of Vermont (NOFA-VT)

This popular agricultural conference brings in some 1,400 farmers from around New England. Thirty-nine people attended the manure management workshop.

April 29th, 2009, San Diego, California, BioCycle International Conference 2009

Manure Management Session panelist: "Manure Management for Sustainable Agriculture and Small Livestock Operations."

## Appendix B: Sample Workshop Flier



# Free Manure Management Workshops



**Workshops are designed to meet the needs of small farmers.**

- Improper manure management can pollute waterways and be harmful to livestock.
- Workshops will address simple and low-cost “Best Management Practices” for handling manure on small farms.

Topics: Manure storage, land application, composting, manure marketing, and more.

- Specifics for all livestock will be addressed.
- All participants receive a free manure management handbook & resource toolkit.
- Technical assistance in manure management also available at no cost.

Refreshments will be provided. Workshop is free, but registration is requested.

Please call (802) 254-3636 or by email [athena@nerc.org](mailto:athena@nerc.org) to register.

### Workshop Schedule



**Saturday, May 17<sup>th</sup>, 11:00 am**

**Newton Town Hall**

2 Town Hall Road, Newton

Co-sponsored by the New Hampshire Horse Council  
& the Newton Conservation Commission.



**Saturday, May 17<sup>th</sup>, 3:00 pm**

**Griffinbrook, Ltd.**

174 Raymond Road, Candia

Co-sponsored by the New Hampshire Horse Council  
& the Candia Conservation Commission.



**Monday, May 19<sup>th</sup>, 6:30 pm**

**Canterbury Town Hall**

Canterbury

Co-sponsored by the New Hampshire Horse Council &  
the Canterbury Conservation Commission.



**Tuesday, May 20<sup>th</sup>, 6:30 pm**

**Remick Museum**

Tamworth

Co-sponsored by the Carroll County Small and Beginner Farmer Network.



**For more information and to inquire about free technical assistance in manure management  
contact Athena at 802-254-3636 or [athena@nerc.org](mailto:athena@nerc.org).**

Sponsored by the Northeast Recycling Council, Inc., the NH Department of Environmental Services, and the NH  
Department of Agriculture, with assistance from a USDA grant.

## Appendix C: Promotional Article for County 4-H Newsletter

### Got Poop?

Learn how to better manage manure on small farms.  
Free workshops to be held the week of March 24<sup>th</sup> in Salem County.

Improper manure management can pollute waterways and be harmful to your livestock. New Jersey Department of Agriculture's new Animal Waste Management Rules require **ALL** agricultural animal operations to follow the General Requirements of the Rule's—whether you have one horse, 25 goats, or 300 cows. At these workshops we will review the Waste Management Rules for small farm operations and look at low-cost ways to manage manure—from composting to land application.

- **March 26, 6:30 pm** at the USDA Rutgers New Jersey Agricultural Experiment Station, 51 Cheney Rd. in Woodstown—*Manure Management for Horse Owners*. For information and to register, contact Michael Marandola at 769-0090.
- **March 27<sup>th</sup>, 7:00 pm** at the Elmer Grange—*Manure Management Basics for All Types of Livestock*, in conjunction with the 4-H Livestock Group. For information contact Lisa Perry at 769-0090.
- Additional workshops to be held at the town offices of Oldsman, Lower Alloways Creek, and Alloway; Cedar Lane Feeds; Cowtown Cowboy Outfitters; and Dolbow Farm.

All workshop participants receive a free Manure Management Handbook and other resources. Refreshments will be served. For information on all workshops, contact [athena@nerc.org](mailto:athena@nerc.org) or call 802-254-3636.

*Sponsored by the Northeast Recycling Council, Inc., the NJ Department of Environmental Protection, and the NJ Department of Agriculture, with assistance from a USDA grant.*

Appendix D: Workshop Flier for Special Workshop with Rutgers Cooperative Extension

# Free Workshop for Horse Owners



## Manure Management Horse Feeding for a Healthy Environment Overview of Animal Agriculture on Small Farms

Workshop is designed to meet the specific needs of small farmers.

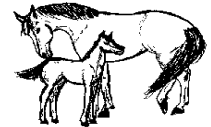
**Monday, March 24<sup>th</sup>, 6:00 pm**  
USDA Rutgers Ware Agricultural Building  
51 Cheney Rd. Woodstown.

Presenters will include: Dr. Michael Westendorf, Dr. Carey Williams, and David Lee from Rutgers University and Monique Purcell, NJ Department of Agriculture.

Topics:

- Manure Storage, land application, composting, manure marketing, and more. All participants receive a free manure management handbook; technical assistance in manure management also available at no cost.
- Environmental Implications of feed rations and a hands-on demonstration of Near-Infrared feed analysis.

For information and to register, contact Rutgers Cooperative Extension at 769-0090. Refreshments will be provided.



### Free Manure Management Workshops throughout Salem County

March 24<sup>th</sup> through March 29<sup>th</sup>

Workshops are designed to meet the needs of small farmers  
Specifics for all livestock will be address.

**Thursday, March 27<sup>th</sup>, 7:00 pm:** *Manure Management Basics and Manure Composting for All Types of Livestock*, in conjunction with the 4-H Livestock Group. Elmer Grange. To register call Lisa Perry at 769-0090.

Other workshops will be held in: Lower Alloway Creek Town Offices; Salem County Utilities Authority in Alloway; Oldmans Township Offices; Cedar Lane Feeds, Upper Pittsgrove; Cowtown Cowboy Outfitters, Woodstown; Dolbow Farm, Mannington--a demonstration of on-farm manure spreading will be presented.

- Improper manure management can pollute waterways and be harmful to livestock.
- New Jersey Department of Agriculture's new Animal Waste Management Rules require **ALL** agricultural animal operations to follow the General Requirements of the Rule's—whether you have one horse, 25 goats, or 300 cows.
- Workshops will review the Waste Management Rules for small farm operations and look at low-cost ways

For more information, complete workshop schedule, and to inquire about free technical assistance in manure management, please contact Athena at 802-254-3636 or [athena@nerc.org](mailto:athena@nerc.org). Sponsored by the Northeast Recycling Council, Inc., the NJ Department of Environmental Protection, and the NJ Department of Agriculture, with assistance from a USDA grant.

## **Appendix E: Posting on Town of Chester, NH Website**

### ***Free Manure Management Workshop***

The Northeast Recycling Council, Inc. is offering a free manure management workshop on **Saturday, January 31, 2009 at 2:00 pm at the Chester Town Hall**. *Co-sponsored by the Rockingham County Conservation District and the Town of Chester Conservation Commission*. Workshop is designed to meet the needs of small farm and livestock operations. Topics will cover storage, land application, composting, manure marketing, and more. A free manure management handbook will be given to all participants; technical assistance in manure management is also available at no cost. For more information and to inquire about technical assistance, please contact Athena at 802-254-3636 or [athena@nerc.org](mailto:athena@nerc.org). The workshop is funded by a grant from USDA. Snow date: Sunday, February 1, 2009 at 2:00 pm.

## Appendix F: Announcement on Equinesite.com

### Free Manure Management Workshops

Anonymous writes *"Workshops are designed to meet the needs of small farmers.*

*Topics: Manure storage, land application, composting, manure marketing, and more. Specifics for all livestock will be address.*

*All participants receive a free manure management handbook & resource toolkit.*

*Technical assistance in manure management also available at no cost.*

#### *Workshop Schedule*

*Saturday, May 17th, 3:00 pm*

*Griffinbrook, Ltd.*

*Raymond Road, Candia*

*Saturday, May 17th, 11:00 am*

*Newton Supply*

*23 South Main Street, Newton*

*Monday, May 19th, 6:30 pm*

*Canterbury Town Offices*

*Canterbury, NH 03224*

*Tuesday, May 20th, 6:30 pm*

*Remick Museum*

*Tamworth, NH*

*Co-sponsored by the Carroll County Small and Beginner Farmer Network.*

*Improper manure management can pollute waterways and be harmful to livestock.*

*Workshops will address Best Management Practices for handling manure on small farms review.*

*Refreshments will be provided.*

*For more information and to inquire about free technical assistance in manure management, please contact Athena at 802.254.3636 or [athena@nerc.org](mailto:athena@nerc.org).*

*Sponsored by the Northeast Recycling Council, Inc., the NH Department of Environmental Protection, and the NH Department of Agriculture, with assistance from a USDA grant.*

## Appendix G: Sample Press Release

### Free Manure Management Workshops in Vermont and New Hampshire

The Northeast Recycling Council, Inc. is offering free manure management workshops this fall. The first workshop will be held on **Wednesday, November 5<sup>th</sup> at 6:30 pm at [Winchester Stables](#) in Newfane, Vermont.** Another workshop will be held at the **[Billings Farm & Museum](#) in Woodstock on Thursday, November 13<sup>th</sup> at 6:30 pm.** Additional workshops will be held in conjunction with the [Northeast Animal-Power Field Days](#) in Tunbridge, VT, the [Green Mountain Horse Association's](#) Fall Foliage Ride, and Evergreen Equine of Vermont. The Evergreen Equine event will be in November.

Workshops are designed to meet the needs of small farmers and livestock owners. Topics cover storage, rotational grazing, land application, composting, manure marketing, and more. Specifics for all livestock—horses, cows, goats, sheep, llamas, pigs, chickens, and rabbits—will be presented. All participants receive a free manure management handbook and CD Resource Kit; technical assistance in manure management is also available at no cost. Refreshments provided at all workshops.

To download a free copy of the handbook and additional resources visit [www.nerc.org](http://www.nerc.org). For more information, to find out about additional workshop dates, and to inquire about technical assistance, please contact Athena at 802.254.3636 or [athena@nerc.org](mailto:athena@nerc.org). These workshops are funded by a grant from USDA.

## Appendix H: Sample Newspaper Ad



**Free Manure  
Management Workshop**



**Saturday, January 31<sup>st</sup>, 2:00 pm\***  
**Chester Town Hall**

Co-sponsored by the Rockingham County Conservation  
District and the Chester Conservation Commission

**Workshop is designed to meet the needs of  
small farm and livestock operations.**

Topics: Manure storage, land application, composting,  
manure marketing, and more.

Participants receive a free manure management  
handbook & resource toolkit.

Refreshments provided. Workshop is free, but  
registration is requested. **Please call (802) 254-3636 or  
email [athena@nerc.org](mailto:athena@nerc.org) to register.**  
Free technical assistance is also available.

**\* Snow Date: Sunday, February 1 at 2:00 pm \***

*Sponsored by the Northeast Recycling Council, Inc.,  
the NH Department of Environmental Services,  
and the NH Department of Agriculture,  
with assistance from a USDA grant.*

## Appendix I: Workshop Survey

### Manure Management Workshop Questionnaire

1. Town in which you live: \_\_\_\_\_  
a. How far did you drive to attend? \_\_\_\_\_ miles
2. How did you hear about this workshop? \_\_\_\_\_ Flier  
\_\_\_\_\_ Ad in paper  
\_\_\_\_\_ Mailing, newsletter  
\_\_\_\_\_ Word of mouth  
\_\_\_\_\_ Other: \_\_\_\_\_

3. Please briefly describe your current manure management practices:

- \_\_\_\_\_ Storage area, covered  
\_\_\_\_\_ Storage area, not covered  
\_\_\_\_\_ Land applied  
\_\_\_\_\_ Compost  
\_\_\_\_\_ Give or sell off-farm  
\_\_\_\_\_ Other: \_\_\_\_\_

4. Do you have concerns or problems with your current manure management efforts?

- \_\_\_\_\_ Yes Please describe:  
\_\_\_\_\_ No  
\_\_\_\_\_ Some

5. How have you previously learned about manure management?

- \_\_\_\_\_ From other farmers \_\_\_\_\_ Workshops/seminars/meetings  
\_\_\_\_\_ Reading magazines, books, other \_\_\_\_\_ Newsletter  
\_\_\_\_\_ Web search; Internet \_\_\_\_\_ Other:  
\_\_\_\_\_ Working on farms

6. Have you contacted agricultural, environmental or other agencies regarding manure management? VT Dept. of Agriculture \_\_\_\_\_ USDA \_\_\_\_\_ NRCS \_\_\_\_\_ Ag Extension \_\_\_\_\_  
Other: \_\_\_\_\_

7. What additional resources would you find helpful?

8. Would you prefer information in electronic \_\_\_\_\_ or print form \_\_\_\_\_?

*Would you like to be contacted for additional technical assistance or information?*

Name: \_\_\_\_\_ Telephone: \_\_\_\_\_  
Email: \_\_\_\_\_ Best time to reach you: \_\_\_\_\_

*This survey is administered by the Northeast Recycling Council. The survey is being used for data purposes only. Your name and contact information is requested only if you would like a follow-up contact, it will remain confidential.*