Development Study for a Household Hazardous Waste Facility

Prepared for

Metropolitan Area Planning Agency

City of Omaha

Douglas County

Sarpy County

Papio-Missouri River Natural Resources District

Keep Omaha Beautiful

Final Report

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HDR Engineering, Inc.

Executive Summary

To implement a household hazardous waste (HHW) collection facility (Facility), a steering committee (Committee) has been formed including representatives from MAPA, the City of Omaha, Douglas County, Sarpy County and the Papio-Missouri River Natural Resources District. The Committee commissioned this study (Study) is to identify and evaluate the requirements and costs associated with the Facility and to present a Facility concept in sufficient detail to enable a grant application to be prepared for funding the siting and detailed design of the Facility.

The Facility is envisioned to initially serve the populations of Douglas County and Sarpy County (576,000 in 2000) and to be expanded over time to additionally serve Washington County and Cass County (projected total population 685,000 in 2010). It is estimated that total HHW generation for the populations served will range from 1,200 tons to 1,400 tons per year.

It is estimated that a permanent, readily accessible Facility will initially receive 302 tons per year and up to 360 tons per year as the population base expands. Materials received will include paint and paint related products, solvents, pesticides, corrosives, used motor oil, antifreeze, batteries, tires and other materials. The Facility will accept HHW from residents and may also accept hazardous materials from conditionally exempt small quantity generators (small businesses generating quantities of hazardous waste within regulatory limits).

In the Facility, wastes will be sorted, and depending on the type of material may be blended, bulked or packaged for disposal in a licensed facility. To the extent possible, materials will be offered to the public for reuse, recycled or used within the Facility.

To meet the processing and storage requirements anticipated, a Facility concept has been developed that includes a 5,300 square-foot processing building and 1,300 square-foot office building situated on a 2½-acre site. Site improvements include roads, paved vehicle maneuvering areas, recycling facilities, parking and security fencing. The processing building includes spaces for material receipt, processing, packaging, analytical testing, storage, load out, employee toilet, lockers and mechanical equipment. The processing building also includes a space for a shop and swap or waste exchange where materials can be made available to the general public. The office building includes reception and administrative area, supervisor's office, restroom and a conference/training room.

Capital costs for the Facility are estimated at approximately $1.1 million excluding land acquisition costs. Operating costs are estimated at approximately $420,000 annually.

1.0 INTRODUCTION

The Regional Integrated Solid Waste Management Plan covers the Omaha metropolitan area and calls for the development of a household hazardous waste (HHW) collection facility (Facility).

To implement this provision of the plan, an HHW Steering Committee (Committee) has been formed including representatives from MAPA, the City of Omaha, Douglas County, Sarpy County and the Papio-Missouri River Natural Resources District. The Committee is interested in pursuing grant funding from the State of Nebraska for the construction and operation of the Facility in the Douglas/Sarpy County area. As defined by the Committee, mission and goals of the Facility are:

- Mission:

  To reduce the volume and toxicity of waste disposed of in municipal solid waste landfills by providing a regional facility that manages household hazardous waste in a manner that ensures safe handling, storage, and disposal and to reduce the generation of household hazardous waste through the promotion of safer alternatives, and responsible purchasing practices.

- Goals:

  - Provide an alternative to land disposal of household chemicals
  - Educate the public regarding the use of safer/alternative products and promote "only buy what you can use"
  - Protect workers and waste management facilities from adverse impacts of discarded household chemical products
  - Improve health and safety of people in their homes and the environment by providing education on how to purchase, use, store, and properly dispose of household chemical products
  - Reduce the toxicity of landfill leachate.

As determined by the Committee, the Facility would:

- Accept paint and HHW from residents of Douglas and Sarpy County.
- Provide blending and recycling of paint received.
- Include a waste exchange as allowed by law.
- Include a drop-off for used tires.
- Provide repackaging and disposal of other HHW received through a licensed HHW transportation and disposal firm.
- Expand over time to serve a wider region of eastern Nebraska.

The purpose of the Development Study for a Household Hazardous Waste Facility (Study) is to identify and evaluate the requirements and costs associated with the Facility,

and to present a Facility concept in sufficient detail to enable a grant application to be prepared for funding for the siting and detailed design of the Facility.

The Study includes:

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- A Needs Assessment including:
  - Identification and evaluation of siting and regulatory issues that need to be addressed in the implementation of the Facility.
  - A review of existing HHW collection and disposal programs operating throughout the Country to determine target materials to be collected and operational approach.
  - Estimates of the quantities and types of materials that would be expected to be collected at the Facility. Estimates include quantities of materials that could be collected from households and small quantity commercial generators.

- A Facility Concept including:
  - Projected physical and operational requirements for the Facility to receive and process the quantities and types of materials identified in the Needs Assessment.
  - Conceptual sketches of a generic facility layout incorporating the identified requirements.
  - Conceptual estimates of probable construction and operations cost for the Facility.

2.0 REGULATORY AND SITING ISSUES

HHW collection programs and activities are regulated under federal and State of Nebraska (State) regulations. At the federal level, the United States Environmental Protection Agency (USEPA) sets national standards and guidelines. The states develop specific regulations and requirements which, at a minimum, must comply with USEPA regulations. Section 2.1 reviews the USEPA's classification of regulations for HHW and conditionally exempt small quantity generator (CESQG) collection programs. Section 2.2 is a review of the titles of the Nebraska Administrative Code (NAC) which would apply to HHW collection programs.

2.1 Federal Regulations

The federal regulations governing the management of hazardous waste can be found in Parts 261 and 262 of Title 40 of the Code of Federal Regulations (CFR). Under 40 CFR 261.4(b)(1), household waste is exempt from the full "cradle to grave" RCRA Subtitle C hazardous waste management requirements. The term household waste refers to any garbage, trash, and sanitary waste derived from single and multiple residences and other residential units such as hotels and motels. In order for household waste to be exempt from regulation, it must meet two criteria: the waste has to be generated by individuals on the premises of a household, and the waste must be composed primarily of materials found in the waste generated by consumers in their homes (EPA 1995). In 1984, the definition of household waste was expanded to include wastes from day-use recreation areas, picnic grounds, campgrounds, ranger stations, bunkhouses, and crew quarters. Although the collection, transportation, treatment, and disposal of household wastes are not subject to hazardous waste regulation under 40 CFR Parts 262 through 270, they are subject to federal, state, and local requirements concerning management of solid waste. This exclusion applies to all household wastes, including HHW.

In the past there has been confusion on how the federal regulations are applied to HHW collection programs that collect: 1) only CESQG waste or 2) CESQG waste mixed with HHW. CESQGs (typically small businesses) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month. A 1986 letter from Mark A. Greenwood, USEPA to Joan H. Peck, State of Michigan Department of Natural Resources (EPA 1986) clarified how 40 CFR 261.5(g)(3)(iv) applies to facilities that temporarily store hazardous wastes produced by CESQGs. CESQG waste is conditionally exempt from full hazardous waste regulations as long as certain requirements are met. Those requirements under 40 CFR 261.5(f)(3) and (g)(3) stipulate that CESQGs must send their wastes to either a federally permitted or interim status hazardous waste management facility, a state authorized hazardous waste management facility, a recycling facility, or a facility permitted, licensed, or registered by a state to manage municipal or industrial solid waste. The requirement that the facility be permitted, licensed or registered by a State was not intended to impose upon the States any particular procedure for approval of the facility. All that is required is that the State have some mechanism for approving facilities that propose to manage the exempt waste. Since the underlying intent of the requirement is that the State assess the risks associated with particular facilities handling the exempt waste, any

mechanisms that the State chooses to accomplish this is, in the view of the regulators, acceptable under the regulations.

In a July 1992 memo (EPA 1992), the USEPA clarified that state-approved HHW Collection Programs that manage both HHW and CESQG waste are not subject to the full RCRA Subtitle C requirements, merely because they mix the two types of wastes together. It was the EPA's interpretation that 261.5 (h) applies to the CESQG and not to the subsequent managers of the CESQG waste. Programs and facilities receiving and mixing CESQG waste and HHW are subject to requirements imposed by States through the States' municipal or industrial permit, license, or registration programs, but are not subject to the full hazardous waste Subtitle C regulations, even if the mixed CESQG and HHW were to exhibit a characteristic of a hazardous waste. The collection facility does not become the generator of the mixture merely by mixing CESQG waste with HHW, and regardless of the quantity of the mixture of wastes, is not subject to the 40 CFR Part 262 generator regulations.

The EPA further clarified that even though HHW is exempt from the definition of hazardous waste, it is still subject to RCRA Subtitle D regulation, which governs disposal of waste. The HHW exclusion extends to those who collect HHW, including private sector or community collection programs. However, HHW that is mixed with small quantity (SQG) or large quantity generator (LQG) wastes, may be subject to full RCRA Subtitle C regulation. In addition, for persons managing HHW that contain a hazardous substance as defined by CERCLA may have CERCLA liability, even if the HHW is not within the definition of a RCRA hazardous waste (EPA 1997).

2.2 State Regulations

State of Nebraska regulations relating to handling, collection, and disposal of hazardous waste are contained primarily in Titles 128 and 132 of the NAC. Nebraska does not have any specific regulations governing HHW collection facilities (NDEQ, 1999). There are no recorded permanent HHW collection facilities in Nebraska at this time. Efforts for collecting HHW are limited to local community pickups conducted one or more times a year. In general, the State of Nebraska follows federal regulations with regard to HHW. As in the federal regulations, household waste, including waste that has been collected, transported, stored, treated, disposed, recovered, (e.g., refuse-derived fuel) or reused, is exempt from regulation as a hazardous waste (NAC Title 128, Chapter 2, Section 009.01).

HHW collection facilities are not considered generators of hazardous waste and are therefore exempt from hazardous waste regulations.

HHW collection facilities can receive waste from CESQGs, which are conditionally exempt from hazardous waste regulations. To retain exempt status, facilities that handle commingled waste must follow CESQG regulations, which can be found in NAC Title 128, Chapter 8, Section 006 and include:

- Following the hazardous waste determination requirement (i.e., determine if the waste is a listed hazardous waste or is excluded from regulation)
- They must not accumulate:
  - More than 1000 kg of hazardous waste at any one time from any one source.
  - More than a total of one kg of acute listed hazardous waste from one source in a calendar month.
  - More than a total of 100 kg of any residue or contaminated soil, waste or other debris resulting from the clean up of a spill, into or on any land or water, of any acute listed hazardous waste.
- If a CESQG generates acute hazardous waste in excess of the limits listed above, all quantities of that acute hazardous waste are subject to full regulation under NAC Title 128, Chapter 10.
- They may either treat or dispose of their excluded hazardous waste in an on-site facility, or ensure delivery to an off-site storage, treatment or disposal facility provided that either of these facilities are authorized to manage their waste.

For the HHW collection facility to retain exempt status there must be a mechanism in place to verify that no SQG or LGQ waste is received at the facility. As in the federal regulations, HHW that is mixed with SQG or LQG wastes may be subject to full hazardous waste regulation.

NAC Title 128, Chapter 25 establishes requirements for managing universal waste (batteries, pesticides, thermostats, and mercury-containing lamps). Facilities that commingle exempt household wastes and exempt CESQG wastes with universal waste, must manage the commingled waste under the requirements of Chapter 25. Requirements for waste management, labeling/marking, accumulation time limits, response to releases, off-site shipments, and tracking are outlined in this chapter.

2.3 Local Regulations

A HHW collection facility located within Omaha City limits would be classified as a Scrap and Salvage Operation. If the facility is located within a general industrial area or a downtown service area, it would require a use permit and an operating permit from the Omaha City Council. If the facility is located within an area designated as a heavy industrial district, it would need only an operating permit from the Omaha City Council (City of Omaha, 1999).

If the Facility is to be located outside of the City of Omaha, it must be located in an appropriately zoned area. Zone requirements should be determined in consultation with the local zoning officials.

2.4 Siting Issues

This Section presents a number of siting criteria that can be considered by the Committee in the identification and evaluation of sites. The siting criteria include:

- fatal flaw criteria;
- technical criteria;
- environmental criteria;
- sociopolitical criteria; and
- economic criteria.

2.4.1 Fatal Flaw Criteria

If a potential site has an attribute included among the fatal flaw criteria, it should be eliminated from further consideration.

In Nebraska, solid waste facility siting restrictions currently do not apply to HHW collection facilities but may be considered as guidelines. Location standards preclude the siting of solid waste facilities:

- within 1,000 feet of any navigable lake, pond or flowage;
- within 300 feet of any navigable river or stream;
- within a floodplain;
- within 1,000 feet of the nearest edge of the right-of-way of any state trunk highway, interstate or federal aid primary highway or the boundary of any public park, unless the facility is screened by natural objects, plantings, fences or other appropriate means so that it is not visible from the highway or park; and
- within 1,200 feet of any public or private water supply well.

These standards may conflict with the need to make the Facility as accessible to the public as possible.

Current local zoning may already include the above restrictions which would preclude the siting of the Facility in certain areas. Selected sites must conform to all local land use plans, zones and ordinances.

2.4.2 Technical Evaluation Criteria

Technical evaluation criteria identified can include:

- site size;
- facility/operations expansion potential;
- configuration of site;
- soils conditions; and
- site accessibility.

The site must be of adequate size to provide sufficient space for daily operations and to meet applicable codes. Building codes typically include required setback distances between buildings and property lines. In addition, fire codes typically include additional setback requirements for buildings in which combustible materials are stored. The site may need to be sized larger than required for current operating needs to allow for future expansion.

Although a square footage quantity may numerically satisfy the size requirement, the shape of the site may not make it conducive to actual operation. For example, a long and narrow site may not meet setback requirements and may prevent a drive-through operations arrangement for one-way traffic flow or may limit adequate on-site maneuvering.

Soils and geological data should be used to identify if costly foundations for structures and roads are required.

The accessibility of the potential site should be evaluated including consideration of:

- accessibility to major roadways;
- convenience to generators;
- availability of utilities including potable water supplies, sewer, and telephone; and
- proximity to and availability of emergency services.

2.4.3 Environmental Criteria

Environmental criteria for siting HHW collection facilities can include:

- surface water;
- groundwater;
- existing environmental contamination; and
- ecology impacts.

The location of potential sites relative to streams, wetlands and other environmentally sensitive areas and the potential environmental damage due to an uncontrolled release of hazardous materials should be evaluated.

The potential for existing soil and groundwater contamination at a potential site should be evaluated. Existing environmental problems may need to be corrected before the Facility could be built at the location and implementation delays may result.

Ecology impacts include the presence of endangered species and unique flora and fauna. A review with the appropriate state and federal authorities should determine if there are any development constraints imposed on the area due to the presence of a protected, rare or endangered species or habitat that is critical to their survival. Unique flora and fauna that exist on any of the sites may delay implementation and increase expenses due to relocation or special protections.

2.4.4 Sociopolitical Criteria

Sociopolitical issues are considered to assess the concerns of the residents and the jurisdiction which may be affected by the location of a HHW collection facility. These issues can include:

- community acceptance (traffic, visual and noise impacts);
- jurisdictional approval;
- surrounding present land use;
- proximity to sensitive receptors;
- ownership/land acquisition potential;
- co-location with other facilities; and
- surrounding future land use.

If the Facility is not conveniently located, it will not attract a large number of participants. But the Facility should not be sited immediately adjacent to residential neighborhoods. Community acceptance can be affected by traffic, visual and noise impacts. Location of and access to the Facility should avoid additional truck and automobile traffic on residential streets. A favorable site may have effective site buffering which includes natural berms, plantings or other appropriate means to screen the Facility from view. Additional noise impacts would be primarily due to an increase in traffic. With site buffering and screening and routing traffic away from residential neighborhoods noise can be mitigated.

Prior and current land use needs to be reviewed for compatibility with the Facility. Siting of the Facility needs to consider distances to and the potential impacts on sensitive receptors such as hospitals, schools, churches, parks, and historic sites. These distances should be maximized as much as possible.

Siting may be easier if the potential site is government-owned property. Potential sites for HHW facilities may include government-owned vacant lands, utility lands, abandoned properties and old landfill sites. Co-location with other public facilities often provides opportunities for shared security, stormwater runoff control, storage, sanitary facility and office space arrangements. If a possible site is not government-owned then the land acquisition potential needs to be reviewed.

Compatibility with planned future land use and anticipated future population densities in the vicinity of the site should be investigated to minimize future conflicts. Future development planned for an area may not be consistent with HHW collection activities. Other siting factors include anticipated changes in land use as indicated by adopted local land use plans, zoning ordinances, and pending development projects.

2.4.5 Economic Criteria

Under this category, the site-specific costs should be considered in site selection. Economic criteria can include:

- raw land costs; and
- site development costs.

If the land has to be purchased or leased, this capital cost should be compared for each site. In addition, the revenues removed from the tax roll should be considered in the purchase cost of private land.

Site development cost is the dollar value assigned to prepare the site for use. Development costs for the Facility site may include, but are not limited to, on- and off-site roads, berms, clearing and grubbing, removal of unsuitable or contaminated soils, materials, water and sewer, electrical power access, structural soil conditions, buildings and structures, and other physical improvements. Site development considerations may also include delays due to special site conditions.

3.0 FACILITY OPERATIONS

3.1 Background Data

3.1.1 Population

The Facility is planned to initially serve Douglas and Sarpy Counties and may be expanded in the future to additionally serve Washington and Cass Counties. Current and projected populations for these counties are given in Table 3-1.

Table 3-1
Population of Counties to be Served by the Facility

County	Projected Population in Years:		
	2000	2005	2010
Douglas	450,000	464,837	480,251
Sarpy	125,845	138,757	152,346
Subtotal	575,845	603,594	632,597
Washington	18,939	20,439	22,039
Cass	24,992	27,192	29,492
Four County Total	619,776	651,225	684,128

Source: MAPA

As indicated in Table 3-1, the Facility may be planned to serve an initial population of 576,000, but may be expanded to meet the demands of population growth and expanded service area to serve a population of 685,000 by 2010.

3.1.2 HHW Generation

In 1987, the U.S. Environmental Protection Agency studied solid waste in two communities and determined that HHW constituted between 0.35% and 0.4% of the total municipal solid waste (MSW) generated (source: Characterization of Household Waste from Marin County, California and New Orleans, Louisiana, U.S. EPA, 1987). Other sources have variously estimated that nationwide, the quantity of HHW is between 0.2% and 1% of MSW generated. Assuming that HHW accounts for 0.4% of the total MSW generated, and based on estimated MSW generation rates included in the Regional Solid Waste Management Plan, estimates for the amount of HHW generated annually in the area are given in Table 3-2.

Table 3-2
Estimated HHW Generation in Douglas, Sarpy, Washington and Cass Counties

County	Projected HHW Generation, tons/year		
	2000	2005	2010
Douglas	920	950	982
Sarpy	257	284	311
Subtotal	1,177	1,234	1,293
Washington	39	42	45
Cass	51	56	60
Four County Total	1,267	1,331	1,398

Notes: 1. Assumes an average MSW generation rate of 2.8 pounds per person per day and 0.4% of MSW is HHW.

3.1.3 Existing Collection Programs

There are currently two programs in Douglas County and Sarpy County that collect HHW.

3.1.3.1 MAPA Paint Collection

MAPA currently operates a paint collection service with a drop-off location at 2115 North Military Avenue. Open from 3:30 to 4:30 each Friday afternoon, the location receives approximately 2,500 gallons per year of paint. MAPA provides for bulking and blending of the paint and makes the product available primarily to public agencies but also to private organizations and individuals. The City of Omaha uses substantial quantities for graffiti clean up. Paint cans, approximately 7500 per year, are crushed for recycling.

3.1.3.2 Sarpy County Paint and Used Oil Collection

Sarpy County holds periodic drop and swap events at four locations in Sarpy County. The events accept paint and used motor oil. Paint is delivered to the MAPA paint program and the motor oil is used as fuel.

3.2 Projected Performance of a Permanent Collection Program

The generation of HHW provides an indication of how much could potentially be targeted for separate collection in the Facility, but is not a good indicator regarding the Facility's likely performance. The level of public awareness and convenience of the Facility will be the most important factors in determining recovery levels. An effective public education

program is essential for raising public awareness and thus participation in any HHW collection program.

The approach used for estimating participation in a permanent HHW program is to compare the results of other HHW programs. The following paragraphs address participation and HHW collection quantities from other areas of the country.

3.2.1 Anticipated Participation

Table 3-3 provides an overview of the participation achieved in a number of existing HHW collection facilities.

Table 3-3
Participation in Existing Permanent HHW Collection Programs

Community	Population	Annual Participation	Percentage Participation[1]
Portland, Or.[2]	438,000	12,342	2.8%
Larimer County, Co.[3]	200,000	1,400	0.7%
Port Washington, Wi.[4]	73,000	900	1.2%
Sussex County, De.[5]	74,253	608	0.8%
Orange County, Ca.[6]	2,500,000	35,265	1.4%
Rochester, N.Y.[7]	714,000	1,969	0.2%
San Francisco, Ca.[8]	723,959	3,820	0.5%
Des Moines, Ia.[9]	356,000	5,770	1.6%
Kansas City, Mo.[10]	1,000,000+	6,500	0.7%
Research Triangle Park, N.C.[10]	930,000	7,527	0.8%
Lawrence, Ks.[10]	82,000	1,450	1.8%

Notes:

1. Annual participation/population served.
2. Source: "Household Hazardous Waste Management News," March, 1993.
3. Source: "Hazardous Waste Management System," by Janelle L. Henderson for the Larimer County Department of Natural Resources.
4. Source: University of Wisconsin Extension.
5. Source: "Clean House/Clean Earth," by Julie Wilke, Delaware Solid Waste Authority, published in the Proceedings of the Seventh National U.S. EPA Conference on Household Hazardous Waste Management, December, 1992. The Sussex County program was a 6-month pilot program. Actual participation during the six-month pilot program is doubled in the Table to provide an estimated annual participation.
6. Source: "Permanent Programs, Orange County, California," by Jim Pfaff, published in the Proceedings of the Seventh National U.S. EPA Conference on Household Hazardous Waste Management, December, 1992. Annual participation is as reported in fiscal year 1991/1992.

7. Source: "Permanent Household Hazardous Waste Facility Case Study," by Edward J. Harding, for Monroe County, N.Y.
8. Source: "San Francisco's Household Hazardous Waste Collection Facility: A Two Year Summary," by Kelly Johnston and Cedar Kehoe, Sanitary Fill Company. Total participation for 1988 and 1989 was reported as 7,639. The total was divided by two to obtain the estimated annual participation rate given in the Table.
9. Source: Des Moines Metro Waste Authority, 1999.
10. Source: City of Omaha, based on phone contacts with facilities, 1999.

For the purposes of this Study, based on the participation rate achieved by existing communities with permanent programs, it is assumed that annual participation in the Facility would be approximately 1.5% of the population served.

3.2.2 Projected Quantities of HHW Collected

3.2.2.1 Quantities Collected per Participant

Table 3-4 lists the average quantities of HHW delivered by each participant to a number of permanent HHW collection facilities which accept a wide range of HHW materials.

Table 3-4
Average Quantities of HHW Collected per Participant
From Permanent Programs

Program	Average Quantity per Participant, lb.
Seattle[1]	69
Portland[2]	68
Madison, Wi.[3]	35
Dakota County, Minn.[4]	68
Santa Monica, Ca.[5]	58
Des Moines, Ia [6]	80
Kansas City, Mo.[7]	138
Research Triangle Park, N.C.[7]	88
Lawrence, Ks.[7]	40

Notes:
1. Source: "Seattle's Road to Recovery, Household Hazardous Waste", City of Seattle.
2. Source: "Household Hazardous Waste Management News," March, 1993.
3. Source: City of Madison.
4. "Waste Types and Quantities," by George Kinney, published in Proceedings of the Seventh National Conference on Household Hazardous Waste Management, December, 1992.
5. Source: "Fear Not the Waste Exchange," by Brian J. Johnson, City of Santa Monica, published in the Proceedings of the Seventh National U.S. EPA Conference on Household Hazardous Waste Management, December, 1992.
6. Source: Des Moines Metro Waste Authority.
7. Source: City of Omaha, based on phone contacts with facilities, 1999.

The quantities per participant shown in Table 3-4 average approximately 72 lbs. per participant.

For the purposes of this Study, it is assumed that program participants will deliver, on average, 70 lbs. of HHW per visit to the Facility.

3.2.2.2 Projected Quantities of HHW Collected in the Facility

Table 3-5 lists the projected annual quantity of HHW that would be collected in the Facility assuming a 1.5% participation rate and 70 lbs of HHW delivered per participant.

Table 3-5
Projected Quantity of HHW Collected
In the Facility

Service Area and Year	Population	Annual Participation	Annual Quantity Collected, tons
Douglas and Sarpy County, 2000	575,845	8,638	302
Douglas, Sarpy, Washington and Cass Counties, 2010	684,128	10,262	359

3.3 Composition of HHW Collected

The quantities of each type of acceptable material that will be collected in a permanent HHW collection program may vary substantially as demonstrated in Table 3-6. In general, it is anticipated that high percentages of the materials collected will be paint and paint related products, and used motor oil. The remaining materials collected will comprise smaller percentages of the total material collected. For planning purposes, Table 3-7 provides a representative anticipated breakdown of HHW received in the Facility and projected quantities of each type of material collected annually based on the materials likely to be targeted by the Facility.

Table 3-6
Types of HHW Collected in Existing Permanent Facilities

Program	Percent of Total Material Collected, by weight					
	Seattle, Wa.[1]	Dakota County, Minn.[2]	Santa Monica, Ca.[3]	Des Moines, Ia.[4]	Lawrence, Ks.[5]	Kansas City, Mo.[5]
Material						
Latex Paint	48%	32%	65%	27.0%	35%	40%
Oil Based Paint	14%	18%	incl. above	23.0%	23%	30%
Paint Related Products	22%	Incl.	5%	Incl.		
Solvents	8%	7%	incl.	5.0%		
Pesticides	5%	9%	7%	4.0%	8.8%	
Corrosives	1%	2%	12%	1.5%	1.1%	
Miscellaneous	2%	1%	8%	11.0%	18.4%	15%
Used Motor Oil	NA	31%	NA	23.5%	12%	15%
Batteries	NA	NA	3%	5.0%	1.7%	Incl.
Total	100%	100%	100%	100%	100%	100%

Notes:

1. Source: "Seattle's Road to Recovery, Household Hazardous Waste", City of Seattle.
2. "Waste Types and Quantities," by George Kinney, published in Proceedings of the Seventh National Conference on Household Hazardous Waste Management, December, 1992.
3. Source: "Fear Not the Waste Exchange," by Brian J. Johnson, City of Santa Monica, published in the Proceedings of the Seventh National U.S. EPA Conference on Household Hazardous Waste Management, December, 1992.
4. Source: Des Moines Metro Waste Authority.
5. Source: City of Omaha, based on phone contacts with facilities, 1999.

Table 3-7
Projected Composition and Quantity of HHW Collected in the Facility

		Projected Quantities of Materials Collected, lbs	
	Projected % of Total	Douglas and Sarpy, 2000	Douglas, Sarpy, Washington and Cass, 2010
Annual total collected, lbs		416,000	492,000
Material			
Latex Paint	45%	271,800	323,100
Oil Based Paint	10%	60,400	71,800
Paint Related Products	10%	60,400	71,800
Solvents	7%	42,280	50,260
Pesticides	5%	30,200	35,900
Corrosives	3%	18,120	21,540
Miscellaneous	5%	30,200	35,900
Used Motor Oil	10%	60,400	71,800
Batteries	5%	30,200	35,900

3.4 Collection Facility Operations

3.4.1 Hours of Operation

Hours of waste receipt at existing permanent HHW collection facilities range from daily to by-appointment-only:

- The Des Moines, Ia facility is open four days per week (Tuesday through Friday) from 1:00 to 5:00 and on two Saturdays per month from 8:00 to 12:00. During the summer, the facility is open every Saturday.
- The Madison, WI. facility is open three days per week (Friday, Saturday and Monday) 10:00 a.m. to 6:00 p.m.;
- The Seattle, WA. facility is open four days per week (Thursday through Sunday) throughout the year;
- The Larimer County, Co. facility is open Monday through Friday but will accept wastes by appointment only;
- The Portland, Ore. facility is open every Thursday, Friday and Saturday, 10:00 a.m. to 5:00 p.m.;
- The Kenosha, WI. facility is open one Saturday only of each month;
- The Ozaukee County, WI. facility is open on Saturdays only; and
- The Austin, TX. facility is open one Saturday each month but is planning to expand operations to three days per week.

- The Kansas City, Missouri facility is open for collections each Thursday and Friday from 10:00 a.m. to 4:00 p.m. and on Saturday from 9:00 a.m. to 4:00 p.m. Collections are by appointment only but the facility does accommodate a minimum number of drive-ups. The swap shop at the facility is open daily Tuesday through Saturday, 9:00 a.m. to 5:00 p.m.
- The Lawrence, Kansas facility is open only on the third Saturday each month from April through October, from 8:00 a.m. to noon. The waste exchange is open on the Wednesday following each collection from 10:00 a.m. to 2:00 p.m.
- The Research Triangle Park, North Carolina program operates four facilities in the Raleigh/Durham and Chapel Hill area. At least one of these facilities is open each Saturday. Hours vary but the facilities are open at least from 9:00 a.m. to 3:00 p.m. The facilities are closed during the winter.

In general, it is recommended that the facility or facilities receive waste at least four days each week in order to accommodate anticipated usage.

Hours for waste receipt should also be selected with consideration for the convenience of participants. Evening and weekend hours should be considered to provide opportunities for working residents to participate. One potential schedule would be to receive wastes every Wednesday through Saturday from 11:00 a.m. to 7:00 p.m. This schedule would allow for convenient participation by most residents. Waste receipt by appointment only during non-scheduled working hours may also be considered for those residents who are unable to participate during regular waste receipt hours.

In addition to waste receipt hours, additional Facility operations hours will be required for other Facility activities including sorting, processing, packaging and shipping. It is anticipated that full time Facility operations (40 hours per week) will be required to accomplish these activities.

3.4.2 Traffic Management

The Facility should be designed and staffed to accommodate peak anticipated traffic rates and to avoid excessive waiting periods. The Des Moines facility has experienced peak lines of up to five to ten cars but is able to handle two cars simultaneously and can process customers at a rate of about one every two minutes. It is recommended the facility should provide for the simultaneous unloading of two vehicles in order to avoid the formation of long lines during peak arrivals.

During the initial weeks of operations, it is anticipated that pent-up demand may produce larger than normal traffic volumes. It is recommended that extra staffing be provided to prevent excessive waits during initial operations.

A drive-through arrangement is also preferred. Participants should be able to drive forward into the unloading area and then drive forward to exit the unloading area rather than backing out. This type of arrangement will help reduce unloading times and will reduce the potential for vehicle collisions.

Driveways should be provided with considerations for the formation of possible lines of waiting cars. Driveways approaching the unloading area should be of sufficient length so that vehicles can line up on the Facility property rather than on the street.

3.4.3 Waste Inspection

As materials are unloaded from private vehicles, they should be inspected to identify acceptable and unacceptable wastes. The materials identified as acceptable wastes may include:

- flammable liquids;
- flammable solids;
- poisons;
- oxidizers;
- waste oil and antifreeze;
- batteries;
- paints and paint products;
- acids and bases;
- herbicides and pesticides;
- mercury
- aerosols containing HHW; and
- fluorescent light bulbs and ballasts.

Materials to be in the unacceptable list may include:

- explosives and ammunition;
- radioactive materials;
- infectious and other medical waste;
- compressed gas cylinders;
- PCB's;
- dioxin; and
- household medical waste.

All materials should be verified with the selected contractor before establishing the final list. For each waste listed as unacceptable the appropriate agency to contact and/or disposal method should be provided to the residents.

3.4.4 Identifying Unknown Wastes

Failure to accept an unknown or unacceptable waste brought by a participant often results in illegal disposal or disposal within the MSW stream. A first-time participant turned away with a material may not come again. To help mitigate this, participants may be provided with a flyer describing appropriate disposal methods or agencies to contact regarding wastes not accepted at the facility.

It is recommended that every container be opened to verify contents and ensure unknown materials have not been mixed unless the container is new and sealed. Materials received in containers which are not in good condition; which do not have an original and readable label or which are not the original containers in which the materials were packaged should be treated as unknown materials. One HHW disposal contractor estimates that unknown materials comprise about 1% of the total materials received. (source: "Identifying HHW," by Deanna Seaman, Norcal, in Proceedings of the Seventh National USEPA Conference on Household Hazardous Waste Management, December, 1992).

There are several options for managing unknown materials:

- the material may be refused and returned to the participant;
- the disposal contractor may be contracted to provide for analysis of the material; or
- the material can be analyzed in the Facility.

As previously discussed, rejecting unknown materials may discourage participation and the material may be disposed in an undesirable manner. In addition, analysis by the disposal contractor may be costly.

Identification of unknown materials in the Facility can be simplified if a member of the Facility staff questions the participant about the container. Asking such questions as "What is it, what was it used for, and how long has the container been stored in the home?" can yield valuable clues about the container's contents.

Testing required to identify an unknown material may include:

- pH test for corrosivity;
- oxidizer/peroxide tests for reactivity;
- char test or water solubility test for flammability (materials which are not water soluble are typically flammable); and
- metals screening tests.

To provide these tests, the Facility can purchase a chemical identification kit (e.g. Hazcat™) and train a person(s) in its use or develop a custom identification system. The disposal contractor should be consulted to determine the type of tests that are required.

3.4.5 Sorting and Segregation

Following material identification, the materials will be sorted and segregated. Sorting will allow for accumulation of like materials for bulking and recycling and for segregation and separate storage of incompatible materials. Depending on markets for recyclable materials and requirements of the disposal contractor, a typical sorting plan may include the following material categories:

- latex paint;
- oil based paint;
- flammable liquids;
- flammable solids;
- corrosive acids;
- corrosive bases;
- toxic materials;
- oxidizers;
- poisons;
- used motor oil;
- batteries; and
- non-hazardous materials

3.4.6 Waste Treatment

The collection, transportation, treatment and disposal of household wastes (including hazardous wastes) are not subject to 40 CFR Parts 262 through 270 (federal hazardous waste regulations). However, these processes are subject to federal, state, and local requirements concerning management of solid waste (EPA 1997). Title 128, Chapter 2, Section 009 of the NAC also states that household waste, including household waste that has been collected, transported, stored, treated, disposed, recovered (e.g., refuse-derived fuel) or reused is not considered a hazardous waste. It is therefore anticipated that allowable treatment processes will include blending, bulking, recycling and others.

3.4.7 Recycling

To reduce some of the cost of packing and shipping hazardous materials, waste exchanges can be implemented. As materials are received, if they are determined to be in good condition and are contained in well-labeled, original packaging, they can be placed in a waste exchange area. In addition, bulked and reblended paint can be offered through the waste exchange. Waste exchange materials can include materials such as paint, paint thinner, charcoal lighter fluid, stain, brake fluid, and other oils, plus cleaners, selected pesticides, adhesives, aerosol cans, and construction products.

Latex paints provide the greatest reuse potential. However, in Nebraska's climate latex products may freeze if left in unheated areas. This ruins the latex paint rendering it unusable. Thus, the materials exchange area should be enclosed in a heatable area. The temperature of the area should be kept within the suggested temperature range on the product labels. All the products should be stored appropriately according to the instructions on the label.

Latex paints not good enough for the materials exchange may be bulked together. The returning product, which is often beige or gray-colored paint in five-gallon containers, may be used by any of the municipalities participating in the program or local groups.

Used oil can be collected and used for heating or recycled through a used-oil service.

3.4.8 Packaging

HHW are prepared for shipment to a disposal facility through packaging which may include bulking of materials and lab packing.

Bulking is the consolidation of materials from small containers into larger containers. Bulking of compatible liquids reduces the number of drums required by increasing the effective utilization of space in the 55-gallon drums. Materials that can be bulked include flammable, used motor oil, and paints. Bulking by trained Facility staff can also save some of the contractor's time. Some contractors may require that they do all the bulking. The request for proposals (RFP) should specify how much contractor involvement is required. In addition, groups of chemical wastes to be consolidated may need to be cleared in advance with the ultimate disposal facility. The Facility should require the disposal contractor to identify the disposal facility and their requirements. Clearance may be provided in the form of an approved waste profile sheet. These chemical groupings should also be reviewed as a part of the documentation of a Health and Safety Plan for the Facility.

Materials that can not be bulked will be lab-packed. Individual containers of waste are placed in approved DOT drums along with similar chemicals. The chemicals allowed in each lab pack are of the same DOT hazard class. They are also chemically compatible with each other and with the absorbent packing material as well. Lab-packing can be done by the contractor or by trained personnel at the Facility. Again, these tasks and the extent of contractor involvement should be clearly identified in the RFP.

With any processing, a log sheet should be maintained for each drum which would identify the types and quantities of all wastes placed in the drum. The log sheet should also identify the accumulation period. (Facilities that commingle HHW, CESQG and universal waste may be considered “small quantity handlers of universal waste” and subject to NAC 128, Chapter 25, Sections 009 to 018 which includes limitation on accumulation period).

3.4.9 Shipment and Disposal

The Facility needs to contract with a licensed hazardous waste management firm for hauling and disposal services. The bidding process is recommended to mirror both a Request for Qualifications (RFQ) and a Request for Proposal (RFP). The bid document should be thorough with adequate legal review. In the RFQ/RFP, estimated quantities and frequency of pick-up should be provided. Responses should include the price per material per drum and the cost for any other activities requested.

RFP/RFQs should include:

- legal requirements for bidding;
- demonstration of the firm's qualifications;
- references and contact names and phone numbers;
- financial standing;
- program description;

- scope of contractor services;
- form of proposal;
- commercial terms and conditions; and
- evaluation criteria.

At the Seventh National Conference on Household Hazardous Waste Management, December 1992, James S. Gruber presented a paper, "Developing an RFQ/RFP for acquiring an outside contractor to assist with a community's household hazardous waste program". In the paper he suggested some of the following items to watch out for in a bid:

1. Watch out for a bidder that allows for partial drums charged at full price, without a very good explanation.
2. Be aware of limitations of what can be consolidated. For example, if the bid says only full gallon cans of paint can be consolidated, and smaller or partial cans are lab-packed, costs will skyrocket.
3. A bidder could give a very low unit price for set-up and then provide a low bulking effort. Since programs usually pay by the drum, this could lead to a large per-gallon or per-pound cost. (This applies to one-day events or cases when the contractor bulks and lab-packs the materials.)
4. Scrutinize the bid for "surcharges", "contingency charges" or "off-spec charges", and ask for full explanations in writing or prohibit these charges in the RFQ/RFP.
5. Beware of a charge for "unknown testing" that could be levied on consumer container quantities. There could be test charges on every container delivered to a program that does not have a readable label.
6. Poor control of bulking could easily lead to more drums contaminated with PCB's. For example, it was the author's experience that marine paints and varnishes, along with concrete floor sealers, appear more likely to contain PCB's. Disposal costs for PCB contaminated material is more than for non-contaminated materials (e.g. paints).

3.4.10 Personnel Safety and Training

A training program is required for the Facility. This includes annual training review and maintenance of training records. A comprehensive HHW training program should have as its objective ensuring safe operation of the program, compliance with all necessary laws and efficiency of operation. The training program should be designed to ensure that each worker is competent and aware of the areas in which they are working.

Worker safety is the most important factor in a HHW program. The primary regulatory force in HHW programs is occupational safety, particularly the Hazard Communication Standard, or "Employee Right-to-know". This requires an employer to provide each employee with sufficient information to enable them to understand all of the chemical and physical hazards associated with their job, and know how to protect themselves from those hazards.

All Program workers at the facility should complete the following training and hold the appropriate certificates.

- 40 hour OSHA training;
- 8 hour OSHA annual refresher;
- first aid and CPR training course approved by American Red Cross;
- 20 hour training course on HHW; and
- 8 hour basic chemistry on HHW.

The Facility needs a written health and safety program. It should identify all potential health and safety hazards, evaluate each hazard identified, and either eliminate the hazard or control it. A basic written safety program should also include a medical surveillance program, procedures for materials handling, training, and emergency procedures, including decontamination. It is important that management set a priority on safety and that each employee be aware of that importance. One way to ensure employee awareness is to include safety as a part of the employee's work performance evaluation. Successful programs include frequent meetings with opportunities to discuss problems.

Under OSHA, a medical surveillance program is required for all employees who are:

- exposed to chemical above the Permissible Exposure Levels for more than 30 days per year;
- wear respirators for more than 30 days per year;
- are injured due to overexposure to chemicals; or
- are members of an emergency response hazardous materials team.

The employees at the Facility may fall under this category. Medical exams should be performed prior to working at the facility and then annually or biannually.

It is important to detail in writing the procedures to be followed for handling each type of waste that may be brought to the site. This should include procedures both for those that you advertise you will accept and those that you will not accept. The procedures should be described in detail, and reviewed with employees to be sure that they understand both the procedure and the rationale behind it. Develop a checklist of procedures covered and after a training session, have both the supervisor and the employee sign the checklist showing that the procedures were covered and that the employee understands what is required.

A contingency plan should be developed for the possibility of spills, fire or explosion, and evacuation. This plan should include activities to be undertaken during and after the emergency such as reporting requirements, plan for decontamination, and instructions for the public. The Program should work with fire departments, police department, and hospitals for assistance with the contingency plan.

The Facility design should include storage for protective equipment, medical supplies, an eye-wash/deluge shower, and emergency response equipment.

The Facility should allow for safe packaging operations in all weather conditions and safe storage of sealed drums.

3.4.11 Public Education and Promotion

Information needs to be disseminated to potential users of the Facility. Information as to what kinds of wastes can be disposed of at the facilities, hours of operation, etc., can help to avoid user-oriented problems.

Waste minimization methods may also be promoted through public education. There are non-hazardous alternatives to many of the HHW products on the market. To further reduce HHW in the MSW stream, these alternatives can be advocated.

3.4.12 Site Security

Site security issues should be considered to reduce the potential for vandalism and for after-hours delivery of material. The Kansas City, Missouri facility site is surrounded by a barbed-wire-topped fence and is monitored by a security camera. The addition of the security camera, along with appropriate signs, has reduced the incidence of after-hour delivery from two per week to one per year. The Des Moines Facility is secured by gates at the entrance and exit.

3.5 Impacts of Accepting Hazardous Waste from CESQGs

CESQGs are small businesses that generate less than 100 kg per month of hazardous waste and less than 1 kg per month of acute hazardous waste. Typical small businesses that are potential CESQGs may include:

- vehicle maintenance;
  - auto service & repair
  - auto body repair
- construction and contracting;
- printing and graphic arts;
- laundries and dry cleaners;
- photofinishing;
- pesticide application;
- furniture/wood manufacturing and refinishing;
- cleaning agents and cosmetics;
- dental offices;
- laboratories;
- schools; and
- governmental departments.

Typical CESQG wastes include a wide variety of substances:

- spent solvents;

- heavy metals;
- ignitable wastes;
- acids/bases; and
- paints and paint sludges.

A few studies have estimated the number of CESQG businesses in an area and correlated it to population. For example, in a metropolitan area of 1.6 million people (Seattle), there is about 1 CESQG business for every 75 people. In the State of Massachusetts, 1 CESQG is estimated for every 450 people statewide; while in Vermont, 1 CESQG is estimated for every 125 people statewide.

In January, 1997, the Nebraska State Recycling Association conducted a survey of small businesses (fewer than 10 employees) in Douglas, Sarpy, Washington, and Cass Counties in Nebraska, and Mills and Pottawattamie Counties in Iowa to determine their hazardous waste management needs. Of 308 businesses surveyed, 14% indicated that they generate some form of hazardous waste. Of the businesses generating hazardous waste, 46.5% dispose of the waste with a licensed private hazardous waste contractor. 14% dispose of the waste with their regular trash service. The remainder use in-house disposal, recycling or shipment back to their suppliers. Those businesses using a licensed contractor typically pay less than $100/month for the service.

The study reports a total population of 14,695 businesses with fewer than 10 employees in the six-county area.

The study concludes that "It appears that there is ample room for improvement on the proper disposal of hazardous wastes."

The Des Moines program accepts hazardous waste from small businesses on a fee basis. The fee charged depends on the type of material received. Some examples of the fees include:

- Aerosols - $1.50/lb.
- Antifreeze - $0.94/gallon
- Mercury - $10.00/gallon
- Oxidizers - $1.50/lb.
- Dioxin forming pesticides - $11.21/lb.

The Des Moines program reports that the quantity of hazardous waste received from business accounts for less than 5% of the total of all materials received.

It is therefore estimated that if CESQGs are accepted in the Program, quantities of materials received will likely increase, but the amount of the increase will depend on the fee structure.

4.0 FACILITY CONCEPT

4.1 Introduction

This Section outlines a Facility concept, including construction and operating cost estimates, for a Facility meeting the general expectations of the Committee.

4.2 Facility Description

Figure 4-1 is a conceptual floor plan for the Facility. Figure 4-2 is a conceptual site plan for the Facility. The conceptual Facility layouts reflect the following features:

4.2.1 General Facility Size and Security

- The Facility is depicted as a stand-alone facility constructed on a relatively flat site approximately 2 ½ acres in size.
- The Process Building is approximately 47'x 113' or approximately 5,300 square feet in size and is anticipated to be approximately 20 feet tall from the floor to the eaves.
- The administration building shown attached to the west side of the processing building is a single story building approximately 17'x 77' or approximately 1,300 square feet in size.
- The site is secured by a perimeter chain-link fence with controlled access through gates. Both gates are clearly visible from the administrative offices. An additional chain-link fence is provided around to the load-out area east of the processing building to help restrict access. Security cameras may be provided for increased security.

4.2.2 Traffic

- Customers, employees, vendors and contractors enter the site through the gate at the southwest corner of the site.
- Employees, swap shop customers and other visitors park in an on-site parking lot immediately inside the gate.
- Drop-off customers enter the drop-off lane and proceed to the south side of the Process Building where they are met by Facility staff. Vehicles are unloaded by facility staff beneath a canopy so that drop-off operations can proceed in most weather conditions. After completing unloading, drop-off customers continue on the one-way traffic lane and exit the Facility at the northwest corner of the site.
- The length of the drop-off lane will allow a peak of four or five cars to be lined-up and waiting to unload without blocking the through-traffic lane. Additional drop-off parking stalls are provided to accommodate additional peak traffic loads.
- A recyclables drop-off area is included at the southeast corner of the site with limited parking for customers to drop-off recyclables.

Reserve for figure 4-1

Reserve for figure 4-2

- Waste disposal contractors follow the through lane past the south side of the processing building and enter the load-out area. The load-out area is sized to accommodate the maneuvering of trucks to back up to the load-out doors on the east side of the Processing Building or to place and collect roll-off containers. After completing their business, contractors exit the load-out area and follow the one-way traffic lane to exit the site at the northwest corner.

4.2.3 Processing Building

- The Processing Building and canopy are of pre-engineered metal building type construction. Concrete masonry walls on the exterior of the building add durability and increase fire protection. The interior of the Processing Building consists of a number of rooms and areas. The mechanical room and the employee toilet/shower/changing and safety equipment room are separated from the rest of the Processing Building by a concrete masonry wall filled with grout. This wall provides the fire rating required to reduce the electrical area classification in the mechanical room and employee comfort areas and reduce the cost of electrical construction.
- As vehicles are unloaded, HHW containers are placed on wheeled carts by Facility staff and wheeled into the receiving area. In this area materials are sorted, lab-packed if appropriate, or placed on carts or pallets for further processing.
- Materials which may be suitable for reuse may be taken directly to the shop and swap area and placed on shelves.
- Tires are taken outside to the load-out area and placed in roll-off containers.
- A small laboratory is provided adjacent to the receiving area for testing of unknown materials or temporary storage of high-hazard or unstable materials. The laboratory includes a fume hood, sink, and cabinets.
- A process room is provided along the east wall of the processing building. It is intended that paint bulking operations, aerosol can processing, can crushing and other selected operations will be conducted in the process room. This will help to isolate activities that tend to be messy from the main processing and storage areas and will facilitate overall Facility housekeeping.
- The product storage and load-out area is sized to accommodate the storage of 120 55-gallon drums. This will allow for storage of a full truckload of drums (90), with additional space to provide flexibility for segregating the types of materials stored and for storage of additional drums while waiting for a disposal contractor to arrive.
- The mechanical room will house HVAC equipment including a boiler that can be fired with used motor oil.
- An employee comfort area includes a unisex toilet, shower, changing and locker area, and a room for workers to store and don tyvek suits and other safety equipment.
- The swap and shop room is a waste exchange area. Customers of the waste exchange can enter the area from the office reception area. The room includes viewing windows to the process building through which visitors can view the activities in the receiving area.

4.2.4 Office Building

- Visitors to the Office Building enter a small reception area and speak with a receptionist located in the administration room.
- The administration room is intended to accommodate clerical, filing and general administrative functions.
- A supervisor's office and public restroom are provided.
- A conference and training room is provided to accommodate public education meetings, employee training, administrative meetings and similar gatherings.

4.2.5 Load-out Area

- The load-out area is located east of the processing building and consists of a paved slab.
- The conceptual design shows a used-oil tank, bulk fuels storage area, empty drum storage and a waste isolation and special waste storage area located along the north side of the load-out area.
- If selected materials are blended for use as fuels at a cement kiln or similar facility, drums of fuel may be stored in this area to reduce the hazards in the interior of the processing building.
- The conceptual design includes an area where empty drums and other materials can be stored outside to reduce storage requirements inside the building.
- Although ammunition and other selected high-hazard materials will not be accepted at the Facility as a matter of policy, it is anticipated that customers will occasionally arrive with quantities of unacceptable materials. The waste isolation and special materials storage area provides an area where selected high hazard materials can be temporarily stored remotely from the general processing and employee areas.

4.3 Capital Cost Estimate

Table 4-1 presents a conceptual-level estimate of construction cost for the Facility described above. Actual costs may vary considerably depending on the location, features included in the final design and whether or not the Facility will make use of existing buildings and structures. The costs do not include an allowance for land costs.

Table 4-1
Conceptual Facility Cost Estimate

Architectural/Structural				
Structural footings and Foundation Walls	$	5,900		
Floor slab	$	15,600		
Concrete masonry walls	$	33,000		
Bollards	$	5,000		
Framing and blocking	$	3,000		
Millwork, shelving	$	24,000		
Insulation	$	10,500		
Roof vents for explosion relief	$	45,000		
Sealant/caulking	$	5,000		
Steel doors and frames	$	25,700		
Overhead door	$	4,500		
Windows	$	19,000		
Metal stud walls	$	17,300		
Painting	$	20,000		
Acoustic ceiling	$	6,000		
Flooring (tile, carpet in locker, offices)	$	8,000		
Locker and shower equipment and accessories	$	8,000		
Tack/white boards and signage	$	2,000		
Fire extinguishers	$	1,000		
Pre-engineered metal building, process, office and canopy	$	69,800		
Subtotal, Architectural and Structural			$	328,300
Mechanical				
HVAC - Office area, swap shop area	$	30,000		
Unit heaters	$	30,000		
Fume hood and controls	$	20,000		
Boilers and accessories	$	42,000		
Backup fuel-oil storage tank	$	8,000		
Plumbing	$	7,500		
Fire protection	$	18,600		
Subtotal, Mechanical			$	156,100
Electrical				
Exterior lighting	$	21,000		
Office area lighting, switches, receptacles, telephone	$	10,300		
Process area lighting, switches, etc.	$	58,200		
Motor connections	$	4,500		
Panelboard	$	2,200		
Subtotal, Electrical			$	96,200
Civil				
Grading	$	14,500		
Pavement	$	110,900		
Sidewalk	$	8,300		
Fencing and gates	$	30,000		
Utilities	$	44,200		
Seeding and landscaping	$	8,300		
Subtotal, Civil			$	216,200

Subtotal, Construction	$	796,800
A/E Fees		65,000
Furniture	$	20,000
Telephone system	$	15,000
Refrigerator, microwave, coffee maker	$	800
Computer network and hardware	$	10,000
Process Equipment		
Can/pail crusher	$	4,000
Aerosol can puncture device	$	300
Bins	$	1,000
Secondary containment palettes	$	2,000
Laboratory equipment	$	3,000
Window treatments	$	1,500
Sign	$	7,000
Subtotal	$	926,400
Contingency @20%	$	185,280
Total Project Estimate	$	1,111,680

4.4 Operating Cost Estimate

Operating costs will include:

- labor;
- employee training;
- transportation and disposal costs;
- supplies;
- utilities;
- insurance;
- public education and promotion; and
- administration.

It is assumed capital costs will be provided by grants or other sources and cost of capital is not included.

4.4.1 Labor

Estimates of staffing requirements are developed below based on actual staffing at existing facilities and the populations they serve.

- The Lancaster County, Pa. facility has a staff of two full time employees (fte) and serves a population of 423,000 or one fte per 210,000 people. (Source: Lancaster County)

- The Dane County, WI. facility has two full time employees and two part time employees who work on average approximately 2 days per week. The equivalent of 2.8 ftes serve a population of approximately 350,000 or one fte per 125,000 people. (Source: Dane County)

- The Rochester, N.Y. facility has a full time staff of four and serves a population of 714,000, approximately one fte for every 180,000 people. (Source: "Permanent Household Hazardous Waste Facility Case Study," by Edward J. Harding, for Monroe County, N.Y.)

Assuming 1 fte per 175,000 population served and an initial population of 575,000 served, 3.28 fte would be required to operate the Facility. For the purposes of the Study, it is assumed that three full-time staff members would be hired and that additional staffing would be provided by volunteer labor on an as-needed basis. Anticipated staffing costs based on an assumed average annual payroll and benefits cost of $50,000 per employee are $150,000.

4.4.2 Employee Training

During the first year of operation, all employees will need to be trained. Assuming four employees are fully trained in the first year (three regular full-time employees and one backup or volunteer), and an average cost of training of $5,000 per employee, first year training costs are estimated at $20,000. In later years, training costs will be limited to refresher training and training for new employees and costs may be reduced.

4.4.3 Transportation and Disposal Cost

One of the largest elements of Program cost will be cost for transportation and disposal of materials at approved disposal facilities. However, transportation and disposal costs can be reduced through recycling and reuse of materials received. Some examples of HHW recycling success include:

- The Santa Monica, Ca. facility reclaims or recycles 72% of the total materials received including paint and paint products (60% recycled), corrosives (10% recycled), pesticides (20% recycled), automotive products (100% recycled), home products including cleaners (50% recycled) and construction products (5% recycled). (Source: "Fear Not the Waste Exchange," by Brian J. Johnson, in Proceedings of the Seventh National USEPA Conference on Household Hazardous Waste Management, December, 1992.)

- The Portland, Or. facility recycles 38% of the collected latex paint, and also recycles fertilizer, cardboard, and metal containers. (Source: Household Hazardous Waste Management News, March, 1993.)

- The Larimer County, Co. facility reports recycling rates of 79% of the total materials received. (Source: "Hazardous Waste Management System," by Janelle L. Henderson for the Larimer County Department of Natural Resources.)

However, in order to recycle materials and reduce transportation and disposal costs, an aggressive program is needed to identify and develop markets for materials. Latex paint, for example, is possibly the most commonly recycled material from HHW programs. The Kenosha, WI. program, however, has had difficulty identifying a consistent market for this material and is currently drying the paint and sending it to a landfill. Other municipalities have used paint for public housing or graffiti cleanup.

Transportation and disposal costs for materials remaining after recycling will depend on the distances to disposal facilities and the disposal fees charged by the disposal facilities. For the purposes of this Study, it is assumed Facility transportation and disposal costs will be comparable to those of the Des Moines Program. The Des Moines program incurred disposal costs of $132,930 in fiscal year 1998 for 590,681 pounds of materials received, or an average of $0.23 per pound. Assuming an average disposal cost of $0.23 per pound of material received, Facility disposal costs are estimated at approximately $140,000 per year.

4.4.4 Supplies

Supplies will include drums, packaging materials, labels, forms, personnel protection clothing and equipment, and other materials required in the day to day operation of the facility. The Des Moines program reports supplies cost $28,515 in fiscal year 1998 with which 590,681 pounds of materials were processed. This equates to approximately $0.05 per pound. Assuming Facility supplies costs of $0.05 per pound of materials received, supplies costs are estimated at approximately $30,000 per year.

4.4.5 Utilities

Utility costs will include costs for electricity, water, natural gas, and phone. It is anticipated that heating will be provided by a boiler burning used oil and that air conditioning will only be provided in the Office Building. Planning level estimates of annual utility costs for the Facilities are $12,000 per year.

4.4.6 Insurance

The Des Moines program reports insurance costs of $14,767 in fiscal year 1998. It is assumed the Facility insurance costs would be comparable and are estimated at $20,000 per year.

4.4.7 Public Education and Promotion

It is anticipated that public education and promotion will be an important factor in the success of the Program. Methods of public education and promotion include developing information packages; advertising in newspaper ads and articles; television public service announcements; disseminating information at town and environmental fairs; public presentations; inserts in tax or utility bills; school presentations and curriculums; presentation at local community groups and organizations; and handouts at grocery stores.

The Des Moines program spent $23,837 on public education and advertising in fiscal year 1998. Assuming the Facility will mount a comparable program, public education and promotion costs are estimated at $25,000 per year.

4.4.8 Administrative Cost

Administrative costs will include costs for developing and administering contracts, hiring personnel, administering payroll, and accounting. These costs will vary depending on how these costs are accounted for by the sponsoring organization. Planning level estimates of Facility administrative costs are $25,000.

4.4.9 Summary of Estimated Annual Operational Costs

Table 4-2 provides a summary of the estimated annual operational cost for the facilities.

Table 4-2
Summary of Estimated Annual Operational Costs

Labor	$150,000
Training	$20,000
Transportation and Disposal	$140,000
Supplies	$30,000
Utilities	$12,000
Insurance	$20,000
Public Education and Promotion	$25,000
Administration	$25,000
Total Annual	$422,000
Pounds collected	604,000
Cost per pound	$0.70

Annual costs may be higher if:

- elaborate facility and site structures and amenities are provided;
- recycling efforts are not maximized;
- staff is not efficiently utilized; and
- competitive contracts for transportation and disposal are not developed.

On the other hand, significant reductions in overall program annual costs may also be reduced:

- operating hours may be reduced;
- facility structures may be limited to temporary storage structures only with all loading, unloading, drum storage, bulking and recycling operations conducted outside.

For example the Facility may be developed simply as a number of prefabricated storage buildings on a concrete slab with a security fence around the facility. The Facility may only be open for operations one day per week or one day per month, weather permitting.

While this minimalist approach is anticipated to result in significantly reduced capital and annual operating costs, it is also likely to result in significantly reduced participation and reduced quantities of HHW diverted from landfill disposal. In addition, the intermittent operation of the Facility and the severely restricted operations and storage areas may tend to make recycling operations more difficult. So while total annual costs may be reduced, the anticipated cost per pound and cost per participant is anticipated to remain approximately the same or increase.

4.4.10 Estimated Costs Compared with Other Existing Programs

The annual operational costs estimated in the previous sections is comparable with annual costs for other existing permanent programs as listed in Table 4-3.

Table 4-3
Operational Costs for Existing Permanent Collection Programs

Program	Cost per pound of material received
Des Moines, Iowa, 1998[1]	$1.02
Kansas City, Kansas, 1996[2]	$0.52
Kansas City, Missouri, 1997[2]	$0.55

Notes:
1. Source: Des Moines, includes total operational expenses less depreciation and quantities for fiscal year 1998.
2. Source: MAPA Household Hazardous Waste Committee

4.4.11 Reducing Program Costs

Program costs may be reduced by implementing measures which can decrease capital expenditures or disposal costs. The following measures were gathered from an information sheet prepared by Elaine Andrews, Environmental Education Specialist, at the University of Wisconsin-Madison.

- Solicit in-kind services or donation of materials, equipment and services.

- Establish "markets" for select usable products and give them to responsible parties (e.g., give latex paint to schools, recreation departments or non-profit groups and give non-restricted pesticides to small commercial growers/nurseries). Establishing "markets" or a waste exchange consciousness reduces amount of waste needing treatment/disposal and therefore reduces overall costs of the program.

- Recycle what you can. Typically, this includes waste oil and car batteries.

- Use reconditioned drums (must be according to DOT specifications) instead of new drums.

- Don't lab-pack products that can be managed as non-hazardous waste. Educate the public on proper disposal methods whenever feasible. (For example, small quantities of latex paint can be dried and then disposed in a solid waste landfill.)

- Bulk paints and other compatible liquids. This will substantially reduce the number of drums needed and will result in cost savings.

- Target oil-based paint for fuel value whenever possible.

- Work with a hazardous waste management firm that is interested in providing effective and creative (but legal) solutions for reducing the amount of waste going to a hazardous waste landfill.

Other measures or activities to reduce HHW Program costs include utilizing government-owned sites, providing self-insurance, and developing minimal design facilities, if possible, with only prefabricated chemical storage buildings.

4.5 Environmentally Friendly Design Concepts

The Committee has expressed an interest in designing and constructing the Facility as an environmentally friendly "green building." The United States Green Building Council has established a green building program entitled Leadership in Energy and Environmental Design (LEED), and as part of the LEED program a rating system has been developed to certify that a building is "green." The major categories and criteria within those categories that generally need to be addressed for certification are presented in Appendix 1.

The following is a summary of "green building" suggestions which the Committee may wish to consider in the planning of this Facility. Additional concepts and options can be explored in the final design.

1. Site
- Zero discharge management of storm water
- Native grasses and planting
- Minimal maintenance/irrigation plantings

- Utilization of recycled glass, recycled rubber, fly ash, or furnace slag in roadway construction
- Utilization of recycled products in exterior furniture
- Use of recycled crushed concrete for aggregate base on roadways
- Use of yard waste compost and recycled wood for landscaping soil amendments

2. Building

- Use of recycled oil for facility heating
- Use of non- or low-VOC (Volatile Organic Compound) paints, adhesives, joint sealant or other compounds
- Use of exposed concrete, rather than painted or finished surfaces in selected areas
- Use of recycled materials in building construction and furnishing
- Use of oil-based release agent instead of solvent based for cast-in-place concrete
- Use of fly ash or furnace slag for cast-in-place concrete and concrete masonry.
- Use of recycled steel for reinforcing and structural steel
- Use of urea formaldehyde free wheatboard instead of particleboard for interior architectural woodwork
- Use of wall board with paper facing manufactured from recycled newsprint, and recycled glass fibers
- Use of ceramic tile with recycled content
- Bentonite waterproofing instead of petroleum waterproofing
- Use of recycled glass in building insulation (fiberglass)
- Use of formaldehyde free fiberglass insulation
- Use of perlite or all natural materials in acoustical panel ceiling tiles
- Use a window glass glazing to lower energy costs
- Use of resource conservation plumbing fixtures
- Use of energy efficient lighting fixtures
- Use of energy efficient construction to minimize heating and cooling requirements

The design of a facility that meets all of the green building criteria would be very difficult. However, if these criteria are considered early in the design process the many benefits of a "green" building can be realized.

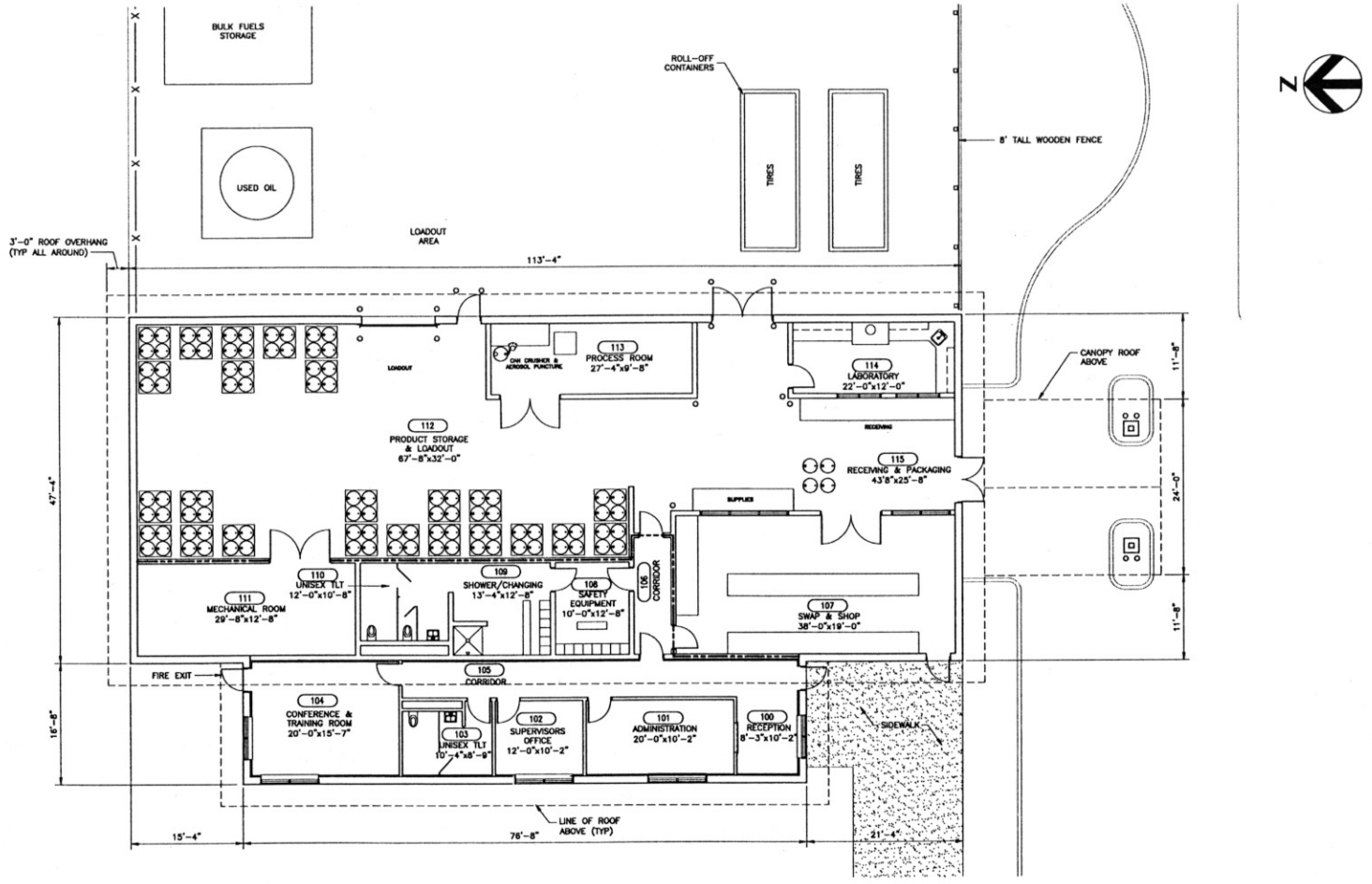
Appendix 1
Green Building Categories and Criteria

The United States Green Building Council has established a green building program entitled Leadership in Energy and Environmental Design (LEED), and as part of the LEED program a rating system has been developed to certify that a building is "green." The major categories and criteria within those categories that generally need to be addressed for certification are presented below.

1) Planning Sustainable Sites
   a) Landscaping for erosion control
   b) Landscaping/exterior design to reduce heat islands
   c) Infill development (selecting a site which is vacant, but in a densely developed area or rehabilitating an existing structure)
   d) Reduction in habitat disturbance
   e) Site preservation/restoration
   f) Efficient building location (located near mass transit)
   g) Providing for alternative transportation facilities (e.g. bicycles, preferred parking for carpools, pedestrian friendly links to mass transit)
   h) Alternative fueling facilities (on-site alternative fuels such as electrical, natural gas, or methanol/ethanol)
   i) Brownfield development
2) Improving Energy Efficiency
   a) Building commissioning
   b) Meeting local, state, federal energy codes or organization standards such as ASHRAE 90.1, Title 24 lighting requirements, or EPA/DOE Energy Star Benchmarking Tool.
   c) Natural ventilation, heating and cooling.
   d) Waste heat recovery
   e) Renewable/Alternative Energy
3) Conserving Materials and Resources
   a) Elimination of CFCs
   b) Storage and collection of recyclables
   c) Existing Building Rehabilitation
   d) Resource reuse
   e) Use of recycled materials
   f) Construction Waste Management Plan
   g) Use of local materials
   h) Elimination of CFCs, HCFCs, and Halons in mechanical equipment and building materials
   i) Occupant recycling equipment
4) Enhancing Indoor Environmental Quality
   a) Elimination and control of asbestos
   b) Fresh air intakes
   c) Smoking ban

d) Thermal comfort – complies with ASHRAE Standard 55
e) Construction IAQ Management Plan
f) Low volatile organic compound (VOC) materials
g) Permanent air monitoring system
h) Chemical storage areas for housekeeping products
i) Architectural entryways with permanent walk-off system (grills or grates)

5) Safeguarding Water
   a) Water conservation
   b) Water quality (lead free)
   c) Water conserving fixtures
   d) Water recovery system
   e) Water conserving cooling towers
   f) Water efficient landscaping
   g) Surface runoff filtration
   h) Surface runoff reduction
   i) Biological waste treatment
6) Improving the Design/Build Process
   a) Use of a LEED Certified Designer



HDR

HDR Engineering, Inc.

Issue No.	Description	Date	Drawn	Chkd.	Resp. Engr.	Proj. Engr.

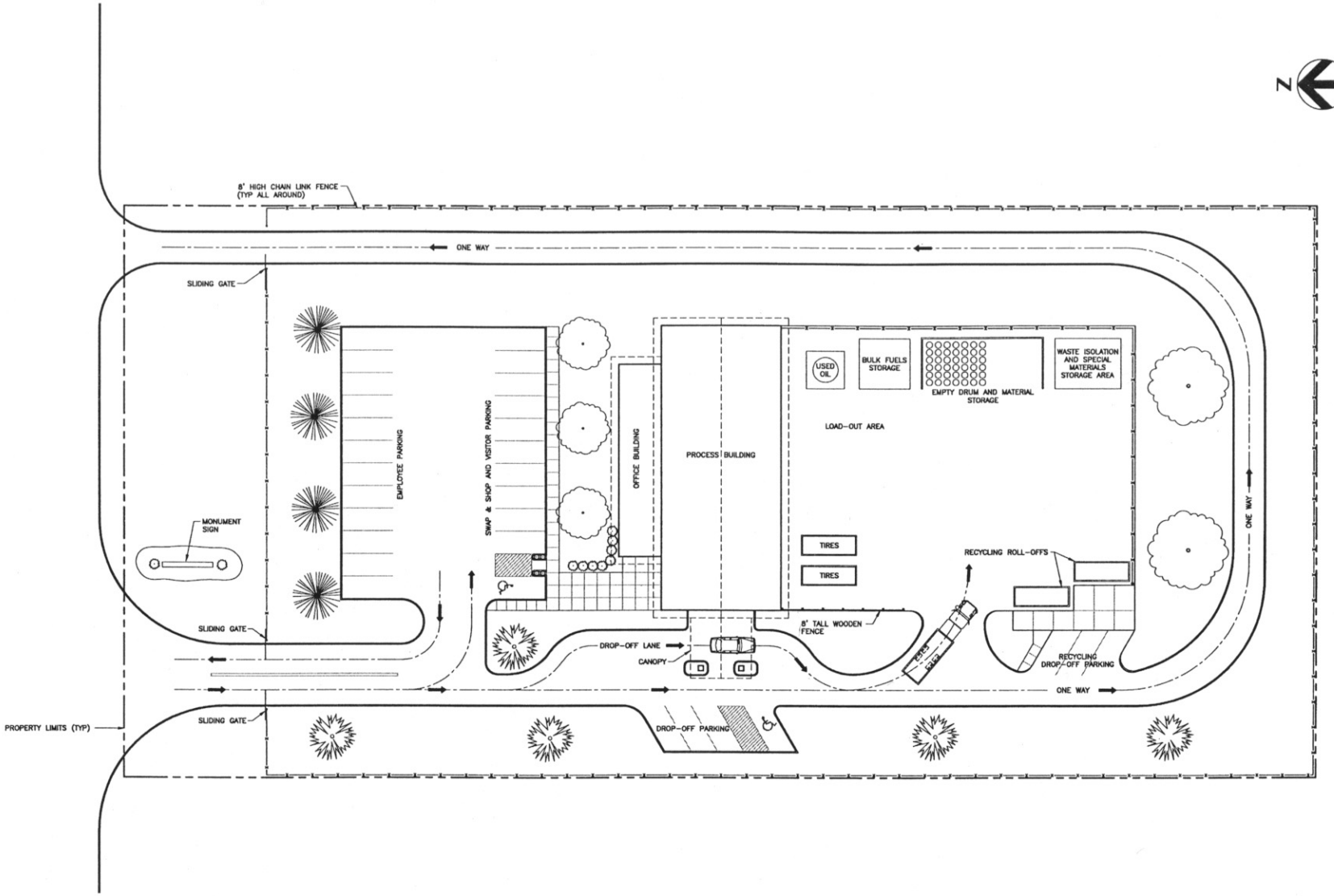
Project Manager: Mark Hunsicker
Architect | MEC/Process
Civil | Mechanical
Electrical | Structural
Project Engineer | Drawn By: D Denton

Household Hazardous Waste Committee

MAPA, City of Omaha, Douglas County,
Sarpy County, Papio-Missouri Natural Resources District
and
Keep Omaha Beautiful

Household Hazardous Waste Facility
Conceptual Floor Plan

Date	Project No.	Drawing No.	Issue
DECEMBER, 1999	08526-004-134	Figure 4-1	A
Scale: 1"=16'-0"	File Name: Figure 4-1		



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Project Engineer	Drawn By: D Denton

Household Hazardous Waste Committee

MAPA, City of Omaha, Douglas County,
Sarpy County, Papio-Missouri Natural Resources District
and
Keep Omaha Beautiful

Household Hazardous Waste Facility Conceptual Site Plan

Date	DECEMBER, 1999	Project No.	08526-004-134	Drawing No.	Figure 4-2
Scale	1" = 40'-0"	File Name	Figure 4-2	Issue	A