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Identifying Costs of Solid Waste Management Services

April 1994

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Introduction

The 1993 Virginia General Assembly passed House Joint Resolution 494 establishing a joint subcommittee to study issues surrounding the privatization of solid waste management. Among the committee's findings was that localities vary in the costs they assign to solid waste management. This can have a significant impact on a locality's analysis of whether to continue with public provision of service or to seek privatization. The committee did not believe there should be a mandatory system for determining these costs. It did believe that an outline of solid waste management costs, drawn from those identified by localities and private industry, would be useful to localities in determining the true cost of solid waste operations.

The committee divided the analysis of solid waste management costs into two areas; collection and disposal. Collection includes the costs associated with collection of solid waste and recyclables. Additional costs associated with recycling such as sorting, processing and marketing are not included. Disposal costs are allocated into the six categories: 1) pre-development, 2) initial construction, 3) annual operation, 4) continued development, 5) closure and, 6) post-closure. This outline assumes waste will be disposed of in a landfill. However, the analysis will be helpful if another option, such as incineration, is under consideration. The committee has not addressed the impact of potential revenue generating activities such as energy production from methane or the sale of recyclables.

The committee decided not to assign specific figures or ranges of figures to each expense.[1] Characteristics unique to each locality or region may produce significant variations that will have an impact on each expense.

The potential cost of consultants, who may be used for any aspect listed below is not included in this work sheet. Use of consultants by a locality will depend on the specific requirements of each project and the needs of the locality. Consideration of consultant fees and the direct and indirect costs of consultant selection should not be overlooked.

Several formats for this document were reviewed. The "work sheet" format that is used in this document is the easiest to follow. However, this work sheet should not be considered a substitute for a local authority's own calculation and analysis.

Note on Indirect Costs:

The committee would like to comment on indirect costs because they are often overlooked, not accounted for, or accounted for in separate programs by some localities. Ignoring these costs can lead to an understatement of the true cost of solid waste management, making it difficult to compare the cost of public and private operation. Indirect costs include governmental costs which are not directly linked to a solid waste operation but which are necessary for its existence. These costs include time spent by locality administrators, attorneys, accountants and other employees that is devoted, at least in part, to supporting the governmental role in solid waste management. Support for these employees including office space, materials, and support staff should be included as indirect costs. These costs will vary from locality to locality depending on the local government size and structure. In this document these costs are included within administration costs. The committee has attempted to footnote some of those which may be overlooked.

Not all indirect costs will be forgone if privatization occurs. While it is important for a governmental unit to identify all of its indirect costs, it is more important that it identify those costs which will be actual savings if the service is privatized. For example, a locality will more than likely continue to have an administrator whether or not it privatizes an operation.[2] While privatization may reduce certain indirect costs, other costs are created. These include procurement, transition, administration and contract and service monitoring costs.

In addition to analyzing direct and indirect costs, potential benefits of privatization should be considered. For instance, if a locality maintains a storage facility for twenty vehicles, and then privatizes, either such costs will be shifted to the contract or possibly gains could be realized. Tax revenue may be generated by the privately owned vehicles, and freed storage space could negate the need for rental space or construction of new facilities.

Part One: Landfill Disposal

I. Pre-Development Costs

Pre-Acquisition Site Selection and Evaluation

Land search

- Identification of sites _____
- Site analysis[3] _____
- Legal[4] _____
- Analysis of cost to prepare site _____

Site selection
Local government approval

- Zoning _____
- Condemnation _____
- Public hearings _____
- Information sessions _____
- Public education and promotion _____

Site evaluation

- Environmental due diligence _____
- Comparative analysis of sites _____

Other[5] _____

Administration[6] _____

Contingency[7] _____

Total Pre-Acquisition Cost _____

Land Acquisition Cost

Land[8] _____

Legal _____

Surveys _____

Condemnation[9] _____

Administration _____

Contingency _____

Total Land Acquisition Cost _____

Permitting

Site suitability
"Part A" application

- Full site assessment[10] _____
- Permit application development[11] _____
- Mapping _____
- Permit fee _____
- Public hearing and information sessions _____

Design, operation and closure
"Part B" application

- Engineering and design plans _____
- Permit fee _____
- Public hearings and information sessions on draft permit _____

Other potential permits (on and off-site)[12]

- Wetlands _____
- VDOT approval _____
- Erosion and sediment control _____
- Storm water management _____
- VPDES _____
- POD _____
- Building _____
- Waste water treatment facility _____

Administration[13] _____

Contingency _____

Total Permitting Cost _____

Total Pre-Development Cost _____

II. Initial Construction Costs

Acquiring financing _____

Construction engineering services [14] _____

Construction management and inspection _____

General site excavation and land clearing [15] _____

Erosion and sediment control _____

Storm water management facilities _____

Local infrastructure upgrading [16] _____

Liner and installation

- Synthetic liner _____
- Clay liner _____
- Filter fabric _____

Leachate collection and treatment system [17] _____

Other site improvements

- Entrance, access roads, gates, signs, fencing, lighting _____
- Site landscaping _____
- Truck scales, weighing system _____
- Scalehouse and office building _____
- Equipment maintenance facility _____
- Citizen drop-off, recycling area _____
- Miscellaneous site paving _____
- Miscellaneous facilities _____

Third party construction quality assurance testing and monitoring [18] _____

Administration _____

Contingency _____

Total Initial Construction Cost _____

III. Annual Operation

Personnel costs [19] _____

Utilities and maintenance [20] _____

Equipment

- Purchase, lease or rental _____
- Operations and maintenance [21] _____

Interest and other financial costs [22] _____

Environmental monitoring [23] _____

Engineering services _____

Insurance [24] _____

Financial assurance [25] _____

Leachate

- Treatment _____
- Pretreatment _____
- POTW _____
- Transportation: truck vs. pipeline _____
- O & M of collection system _____

O & M of methane system _____

Daily Cover

- Off-site purchase and transportation _____
- On site movement _____

Administration [26] _____

Contingency _____

Total Annual Operation Cost _____

IV. Continued Development Cost

Methane monitoring and control system [27]

- Gas wells _____
- Collection _____
- Vents or flares _____
- Monitoring wells _____
- Testing for off-site migration _____

Surveys for new cells _____

On-going development and construction costs [28] _____

Engineering services _____

Additional capital outlays

- Financing _____
- Amortization _____

Permitting [29] _____

Administration _____

Contingency _____

Total Continued Development Cost _____

V. Closure

Engineering services for preparation of a final closure plan _____

Construction services _____

Final site grading, cap and re-vegetation _____

Material acquisition

- To bring up to grade _____
- To cap _____

Dismantling of support facilities _____

Administration _____

Contingency _____

Total Closure Cost _____

VI. Post-Closure (Annual Costs)

General site maintenance _____

Storm water management facilities _____

Cap and cover maintenance, repair and replacement [30] _____

O & M of methane system _____

O & M of leachate collection and treatment system _____

Leachate disposal _____

O & M of groundwater monitoring wells _____

Environmental monitoring and analysis [31] _____

Administration _____

Contingency _____

Total Annual Post-Closure Cost _____

Landfill Cost Summary Worksheet

Conversion of total annual costs to costs per ton may be helpful in rate setting or in comparing local government costs to private company proposals. The following is provided as an example of how this conversion may be accomplished.

Capital Costs	*Total Cost*	*Amortization period*	*Cost Per Year*
I. Pre-Development	_____	_____	_____
II. Initial Construction	_____	_____	_____
IV. Continued Development	_____	_____	_____
V. Closure	_____	_____	_____
Capital Cost Sub Total	_____	_____	_____
Annual Costs			
III. Annual Operation			_____
VI. Post Closure			_____
Annual Cost Sub Total			_____
Total Cost Per Year			_____

Per Ton Cost Calculation: $\frac{\text{Total Cost Per Year}}{\text{Tons Per Year}}$ = $ _____ Per Ton

Part Two: Collection

Collection costs[32] fit into a pattern of annual costs much more readily than do the costs of disposal. Therefore, the collection cost outline is presented in a somewhat different format. The potential initial cost of garage and office facilities, transfer stations, weigh stations and other capital improvements are not listed; rather, a portion of these costs (depreciation) should be included each year.

1. Salaries

Direct labor

Full-time _____

Part-time _____

Seasonal _____

Overtime

Regular _____

Holiday _____

Merit Increases _____

Across-the-board increase _____

Longevity pay _____

Total _____

2. Fringe Benefits

Paid holidays, sick leave, vacation _____

Retirement or pension contributions _____

Hospitalization and health insurance _____

Life insurance _____

Social security payments _____

Worker compensation insurance _____

Unemployment insurance _____

Incentives, bonuses, awards _____

Training and educational reimbursements _____

Total _____

3. Materials and Supplies

Office supplies _____

Cleaning supplies _____

Uniforms _____

Hand tools _____

Food _____

Printing _____

Postage _____

Safety equipment _____

Containers and bins _____

Total _____

4. Contractual Services

Advertising _____

Dues and subscriptions _____

Professional and consulting services _____

Total _____

5. Insurance

Vehicles _____

Liability _____

Deductibles or actual awards _____

Total _____

6. Facilities Management

Rent or depreciation _____

Utilities _____

Custodial services _____

Security _____

Storm water management _____

Total _____

7. Fleet Operations

Vehicle maintenance _____

Fuel _____

Vehicle repair _____

Vehicle wash _____

Vehicle depreciation or use allowance _____

Licenses, permits and fines _____

Total _____

8. Interdepartmental Charges

Computer use time _____

Purchasing and warehouse charges _____

Total _____

9. Internal or Indirect Costs [33]

Management _____

Personnel _____

Finance _____

Procurement and other administrative costs _____

Legal _____

Total _____

Annual Collection Cost (Total of 1 through 9) _____

Endnotes

1. The documents by Joyce Engineering, Browning Ferris Industries and the Virginia Department of Environmental Quality listed in the bibliography and marked with a $ sign are examples of documents which do assign costs to each expense.

2. Certain direct costs may continue whether privatization occurs or not. For example, maintenance of a closed landfill.

3. Regulations require an analysis of a site regarding a number of factors which may reduce the potential for the use of the site. Examples include the location of flood zones, drinking water wells, faults, airports, dams and wetlands. This is sometimes called a "fatal flaw" analysis.

4. Examples include title searches and contract development.

5. Examples include paying for options on parcels of land and adjacent property value protection programs.

6. As noted in the introduction, administrative costs include a wide range of direct and indirect costs. Here RFP preparation and selection and staff time devoted to contract monitoring should not be overlooked. These costs are listed throughout this document and the authors have attempted to list some of those costs which are often overlooked.

7. In projects of the magnitude of solid waste disposal, the unexpected is likely to occur. The committee has reviewed numerous documents, and calculation for contingencies range from 0 to 15% of an activity's cost. It is advisable for localities to consider this when making solid waste management decisions.

8. If a locality must purchase land for the facility, that cost is readily determinable. However, if the locality already owns the property, the reduction in value of the land from prior to development to closure is often overlooked. Regardless, the value of land must be accounted for in order to determine true costs for the project.

9. This cost will vary depending on the value of the property to be condemned and whether or not the property owners are willing to transfer their property.

10. Geotechnical evaluation, hydrogeological investigation, and environmental assessment.

11. Legal and consultant fees.

12. There will be costs associated with the permit application process for each of these permits, potentially including: site investigation and surveying, application development, fees, hearings and consultants.

13. Procurement process costs including RFP development, evaluation and selection, contract monitoring, contract preparation and submission costs.

14. Including bid documents, construction drawings, and bidding services.

15. Depending on (i) the parcel size, (ii) the amount of excavation required and (iii) the availability of other material on site to use as cover, provision may be required for storage of excavated material during excavation and for use as daily cover.

16. Potentially including local sewer service, public water systems, other utilities and local roads.

17. Requirements will vary from situation to situation and may include collection tanks and pretreatment facilities.

18. Quality control certification testing is required for landfill components such as the clay liner, flexible membrane liner, geotextiles, and drainage zone materials for certification to the state that the facility was constructed as permitted.

19. A detailed list of personnel costs can be found in part two of this document.

20. Including roads, buildings, grounds, disposal site upkeep, dust control, security, waste screening, safety programs, public education, vermin control, electricity, gas and telephones.

21. Including fuel, repairs, equipment operation and storage facilities.

22. Contingent on options such as leasing, purchasing, bond issuance.

23. Testing will be required of ground water, surface water, landfill gas and possibly nearby private wells. Collection and lab costs will be associated with these requirements.

24. Examples include employment, health, property and personal injury insurance. Most localities are unable to acquire environmental impact insurance. Localities may self insure or develop an accrual system to build up funds for future environmental liability. These costs should be included.

25. Amendments to the federal Resource Conservation and Recovery Act require localities to provide financial assurance for landfill closure, post closure environmental monitoring and corrective action. The U.S. Environmental Protection Agency has not finalized regulations in this area, making determination of this expense difficult. The Governmental Accounting Standards Board Statement Number 18 discusses how to reflect these liabilities in financial statements. However, the statement does not contain a method to determine the amount of liability.

26. Including management costs such as billing, accounting, bill collection, data processing as well as engineering, legal and auditing expenses.

27. There are different options for methane control, including venting and capture. The systems associated with these methods are generally constructed as the site is filled and closed and methane is produced. Also, the time value of money should be considered. For example, the cost of installation of a methane system in the future should be converted into today's dollars.

28. This cost will change from year to year depending on expansion and closure needs.

29. Permits are periodically reviewed. The process of renewal, revision or amendment will necessarily carry some expense.

30. Including landfill slope, surface and landscape maintenance.

31. Including gas, groundwater and storm water.

32. As mentioned in the introduction the costs of collection of solid waste, recyclables and yard waste require separate analysis. While this section provides a general framework for the analysis of collection costs, it does not include costs or resources associated with the processing or marketing of recyclables or yard waste.

33. These costs need to be identified, but it should not be assumed that they will be eliminated if the service is privatized.

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