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Center for International Development

Local Environmental Management Project

SOLID WASTE SURVEY

CITY OF OZD
HUNGARY

SEPTEMBER 1993
DRAFT REPORT

Research Triangle Institute
P.O. Box 12194
Research Triangle Park, NC 27709

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Environment and Natural Resources Division
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RESEARCH TRIANGLE INSTITUTE

FUNDED BY THE UNITED STATES AGENCY
FOR INTERNATIONAL DEVELOPMENT

FOREWORD

This is a draft, or working report, based on the consolidation and editing of separate reports written by members of the LEM technical assistance teams focused on each of the participating LEM municipalities. The report, in both its English and Hungarian versions, has been prepared for the LEM Project Workshop to be held on September 20-22, 1993, where it—along with the reports from the other participating municipalities—will be the main basis for discussion.

Comments, suggestions, and proposed revisions received at the Workshop will then be evaluated and included in the final version of the report. Recommendations for additional technical assistance, training, and modifications in project direction made by the Workshop participants may also be included. Moreover, additional information not available at the time that field work for the report was completed will also be incorporated into the final version.

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1 INTRODUCTION

1.1 Local Environmental Management Project Overview

The Local Environmental Management (LEM) Project is being administered by the Center for International Development of the Research Triangle Institute (RTI), a not-for-profit organization based in the Raleigh/Durham area of North Carolina. The program operates under a contract between the Environmental and Natural Resources Division of the Bureau for Europe of the United States Agency for International Development (A.I.D.) and the Research Triangle Institute. Joining RTI in the effort as subcontractors are the International City/County Management Association (ICMA), headquartered in Washington, DC; and the Eastern Research Group (ERG), based in Lexington, MA, which specializes in training on environmental issues. The 3-year contract period commenced on July 7, 1992, and the Project Manager began work on August 15, 1992.

Following a series of in-depth discussions in Washington in August 1992 regarding the scope of the LEM Project, it was decided to focus the efforts of the program in Poland and Hungary. Two intensive field trips in both countries, one during the month of September and the other in November 1992, resulted in a clear definition of the goals of the program and the selection of three municipalities in Poland and four in Hungary. The four Hungarian sites are listed in **Table 1**.

Table 1. Hungarian LEM Project Sites

Municipality	Population	Project Description
Gyor	140,000	Solid Waste Collection and Disposal
Ozd	47,000	Solid Waste Collection and Disposal
Edeleny	14,000	Solid Waste Collection and Disposal
Sajoszentpeter	14,000	Hazardous Waste Site Assessment

The LEM Project office was established in February 1993 in Krakow, Poland, to facilitate the travel of the Project Manager to the initial seven sites in the two countries. During the period of intensive initial technical assistance in the seven municipalities, a temporary LEM Hungarian Coordinator was employed to provide adequate oversight of the eight professionals operating in Hungary.

1.2 Survey Purposes

The overall purpose for all the LEM projects is threefold:

a. To demonstrate the extent to which local governments can effectively manage their environmental problems if given adequate and consistent support;

b. To assist project municipalities in producing reliable and technically acceptable proposals for the funding of environmental projects for presentation to national and international funding agencies; and

c. To make available for use by other municipalities the replicable details as a result of activity undertaken in "a" and "b" above.

A sub-purpose of the project is to act, through the Project Manager, as a broker-liaison by matching municipal requests for technical assistance not supplied by LEM with various A.I.D.-supported projects that may be able to provide the needed information, data, or assistance.

During the progress of the survey, several other useful goals or purposes presented themselves, as follows:

a. To use and transfer technology to Hungarian private-sector engineering firms and equipment suppliers;

b. To find, use, and transfer information to Hungarian nongovernmental environmental organizations;

c. To identify and involve appropriate agencies that could continue to provide the training and technical assistance activities being offered by LEM;

d. To identify appropriate private-sector roles in the Hungarian solid-waste sector; and

e. To reduce costs in the collection and disposal of solid waste.

1.3 Survey Methodology

Under the direction of the LEM Resident Project Manager and the LEM Hungarian Coordinator, a three-member team met with local officials in Ozd (Borsod County) to gather technical, organizational, and financial data regarding the current and future collection and disposal of solid waste. The team members visited field sites and reviewed pertinent documents and reports (**Figure 1** is a map of Borsod County).

The team members also met with individuals involved in private-sector firms responsible for the collection and disposal of solid waste, including the providing of capital investment funds.

Prior to leaving Borsod County, the LEM team orally presented its recommendations in separate meetings with Ozd officials. These meetings were also attended by representatives from appropriate county and national agencies. Based upon feedback and questions at the two meetings, this draft report was prepared and translated into Hungarian so that it could serve as the basis for a workshop to be held September 20 through 22, 1993, at the Lake Malyi training center. Results of the workshop will be incorporated into the final version of the report and submitted to the participants and to A.I.D.

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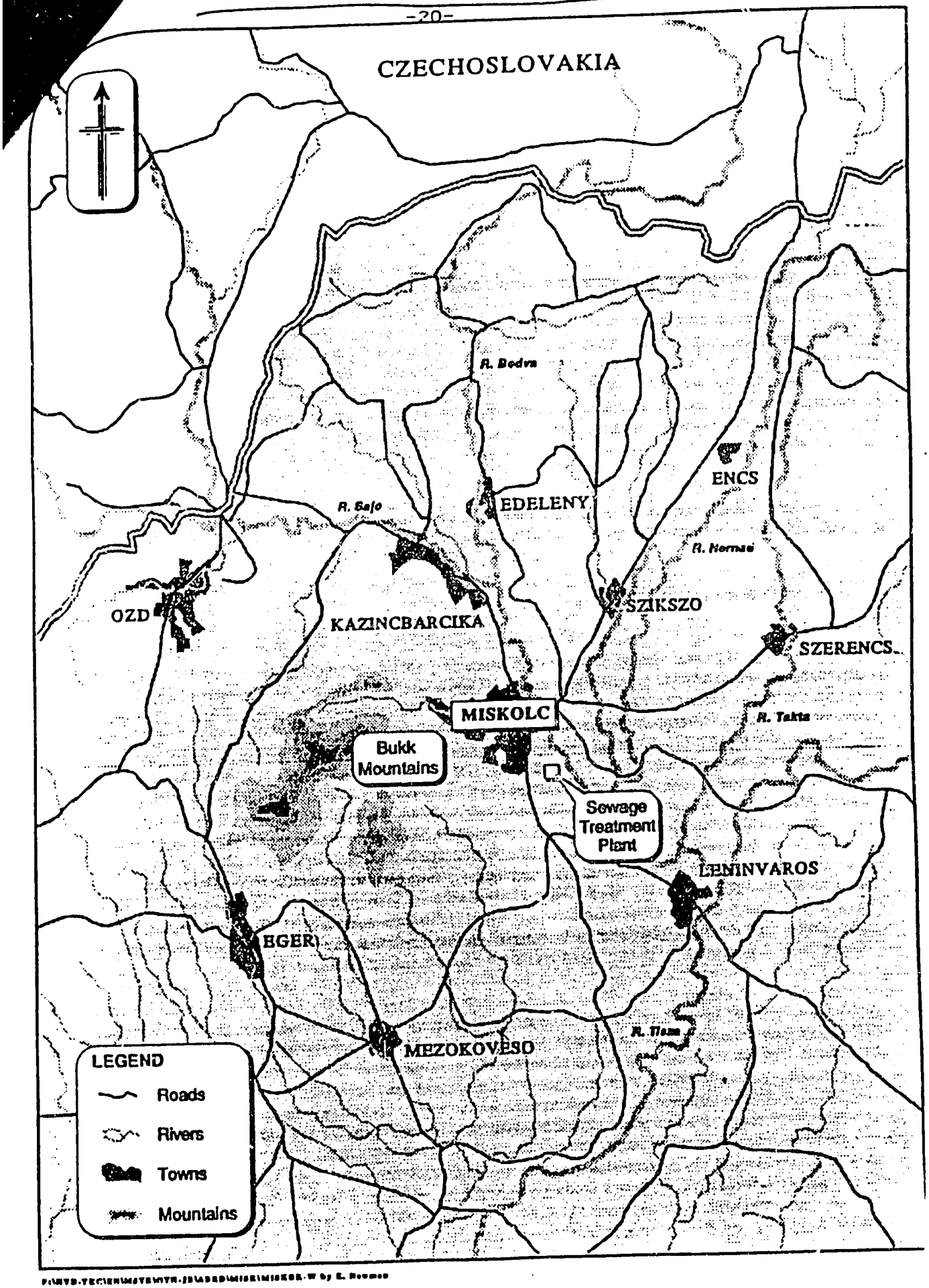
Project Area



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1.4 Survey Team Profile

The three-member survey team for the Ozd survey consisted of (1) Phin Horton, a specialist in solid waste finances and collection procedures; (2) Victor E. Vasas, a Hungarian-speaking civil engineer with a specialty in the design of landfills; and Paul A. Flynn, a municipal finance specialist. The three-member team arrived in Miskolc on May 10 and stayed until June 11, 1993. In addition, George Murray, a geologist with experience in the operation of landfills, joined the team for the last 2 weeks of work and played a key role in the preparation of the draft report along with Kennedy Shaw, the LEM Hungarian Coordinator.

Demeter Zsekov was the principal interpreter for the LEM team, ably assisted by Erica Arvai and Judith Visnyovszky Vegh. The LEM team was joined in its efforts to analyze the Ozd landfill by the Keviterv engineering firm, based in Miskolc, whose principal contact was Nemeth Csaba. Katalin Szanto provided effective logistical support to the LEM team members.

1.5 Overview of Local Government Structure

Local governments in Hungary have continued to undergo rapid change over the short period of time since 1989 when the new government began operation. Hungary has a total of 3,111[1] local governments; Borsod County, which includes all of the Hungarian municipalities involved in the LEM Project except Gyor, contains 349 local governments (**Table 2**).

Table 2. Number of Hungarian and Borsod County Local Governments

	Hungary	Borsod County
Major Cities	21	1
Secondary Cities	156	14
Villages (Settlements)	2,915	333
Counties	19	1
Total	3,111	349

Under the Law on Local Self-Government passed in 1990, cities and villages have been assigned a broad range of functions, including education, health, social welfare, housing, local roads, and urban services.[2] The national population is 10.5 million and the average population per municipality is

[1]Central Statistical Office of Borsod County.

[2]Ian Blore and Nick Devas, *Final Report: Policy Determinants of Municipal Credit in Hungary* (Birmingham, UK: Institute of Local Government Studies, University of Birmingham, August 1, 1992), p. 9.

3,415. More than half of Hungary's municipalities have fewer than 1,000 residents, with the result that all of these towns combined only serve 7.41% of the country's population.[3]

The relatively small size of the average Hungarian municipality may make it difficult for many of them individually to mobilize the necessary financial and management capacity to carry out all of the functions expected of them.

The 19 county governments, which previously supervised the local governments, now find themselves in a greatly diminished role. County officials are searching for a new mission in providing services (such as hospitals and secondary schools) that must cover large areas composed of several municipalities. The Local Self-Government Law stipulates, "There is no relationship of dependence between the county self-government and the municipal self-governments; they shall cooperate on the basis of mutual interest."[4]

In addition to the 19 counties, there are 20 large cities with more than 50,000 population. These municipalities have county status, allowing them to provide all of the local services within their jurisdictions.[5]

Both the local governments and the counties are still picking their way through the new laws. At the same time, a thorough study of the local government law is being undertaken by the Hungarian National Association of Local Authorities in cooperation with the Institute of Public Administration.[6] It is not surprising, given the rapid change that both local and national officials are experiencing, that local officials are not always sure of their powers or the procedures to be followed.

Borsod County has a population of 409,025 and includes an area of 115,893 km^2, according to the 1991 statistical report. As determined by its population and the Local Self-Government Law, the County Assembly is made up of 50 representatives elected by delegates representing the 348 self-governments in the county. Three delegates from each self-government are elected by its Representative Body and at least two of the three must be members of the Representative Body. Each Representative Body nominates one of its three delegates as a member of the (national) General Assembly. The elections take place in districts of one or more self-governments as determined by the General Assembly.[7]

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[3]V. Chomentowski, J. Pigey, and A. Delasnerie, *Summary Report: Diagnostic of Hungarian Local Governments* (European Bank for Reconstruction and Development, August 1992), p. 6.

[4]Chapter I, Section 7.(3) of the Fundamental Acts on Local Self-Government in Hungary.

[5]Blore and Devas, p. 9.

[6]Conversation with the Secretary General of the Association on May 28, 1993.

[7]Chapter VIII, Sections 72 and 73 of the Fundamental Acts on Local Self-Government in Hungary.

1.6 Overview of Local Government Finances

It is difficult to draw firm conclusions regarding the Hungarian local government financial scene because of the number and rapidity of the changes taking place. On one hand, local governments have been given increased latitude to levy taxes and raise revenues at their own volition under the 1990 local government law. On the other hand, because of the time required to pass local laws, to assemble and train the necessary staff, and to implement collection procedures, local taxes are just beginning to build momentum.

Under the local government law, municipalities can levy four different types of taxes: property, communal, tourism, and business. Within ceilings established in the legislation, they can establish their own rates. A recent estimate prepared for the European Bank for Reconstruction and Development (EBRD) indicated that the revenue-generating *potential* for local governments under the 1990 law was 103 billion forints (Ft.) and that it could rise to 170 billion by 1998.[8] (Note: July 1993 exchange rate was 85 Ft. = U.S. $1.)

Table 3 indicates the increase in the amount of local taxes estimated to have been—or to be in the process of being—collected.[9]

Table 3. Increase in Local Taxes, 1991-1993

Year	No. of Local Governments	Percent of Population	Percent of Governments	Amount of Collection (Ft.)
1991	300	---	10	9.5 billion
1992	1,392	67	45	14.2 billion
1993	2,071	80	67	28.5 billion

Local governments derive approximately 10% of their total revenue (or 50% of what they receive from local sources alone) from charges for services which they establish. Such charges increased rapidly—in the magnitude of 40%—between 1990 and 1991, and included fees from kindergartens, day care centers, and old people's homes. These revenues do not include charges for services provided by utility companies or local government enterprises.[10]

Several general observations can be made with regard to Hungarian local government finances:

[8]Chomentowski, p. 25.

[9]Blore and Devas, p. 14.

[10]Blore and Devas, p. 17.

1. The percentage of local government revenue coming from local sources is currently relatively low, in the area of 19%.

2. Borrowing is low and debt service represents only 1% of total expenditures.

3. The surplus carried forward from 1991 to 1992 was 9% of the total local budgets, a substantial increase from the previous year. In the words of the EBRD study, "On the whole, Hungarian local governments generate a satisfactory level of net savings corresponding to 14% of their current operating revenues. This net savings allows them to self-finance 80% of total investments."[11]

4. The equalization grant currently appears to be effective and allows 40% of the municipalities to receive a level equal to or exceeding the average of 6,600 Ft. per resident.[12]

5. County revenues are more rigid and the counties have no power to levy local taxes. They therefore have to rely primarily on national funds.[13]

6. The Law on Local Self-Government permits local governments to borrow and places no restrictions on it. The central government currently has no mechanism for controlling the borrowing by local government: "The liberality of the arrangements for borrowing by local governments is striking: the position appears to be considerably more liberal than in most Western European countries."[14]

7. The high degree of annual inflation complicates the local government financial picture and makes it difficult to accurately forecast municipal financial trends, including the ability to borrow funds. Inflation was at a level of 35% in 1991 and was estimated to be 25% in 1992.[15]

In summary, Hungarian local authorities have considerable financial flexibility but the history under the new law has been too short to develop reliable trends. In theory, local governments appear at present to have the financial capacity to borrow for infrastructure improvements such as solid waste landfills. Fiscal conservatism and lack of recognized borrowing sources may be holding back the process.

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[11]Chomentowski, p. 14.

[12]Chomentowski, p. 9.

[13]Chomentowski, p. 29.

[14]Blore and Devas, pp. 30 and 32.

[15]Blore and Devas, p. 74; and Chomentowski, p. 22.

1.7 Overview of Hungarian Solid Waste Sector

The Hungarian solid waste sector is basically unregulated. Enforcement rarely takes place, except in the case of a serious threat to the water supply. New landfills are approved by the municipality in which they are located, although the Regional Inspectorate, the appropriate regional water agency, and the Health Directorate can insist upon conditions and particular requirements in order to protect the environment. Most landfills were in existence before the new local government law was passed and are operated under pre-existing permits.

County governments, which have an Environmental Office, and previously played a major role in the regulation of landfills, no longer have that responsibility. The role of county governments, as mentioned in the earlier section, is still evolving in terms of providing services that involve more than one municipality. In the case of Borsod County, the Environmental Office is staffed by experienced professionals who are capable of playing a more important role in solid waste collection and disposal. County environmental officials believe and have stated publicly that solid waste collection and disposal is the highest priority in their concerns regarding Borsod County's environment.

Although the Ministry of Interior has distributed a publication setting forth guidelines for the collection and disposal of solid waste, there are no official regulations for the operation of landfills. It is therefore not possible for any Hungarian governmental agency to enforce particular requirements for the operation of a landfill.[16] The Ministry of Interior is currently working on an Environmental Protection law that will include solid waste issues. An 800-page draft is in the process of being circulated through various ministries and other agencies for comment and it is hoped that the new legislation can be introduced in the Parliament before the end of the year.[17]

The February 1993 World Bank Environmental Strategy Study cited a 1989 estimate for the makeup of municipal solid waste, as follows:

Residential	58%
Industrial and Agricultural	28%
Other	14%

The same World Bank study presented a 1988 breakdown of the characteristics of solid waste as shown in **Table 4**.

Hungarian landfill operators rarely cover the working area daily, most allow scavengers free access to the site, and most use burning to reduce the amount of solid waste. Few landfills have scales with which to compute the amount of solid waste being delivered to the site. There is increasing public interest in recycling, but other than the activities of a few private-sector firms in the large cities that are involved in the collection and sale of metal, newspapers, and glass, little is being done by the

[16]Conversation with the Executive Director and the Chief Engineer of the Public Cleansing Association, May 25, 1993.

[17]Borsod County Conference on Environment Issues, statement by Mr. Robert Rakics, Ministry of Environment and Regional Policy, May 18, 1993.

Table 4. Solid Waste Characteristics, 1988

Constituent	Household (%)	Industrial/ Commercial (%)
Paper	16.5	3.2
Textile	3.1	0.8
Plastic	5.0	1.2
Glass	4.0	1.2
Metal	4.3	5.2
Biodegradables	23.8	23.6
Ash, clinker, earth	31.8	57.4
Other	11.5	7.4
Total	100.0	100.0

Source: Environmental Strategy Study, World Bank, 1993.

cities themselves at this point in time. Based on the observations of the LEM team members, effluent from septic tanks is often trucked to landfills for disposal rather than to regional sewage treatment plants.

In summary, because of limited municipal funds and historical patterns, Hungarian landfills are operated in much the same fashion as were landfills in the United States two to three decades ago. Hungarian local governments will have to go through the same type of expensive, slow evolution that occurred in the U.S. in order to raise the standards and level of operation for their solid waste collection and disposal systems.

2 OVERVIEW OF OZD SOLID WASTE MANAGEMENT

2.1 Profile of Ozd

The City of Ozd is located approximately 50 kilometers (by road) to the west of Miskolc, the county seat of Borsod County. It has an area of 97.22 km^2 and the 1991 statistical report showed it as having a population of 42,620. The Ozd city officials believe the population figure to be closer to 47,000.

Ozd was the site of a major steel manufacturing plant that has, for the most part, ceased operations. Because the plant, located in the very center of the city, is now idle, Ozd city officials believe the unemployment rate to be as high as 40%. The city is receiving special funding from the national government with which to hire workers for street cleaning and other municipal tasks. Under the auspices of the program, 2,700 people have been hired at a salary equal to 80% of their previous level, of which the city pays 30% and the national government pays 70%.

On the basis of the Fundamental Acts on Local Self-Government in Hungary enacted in 1990, the City of Ozd elects a 27-member Representative Body that is charged with running the municipality. Fourteen of the representatives are elected from individual constituencies and 13 are elected on a party ticket. The mayor is elected by a secret ballot of the Representative Body at a Statutory Meeting that must be held within 15 days following the municipal election.

Ozd has begun to implement some of the new taxes available to it under Hungarian law. The city has enacted a 100 Ft./m^3 annual tax on buildings. The building taxes are waived for the first 5 years on renovation and reclamation projects in an effort to stimulate employment.

In addition there is a communal tax of 1,500 Ft. per person paid by employers and a 0.3% business license tax on net sales. An automobile tax based on weight is shared on a 50% basis with the national government.

2.2 Ozd Solid Waste Background

Solid waste is currently managed by KOMSZOLG Company, a city-owned solid waste management company. The City of Ozd was interested in having the LEM team include the city as one of its projects in Borsod County. Because of its financial difficulties and high unemployment, the city wishes to reduce the costs of collecting and disposing of its solid waste. The members of the Representative Body's Environmental Committee who met with the LEM team during one of its early visits indicated that they were also interested in having the waste collected and disposed of in an environmentally safe fashion. The city has not formally explored the possibility of involving the 22 communities in its immediate vicinity in a regional approach to solid waste collection and disposal.

2.3 Ozd Solid Waste Finances

2.3.1 Findings

In an effort to improve the financial condition of its solid waste company, KOMSZOLG, the Ozd Representative Body authorized an increase in its refuse fee. The company, as of August 1, 1993, will be charging 520 Ft. per month plus a 10% value-added tax for each room in a house or flat per year. The charge has risen rapidly over the past year, having been 280 Ft. per room until February 1993 and 400 Ft. until August 1, 1993. The company collects waste from about 9,750 houses and flats, broken down as shown in Table 5.

Table 5. Housing Units for Residential Solid Waste Collection, Ozd

Category	No. of Units	No. of Rooms
Single-family houses	6,000	18,000
Semi-detached houses	1,700	5,000
Apartment flats	2,043	6,129
Totals	9,743	29,129

The city company does not pick up any of the waste coming from the flats under the jurisdiction of the housing associations. A competitive private company owned by Lajos Pallagi collects all of the waste from the association flats, totaling 6,000, and disposes of it in the Ozd landfill. He is paid directly by the association and does not have to collect fees from the individual customers. He charges 275 Ft. per room—which is a lower rate than the city's—and he pays a tipping fee to the city of 40 Ft./m^3.

The industrial, commercial, and institutional customers number 159:

Industrial and large commercial	22
Small commercial	122
Institutional	15

The 159 customers use containers of various sizes, and some of them share containers. The customers are billed based on the size of the containers (Table 6), which are picked up weekly. The customer is charged based on the size of the container regardless of whether it is full at the time of collection.

The company has two bill collectors who make collections every 6 months. The collectors are paid a basic salary of 9,000 Ft. per month plus 3% of the money they collect. The company is considering a change in the percentage paid under the new rates because it is concerned about the high remuneration that would result.

Table 6. Commercial Solid Waste Collection, Estimated Revenue Potential, Ozd

Size of Container	No. of Containers	No. of Customers	Charge (Ft./m³)	Annual Total
4 m³	40	100	750	6,240,000
1.1 m³	25	39	280	400,400
110 L	20	20	280	32,032
Total				6,672,432

The potential income from all types of customers, based on the new rates, will total 21,752,000 Ft. Based on the past 6 months, the company has a collection rate of 85% for commercial and institutional customers and approximately 70% for residential customers. It is likely that the collection rate will drop below 70% with the implementation of the higher rates. The company has been considering the possibility of collecting the fees more often than twice a year in order to reduce the amount in a single bill.

The company is in the process of installing a computerized accounting system to improve its financial operations.

The KOMSZOLG Company does not have an annual budget for the collection and disposal of solid waste. This deficiency makes it very difficult to draw any firm conclusions about its financial condition. The company officials estimate that the city has subsidized the refuse operation by approximately 2,000,000 Ft. through May of 1993. In addition, the city previously loaned the company 1,500,000 Ft. The company also has outstanding liabilities of 2,108,000 Ft. The financial situation of the KOMSZOLG Company does not appear promising.

The company has a serious cash flow problem that has led it to encourage refuse truck drivers to collect fees from their customers. This arrangement has been made in an attempt to provide sufficient funds with which to meet payrolls. The cash flow problem makes it very difficult for the company to schedule truck repairs on a timely basis.

The city is now requiring that everyone, including KOMSZOLG Company, pay a tipping fee of 40 Ft./m³ for the use of the landfill. The charging of the tipping fee to the company probably will further complicate the company's financial situation and may well result in a larger subsidy payment by the city.

2.3.2 Solutions and Costs

One of the first steps to be taken in Ozd is the development of a detailed annual budget. Neither the city management nor the management of the KOMSZOLG Company can make sound decisions without having an adequate annual budget to guide their actions. By the same token, the Representative Body is not in a good position to make decisions regarding possible fee increases

without having an accurate budget showing all of the necessary expenditures and the detailed revenue estimates.

As part of its technical assistance effort in Borsod County, the LEM Project could provide financial technical assistance to the city for the immediate development of an effective budget together with a manual. Particular attention should be given to the separation of costs and revenues in the budget for collection and disposal of waste. The exercise would also serve as a model for the other municipalities with which the LEM Project is working since all of them have shown a lack of understanding regarding the importance of a detailed budget for improving solid waste collection and disposal services and for making the attendant policy and financial decisions.

Secondly, the city needs to improve its collection procedures. The use of refuse truck crew members to collect fees is a questionable procedure, not only in terms of the proper control of the money but also from the standpoint of the effective use of the time of the personnel. The city's financial situation is certainly difficult but it does not justify the very low rate of collection. As has been pointed out to the LEM team in other communities, there are welfare funds available to poor families, part of which can be used to pay refuse fees.

The LEM Project could assist the city in examining its collection procedures in detail and in considering ways of improving the rate of collection. The LEM financial specialist could help the city consider possible alternate refuse rate schemes, including tying the rate to a pickup stop instead of using the complicated system of relating it to the number of rooms.

Another issue that could be considered is the number of collectors necessary to do the job effectively and to increase the percentage of collections. Also, the question as to whether the collectors should be paid by salary or on a commission basis should be explored. As is the case with the annual budget technical assistance recommended above, the collection information would be useful for all of the communities in Borsod County that have refuse fees. It could also serve as the basis of a financial training course.

2.4 Ozd Collection System

2.4.1 Findings

The company owns and maintains office, garage, and repair facilities in the city. **Table 7** indicates the number, type, capacity, and age of the trucks belonging to the KOMSZOLG Company.

Table 7. Data on Trucks Belonging to KOMSZOLG Company

Number	Type of Truck	Capacity	Make
4	Revolving drum	8 m^3	Liaz
3	Packer	5 m^3	IFA
3	Bin transporter		IFA

None of the trucks are new; they date from 1981 to 1989.

2.4.2 Problems Identified

The most serious problem with the Ozd solid waste collection system is the lack of a replacement program for the older vehicles and the lack of spare parts for repairs. Both problems have occurred because of the cash flow situation and the lack of a sound budget. Dependable, effective service cannot be provided to the city's refuse customers without adequately maintained equipment.

2.4.3 Solutions and Costs

The city could benefit from receiving technical assistance from the LEM Project for the establishment of an effective preventive maintenance program for its refuse collection vehicles. The technical assistance would include the creation of an effective vehicle record system that could be maintained either manually or by computer. There would be no cost to the city for the technical assistance.

3 OPTIONS FOR OZD SOLID WASTE DISPOSAL

3.1 Existing Landfill

3.1.1 Findings

The existing Ozd landfill is located 3 kilometers from the center of Ozd in a northeasterly direction, in the Kajla Creek Valley. The paved access road runs for approximately 1 kilometer through a residential neighborhood. The final ½ kilometer of the access road is unpaved as it runs up a steep hill to the site (see **Appendix A**).

There is no scale to weigh or otherwise measure the amount and source of the refuse being brought into the site. The manager of the KOMSZOLG Company estimates that the City of Ozd produces approximately 60,000 m^3 annually, with another 1,200 m^3 coming from the other surrounding settlements. The survey done for Borsod County by the Keviterv engineering firm estimated the input by Ozd at 45,000 m^3.

The landfill has two plateaus at the top. Refuse is dumped from the top of the two hills, creating steep slopes of 1:1 on three sides. This dumping arrangement makes the sides unstable and incapable of being covered with soil. The landfill is being slowly extended in a southwesterly direction along the center line of the valley. The valley ends in a wetland and temporary water flow that eventually joins the Sajo River. There is a small spring located 800 meters down the valley from the face of the landfill. The team noted evidence of leachate at the foot of the landfill face, with burned vegetation and other signs of pollution. No clay barrier layer is installed below the landfill working area.

There is no security fence or gate restricting access to the site. Scavengers, including small children, were visible working at the top of the slopes. The scavengers continuously set fires to facilitate their work.

The working face of the landfill is not covered daily; the slopes are not covered at all. The lack of cover and a security fence to act as a barrier results in wind-blown papers and debris being widely dispersed in the vicinity of the nearby residential neighborhood. The wastewater treatment plant delivers approximately nine tanker loads per day of liquid sludge to the upper plateau, where the sludge is unloaded into one of three earthen containment areas. During its visit to the landfill, the LEM team also observed a driver attempting to deliver a truckload of septic tank effluent.

There is no leachate drainage collection system and no ground water runoff diversion system to keep surface water from running into the landfill and becoming polluted.

In March 1993, the city went through a tendering process to reduce the cost of operating the landfill. Previously, KOMSZOLG Company operated the dump and charged the city more than 200,000 Ft. per year. The lowest bidder, which is now operating the landfill, charges the city 70,000 Ft. per year.

3.1.2 Problems Identified

A number of environmental and safety problems were observed at the site, as follows:

- The potential for health and accident problems at the site is large because of the adult and child scavengers working and playing in the uncovered waste and around vehicles.
- Fires burning continuously at the site were causing air pollution.
- Uncontrolled and untreated leachate was finding its way into the wetlands at the mouth of the valley, complicated by the dumping of wet sludge from the treatment plant and possibly septic tank effluent.
- The approach to the landfill, which is close to a residential neighborhood, was visually polluted with litter.
- No scale was present with which to accurately measure incoming waste or to determine fair tipping fees for participating communities.
- No attendant was present to control access to the site.

3.1.3 Solutions and Costs

In recognition of the serious financial difficulties being faced by the City of Ozd, the LEM team developed three options for the mayor and the Representative Body to consider. The LEM team believes that the first option actually represents the bare minimum that needs to be done in order to mitigate some of the potentially serious health and environmental problems that already exist as a result of landfill operating procedures. This first option has been titled "short-term improvements to the landfill." The second option involves further improvements to the landfill designed to make it even more environmentally acceptable and to extend its life span significantly. These improvements could be made at a later date. The third option, described under Section 3.2 below, involves constructing a transfer station and transporting the waste to the Sajcbaza Regional Landfill. The third option would involve the closure of the existing landfill when it has reached the design capacity of the first stage, in approximately 5 to 6 years.

3.1.3.1 Short-Term Improvements to the Landfill

The LEM team estimates that the short-term improvements to the landfill will provide a capacity of 178,000 m^3. The estimated life span at this capacity is shown in **Table 8**, which shows sets of figures for life span—one set based on current landfill practice, and another set based on using a compactor/bulldozer on a daily basis, which would extend the landfill's life considerably. Costs associated with this option appear in **Table 9**.

Capital Improvements

Site security. 688-meter fence, 2 meters high, needs to be placed on the east and south sides of the landfill to restrict access. The fencing will abut the wooded area to the west and the north, and will restrict access from those directions. A lockable gate will be required at the access road. At a unit cost of 1,500 Ft./m, the cost of the fence and gate will total 1,032,000 Ft.

Scale, office, and related facilities. A scale and office area needs to be installed at the landfill. This area would include bathroom facilities, and would require the installation of power, water, and a septic tank. In addition, an unheated shed needs to be constructed to house the compactor. In the event that the city decides to use a transfer station and not implement the long-term improvements to the landfill, it should consider reducing the costs of the recommended facilities by using temporary structures. The cost of the installation of the facilities described above is estimated to be 7,500,000 Ft., as follows:

Scale and scale house	4,500,000
Office and bathroom	2,000,000
Water supply	150,000
Power	250,000
Septic tank	100,000
Garage	500,000

Table 8. Estimated Life Span of Ozd Landfill at 178,000 m³ Capacity (Short-Term Improvements)

Contributing Communities	Annual Volume (m^3)		Life Span (years)	
	Ozd's Figures	Keviterv/LEM's Figures	Ozd's Figures	Keviterv/LEM's Figures
Current practice: 300 kg/m³				
Ozd	60,000	45,000	3.0	3.9
Ozd and others	61,200	46,200	2.9	3.8
Improved practice: 500 kg/m³				
Ozd	60,000	45,000	4.9	6.6
Ozd and others	61,200	46,200	4.8	6.4

Table 9. Landfill Improvement Costs, Ozd

Item	Short-Term Improvements	Long-Term Improvements*
1. Landfill capacity, m^3	178,000	920,000
2. Life span, years	4.8-6.6	25-34
3. Costs, Ft.		
Fencing and gates	1,032,000	---
Scale and facilities	7,500,000	---
Regrading waste	3,391,000	---
Drainage ditches	313,000	175,000
Preliminary clay barrier	---	5,704,000
Excavation	---	1,710,000
Clay liner for cell	---	1,125,000
Leachate collection layer	---	4,988,000
Leachate collection drains	---	3,427,000
Leachate collection basin	---	300,000
Ground water monitoring system	210,000	---
Compactor	12,000,000	---
Engineering services	600,000	950,000
Total improvement costs	25,046,000	18,379,000
4. Increased annual operating costs, Ft.		
Personnel at landfill	918,000	918,000
Maintenance of compactor	3,250,000	3,250,000
Total increased operating costs	4,168,000	4,168,000
5. Capital unit costs, Ft./m^3, based on capacity	141	20
Annual operating costs, Ft./m^3	70	70

*These costs represent *additional expenditures* to implement additional long-term improvements that could be done after the short-term improvements.

Regrading of waste. One of the essential steps in the improving of the site is the regrading of the waste hill so that the slopes can be stabilized and covered. The northern slopes are 20 to 24 meters high with 1:1 slopes. The regrading, as shown in **Appendix A**, will result in new slopes that have a 3:1 grade and will enable them to be covered with soil and later a clay layer. The regrading will involve the moving of 35,690 m^3 of waste material. At a unit cost of 95 Ft./m^3, the cost of the regrading of the waste is estimated to be 3,391,000 Ft.

Soil cover. A 30-cm soil cover will need to be placed on the plateau areas and the slopes of the regraded landfill to control fires, wind-blown debris, and odors. The material will also serve as the base for the preliminary clay cap on the side slopes. A total of 12,675 m^3 of soil will be required. This soil can be mined from the existing sand borrow on the site. Because the material can be obtained on the site and moved by the machine being recommended for the landfill operation, no cost is associated with this recommendation.

Drainage ditches. It will be necessary to install 895 meters of drainage ditches surrounding the eastern, western, and southern perimeters of the landfill. The ditches will slope to the south and carry the surface runoff around the landfill and into the temporary water flow bed. The ditches will have a trapezoid shape with a seeded bottom and side slopes. Sections of the ditch with slopes over 5% will require erosion control netting to reduce runoff damage and to facilitate vegetative growth. At a unit cost of 350 Ft./m, the drainage ditches are estimated to cost 313,000 Ft.

Ground water monitoring system. A ground water system will be necessary to monitor the ground water quality at the landfill site, for both the short-term and the long-term phases. The system will include three 10-meter-deep wells requiring the installation of 30 meters of well shaft. At a unit cost of 7,000 Ft./m, the three wells will cost a total of 210,000 Ft.

Compactor. In order to operate properly, the landfill needs to have a tracked compactor at the site that is capable of moving and placing soil and covering the landfill working area daily. The correct type of compactor will enable the landfill operator to achieve a landfill density of 500 kg/m^3 instead of the present 300 kg/m^3. The cost of a used compactor is estimated to be 12,000,000 Ft.

Engineering consultation. Additional engineering consultation will be necessary to develop tender documents and final designs and to supervise the construction of the improvements. It is estimated that the additional engineering assistance will cost 600,000 Ft.

Operating Improvements

In addition to the physical improvements to the site, several operating changes need to be made, some of which will have costs connected with them, as follows.

Eliminate sludge dumping. The City of Ozd needs to identify local or national funds in order to provide sufficient sludge drying facilities at its sewage treatment plant. The additional facilities will ensure that the practice of dumping wet sludge at the landfill is eliminated at the earliest possible date. The city has employed the Keviterv engineering firm to investigate the situation and to recommend a solution.

The treatment plant currently produces between 50 and 60 m^3 of sludge a day. Keviterv is recommending the use of a mechanical sludge dewatering unit, which could handle the present plant production (60 m^3/day) in an 8-hour period. The cost of the unit, including 25% VAT, would be 12,250,000 Ft. The work could be done within approximately 6 months of the signing of a contract.

Although the capital investment is not a part of the landfill investment figures, it still would be a significant factor in improving the environmental conditions at the Ozd landfil.

Operating costs for the compactor. Based on experience in the private-sector refuse operations in Hungary, it is estimated that the annual sanitation budget will have to include approximately 3,250,000 Ft. for the maintenance and repair of the landfill compactor.

Landfill procedures. A landfill with the volume of waste that will be received at Ozd requires the services of at least three individuals to ensure proper operation and maintenance. The first step that should be taken by the city and the KOMSZOLG Company is to examine the agreement with the current landfill operator. It is essential that the landfill manager be held accountable for the proper operation of the landfill. In addition, the income flow from the tipping fee will become increasingly important to the city.

The operation and maintenance of the landfill should stress the use of daily cover, the restriction of the working area and the maintenance of the facilities and equipment at the site. Careful records need to be kept of the incoming amount and source of the waste, particularly with more than one community using the site.

The additional cost of the landfill personnel is not clear at this point because of the lack of a budget that could be reviewed. However, the LEM team estimates that the additional personnel might cost approximately 918,000 Ft. per year (see **Table 9** for a summary of the costs).

Closure Costs

In the event that the city decides to implement the transfer station option and cease using its current landfill after the short-term phase is complete, it will be necessary to expend funds to properly close the landfill. The following steps will have to be taken. The associated costs are listed in **Table 10.**

Sand foundation and gas control layer. The 15-cm ground cover will be increased to 30 cm. It will provide a level foundation for the clay cap and also will serve as a gas-control layer. It will be composed of granular material found on the site. Because the material is located on the site and can be moved and spread by the city's compactor, no cost is associated with this recommendation.

Clay cap. A 60-cm clay cap will need to be installed on top of the sand foundation layer to prevent infiltration of surface water into the landfill. The clay should have a hydraulic conductivity of 2.0×10^{-6} cm/sec and be free of stones, debris, sand, and organic materials. A total of 22,320 m^3 of clay will be required. At a unit cost of 450 Ft./m^3, the cost of the clay cap will total 10,044,000 Ft.

Protective sand drainage layer. A 45-cm layer of sand should be installed on top of the clay barrier to help remove excess moisture from the cover and to provide frost protection to the clay cap. The material should have a hydraulic conductivity of 1.0×10^{-3} cm/sec and can be constructed from materials located on the site. A total of 16,740 m^3 of material will be required. At a unit cost of 200 Ft./m^3 for moving and distributing the material, the cost of the sand drainage layer will total 3,348,000 Ft.

Table 10. Comparative Closure Costs, Ozd

Item	Short-Term Improvements	Long-Term Improvements
Capacity of landfill, m^3	178,000	920,000
Closure costs, Ft.		
Clay cap	10,044,000	16,470,000
Protective sand layer	3,348,000	5,400,000
Topsoil layer	1,116,000	1,830,000
Seeding	744,000	1,220,000
Passive gas venting system	200,000	280,000
Removal of facilities	400,000	500,000
Engineering services	350,000	500,000
Totals, Ft.	16,202,000	26,200,000
Unit cost, Ft./m^3, based on capacity	91	19

Topsoil layer. The final cover structure will consist of 15 cm of topsoil capable of supporting the growth of grass. A total of 5,580 m^3 will be required. At a unit cost of 200 Ft./m^3, the cost of the topsoil layer will be 1,116,000 Ft.

Seeding. The topsoil layer will need to receive a seeded grass cover to protect the cover structure from water and wind erosion. The area to be seeded totals 37,200 m^2. At a unit cost of 20 Ft./m^2, the total for the seeding comes to 744,000 Ft.

Passive gas venting system. A passive gas venting system will need to be installed as part of the landfill closure activities. The system will be composed of 10 gas vents spread evenly over the entire area of the landfill cap. By discharging the gas generated in the landfill into the atmosphere, the vents will prevent a dangerous accumulation of methane gas in the waste. At a unit cost of 20,000 Ft. per vent, the total cost for the gas vent system will be 200,000 Ft.

Miscellaneous costs. Upon closure of the landfill, the scale and other movable facilities will need to be relocated to another site or sold to another community. The estimated cost for the removal of the facilities is 400,000 Ft.

Engineering costs. Engineering services will be required to prepare tender documents and to oversee the construction work. It is estimated that the engineering work will total 350,000 Ft.

3.1.3.2 Long-term Improvements to the Landfill

It is estimated that the long-term improvements to the Ozd landfill will result in a design capacity of 920,000 m^3 of waste. That capacity will provide the landfill with a life expectancy shown in **Table 11** (see **Table 9** for associated costs).

Table 11. Estimated Life Span of Ozd Landfill at 920,000 m³ Capacity (Long-Term Improvements)

Contributing Communities	Annual Volume (m^3)		Life Span (years)	
	Ozd's Figures	Keviterv/LEM's Figures	Ozd's Figures	Keviterv/LEM's Figures
Current practice: 300 kg/m³				
Ozd	60,000	45,000	15.3	20.4
Ozd and others	61,200	46,200	15.0	19.9
Improved practice: 500 kg/m³				
Ozd	60,000	45,000	25.6	34.1
Ozd and others	61,200	46,200	25.1	33.2

Capital Improvements

The Ozd landfill will require additional improvements beyond the short-term stage in order to significantly increase its capacity and improve upon its environmental impact. These additional improvements are as follows.

Increase of the foundation soil. The daily cover over the final design contours of the short-term waste disposal area, consisting of 15 cm of soil, will be increased to 30 cm to serve as a foundation for receipt of the clay barrier layer. Because the material is available at the site and can be moved by the landfill machine, no cost is included for this recommendation.

Drainage ditches. An additional 500 meters of ditch will need to be installed on the northern and eastern perimeter of the new landfill cell area to control the runoff water and prevent it from going into the landfill and becoming contaminated. The ditch will be constructed to the same specifications mentioned under the short-term solutions. At a unit cost of 350 Ft./m, the additional ditches will cost a total of 175,000 Ft.

Preliminary clay barrier. A 30-cm-thick clay barrier layer will be placed on the 30-cm soil foundation layer described above. The clay barrier will prevent further infiltration into the waste below from precipitation or from the waste that will be placed above it during the long-term or second phase of the landfill. The clay must be free of contamination, debris, rock, sand, and organic material, and must have an in-place hydraulic conductivity of less than 1.0×10^{-7} cm/sec. The layer will require 12,675 m³ of clay. At a unit cost of 450 Ft./m³, the clay barrier will cost a total of 5,704,000 Ft.

Excavating of new cell area. It will be necessary to strip and stockpile the topsoil and other material to the east of the short-term landfill area where the new landfill cell is to be located. The recommendation will require the excavation of 18,000 m^3 of material. At a unit cost of 95 Ft./m^3, the total cost will come to 1,710,000 Ft.

Recompacted clay liner. A 60-cm recompacted clay liner will be installed in the bottom of the newly excavated landfill cell to the east of the short-term landfill area. The purpose of the clay liner is to prevent infiltration of leachate into the ground water. The liner will require a total of 2,500 m^3 of clay of a quality similar to that described in "preliminary clay barrier" above. At a unit cost of 450 Ft./m, the cost of the clay liner will be 1,125,000 Ft.

Leachate collection layer. Following the completion of the clay liner in the new cell and the clay barrier in the original landfill, a 30-cm granular leachate layer will be placed over them. The 18,300 m^3 of sandy material to be used should have a hydraulic conductivity rating greater than 1.0×10^{-3} cm/sec. The leachate collection layer will be covered with a layer of geotextile to prevent erosion in the layer and mixing with the waste. A total of 16,600 m^2 of geotextile will be required. At a unit cost of 200 Ft./m^3, the cost for the granular layer will be 3,660,000 Ft. The unit cost for the geotextile is 80 Ft./m^2, which will total 1,328,000 Ft., bringing the overall figure for the leachate collection layer to 4,988,000 Ft.

Leachate collection drains. The leachate collection drains in the new landfill cell area will be composed of 80-mm-diameter perforated HDPE pipe. It will be placed in trenches that are 60 cm deep and 60 cm wide and rest in drainage rock. The rock will be wrapped in a layer of geotextile to prevent the mixing of the rock with either the clay or the leachate layer material. A total of 1,360 meters of drains will be required. At a unit cost of 2,520 Ft./m, the leachate collection drains will cost a total of 3,427,000 Ft.

Leachate collection basin and backspray. A leachate collection basin will be required on the south side of the landfill to receive the leachate from the collection drains. A pump and backspray system will be required to spray the leachate over the top of the waste to help eliminate it by evaporation. This recommended solution will only work if the city eliminates the liquid waste from the landfill as recommended in the short-term phase. Otherwise, an additional investment will be required to treat the leachate or otherwise reduce its volume. The estimated cost for the collection basin plus the pump and backspray is 300,000 Ft.

Engineering services. Additional engineering services will be required for developing tender documents and diagrams for the long-term phase and for supervising the construction. In addition, geotechnical investigation is likely to be needed. The cost for the necessary engineering and geotechnical services is estimated to be 950,000 Ft.

Alternate road access. Because the current access road to the landfill goes through a nearby residential neighbourhood, the Ozd Representative Body employed an engineering firm to undertake a feasibility study for the construction of an alternative road. The Termu engineering firm developed a plan for a new road that would leave the main highway and approach the landfill by coming up the valley in which it is located. The new road would be 4 meters wide and 2,500 meters long. At a unit cost of 6,000 Ft./m, the new road would cost a total of 18,750,000 Ft., including the VAT of 25%.

The city asked the LEM team to comment on the proposed access road. The LEM team believes that the cost is very high and that the city would be better advised to install trees and other buffer plants along the fence area of the landfill to shield it from the nearby residences. The city could also improve the situation by ensuring that the landfill operator eliminates the fires at the landfill and periodically collects any wind-blown papers that collect along the fence line. Steps should further be taken to ensure that open trucks are not used for refuse collection so that odor problems and spilling debris are not a problem in the nearby neighborhood. In the same manner, eliminating sludge dumping will reduce the number of trucks and the presence of odors.

Operational Improvements

The LEM team has not identified any operational improvements different from those recommended for the short-term phase of the landfill. Therefore, there is no cost increase for operational purposes in connection with the long-term phase.

Closure Costs

When the Ozd landfill has reached its design capacity for solid waste, steps will need to be taken to close the landfill and leave it in a condition such that it does not represent any threat to the environment. The total cost for the closure process is estimated to be 26,200,000 Ft., as listed in **Table 10** above. The closure steps include the following:

Sand foundation and gas-control layer. The 15-cm ground cover will be increased to 30 cm. It will provide a level foundation for the clay cap and also will serve as a gas-control layer. It will be composed of granular material found at the site. Because the material is located at the site and can be moved and spread by the landfill compactor, no cost is associated with this recommendation.

Clay cap. A 60-cm clay cap will need to be installed on top of the sand foundation layer to prevent infiltration of surface water into the landfill. The clay should have a conductivity of 2×10^{-6} cm/sec and be free of stones, debris, sand, and organic materials. A total of 36,600 m^3 of clay will be required. At a unit cost of 450 Ft./m^3, the clay barrier will cost 16,470,000 Ft.

Protective sand drainage layer. A 45-cm layer of sand should be installed on top of the clay barrier to help remove excess moisture from the cover and to provide frost protection to the clap cap. The material should have a hydraulic conductivity of 10^{-3} cm/sec and can be constructed of materials that are available at the site. A total of 27,000 m^3 of material will be required. At a unit cost of 200 Ft./m^3, the drainage layer will cost a total of 5,400,000 Ft.

Topsoil layer. The final cover structure will consist of 15 cm of topsoil capable of supporting the growth of grass. The layer will require a total of 9,150 m^3 of topsoil, which was previously stockpiled at the site. At a unit cost of 200 Ft./m^3, the cost for the topsoil layer is estimated to be 1,830,000 Ft.

Seeding. The topsoil layer will receive a seeded grass cover to protect the cover structure from water and wind erosion. The area to be seeded totals 61,000 m^2. At a unit cost of 20 Ft./m^2, the seeding is estimated to cost a total of 1,220,000 Ft.

Passive gas vent system. A passive gas vent system will need to be installed as part of the landfill closure activities. The system will be composed of 14 gas vents spread evenly over the entire area of the landfill cap. By discharging the methane gas generated in the landfill into the atmosphere, the vents will prevent a dangerous accumulation of methane gas in the waste. At a unit cost of 20,000 Ft. per vent, the cost of the passive gas vent system will total 280,000 Ft.

Engineering costs. Engineering services will be required for preparing tender documents and supervising the construction. It is estimated that the cost of the engineering services will total 500,000 Ft.

Miscellaneous costs. Upon closure of the landfill, the scale and other movable assets should be moved to the new landfill site. Some of the facilities—such as the office and the bathroom facilities— might be kept on the site in the event that it is developed for a park or other similar public purpose. The estimated cost for the removal of the facilities is 500,000 Ft.

3.2 Transfer Station and Regional Landfill

3.2.1 Background

The LEM team considered one other option for the City of Ozd that is related to the team's research in connection with the Sajokaza regional landfill. The City of Putnok's refuse is collected by MULL/TESCONT Ltd. and taken to the Kazincbarcika landfill. Putnok is 17 kilometers from the Ozd landfill and 21 kilometers from the center of Ozd. Putnok is also 17 kilometers from the Kazincbarcika landfill, or about the same distance as it is from the Ozd site. It therefore occurred to the LEM team that the use of a transfer station to gather the Ozd and Putnok waste and transport it to the regional landfill at Sajokaza might be a viable alternative for Ozd, as well as for Putnok (see below). Transfer stations are relatively new to Hungary, perhaps because current operating costs for landfills tend to be low and landfill regulations have not been developed or enforced.

The option would have two main advantages for Ozd. It would reduce the capital costs for improving the current landfill, which Ozd will have a difficult time supplying; and it will also enhance an application for a national and/or international grant or loan because of its regional and innovative nature. It also requires a large amount of capital investment, but because the solution is regional and a grant more feasible, that factor may not end up being a decisive one.

3.2.2 Sajokaza Regional Landfill

3.2.2.1 Findings

During the course of its research into the Ozd and Edeleny solid waste systems, the LEM team became aware of a regional landfill that had been constructed in Sajokaza in 1989 but never placed in operation. The 20-hectare site is composed of two valleys: the Hatar, with 11 hectares; and the Orban, with 9 hectares. Part of one of the valleys contains the first 3.5-hectare stage of a large regional landfill that was built to modern standards. The site is located approximately 15 kilometers west and slightly south of Edeleny.

The landfill site was purchased by the City of Kazincbarcika in the late 1980s in recognition that the city's existing landfill was nearing the end of its life.[18] The landfill was designed by the Keviterv engineering firm to serve 30 municipalities for a period of up to 50 years. The first stage was constructed by the Kazincbarcika Mining Company at a cost of 20,000,000 Ft. The construction work was supervised by the Kazincbarcika City Management Company.

Borsod County furnished the largest part of the construction funds, which were channeled through the participating municipalities and paid to the construction firm. Kazincbarcika contributed some of its own money for the project.

The first stage of the landfill was given a Use Permit (commissioned) on May 24, 1991. The design meets all of the current Hungarian landfill guidelines. A gatehouse and guard are maintained at the site to prevent unauthorized entry or use of the landfill.

During the interim period between the construction of the landfill and the present time, the agency responsible for the collection and disposal of solid waste in Kazincbarcika has undergone a series of organizational changes. The City Management Company, which was originally responsible for solid waste, went into bankruptcy. To prevent any collection and disposal problems arising from the bankruptcy, the Sanitation Task was transferred to the city Trusteeship Company in early 1992. During the interim period the city financed the operation of the Sanitation Task.

Three months later, in June 1992, the city created an independent, city-owned company called MULL. In April 1993, a further organizational change took place when a public/private venture called MULL/TESCONT Ltd. was formed. The City of Kazincbarcika owns 50% of the new company, while TESCONT, a privately held holding company in Miskolc, owns 48.5%, and the employees own 1.5%. According to the Managing Director, it is one of the few companies in Borsod County that has an employee representative as one of its shareholders. MULL/ TESCONT Ltd. employs 66 people, most of whom have been involved in refuse collection and disposal activities under the various forms of the company for 15 to 20 years.

MULL/TESCONT Ltd. was established with a prime capital of 100,000,000 Ft. The city contributed the present landfill site, the new landfill site, plus existing equipment and buildings as its in-kind contribution to the new company, while TESCONT contributed the cash. In the event that additional large capital contributions are required, the three parties involved in the company may have to negotiate changes in the percentage of the ownership.

The meeting of the shareholders is held irregularly as needed. The shareholders consist of three individuals who vote proportionately based upon their percentage of ownership. The City of Kazincbarcika is represented by a Municipal Representative who is selected by the city's Representative Body. The employees are represented by an individual whom they select, and the third individual is selected by the TESCONT holding company.

The shareholders elect a five-member Supervising Committee, which meets monthly and works with the Managing Director. The current Supervising Committee consists of an individual representing

[18]Interview with Ferenc Hunyadi, the Managing Director of MULL/TESCONT Ltd., in Kazincbarcika on June 11, 1993.

the Mayor's Office, a representative of the MULL/TESCONT Ltd. employees, a representative of TESCONT, plus two additional individuals elected from outside. At present, both individuals are employed by the Borsod Chemical Company, one as an engineer and the other as an economist.

Currently, MULL/TESCONT Ltd. collects solid waste from 17 municipalities and disposes of it in the 9-hectare Kazincbarcika landfill. In addition, refuse is collected from an additional five municipalities by other companies that dispose of the waste in the Kazincbarcika landfill, which is owned and operated by MULL/TESCONT Ltd. MULL/TESCONT Ltd. also collects waste from five additional municipalities and disposes of it in the Szendro landfill (north of Edeleny).

The company collects refuse once a week from residences and charges a fee of 100 Ft. per month for the service. The company employs individuals to collect fees in Kazincbarcika and Sajokaza. The collectors are paid 8 Ft. per fee collected each month. The Managing Director indicated that the company has been able to collect 95% of the fees from the 1,600 Kazincbarcika residences. In the case of the other municipalities, the mayors collect the fees and pay the company. The same situation holds true for the Housing Associations in all of the municipalities, including Kazincbarcika, where the associations collect the fees and pay MULL/TESCONT Ltd.

MULL/TESCONT Ltd. charges a tipping fee of 100 Ft./m^3 for the use of the Kazincbarcika landfill by people or firms other than itself. The company has a fleet of 19 trucks and maintains its own vehicles using company-owned repair facilities. Its shops and offices are located in Kazincbarcika near the existing landfill. The shop buildings were inherited from the city and are in need of renovation into acceptable condition.

The company would like to continue to use the existing landfill in Kazincbarcika until it is completely filled, which they estimate will take between 3 and 5 years. However, if the North Hungarian Environmental Protection Inspectorate gives the company permission to increase the landfill height an additional 5 to 7 meters, the landfill might last for 5 to 8 years.

The current Kazincbarcika landfill suffers from many of the problems observed by the LEM team at other landfills. Scavengers are given free access to the site, fires burn continually, the working area is very large, and it is not covered daily to control environmental problems or wind-blown debris. The Managing Director indicated that cost prevented the company from placing daily cover over the waste since it was not available on the site. The LEM team pointed out that tailings from the coal mine operations were available in close proximity to the landfill and could be considered for cover material by the company. The landfill does not have a compactor despite the high volume of solid waste at the landfill and the expressed desire to keep it open as long as possible. However, it does use a large tracked bulldozer that could attain acceptable compaction if waste were placed and compacted properly.

The Managing Director estimated that it would cost approximately 25,000,000 Ft. to close the existing landfill after it was filled to capacity.

The City of Kazincbarcika commissioned an engineering study of the new landfill in mid-1992 by the Miskolc engineering firm of Komver Kft.—in association with the Geophysical Institute of Eotvos Lorand University in Budapest—at a cost of 300,000 Ft. The report, received in November 1992, found the original design and construction work to be basically sound but identified necessary

additional improvements in the amount of 25,000,000 Ft. The improvements identified in the report included a scale, monitoring wells, and improvements to the access road to handle heavy trucks. An additional investment of 12,000,000 Ft. would be required for the purchase of a used compactor, according to the Managing Director.

MULL/TESCONT purchased the area between the two valleys that make up the present Sajokaza landfill, in January 1993. The landfill area now totals 60 hectares. In June 1993, the company also commissioned a Hungarian-United States firm, Novia, to undertake an additional engineering survey of the drainage of the site, to determine the equipment that will be needed, and to determine the costs for the final closure of the new regional landfill. In addition, the company is putting out tender documents in order to determine the cost for closing and landscaping the existing Kazincbarcika landfill. They are considering the possibility of using the current landfill site as a transfer station.

The Managing Director informed us that Edeleny had withdrawn from the MULL/TESCONT Ltd. operation in April 1993. He did not understand the withdrawal, since Edeleny's refuse fee is higher than MULL/TESCONT's and the city has no access to standby trucks or sufficient spare parts.

3.2.2.2 Problems Identified

The LEM team identified several problems in connection with the Sajokaza Regional Landfill that require consideration as follows.

Oversight of Landfill Charges

The LEM team has been very much interested in the regional landfill and its origin. The situation has been complicated by the tremendous governmental changes taking place in Hungary in the past few years with regard to the role of municipalities and county governments, as well as by the pressure to privatize governmental enterprise activities whenever possible. The Sajokaza regional landfill was constructed with state funds with the idea that it would serve the needs of approximately 30 communities.

Because of the changes in government and the trend towards privatization, we now find the landfill in the ownership of a joint private-public company that gives every indication of doing a good job in managing the collection of solid waste. Because of the scale of its operation, the regional landfill should be able to dispose of waste in an economical fashion and operate in a way to minimize environmental problems.

However, the LEM team is concerned about the question of oversight with regard to the setting of tipping fees for the disposal of solid waste in the regional landfill. It will be a monopoly operation of a publicly constructed facility, which will affect budgets in a great many municipalities. The current ownership arrangement for the landfill does not provide for any participation by the municipal participants in the rate-setting decisions.

Hungary at present does not have anything like the public utility commissions found in the United States and elsewhere in the world that are charged with reviewing and approving rate increases for utility services supplied on a monopoly basis, such as electrical power or telephone service. The

ownership of the site has evolved to the point that it does not appear possible either (a) to establish a special authority or district that could hold and operate the regional landfill in the name of all of the participating communities, or (b) to have the County Government own the landfill.

The LEM team has discussed the situation with officials of the City of Kazincbarcika and MULL/TESCONT Ltd. There appears to be a possibility of working out some type of oversight process that would protect the participating communities from arbitrary rate increases while at the same time ensuring the interests of the City of Kazincbarcika and the company. The LEM team would be uncomfortable with recommending an increased usage of the regional landfill unless the oversight problem can be properly addressed.

Operation of the Regional Landfill

Because of its size and the number of participants, it is important that the regional landfill be operated in a businesslike and environmentally sound fashion. Once again, given the landfill's size and potential for environmental problems, the LEM team would be unwilling to recommended increased usage of the regional landfill unless the team could be assured of proper operation. "Proper operation" includes such issues as daily cover, effective compaction, control of scavengers, leachate control, and accurate measurement of incoming waste.

The operation of the current regional landfill at Kazincbarcika is not a model to follow, nor is the landfill being used in Szendro by MULL/TESCONT Ltd. Conditions would need to be established for the operation of the new landfill before funding and increased usage could be recommended.

Accurate Usage Data

As pointed out earlier, accurate information does not exist with regard to the amount (and type) of solid waste deposited in the four landfills that have been examined by the LEM team—Kazincbarcika, Szendro, Edeleny, and Ozd. The communities, the Borsod County Environmental Office, and the Ministry of Environment and Regional Policy would all benefit from having more accurate information available regarding the amount of solid waste being generated.

The LEM team has been placed at a disadvantage in trying to predict future usage and landfill life expectancies because of the lack of accurate data on solid waste tonnage and cubic meters.

3.2.2.3 Solutions and Costs

Oversight Negotiations

The LEM team is reluctant to recommend a specific method for providing an effective oversight process for the establishment of tipping fees at the Sajokaza regional landfill because of its limited knowledge of the legal and policy ramifications of the issue. It is instead proposing that the LEM Project provide the technical assistance necessary to enable a representative advisory committee to work with a specialist from the United States in rate setting procedures. This specialist will work with a Hungarian attorney with an in-depth knowledge of local government and rate setting procedures and if needed, a Hungarian engineer with knowledge of rate setting.

The advisory committee would be composed of five people, including representatives of the City of Kazincbarcika, MULL/TESCONT Ltd., the County Environmental Office, and the Office of the Regional Representative of the President, plus one mayor selected by the 22 mayors currently using the company landfill. The advisory committee would meet with the LEM Project specialist plus the other resource people and negotiate an oversight process that could help set the tipping fees for the new regional landfill.

Operating Manual

In order to develop specific details for the proper operation of a regional landfill in Borsod County, the LEM team is recommending that the LEM Project provide the technical assistance and funds necessary to develop a manual for the operation and maintenance of a regional landfill. The manual would be developed in consultation with an advisory committee composed of representatives of the City of Kazincbarcika, MULL/TESCONT Ltd., the Borsod County Environmental Office, the North Hungarian Environmental Protection Inspectorate, the Health Directorate, and the North Hungarian Water Directorate. The work would be done by a solid waste specialist from the United States working in close cooperation with a Hungarian engineering firm and the Public Cleansing Association.

Measurement of Solid Waste Input

Because of the importance of accurate data concerning the current input of solid waste at the four working landfills—Kazincbarcika, Szendro, Edeleny, and Ozd—the LEM team recommends that the LEM Project take immediate steps to acquire a portable scale that can be used to measure the input of waste at the four sites. It is recommended that this step not be delayed until after the September workshop but that work begin in August under the auspices of the LEM Hungarian Coordinator.

It is recommended that the Keviterv engineering firm be called upon to provide a field person who can use the portable scale at the four sites to obtain accurate weight figures for the solid waste being disposed in each. One week should be spent at the Edeleny and Szendro landfills and two weeks at the other two sites.

When the field work is finished, the portable scales and other equipment should be turned over to the Borsod County Environmental Office so that it can be used by other county municipalities under supervised conditions, and so that the solid waste database can be expanded gradually to the entire county.

3.2.3 Transfer Station

3.2.3.1 Transfer Station Description

A transfer station consists of one of two basic facility designs that can be further adapted to the user's specific needs. The basic premise of the transfer station is to have smaller trucks dump into a larger container in which the waste is often (but not always) compacted and then transported to the landfill. The economy is achieved by allowing the expensive and heavily manned packer trucks to spend a larger percentage of their time on the collection of refuse.

Compaction Transfer Station

The top of **Figure 2** shows a compaction-type transfer station; the bottom shows the uncompacted type. Both facilities operate on the same premise, except that the compaction type uses a hydraulically driven ram to push waste dumped from a feedhopper into the compaction container. The ram is activated by a station attendant who also monitors what goes into the hopper and arranges to have the container hauled to the disposal site when full.

Containers come in a variety of capacities. The size needed for a particular facility depends on the amount of waste expected over a certain period of time. The amount of waste directly affects the number of times the container must be emptied.

When the truck is called to haul the container to the disposal site, an empty container usually is brought to the facility to swap with the full one. This procedure eliminates a return trip to replace the original container.

The truck that hauls the compaction containers usually has a straight chassis frame with dual rear axles. The structure and winch that load the box onto and off of the truck also allow the truck to dump the container at the landfill. The advantage of this type of truck is the relatively short wheel base that makes the truck more maneuverable. This design would be well suited to Hungary's many narrow roads and sharp turns.

Uncompacted Transfer Station

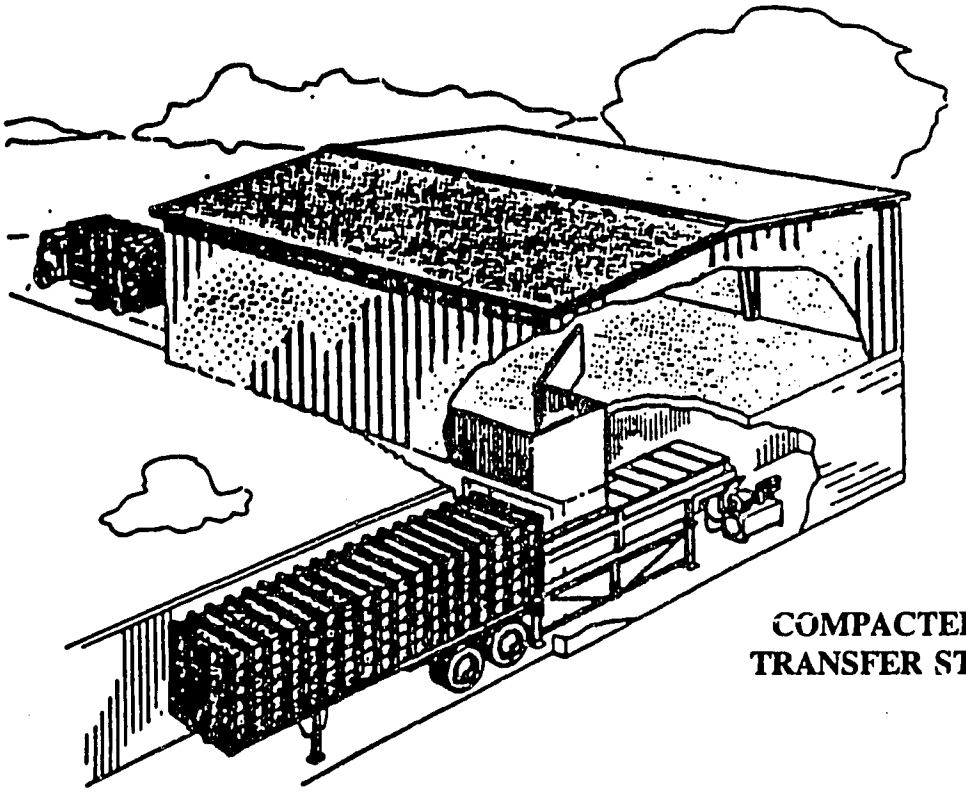
The uncompacted-type transfer station has a large, open-top container arrangement whereby wastes are dumped directly into the top of the container. The containers come in sizes ranging from 5 to 45 m^3.

This type of transfer station does not have any on-site, fixed machinery and does not rely on electricity to operate. It does, however, require a retaining wall high enough to allow a refuse truck to dump into the top, which is approximately 2.4 meters high. Or it could rely on a front-end wheel loader to lift the waste into the container from a lower wall; this option, however, obviously would require the acquisition of a wheel loader.

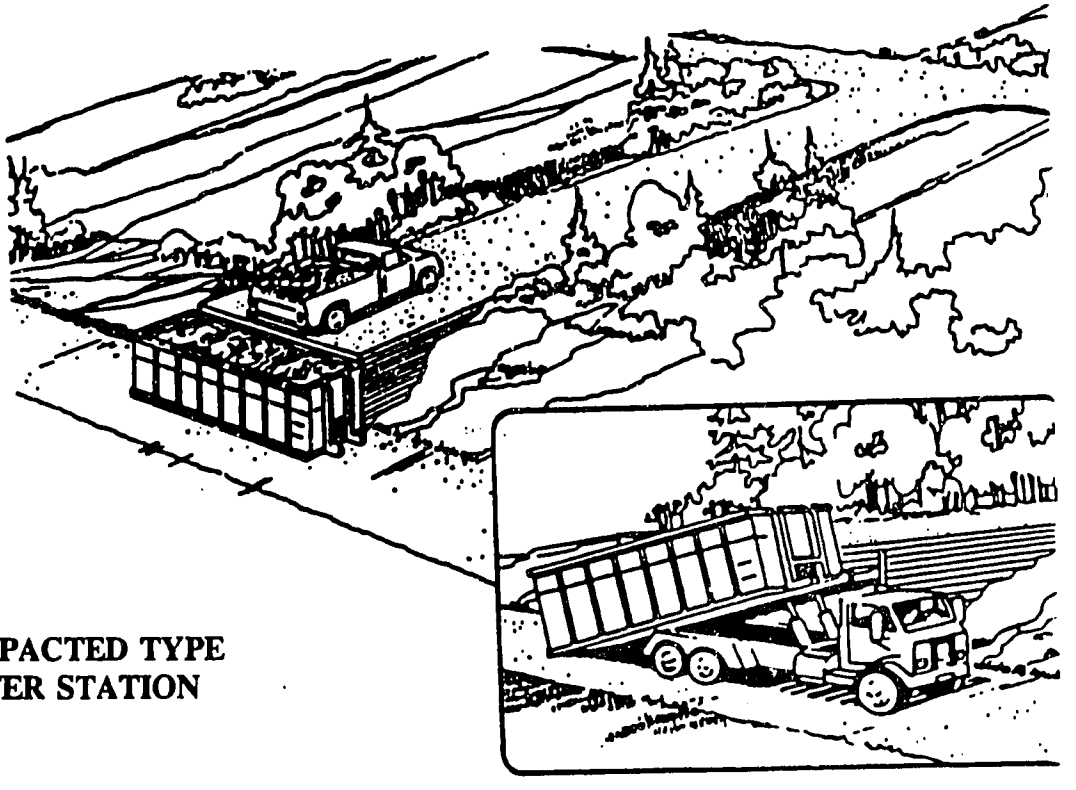
The container is hauled to the disposal site once it is filled. The truck used to haul the container can also bring a second one empty to the site to eliminate the extra trip back with the original container. The full one is emptied by hydraulically dumping the load out of the back of the container.

Site Design

A transfer station can be located in most areas with nearby access to electrical supplies (for operating the compaction unit and the scale equipment). The site that the LEM team proposes would consist of a paved entrance road with a scale and scale house; a paved maneuvering area to allow trucks to turn around and to back into the unloading area; a retaining wall to allow the compaction unit to be installed at a lower elevation; and a concrete slab for the compaction unit and container to sit on, for stability.



COMPACTED TYPE
TRANSFER STATION



UNCOMPACTED TYPE
TRANSFER STATION

The entrance to the site could and should be landscaped to present an aesthetically pleasing appearance. The entire site should be fenced for security and to keep any blowing paper within the facility.

In lieu of an open site exposed to the weather, the facility could be incorporated into one of the many empty factory buildings found throughout the study area. In this situation, the dumping of the waste would occur inside a building, with the container located outside where it could be serviced when needed. Having the facility inside a building would put the entire operation out of the public's view.

Using a transfer station would eliminate unnecessary travel by small trucks to the disposal site, thereby saving transportation costs and travel time. Closing the local small landfill also would (a) remove the cost burden of the site operations from the local inhabitants, (b) allow the municipalities to use a larger disposal site, (c) be environmentally safer, and (d) be less expensive to operate on a unit cost basis because of the economies of scale from the larger volume of waste received.

3.2.3.2 Ozd/Putnok Transfer Station Option

Proposed Location

The transfer station should be within a short distance of all the towns that will be contributing waste to the facility. The LEM team proposes several locations as noted below, but only with the understanding that these general locations would be investigated more thoroughly during a future feasibility study.

The location of the transfer station proposed for the regional program in the western part of the study area is between Ozd and Putnok. This site would serve the large population of those two areas. It is assumed that other smaller settlements also would use this facility; however, as of May 1993, no contacts had been made with these settlements concerning this project. The Ozd and Putnok population and estimated waste volumes are shown in **Table 12**.

Table 12. Populations and Estimated Waste Volumes, Ozd and Putnok

Town	Estimated Waste Volume, m^3
Ozd and others	61,200
Putnok	11,500
Total	72,700

Waste Transportation Logistics

The transfer station would serve as the main waste-receiving area for the Ozd/Putnok area, with an estimated 72,700 m^3 of waste delivered annually. In order to determine the most efficient type of transfer station equipment to use, the daily trips to the landfill must be calculated.

If the transfer station were to remain open 6 days per week, 52 weeks per year, the daily volume through the station would be:

$$72{,}700\ m^3/yr \div (6\ days \times 52\ weeks) = 233\ m^3/day.$$

The capacity of the two different transfer containers, compacted or uncompacted, would be 27.5 m^3 compacted and 33 m^3 uncompacted.

If the uncompacted transfer station configuration were selected, there would be an estimated 7 trips to the disposal site per day, or 42 trips per 6-day week based on a container with capacity of 33 m^3.

To determine the number of trips the compacted configuration would require, it is necessary to calculate the weight per compacted cubic meter versus the weight of the as-received uncompacted waste. The as-received waste is reported to have densities in the range of 150 to 250 kg/m^3. Using an average of 200 kilograms, the compacted waste would increase in density to 355 kg/m^3 through compaction.

Therefore, the number of compacted loads to the disposal area would be:

$$233\ m^3 \times 200\ kg/m^3 = 46{,}600\ kg \div 355\ kg/m^3 = 131\ m^3.$$

The compaction container has a capacity of 33 m^3, which would require 4.0 trips per day or 24 trips per 6-day week.

Cost of the Transfer Station

The cost of the transfer station will vary from the estimates shown in **Tables 13** through **18** once a more detailed feasibility study is conducted. Especially subject to change are the figures for the amount of waste generated in Ozd/Putnok; another factor is the possibility of additional towns joining the system in the future. Estimates in **Tables 13 and 14** compare the costs of an uncompacted transfer station and a compacted station. Following the construction cost tables are operation and maintenance costs (**Tables 15 and 16**) for the two types of stations.

For the purposes of this report, the following assumptions were made to determine the layout and cost of the facilities.

1. The compacted station will use only one compaction unit initially. Two transfer containers will be used for the uncompacted-type station.

2. Standardized costs have been used to provide a preliminary cost estimate.

3. The facility will be located outside versus inside a building.

4. The facility will consist of a 1-hectare lot with a scale and scale house, paved maneuvering area, concrete retaining walls, concrete slab base for the transfer containers and/or compaction unit and containers, and paved access road for the truck to pick up and haul the transfer containers or compaction containers.

Table 13. Estimated Costs for the Ozd/Putnok Uncompacted Transfer Station

Item	No. and Units	Ft./Unit	Total Unit Cost (Ft.)
Fencing	400 linear meters	1,000	400,000
Scale and scale house	1	4,500,000	4,500,000
Electrical service to site	1	250,000	250,000
Septic tank	1	100,000	100,000
Paved access roads	800 m^2	1,670	1,336,000
Concrete retaining wall	40 linear meters	51,000	2,040,000
Concrete pad	120 m^2	7,555	907,000
Excavation and backfill	1500 m^3	350	525,000
Paved maneuvering area	3500 m^2	1,670	5,845,000
Transfer containers	4	562,750	2,251,000
Transport truck	1	9,275,000	9,275,000
Landscaping	1	350,000	350,000
Engineering (3%)	1	820,000	820,000
Contingencies (5%)	1	1,365,000	1,365,000
Total for transfer station			29,964,000
Cost/m^3 based on 72,700 m^3/yr over 20 yrs			21 Ft./m^3

Table 14. Estimated Costs for the Ozd/Putnok Compacted Transfer Station

Item	No. and Units	Ft./Unit	Total Unit Cost
Fencing	400 linear meters	1000	400,000
Scale and scale house	1	4,500,000	4,500,000
Electrical service to site	1	250,000	250,000
Septic tank	1	100,000	100,000
Paved access roads	800 m^2	1,670	1,336,000
Concrete retaining wall	30 linear meters	51,000	1,530,000
Concrete pad	90 m^2	7,550	680,000
Excavation and backfill	1,500 m^3	350	525,000
Paved maneuvering area	3,500 m^2	1,670	5,845,000
Compaction unit	1	1,998,000	1,998,000
Compaction containers	2	833,000	1,666,000
Transport truck	1	9,275,000	9,275,000
Landscaping	1	350,000	350,000
Engineering (3%)	1	713,000	713,000
Contingencies (5%)	1	1,188,000	1,188,000
Total for compacted-type transfer station			30,356,000
Cost/m^3 based on 72,700 m^3/yr over 20 yrs			21 Ft./m^3

Components of the operating costs of the facility will consist of labor costs for the scale house attendant and a truck driver for the transfer truck, and the operating costs of the equipment. The estimated costs for annual operation are shown in **Tables 15 and 16.**

Table 15. Operating Costs, Uncompacted-Type Transfer Station

Item	Quantity	Ft./ Unit	Total Cost (Ft.)
Labor, scale house attendant	2	240,000	480,000
Labor, truck driver	2	360,000	720,000
O&M of vehicles	1	30,576,000	30,576,000
Utilities and miscellaneous	1	300,000	300,000
Total operating costs			32,076,000
Operating costs/m^3			441 Ft./m^3

Table 16. Operating Costs, Compacted-Type Transfer Station

Item	Quantity	Ft./ Unit	Total Cost
Labor, scale house attendant	2	240,000	480,000
Labor, truck driver	2	360,000	720,000
O&M of vehicles	1	17,470,000	17,470,000
Utilities and miscellaneous	1	300,000	300,000
Total operating costs			18,970,000
Operating costs/m^3			261 Ft./m^3

The cost to transfer and dispose of each cubic meter of waste is as shown below. The disposal cost per cubic meter reflects the existing costs at the Kazincbarcika landfill of 100 Ft./m^3. The transfer station costs are the two operating costs shown above, divided by 72,700 m^3/yr (**Table 17**).

Table 17. Cost of Transfer and Disposal (Ft./m^3)

Station Type	Capital Cost	Transfer Costs	Disposal Costs	Total Costs
Uncompacted	21	441	100	562
Compacted	21	261	100	382

3.2.4 Estimated Cost to Use Improved Landfill in Ozd

In order to make an informed decision of whether to construct a landfill in Ozd or a transfer station between Ozd and Putnok, planners will need to review a comparison of the costs of the two options. The costs of improving the Ozd landfill have been calculated by the LEM team. The costs of the improvements include upgrading the present landfill and constructing a new disposal area adjacent to the upgraded area.

Short-term and long-term landfill improvement costs are shown in **Table 18.**

Table 18. Cost of Landfill Improvements (Ft.)

Type of Cost	Capital Improvements	Closure	Total
Short-term	25,046,000	---	25,046,000
Long-term	18,379,000	26,200,000	44,579,000
Total	43,425,000	26,200,000	69,625,000

The capacity of the improved landfill has been estimated to be 920,000 m^3. At this size, the landfill would last approximately 20 years at a density of 300 kg/m^3 if the present type of landfill operations were to continue. The site could last for about 34 years if waste were properly compacted to a density of 500 kg/m^3. Compaction would decrease the annual capital payments to:

$$69{,}625{,}000 \text{ Ft.} \div 34 \text{ yrs} = 2{,}048{,}000 \text{ Ft./yr.}$$

Based on a waste stream of 45,000 m^3, the capital cost is 46 Ft./m^3.

To upgrade the operations to an acceptable level with daily cover, proper compaction, and proper grading of the incoming waste, the annual cost to operate is estimated in **Table 19**.

Table 19. Estimated Annual Operating Costs of Ozd Landfill

Item	Cost (Ft.)
Bulldozer use (1,300 Ft./hr),* 2,500 hr/yr	3,250,000
Daily cover, 200 Ft./m^3, 3,180 m^3/yr	636,000
Labor, equipment operator	240,000
Labor, daily maintenance/gate attendant	120,000
Miscellaneous	200,000
Total landfill operations	4,446,000
Operating costs/m^3	99 Ft./m^3

*Rental rate based on current rate paid by City of Gyor for a large bulldozer.

3.2.5 Cost Comparison, Landfill/Transfer Station

Table 20 compares the costs of operating a landfill and the two types of transfer stations.

Table 20. Comparative Costs for Three Options

Option	Cost (Ft./m^3)
Uncompacted waste transfer station	562
Compacted waste transfer station	382
Improved landfill	145

Based on the costs of transfer versus landfill, it appears that Ozd should consider constructing the improvements at its own landfill and continue operating the facility. However, further consideration should be given to the realities of operating a landfill at the present site once environmental

investigations are performed. These investigations may reveal contamination of the environment that may force the city to discontinue use of the site.

3.3 Overall Conclusions Regarding Ozd

The City of Ozd needs to work with the Komszolg Company to improve the management of the solid waste function. A detailed budget setting forth the revenues and expenditures of the solid waste system needs to be established as soon as possible to guide the company and the city officials in making sound decisions regarding the expenditures, the fees to be charged, and the subsidies required. In addition, attention needs to be given to improving the billing and collection of the refuse charges. The solid waste systems need to be operated on a businesslike, enterprise-fund basis.

The city and the company need to give proper attention to the establishment of both a preventive maintenance program for the refuse vehicles and an adequate replacement program.

Most importantly, the city needs to take corrective measures to improve the landfill so that it is operated in an environmentally sound fashion and becomes a better neighbor for the residents living in the vicinity. The recommended short-term solution is the best way to accomplish that objective.

The city will need to give careful attention to the long-term option and the transfer station before deciding what the best solution will be for its solid waste disposal system.

4 IDENTIFICATION OF TRAINING AND TECHNICAL ASSISTANCE NEEDS

The LEM team identified a variety of training and technical assistance needs during its discussions with municipal, county, and national officials. The team also discussed training and technical assistance issues with officials of the Public Cleansing Association and the Hungarian National Association of Local Authorities. The discussions covered not only the needs but also ways in which the training and technical assistance efforts might be continued after the LEM Project had concluded its work in Hungary.

4.1 Technical Assistance Projects

Based on input from Hungarian officials as well as its own observations, the LEM team identified six technical assistance (TA) projects—three in connection with its research and recommendations concerning the Sajokaza regional landfill (see Section 3.2.2), and three in connection with its work in Ozd (see Sections 2.3.2 and 2.4.3).

The six technical assistance projects not only will benefit the particular local officials with whom the LEM Project will be working, but the resulting information and material also can be shared with all of the local governments in Borsod County. The projects will be developed in such a way as to involve county and national agencies in the activities, but also to involve municipally oriented national associations so that the materials can continue to be made available to communities throughout Hungary.

The currently identified technical assistance projects are identified in **Table 21**. A more detailed description of each of the seven technical assistance projects is provided in the text below.

4.1.1 Landfill Operations and Maintenance Manual

4.1.1.1 Purpose and Description

All of the landfills visited by the LEM team could benefit from having an operations and maintenance manual available to guide their supervisors and workers. The LEM team suggests that technical assistance also be provided so that a landfill O&M manual can be prepared for the Sajokaza Regional Landfill, which is not yet in operation. The manual will help to ensure that the landfill is operated in a manner that properly protects people's health as well as the environment. In addition, it will help the managers of the new landfill to properly budget for its operation and maintenance.

The manual will also be useful for other communities as they try to improve the operation and maintenance of their landfills; further, it will serve as the basis for a training course on landfill O&M.

Table 21. LEM-Recommended Technical Assistance Projects

Topic	Resources	Clients
1. Landfill Operations and Maintenance (O&M) Manual	• U.S. landfill specialist • Hungarian Public Cleansing Association	Ozd, Edeleny, and Kazincbarcika
2. Waste Measurement	• Keviterv Engineering Firm • U.S. landfill specialist	Ozd, Edeleny, and Kazincbarcika
3. Oversight Mechanism	• U.S. utility management specialist • Hungarian attorney • Hungarian Institute of Public Administration • Hungarian National Association of Local Authorities	Edeleny, Kazincbarcika, and 33 other local governments
4. Budget Format and Manual	• U.S. financial specialist • Hungarian Public Cleansing Association • Hungarian National Association of Local Authorities • Ministry of Finance	Ozd, Edeleny, Kazincbarcika, and other Borsod County municipalities
5. Fee Collection Program and Manual	• U.S. financial specialist • Hungarian Public Cleansing Association • Ministry of Finance	Ozd, Edeleny, and other Borsod County municipalities
6. Vehicle Maintenance Program and Manual	• U.S. vehicle maintenance specialist • Hungarian Public Cleansing Association • Hungarian private sector company specialist	Ozd, Edeleny, and Kazincbarcika

4.1.1.2 Resources

The technical assistance effort will be led by a landfill specialist from the United States who is thoroughly familiar with landfill O&M procedures. In addition, assistance will be sought through the Hungarian Public Cleansing Association in the form of a Hungarian specialist with experience in landfill O&M procedures.

An advisory committee will be established, composed of representatives of the following city sanitation operations, both public and private: Miskolc, Ozd, Edeleny, and MULL/TESCONT Ltd.

In addition, representatives will be invited from the Hungarian Public Cleansing Association, the Ministry of Environment and Regional Policy, the Borsod County Environmental Office, the North Hungarian Environmental Protection Inspectorate, the North Hungarian Water Directorate, and the Health Directorate.

The advisory committee will be asked to meet three times to assist the resource people in the program design, to review the work in progress, and to review the manual when it is completed.

It is estimated that the effort will require two trips by the TA specialist from the United States, one for 3 weeks and one for 10 days, and that the project can be completed in a 3-month period.

4.1.2 Waste Measurement Project

4.1.2.1 Purpose and Description

The almost complete absence of scales at Hungarian landfills has made it difficult for the LEM team to gather accurate data on the amount of waste being placed in the sites that were examined. Many of the computations included in the report in terms of landfill capacities, number of trucks required, etc., are therefore subject to question. The LEM team believes that steps should be taken immediately to begin to gather a good database on tonnage and cubic meters of waste at the four landfills that have been under observation and study.

Installing a permanent scale is fairly expensive (4,500,000 Ft. with a scale house) and time-consuming. Portable scales are available at a much lower price (350,000 Ft.), and these could be used to obtain readings at the various sites. A Miskolc engineering firm would be selected to be trained in the use of the scale and to take readings at four of the landfill sites: Edeleny, Ozd, Kazincbarcika, and Szendro. It is estimated that the project will require approximately 40 days of time for a local technician to take the readings at the four sites and compile them in written form. The scales will be used for 10 days each at the Ozd and Kazincbarcika landfills and 5 days each at the Edeleny and Szendro landfills.

Following completion of the readings, consideration could be given to basing the portable scale with the Borsod County Environmental Office, where other communities could use it to measure the amount of waste being brought into their landfills. In that way, an accurate solid waste database could begin to be assembled for the entire county.

4.1.2.2 Resources

The technical assistance effort will be overseen by the LEM Project Manager. He will be able to call upon a landfill specialist based in the United States. A Miskolc engineering firm will be selected to take the initial reading and assemble the data in report form.

An advisory committee will be established to work with the engineering firm in the collection of the data. It will include representatives of Ozd, Edeleny, MULL/TESCONT Ltd., the County Environmental Office, and Szendro. The committee will meet three times: once to review the procedure of the project before it begins, once to review the work in progress, and once to review the report after it is compiled. No trips from the United States by the landfill specialist should be

necessary since that person can review the project design and the study results as they are sent to him or her. The study can be accomplished within 2 months following the arrival of the equipment in Borsod County.

4.1.3 Oversight Mechanism

4.1.3.1 Purpose and Description

The LEM team believes that some type of oversight mechanism should be developed regarding the tipping fees at the Sajokaza Regional landfill after it goes into operation. The landfill was constructed using public funds. On the basis of several evolutionary changes, the landfill is now owned by MULL/TESCONT Ltd., a joint public-private firm. It is likely that waste from approximately 30 communities will be placed in the landfill. In effect, the firm will have a monopoly operation with regard to solid waste disposal for those communities.

At present, Hungary does not have any type of public utility commission to oversee and approve rates for monopolistic services such as power and telephone. The LEM team has discussed the situation with representatives of both MULL/TESCONT Ltd. and the City of Kazincbarcika. Both agencies indicated their willingness to explore some type of oversight mechanism.

4.1.3.2 Resources

A United States specialist in utility management and rate setting will lead the project. The project will require the U.S. specialist to make two trips to Hungary: one for 4 weeks and one for 10 days. He or she will be assisted by a Hungarian attorney with knowledge of municipal utility organizations whose services will be sought in consultation with the Hungarian Association of Local Government Authorities, the Hungarian Public Cleansing Association, the Ministry of Finance, and the Institute of Public Administration.

An advisory committee will be formed with representatives of the following communities and organizations: Sajokaza, Kazincbarcika, MULL/TESCONT Ltd., the Borsod County Environmental Office, the Borsod Office of the Special Representative of the President, the Hungarian Association of Local Government Authorities, the Hungarian Public Cleansing Association, the Ministry of Finance, and the Ministry of Environment and Regional Policy.

The advisory committee will be asked to meet twice: once to discuss the problem and how best to approach it and once to review the report and suggest necessary changes. It is anticipated that the project will require 3 months to complete.

4.1.4 Solid Waste Budget Format and Manual

4.1.4.1 Purpose and Description

The LEM team identified a pressing need for the development of a sound, detailed budget for the solid waste organization in Ozd. Although the technical assistance project will focus largely on Ozd, the other communities with which the team worked can also benefit from the exercise. The project

will require a careful analysis of the expenses required to properly operate and maintain the Ozd solid waste collection and disposal systems.

The project will also include an analysis of the revenues for the system. The budget will be separated into two cost centers: collection and disposal, so that the managers and policy decision-makers will be in a position to make decisions regarding rates; and establishment of contracts with outside communities for collection and/or disposal. Capital needs will be examined as well as operating costs, and a 5-year solid waste capital budget will be established as part of the project.

The budget manual will be written so that it can be used in other communities for training well as operating purposes. Attention will be given to manual as well as computerized budget reporting systems. Report formats will be suggested that can be useful to both managers and policymakers.

4.1.4.2 Resources

The project will be led by a United States municipal financial specialist with experience in enterprise operations. The project will require the specialist to make two trips to Hungary: one for 4 weeks and one for 10 days. The U.S. specialist will be assisted by a Hungarian financial specialist with experience in municipal utility operations.

An advisory committee will be established to work with the two specialists and will be composed of representatives of the following communities and organizations:

Ozd
Edeleny
Kazincbarcika
Ministry of Finance
Hungarian Public Cleansing Association
Hungarian Association of Local Government Authorities
Hungarian Institute of Public Administration
Miskolc University
Ministry of Environment and Regional Policy
Borsod County Environmental Office.

The advisory committee will be asked to meet twice: once at the beginning to agree on the project design and once at the end to review the manual and make necessary changes and suggestions. The project can be completed within 4 months following the arrival of the U.S. specialist.

4.1.5 Refuse Fee Collection Program and Manual

4.1.5.1 Purpose and Description

Several of the communities are experiencing difficulties with the collection of refuse fees from their citizens. This is particularly true in Ozd because of the high unemployment rate. The project is designed so that it can help Ozd to analyze the reasons for the high level of uncollected fees and to develop strategies for improving the level of collections.

The project will also enable Ozd to examine alternate methods for reimbursing its fee collectors as a way of improving the percentage of collections. In addition, the study will enable the Ozd policymakers to examine alternate ways of charging the waste fee based on residences instead of rooms (as is the case currently).

The manual will be written so that other communities can use it for both training and as an operating guide.

4.1.5.2 Resources

The same U.S. municipal finance specialist who will be used for the budget format and manual might also be called upon for the collection manual if the decision is made to proceed with both technical assistance projects. It will require two trips by the specialist, one for a 3-week period and one for 10 days. The U.S. specialist will be assisted by a Hungarian financial specialist with experience in municipal utility financial operations.

The same advisory committee that was recommended for the budget project can also work on the collections manual. The project can be completed within 4 months following the arrival of the U.S. specialist. In the event that both the budget and the collection manual projects are done at the same time, the two projects can be completed together within 6 months.

4.1.6 Vehicle Maintenance Program and Manual

4.1.6.1 Purpose and Description

Solid waste collection and disposal equipment is very expensive in Hungary. In addition, much of it is manufactured outside of Hungary, which sometimes complicates the obtaining of parts for timely repairs. Because of insufficient budgets, spare parts are often not stocked and equipment remains idle longer than it should. Formal preventive maintenance programs were not in evidence in the communities visited by the LEM team. Once again, Ozd, because of its serious financial problems, is suffering more than most of the communities with regard to equipment downtime.

A technical assistance effort will be mounted in Ozd to work with KOMSZOLG Company to develop an effective solid waste equipment maintenance program, including a formal preventive maintenance component. The program will be designed so that it can be maintained either manually or by computer. The manual will be designed so that it can be used by other communities as well as Ozd for both training and operational purposes.

4.1.6.2 Resources

A U.S. specialist in vehicle maintenance programs will lead the project. The U.S. specialist will need to make two trips to Hungary, one for 3 weeks and one for 10 days. He or she will be assisted by a Hungarian vehicle maintenance specialist with a knowledge of local government operations and problems.

An advisory committee will be formed composed of representatives of the following local governments and organizations: Ozd, Edeleny, KOMSZOLG Company, Kazincbarcika, the

Hungarian Public Cleansing Association, MULL/TESCONT Ltd., and the Borsod County Environmental Office. The committee will need to meet twice, once to discuss the design of the study and once to review the report and make any necessary suggestions or corrections. The project can be completed within 4 months following the arrival of the U.S. specialist.

4.2 Training

The LEM team, with the help of Hungarian local and national officials, identified 10 possible training programs and workshops that would be of assistance to local governments. Four of the programs would be based on manuals being developed under the technical assistance efforts discussed in Section 4.1. All of the training programs will be developed by the LEM Project in such a way that the curriculum materials can be left behind, and that appropriate Hungarian organizations can use the materials to continue the training effort.

The LEM team identified one demonstration project, six training courses, and three workshop projects that could be considered by Hungarian local and national officials in connection with improving the operation and maintenance of the solid waste sector. They are listed in **Table 22** (not in any order of priority).

Table 22. LEM-Recommended Training Projects

Topic	Possible Resources	Clients
1. Landfill Demonstration	• Private equipment firm • U.S. landfill expert • Hungarian landfill expert	Ozd, Edeleny, Karzincbarcika, Miskolc, TESCONT, Borsod County officials
2. Landfill Operation & Maintenance Course	• Hungarian Public Cleansing Association • Miskolc University • U.S. landfill expert • Hungarian landfill expert • Ministry of Environment and Regional Policy (MERP)	LEM communities, Borsod County, Miskolc, Kazincbarcika, TESCONT
3. Maintenance of Hydraulic Systems Course	• Hungarian Public Cleansing Association • Private firm • Manufacturer • Hungarian local government expert	LEM communities, Kazincbarcika, Miskolc, other Borsod County communities

Topic	Possible Resources	Clients
4. Vehicle Records & Preventive Maintenance Course	• Hungarian Public Cleansing Association • Hungarian local government expert • U.S. expert • Private firm expert	LEM communities, Kazincbarcika, Miskolc, other Borsod County communities
5. Course on Tendering Process	• U.S. expert • Hungarian expert • Hungarian Public Cleansing Association • Institute of Public Administration • Ministry of Finance • Miskolc University	Same as above
6. Enterprise Budgeting Course	• Ministry of Finance • U.S. expert • Hungarian local government expert • Hungarian Institute of Public Administration • Hungarian Association of Local Authorities • MERP • Miskolc University	Same as above
7. Enterprise Accounting Course	Same as above	Same as above
8. Enterprise Revenue Collection Course	Same as above	Same as above
9. Enterprise Management Workshop	• U.S. expert • Hungarian moderator • World Bank expert	Ministry of Finance, MERP, Hungarian Institute of Public Administration, Miskolc University, Hungarian Public Cleansing Association, Hungarian Association of Local Authorities, LEM Communities, Borsod County

Topic	Possible Resources	Clients
10. Workshop on Local Government Bank	• European Bank for Reconstruction and Development • MERP • Ministry of Finance • New bank officials	Same as above
11. Workshop on Regional Approaches to Solid Waste	• U.S. expert • Hungarian expert • Ministry of Interior	Same as above

4.2.1 Landfill Demonstration

4.2.1.1 Description

The LEM team has identified a need for better landfill operation in terms of restricting the size of the daily working area, covering the daily work area, and compacting the waste to increase the capacity and life span of the landfill. None of the landfills visited by the team had adequate compaction or earthmoving equipment at the landfill on a full-time basis. The landfill managers and operators are not familiar with the types of landfill techniques being discussed by the LEM team.

The team would like to make arrangements with a Hungarian equipment supplier to bring a tracked compactor to one of the landfills for the purpose of demonstrating the proper procedures. The demonstration could be done in one location or in several, depending upon the willingness and availability of the equipment supplier. It is possible that the LEM Project may have to rent the necessary equipment for the demonstration training if a willing supplier cannot be found.

The demonstration session could be done in one day and managers and equipment operators from several of the landfills studied by the team would be invited, including Ozd, Edeleny, and Kazincbarcika. In addition, representatives of the following organizations would be invited to attend the demonstration training: the Borsod County Environment Office, the Health Directorate, the North Hungarian Water Directorate, the North Hungarian Environmental Protection Inspectorate, the Hungarian Public Cleansing Association, the City of Miskolc, and the Ecological Institute for Sustainable Development. An effort should be made to include both elected and appointed municipal and county officials in the list of invitees.

4.2.1.2 Resources

The demonstration training session would draw upon the services of a U.S. landfill specialist with in-depth knowledge of landfill O&M. A special trip to Hungary will not be scheduled; instead, the work of the specialist will be done as part of one of the technical assistance projects. The specialist will work in conjunction with a Hungarian landfill specialist with extensive knowledge of landfill procedures. That individual will be responsible for the logistics of the demonstration, including working with the equipment manufacturer and sending out the necessary invitations.

Based on the demand and the availability of equipment, the 1-day demonstration can easily and inexpensively be repeated in other locations either inside or outside of Borsod County.

4.2.2 Landfill Operation and Maintenance Procedures Course

4.2.2.1 Description

Section 4.1 recommended the development of a manual for the proper operation and maintenance of a landfill, including the maintenance of equipment and facilities. The manual could easily be adapted for use as a training resource for teaching landfill managers and operators. The course could be used not only for the communities in which the LEM team worked but also for the rest of the Borsod County communities with functioning landfills.

Depending on the further analysis of the training content and the individuals to be trained, the curriculum will probably be based on a 2- or 3-day format. A field trip to an operating landfill could be part of the training exercise. In order to stimulate participation in the course, it is tentatively recommended, subject to the curriculum development, that enrollment in the course be limited to a maximum of 25 persons.

4.2.2.2 Resources

A U.S. training specialist will work with an advisory committee to develop the detailed curriculum, using the O&M manual coming from the technical assistance project described above. The Hungarian Association of Local Government Authorities and the Hungarian Public Cleansing Association will be asked to assist in identifying a Hungarian training organization that can assist in the development of the curriculum and the teaching of the course.

An advisory committee will be established, composed of representatives invited from the following communities and organizations: Ozd, Edeleny, MULL/TESCONT Ltd., KOMSZOLG Company, the Borsod County Environment Office, the Health Directorate, the North Hungarian Environmental Protection Inspectorate, and the Ministry of Environment and Regional Policy.

The advisory committee will meet with the resource people three times: once to discuss the curriculum needs, once to review the completed curriculum, and finally to observe and comment on the initial training course.

The curriculum will be developed in such a way that appropriate Hungarian institutions can use it to continue the training course beyond the life of the LEM Project. It is estimated that it will require approximately 3 months to develop the curriculum and present the pilot training session after the arrival of the U.S. training specialist.

4.2.3 Maintenance and Repair of Hydraulic Systems Course

4.2.3.1 Description

The Hungarian Public Cleansing Association indicated that one of the training needs identified by its membership was the maintenance and repair of hydraulically operated equipment. Increasing

amounts of solid waste collection and disposal equipment contain hydraulic components. Many of the solid waste organizations do not have mechanics with training in that type of equipment. Unless expensive equipment can be returned to duty quickly following a breakdown, it can result in uncollected waste and citizen complaints.

The LEM team believes that an effort needs to be made to identify manufacturers who would be willing to help design hydraulic repair curriculums and to teach the courses. The courses are likely to be 1 to 2 days in length and may require demonstration equipment for teaching purposes.

4.2.3.2 Resources

It is recommended that the LEM Project enter into contract with the Hungarian Public Cleansing Association to provide a training resource person. This person would work with solid waste equipment suppliers and manufacturers to develop a training course for repairs and preventive maintenance of the hydraulic components of solid waste collection and disposal equipment. The Association will develop the curriculum, select the faculty, invite participants, and handle the logistics for the training facilities and equipment required to teach two pilot courses. A further condition of the agreement will be that one of the sessions will be held in Borsod County and the other one in Gyor, where the LEM Project is also active.

The LEM Project will provide the services of a training evaluation person to attend the courses, evaluate the curriculum, and prepare a summary report on the course. It is estimated that it will require a period 6 months, following the signing of an agreement with the Association, to design and administer the two training sessions and evaluate the course. Following the end of the agreement period, the association would be free to administer the training on a fee-supported basis to its membership.

4.2.4 Vehicle Records and Preventive Maintenance Course

4.2.4.1 Description

The LEM team previously identified the need for a technical assistance project for the purpose of developing a vehicle records and preventive maintenance program for the Ozd solid waste organization. The project will include a manual that can be used as the basis for developing a training course. There is a need in all of the communities visited by the LEM team to improve vehicle records and preventive maintenance.

4.2.4.2 Resources

A contract should be developed with the Hungarian Public Cleansing Association in cooperation with a Hungarian training institution to design and implement a training program, using the manual on vehicle records and preventive maintenance as the base. The U.S. specialist who developed the manual should be available for 1 week to meet with the Hungarian trainers to consult on the curriculum material. It is assumed that the course would be approximately 2 to 3 days in length, subject to the detailed curriculum development. The agreement should call for the presentation of two sessions of the course, one in Borsod County and one in Gyor. Following the completion of the contract requirements, the association should be free to present the course under its own auspices

on a fee-supported basis. It is estimated that it will require 6 months to design the curriculum and present the two courses following the signing of the agreement with the Association.

The LEM Project should employ a training specialist to evaluate the curriculum and the training presentations and to prepare a report.

4.2.5 Course on Tendering Process

4.2.5.1 Description

The LEM team observed a great deal of private-sector interest in becoming involved in solid waste collection and disposal. In many cases, the communities were proceeding without the input of an experienced solid waste consultant, one who was not in the business of selling services or equipment. As a result, tender documents were often vague and incomplete and the communities did not have a clear idea of exactly what they wanted to have the private companies do. In effect, they were passive participants in the tendering process. In many cases, the proposals received by the communities were so varied that it made analysis quite difficult and sometimes resulted in a second round of tendering.

It is extremely important that communities wishing to entertain proposals from private firms take the necessary time, using a qualified engineering consultant, to prepare a clear and complete tender document. A great deal of money is at stake, as well as an increasingly vital community service. The private firms know exactly what they want to accomplish. It is important that communities be just as well prepared for the tendering process.

4.2.5.2 Resources

A U.S. tendering specialist, in collaboration with a Hungarian tendering specialist, will help prepare an outline for a course on the tendering process, with an emphasis on solid waste. In addition, a Hungarian training specialist will be involved in the course development.

An advisory committee will be established to work with the three specialists, composed of representatives of the Hungarian Public Cleansing Association, the Hungarian Association of Local Authorities, the Hungarian Institute of Public Administration, Miskolc University, and the Ministry of Finance. The advisory committee will be expected to meet three times: once before the specialists begin their work; once to review the course outline when it is finished; and finally, after the two pilot courses have been presented, to approve any necessary changes. One of the pilot courses will be given in the Miskolc area and one in the Gyor area.

The intention of the course development will be to leave behind a course outline and teaching materials that one or more Hungarian educational institutions can use to continue the course offering after the LEM Project is completed.

The U.S. expert will be expected to spend a total of 6 weeks during two trips to Hungary for the project. It is anticipated that the work can be completed, including the conduct of the two pilot courses, within a 6-month period following the selection of the three specialists.

4.2.6 Enterprise Budgeting Course

4.2.6.1 Description

In the technical assistance section above (Section 4.1), the LEM team recommended a TA project in Ozd to help the city refuse agency develop a detailed solid waste budget, including both expenses and revenues. The project will result in a budget format and also a budget manual. The manual can also serve as the basis for a training program on enterprise budgeting, a topic not yet well understood by many Hungarian solid waste managers and financial specialists.

In many cases, elected officials are being asked to make key decisions regarding solid waste fees and capital investments without having credible budgetary information. Many communities do not have a 5-year capital investment plan for their solid waste systems. The budget document is key to understanding and controlling the improvement and financial health of the system. The subject needs far more attention from local officials than it is currently receiving.

4.2.6.2 Resources

A U.S. training specialist with experience in financial training will design the curriculum, in consultation with a Hungarian finance specialist with a knowledge of local government utility systems. The services of the U.S. training specialist will be needed for two trips totaling 5 weeks. The Hungarian specialist will be selected from a training institution based on consultations with the Advisory Committee.

The same committee that advised on the development of the budget manual could also work on the design of the curriculum, since it will be based on the manual. It is estimated that it will require a period of 4 months from the signing of an agreement with a Hungarian training institution, and following the receipt of the completed budget manual, to complete the curriculum design and present two pilot courses, one in Borsod County and the other in Gyor. The expectation is that the Hungarian training institution selected to work on the program will continue to offer the course in cooperation with the Hungarian Public Cleansing Association and the Hungarian Association of Local Government Authorities.

4.2.7 Enterprise Accounting Course

4.2.7.1 Description

Many of the local officials and public sanitation company officials who are responsible for solid waste activities do not understand enterprise accounting systems and procedures. With the creation of a Hungarian Local Government Bank (with the assistance of the EBRD), hopefully in early 1994, loan funds will become available to local governments for infrastructure improvements, including solid waste systems. The new bank officials, as well as international donors and lenders, will expect to see financial reports based on enterprise accounting standards. In many cases, current local government accounting procedures will not meet those standards. It is important that local officials begin to understand and implement enterprise accounting.

4.2.7.2 Resources

A U.S. training specialist with experience in enterprise accounting, in collaboration with a Hungarian specialist, will prepare a course outline for enterprise accounting. The same committee that advised on the development of an enterprise budgeting course can also help develop the accounting course. In addition, expertise could be requested from the new Local Government Bank as well as the World Bank and the EBRD. It is estimated that the U.S. specialist will need to travel to Hungary twice for a combined period of 8 weeks, and that the development of the course and the teaching of two pilot courses at Miskolc and Gy . will take a period of 6 months following the identification of the Hungarian specialist.

4.2.8 Enterprise Revenue Collection Course

4.2.8.1 Description

The LEM team recommended a technical assistance project for Ozd in Section 4.1 above, designed to improve the procedures as well as the rate of solid waste fee collections. One of the products of the project will be a manual that could serve as the basis for a training program. The LEM team has observed a number of instances where the rate of collection for refuse fees is unacceptably low. Local governments are not used to having all of the financial responsibilities that have been thrust upon them by the 1990 local government law. Hungary, like most countries, has been experiencing an economic downturn and high unemployment. Local officials are increasingly feeling the pressures from their constituents regarding higher municipal fees and taxes.

However, some communities have a much higher rate of collection than others; management and collection procedures are quite varied. In many cases, communities can learn valuable lessons from each other. It is an opportune time to develop and administer a training program designed to improve the collection of solid waste (and other) fees in Hungarian local governments.

4.2.8.2 Resources

A U.S. training specialist with experience in financial training will develop the training curriculum based on the manual on fee collection developed under the technical assistance project. It would be desirable to call upon the same Hungarian training institution and specialist who will be developing the budgeting course curriculum, in the event the decision is made to proceed with both training programs. The services of the U.S. training specialist will be needed for two trips totaling 5 weeks. The expectation is that the training institution, in cooperation with the Hungarian Association of Local Government Authorities and the Hungarian Public Cleansing Association, will continue to offer the course after the LEM Project is completed.

Likewise, the same Hungarian finance specialist and the same committee that advised on budget training could be used in order to reduce costs and logistical problems. It is estimated that the development of the curriculum and the holding of two pilot courses, one in Miskolc and one in Gyor, will require a period of 4 months.

4.2.9 Enterprise Management Workshop

4.2.9.1 Description

Because of the increasing number of local managers involved in utility enterprise operations such as water, sewage, and solid waste, there is a growing need for management training. Some of the individuals are new to utility operations and some are new to government management jobs. Many new managers have insufficient knowledge concerning cost recovery concepts, rate setting, budgeting, the necessity for public education, and enterprise accounting. It will be important for Hungary's national and local officials to turn their attention toward the development of a professional cadre of utility managers.

It is perhaps too large an effort for the LEM Project to undertake on its own. However, a start could be made in terms of having the LEM Project bring a group of people together to define the problem and consider the options for solving it. The first step could be the organizing of a workshop on the topic of professional training needs of municipal utility organizations.

4.2.9.2 Resources

The LEM Project would provide a training resource specialist to work with an advisory committee made up of Hungarian national and local officials, including representatives of the following cities and organizations:

Gyor
Hungarian Association of Local Government Authorities
Hungarian Public Cleansing Association
Ministry of Finance
Ministry of Interior
Edeleny
Borsod County
Miskolc
MULL/TESCONT, Ltd.
Kazincbarcika
Ministry of Environment and Regional Policy
Institute of Public Administration
Ozd.

The training resource people will develop an outline for a 2-day workshop to be held in Budapest, following which a paper will be prepared outlining the findings and recommendations arising from the conference. The LEM Project will contract with the Institute of Public Administration concerning their serving as secretariat for the workshop, including handling logistics and invitations and preparing and disseminating the workshop report.

4.2.10 Workshop on Local Government Bank

4.2.10.1 Description

As mentioned earlier, the European Bank for Reconstruction and Development has been working with the Government of Hungary to create a new Local Government Bank. An institution would then be available from which local governments could borrow money for infrastructure improvements, including solid waste systems. The new bank may be in operation as early as the first half of 1994.

Local officials will need to understand the type of applications, financial statements, and feasibility studies that the bank will require to support loan applications. The bank will need a much more comprehensive financial statement and budget than may have been required under the present national government grant program. Local officials could benefit from workshops in both the Miskolc and Gyor areas to acquaint them with the bank's procedures as soon as possible after the bank has begun operation.

4.2.10.2 Resources

The LEM Program, using the services of a U.S. training specialist, would work with the Hungarian Association of Local Authorities, the Ministry of Finance, the Ministry of Environment and Regional Policy, and the new bank's officials to develop a 1- or 2-day workshop. The project would call for two pilot workshops, one in Gyor and one in Miskolc. The workshop outline, following any improvements deemed necessary after the two pilot workshops, would be given to the new bank or another appropriate Hungarian institution. Additional workshops could be provided in other areas of Hungary.

4.2.11 Workshop on Regional Approaches to Solid Waste

4.2.11.1 Description

The 1990 Local Government Law delegated a great deal of authority to local governments and greatly reduced the powers of county governments. Although the law discusses regional arrangements that can be made, local officials often do not understand the procedures. Solid waste landfills, because of their high cost, are often more feasible financially when designed on a regional basis.

A workshop not only would raise the level of knowledge of local officials regarding regional structures that might be used, but also might suggest the need for additional alternative solutions that could be considered for enactment into law. The workshop should be designed to bring together a variety of local, regional, and national officials to discuss the various options and their respective strengths and weaknesses.

4.2.11.2 Resources

The workshop will be developed by a U.S. specialist in environmental training, but the resource persons will be obtained primarily by invitations to a variety of local, regional, and national officials and organizations. The various organizations invited to participate in the workshop would include, but not be limited to, the following:

Ministry of Interior
Borsod County Assembly
Ministry of Finance
Borsod County Environment Office
Ministry of Environment and Regional Policy
LEM Communities
Regional Representative of the President

Hungarian Association of Local Authorities
Regional Health Organization
North Hungarian Water Directorate
Miskolc University
Ecological Institute of Sustainable Development
Miskolc Chamber of Commerce
TESCONT
Hungarian Institute of Public Administration
Hungarian Public Cleansing Association.

5 GENERAL SUMMARY AND CONCLUSIONS

The activities of the LEM team were carried out in an environment of rapid change. The local government laws and regulations have changed dramatically under the new system and cities have had to assume new responsibilities. In addition, the environmental laws are undergoing a thorough revision and a new law is expected to be introduced into Parliament before the end of the year. Without question, it will impose new requirements and costs on local government, including the solid waste sector.

The national government, as well as the international lending and donor agencies, are strongly advocating regional approaches to the solving of solid waste problems because of the high costs involved in constructing and operating a modern sanitary landfill.

The experience of the LEM team leads it to believe that local officials do not understand, in depth, the various mechanisms that are at their disposal for regional approaches to service delivery. There may even be a need to consider additional regional mechanisms for delivering services that are not available under the existing laws.

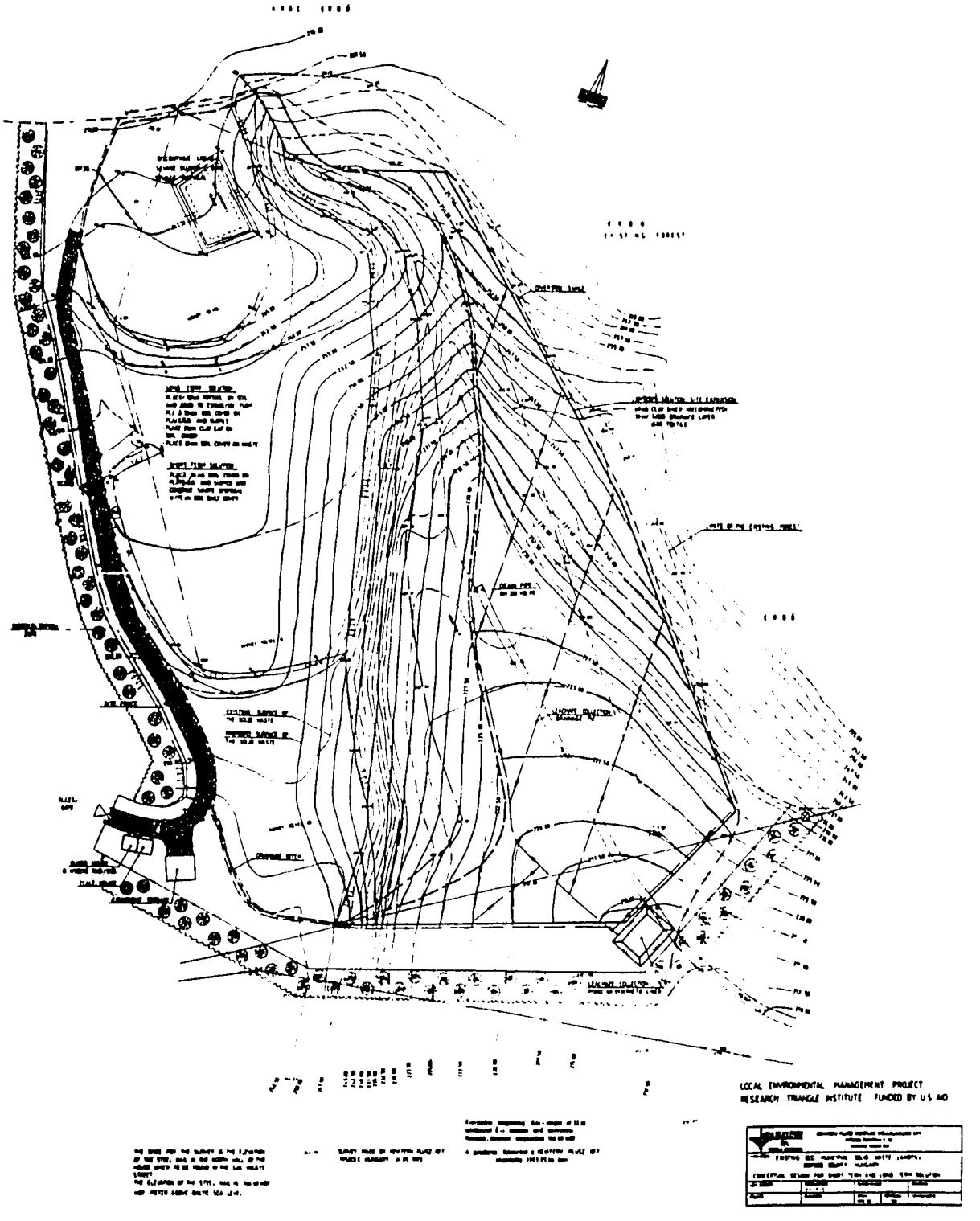
The LEM team also identified a need to assist Hungarian local officials to better understand enterprise activities, particularly the financial ramifications. The team expects an increasing emphasis to develop on enterprise activities in terms of the proposed Hungarian Local Government Bank and the increasing interest of international lending and donor agencies. Solid waste and the other enterprise activities—such as water and sewage—increasingly will have to be run on a businesslike basis if they are to attract loans and other potential financing.

There is a need to attract the prestige and capacity of the regional universities to work with local officials. With such assistance, these local officials could increase their ability to operate their municipalities effectively, and learn to adapt to the new financial and legal changes. The universities are already making a similar effort to help private-sector businesses adapt to the changes they must face.

It is an exciting and challenging period for local officials. Both they and the national government need to give careful consideration to the type of training and technical assistance that will enable Hungary to develop strong and effective local governments over the coming few decades.

Appendix A

Map of Proposed Improvements for Ozd Landfill



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