



An Operations Manual for Recycling Drop-Off Centers

Lillian Wege | City of Holland | July 2025



MICHIGAN DEPARTMENT OF
ENVIRONMENT, GREAT LAKES, AND ENERGY



Holland
MICHIGAN



GRAHAM SUSTAINABILITY
INSTITUTE
CENTER FOR
EMPOWERING COMMUNITIES
UNIVERSITY OF MICHIGAN

THANK YOU

- **My mentor, Dan Broersma, and advisor, Kristen Wieland**
- **Professionals and facilities that hosted me**
- **Consultants and experts**
- **The Graham Institute, Sarah, and my fellow fellows**

DROP-OFF CENTERS

Centralized
location to bring
recyclable
materials

Collection, sorting,
consolidation, and
processing

Self-serve or
assisted transfer

Complementary
to curbside or
stand alone

Same
materials
or more

LOCAL CHALLENGE

1

The City of Holland is building a new drop-off center and looking for operations information.

Goal: Create an educational resource for Holland staff

STATE CHALLENGE

2

Michigan's goal recycling rate is 45% by 2030
– it's currently 25%.

Goal: Develop a resource that supports Michigan communities in expanding recycling

INDUSTRY CHALLENGE

3

Information about recycling operations is scattered, if it's collected at all. Knowledge is also lost when people leave / retire.

Goal: Collect, synthesize, and preserve industry knowledge

TACKLING THREE CHALLENGES

Create a resource to support Holland's new drop-off center

Make an accessible manual for all Michigan communities

Centralize industry knowledge and preserve it

FIVE FACILITY VISITS



Emmet County



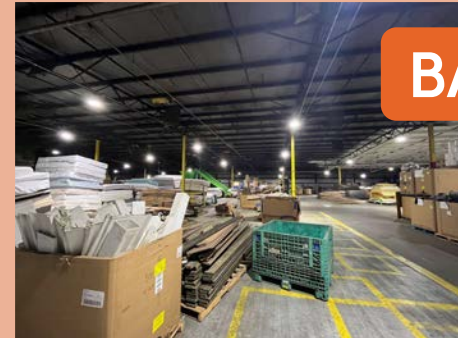
Biz Aid LLC



Recycle Ann Arbor



MSU



BARC

BREADTH OF INFORMATION

	MSU SSRC	BARC	Emmet County	Biz Aid LLC	Recycle Ann Arbor
Region	Central	Northern	Northern	Southcentral	Southeast
Type	University	Non-profit	Public	Private	Non-profit
Services	Drop-off, MRF*, resale	Drop-off, pick-up, resale	Drop-off, transfer station, MRF*	Drop-off, commercial service	Drop-off, MRF*

*MRF = material
recovery facility

KEY INSIGHTS

Materials contracts:

Not as important as you might think

Public education:

Build relationships and trust

Equipment:

Compactors reign supreme

OTHER METHODS



THE MANUAL



Recycling Drop-off Center Operations Manual for Michigan Communities

July 2025

9. Regulation and Permitting

This section introduces policies relevant to recycling facilities of all sizes including permitting and reporting regulations. Municipalities will have local ordinances about solid waste management. Zoning, design restrictions, and easements may also interact with the use and function of your facility. This manual section is meant to serve as a guide. Legal and regulatory experts should be consulted as drop-off centers are set up to navigate regulations and reporting. For more educational resources related to these policies, see Appendix A.

Part 115, Solid Waste Management, of Act 451 was updated in 2022 to shift the focus of solid waste management from landfills to more comprehensive materials management including recycling and compost. Part 115 is the guiding law that oversees the function and role of recycling in Michigan's waste streams. Familiarize yourself with the law, which can be found in Appendix A, to understand what it means to recycle in Michigan.

- Part 115 defines a **materials recovery facility (MRF)** as a facility that both "receives primarily source separated material and sorts, bales, or processes the source separated material for reuse, recycling, and utilization as a raw material or new product" and "on an annual basis, does not receive amount of solid waste equal to or more than 15% of the total weight of material received by the facility unless the materials recovery facility is making a reasonable effort and has an education program to reduce the amount of solid waste."
- Part 115 requires each county or group of neighboring counties to develop a **Materials Management Plan (MMP)**, and that recycling facilities that collect more than 100 tons of material per year maintain operations consistent with their county MMP.

Part 175, Recycling Reporting, of Act 451, passed in March of 2016, requires recycling establishments to register and report the amount of recycled material they recycle each year with EGLE. Reporting is mandatory for all facilities that fit the definition of a recycling establishment in the law, and reporting covers seven materials.

- Part 175 defines a **recycling establishment** as "an establishment engaged in the recycling of, or baling of, reportable recyclable materials."
- Part 175 defines **recycling** as "an action or process such as separation, sorting, baling, or shipping applied to reportable recyclable materials for the purposes of reuse, or conversion into raw materials, or new products."
- **Reportable materials** are: glass, paper and paper products, plastic and plastic products, ferrous metal including white goods, non-ferrous metal, textiles, and single-stream recyclables. Voluntary reporters are able and encouraged to report on more types of materials than are listed here.
- Facilities that process **less than 100 tons** of these materials per year are exempt from mandatory reporting, but may report voluntarily.
- Drop-off facilities that receive materials but do not sort or process it are exempt from mandatory reporting **if they ship the materials to another establishment that does report under Part 175**. If any material is sorted and sent to a facility that is exempt from reporting, such as an end user, it drop-off facility must report the material that was sorted. Example: If a drop-off center sorts cardboard and sends it to a papermill, the drop-off center must report the cardboard because the paper is exempt from reporting under Part 175.
- Exemptions exist for scrap metal subject to the Scrap Metal Regulatory Act and electronic waste subject to Part 173, Electronic Equipment, of Act 451.

Appendix

Appendix A: Additional Information

Safety Resources:

Health and Safety Self-Assessment from MRE Operations Manual by Patrick Engineering (resource begins on page 63 of the manual)

Green Job Hazards - Recycling, Waste Management and Recycling | Occupational Safety and Health Administration - Occupational Safety and Health Authority (OSHA)

Preventing Deaths & Injuries While Compacting or Baling Refuse Material | NIOSH | CDC - OSHA

Hazardous Waste Operations and Emergency Response (HAZWOPER) - HAZWOPER Training EAQs - OSHA

Education and Public Relations Resources:

How to Promote your Community Recycling Program Handbook - Houston-Galveston Area Council and Clean Houston

Recycling Education Guide for Community Programs - Emmet County, Michigan Recycling Coalition

Materials Marketing Resources:

Michigan Recycled Materials Market Directory | RecycleSearch

Model Bale Specifications - Association of Plastic Recyclers (APR)

What Recyclable Materials can be Baled? - Harmony, specifications of equipment for different materials

Scrap Specifications Circular - Institute of Scrap Recycling Industries, Inc., July 2022

Introductory Buyers List

Michigan Materials Marketplace - Rheaply

Facility Financing Resources:

Operational and Funding Options for Municipal Recycling Programs - DEQ (now EGLE)

Guide: Use of Special Assessments to Fund Recycling Services & Facilities - DEQ (now EGLE)

Grants and other financial opportunities:

Closed Loop Partners

EGLE Recycling Grants

EGLE Recycling Grant guidelines

All EGLE funding opportunities, updated periodically with new programs

Accelerator Tracks — NEXTCYCLE MICHIGAN

MANUAL FEATURES

- Ten informative sections
- 'Take it or leave it' considerations for all kinds of facilities
- Designed to be referenced as topics become relevant
- Appendix with additional resources and examples
- Knowledge and advice from successful professionals

**LET'S
EXPLORE
SITING**

Introduction to the topic and its importance

List of features for an existing building

1. Siting a Drop-off Center

The location and condition of your drop-off center will determine your usership and may impact marketing options. More than anything, it will set into motion the overall life and function of the facility. Siting should take into consideration the expected scale of operations as well as anticipated future expansion. Efficiency of collection, processing, storage, and transportation are also important priorities. Below is a list of site features that will contribute to the successful and efficient development of your drop-off site. See the siting checklist in Appendix D for a related, actionable resource.

- **Location:** Locating your drop-off center close to major transportation arteries and destinations such as schools and shopping centers may make users more likely to stop by your facility while doing daily tasks or driving to or from work. Siting near a large road also accommodates tractor-trailer traffic. However, be cautious of proximity to residential areas to avoid conflicts over noise, dust, and other nuisances.
- **Size:** Acreage should accommodate the structure, outside storage, parking, and have enough space for orderly vehicular movement including tractor-trailers and buffers between your and neighboring properties.
- **Natural barriers** like trees and hills can serve your facility for security, as a buffer for noise, and aesthetics.
- **Notice features** such as inclines and blind curves. Such features may make operations more difficult for workers, customers, or buyers. Conversely, consider whether they could be leveraged to make operations more efficient.

You may want to use an existing structure.

Retrofitting an existing facility can decrease costs, materials, construction emissions, and the construction timeline of your facility. Existing sites may be better situated than lots available for new construction, and sites such as industrial parks may provide desirable infrastructure and features such as roads, fencing, drainage, and loading docks as well as commercial neighbors who may become customers. Key considerations related to the reuse of an existing building as a drop-off center include:

- **Building shell type:** Pre-engineered steel buildings are often desirable for their durability. Former buildings suitable for drop-off centers include warehouses, distribution centers, and light industrial manufacturing facilities.
- **Interior structure:** Clear span buildings allow for operational flexibility because layout and equipment arrangement can be changed to serve various functions. There are also no support pillars for vehicles to run into.
- **Ceiling height:** Ideal dimensions for your facility depend on the specific functions anticipated. For example, an eave height of 25 feet accommodates the tipping of roll-off containers, and 15 feet accommodates a vertical baler. Keep in mind the possibility of expansion and/or additional equipment in the future.
- **Utilities:** HVAC, lighting, sewer or other water, and electrical services should be adequate for anticipated staffing, material capacity, and equipment. Air handling should be evaluated by an engineering or technical design firm based on the level of dust anticipated. Also note that temperature control may not be necessary for your entire facility, and can be distributed for cost savings.

What if your site is a brownfield? Remediation of previously polluted properties can bring ne-

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- **Location:** Locating your drop-off center close to schools and shopping centers may make users more likely to stop by your facility while doing daily tasks or driving to or from work. Siting near

List of features for locating a new site

Possible scenario

Progressive steps to navigating brownfield remediation

glected land back into organized use, and may rally community buy-in for your new site. Brownfield redevelopment can also bring in new funding structures for your project. Specific remediation measures depend on the cause and status of contamination at your site, but an overview of the redevelopment process is offered here. The steps to working with a brownfield facility include:

1. Continuous collaboration with an environmental consultant to identify the necessary cleanup steps, precautions for use, and to meet appropriate state agency standards throughout planning and construction.
2. A Phase I environmental assessment to identify existing contamination, if there is any. All facility development projects should conduct a preliminary environmental assessment even if legacy pollution is not suspected to establish a record of environmental conditions and avoid liability for any contamination discovered later. A Phase I environmental assessment results in an environmental report that declares the environmental conditions found on the site.
3. A Phase II study to identify exactly what and where contamination is on the property. This includes soil and water samples. If only part of a property is contaminated, you may be interested in arranging your use and remediation measures across the land to account for that distribution.
4. After Phase I and Phase II assessments, a baseline environmental assessment is compiled and submitted to EGLE.
5. Establishing a due care plan to ensure your use and operations remain within safe limits, and nothing contributes to expanding or exacerbating contamination. This plan includes environmental assessments, development plans, and remediation or protection measures.

Additional notes on brownfield redevelopment:

- Your regional Brownfield Coordinator will oversee your project and discuss results and opportunities for your site. Call them at the beginning of your project to make sure you meet the necessary requirements and take advantage of all opportunities.
- The EGLE Brownfield Site Assessment (BSA) Program offers environmental assessments at no cost to sites with suspected or documented environmental contamination.
- EGLE offers funding in the form of grants and loans. Grants and loans are managed through your local government unit, and are each capped at \$1 million per project per local government per year. Sites receiving grants and loans are subject to different requirements such as demonstrated local capital investment and economic potential. Your county or local government may also have access to EPA brownfield funds.
- EGLE's RIDE Mapper platform can help you locate sites with reported contamination. Key features includes the "Inventory of Facilities" window, which offers a spreadsheet of identified contaminated sites and access to relevant records and reports for most sites, and "RIDE Mapper," an interactive map that allows you to locate known contaminated sites and filter by status, EGLE support received, and regulatory type.

The process and timeline of developing or enhancing a drop-off center will vary depending on multiple factors, including who is leading the project and the governance structure within which it will take place. In general, as you discuss the drop-off center with your governing body, make sure that you...

- **Identify your community's need for a drop-off center.** In one community, this was done by a materials taskforce. Community needs may include the geographic limitations of current curbside service or public demand for specific services such as electronics recycling or paint collection. Your circumstance will be unique, but understanding the "why" of your facility is integral to building community

and organizational buy-in, and will make your facility actually useful!

- **Develop a preliminary plan of costs and facility needs.** When you're presenting your plan to your governing body, consider separating capital costs such as construction, infrastructure, and equipment, and operational costs such as staff, marketing, and transportation. Like above, consider hiring external consultants to provide expertise and tap into professional networks when developing budgets and financial plans. Include other public offices in the siting process such as planning, facilities, and utilities if applicable.
- **Verify the sites.** A site must be financially and logistically feasible, in addition to available. Check zoning, deed restrictions, easements, and any site-specific conditions such as soil type that may cause the development of your site to take longer or be more expensive. The necessary utility infrastructure, such as water, sewage, septic, electrical, and natural gas, must be available and appropriate for the scale of your facility. The electrical needs of the equipment you plan on using should be communicated to your utility provider. Also for this reason, locating your facility in an established industrial area may make the development of your site simpler.
- **Identify funding and develop financial plans.** Really, this should be done throughout. See Organizational Structure and Appendix A for more information and resources regarding funding a drop-off center. State grants may be available to support the placement of needed infrastructure but can not be used to offset operational costs. If you're using grant funding to support the development of your facility, make sure you understand any restrictions the grantee may place on your site, such as your ability to lease versus buy a site. Clarify any grant restrictions before starting the siting process. Material sales will generally not cover operational costs, so additional funding mechanisms will need to be established. Understanding your community's financial "philosophy" towards the facility will help decide which services can be feasibly offered, and where services must be limited to maintain financial viability.
- **Put together a plan for presentation.** This will look different for every organization. Understand what the group wants, and where their priorities lie. Include unique aspects of the facility that will get both the governing body and greater community interested in your project in particular. This could be the creation of opportunities for recycling local materials like boat wrap that residents are interested in diverting, specialised equipment you'll be able to manage the material, such as a densifier, or a resale store that will create a new market for devalued goods.

More brownfield tips (from the experts)!

Key aspects to include in your plan / presentation to governing body

CONTINUING WORK

- Updates
- New sections
- Additional resources

Used by the
City of Holland,
managed by
the MRC or
EGLE

A comprehensive
suite of resources to
support community
recycling

CHECK IT OUT!

Options and
ideas for all
drop-off
centers

Supported by
a network of
experts

Explore a
drop-off center
for your
community!

THANK YOU!
QUESTIONS?