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SANITARY LANDFILL MANUAL



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Planning Division

IOWA DEVELOPMENT COMMISSION

SANITARY LANDFILL

Prepared By:

Planning Division
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OCTOBER, 1969

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To: Governmental Officials of Iowa

Gentlemen:

The Planning Division of the Iowa Development Commission has, over the past several months, received numerous requests from governmental officials asking for information on solid waste disposal methods. Most of these have been requests for information on a specific solid waste disposal method -- the sanitary landfill. The major impetus behind these requests is the necessity for governmental bodies conducting refuse disposal operations by burning to comply with the rules and regulations relating to air pollution control as authorized by Subsections 3 and 5, Section 4, Chapter 162, Acts of the Sixty-second General Assembly by April 10, 1970 (see Appendix I). This report is in response to these requests.

The report conveys information of an introductory nature on the sanitary landfill method of solid waste disposal and an intergovernmental approach to its operation. However, this report should not be construed as an endorsement of the sanitary landfill method of solid waste disposal or the intergovernmental approach by either the Planning Division of the Iowa Development Commission or the State of Iowa. It is merely a response to the most numerous type of request.

I wish to thank Mr. Jack Clemens, Environmental Engineering Service of the Iowa State Department of Health, Mr. Edwin Allen of the League of Iowa Municipalities, and Mr. Ray Johnson, Urban Planner of the Iowa Development Commission for their valuable assistance in the preparation and review of this report.

Very truly yours,

William M. McLaughlin

William M. McLaughlin AIP
Planning Director

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INTRODUCTION

One of the vital issues of today is the control and prevention of environmental pollution -- air, water and land. Sources of pollution are many and have been well documented by concerned individuals such as Rachel Carson. One such source is a concomitant of both man's seemingly infinite capacity to produce solid waste materials and, in too many instances, his inability to adequately dispose of the waste he creates. Ours is a "throw it away" society from beer cans and pop bottles to paper dresses



Figure 1

and diapers. We continue to create products which are short-lived and discardable as witnessed by this news entry in the July-August, 1969, Land Pollution Reporter:

More disposables: raincoats, advertised, "when it gets dirty, throw it away...you'll be able to buy a new one for about what

it costs to have a cloth raincoat cleaned and rainproofed"; sleeping bags good for seven nights (\$3.98); blankets (\$3.50); sheets (89¢); ladies underpants (15¢).

The business of handling and disposing of our solid wastes comes to \$3 billion annually [3] and is rapidly increasing.

Although at times it seems to be our American habit to wait until things get really bad before we arouse ourselves to action, there are definite signs that we are at last going to confront this problem with the determination and resources necessary to solve it. Citizens are supplying the cry for action, science the technology and governments the financial and legal means to act.

This report presents general information on the organization and operation of a sanitary landfill on a regional or intergovernmental basis. Although sanitary landfill is but one of several acceptable solid waste disposal methods, it is the only method capable of handling all types of solid waste and is generally recognized as the most economical of the acceptable methods, given reasonable haul distances. [1] This report also stresses the intergovernmental approach to solid waste management primarily because of economies of scale that are usually realized. Section I -- "Sanitary Landfill Facts" is a reprint of a Public Health Service publication of the same title. It examines the planning, design, operation, and public health aspects of sanitary landfills in a concise and cogent manner. Copies of this federal publication may be obtained for 35¢ per copy by writing the Superintendent

of Documents , U.S. Government Printing Office , Washington , D.C. 20402 .

Section II -- "Intergovernmental Approach to Solid Waste Management" covers the organizational and financial aspects of an intergovernmental solid waste disposal agency .

This report has generously borrowed from past publications covering material outlined above . To give proper credit to these excellent publications , reference numbers set in brackets [] have been used where appropriate and relate to those publications under "Selected References ."

SECTION I -- "Sanitary Landfill Facts" -- U.S. Public Health Service by
Thomas J. Sorg and H. Lanier Hickman

Misconception

Upon hearing the term, "sanitary landfill," many of us immediately picture the traditional open, frequently burning, dump. This misconception



Figure 2

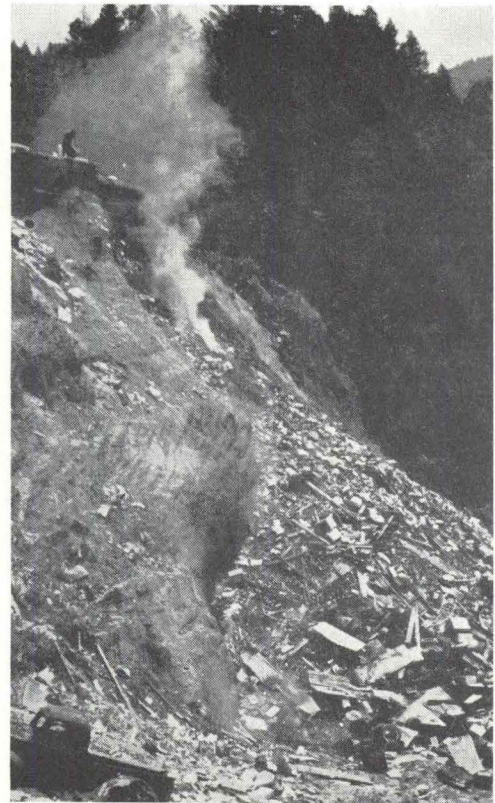


Figure 3

Figure 4



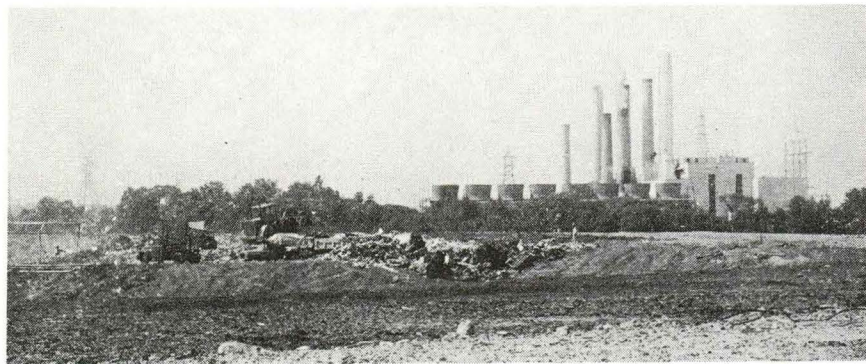
is quite natural because in many instances the term "sanitary landfill" has been misused as a label for an open dump. The fact is, however, that a true sanitary landfill is not an open dump.

Figure 5



BEFORE conversion to landfill, smoke from the burning dump obscured all but the stacks of the incinerators in background, above. Shown below is the same site with landfill operations underway and burning eliminated. Visibility is no problem.

Figure 6



The sanitary landfill is defined by the American Society of Civil Engineers as: "A method of disposing of refuse on land without creating nuisances or hazards to public health or safety, by utilizing the principles of engineering to confine the refuse to the smallest practical area, to reduce

it to the smallest practical volume, and to cover it with a layer of earth at the conclusion of each day's operation, or at such more frequent intervals as may be necessary."¹

Such a landfill is a well-controlled and truly sanitary method of disposal of solid wastes upon land. It consists of four basic operations: (1) the solid wastes are deposited in a controlled manner in a prepared portion of the site; (2) the solid wastes are spread and compacted in thin layers; (3) the solid wastes are covered daily or more frequently, if necessary, with a layer of earth; (4) the cover material is compacted daily. The final result can be a golf course or playfield as suggested in Figures 7 and 8.



Figure 7

Figure 8



NEIGHBORHOOD park offers playground, a children's fishing area and picnic facilities on the site of a former landfill in Brighton, Colorado.



Figure 9



BASIC
OPERATIONS OF
A SANITARY
LANDFILL

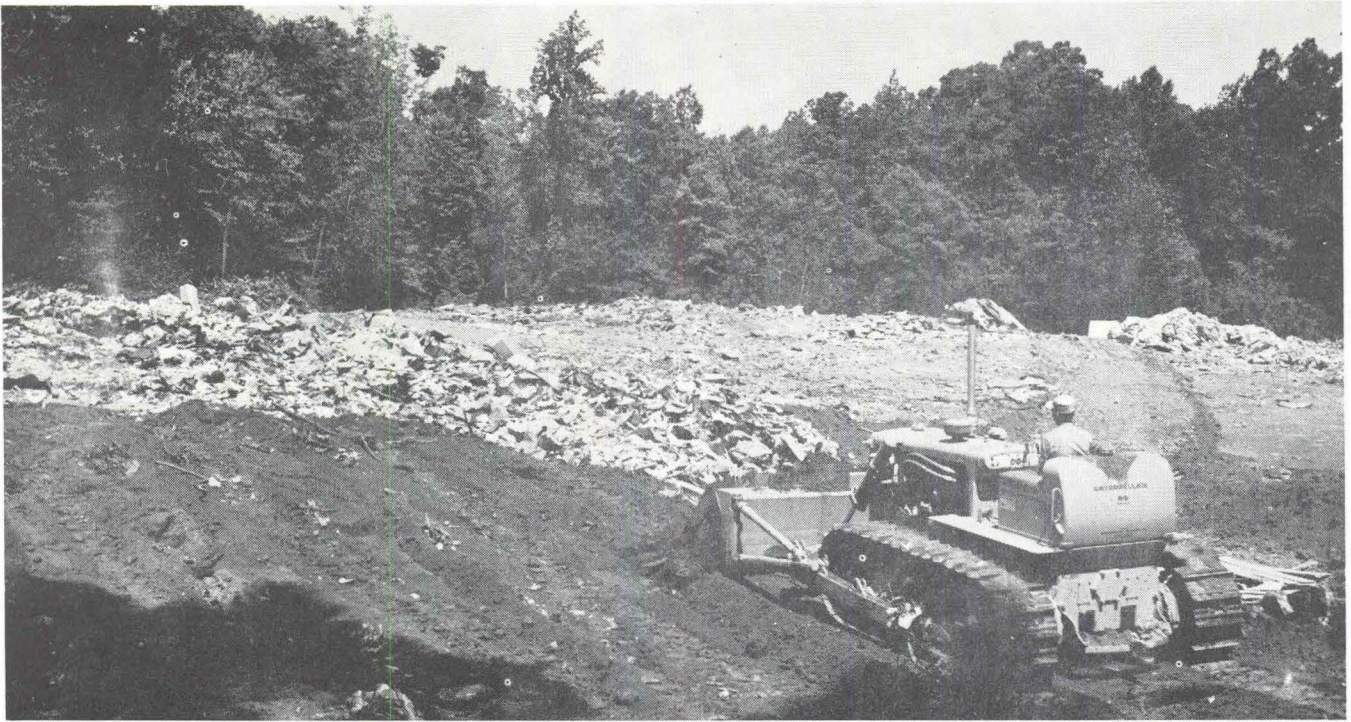
Figure 10



Figure 11



Figure 12



Figures 13 and 14: IMPORTANT rat control measure is to place an adequate, well compacted cover on refuse deposited in a sanitary landfill.



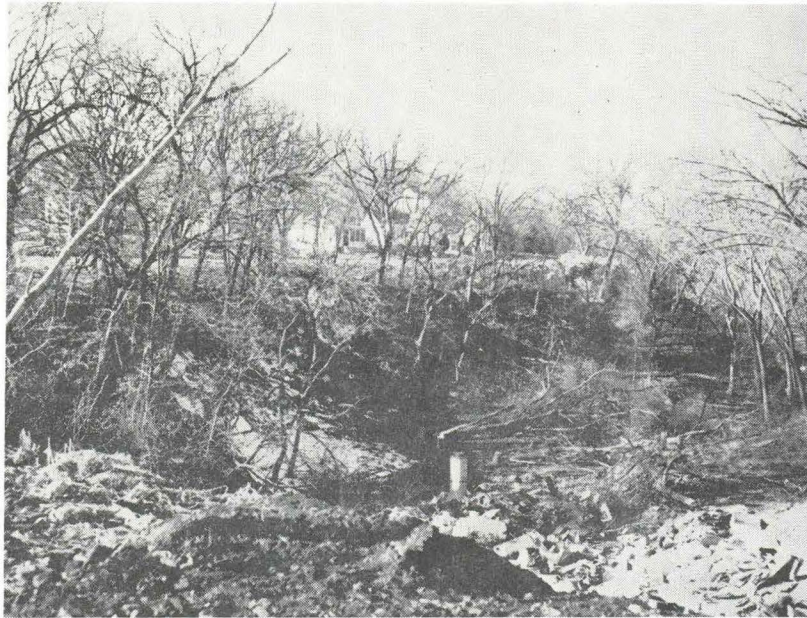


Figure 15

BENEFITS of a well-planned sanitary landfill operation are demonstrated by these before and after views of an eroded gully which was transformed into an attractive recreational area. Similar locations in need of improvement may be discovered by a refuse disposal study, though the primary objective is to develop a long-range program for handling solid waste.

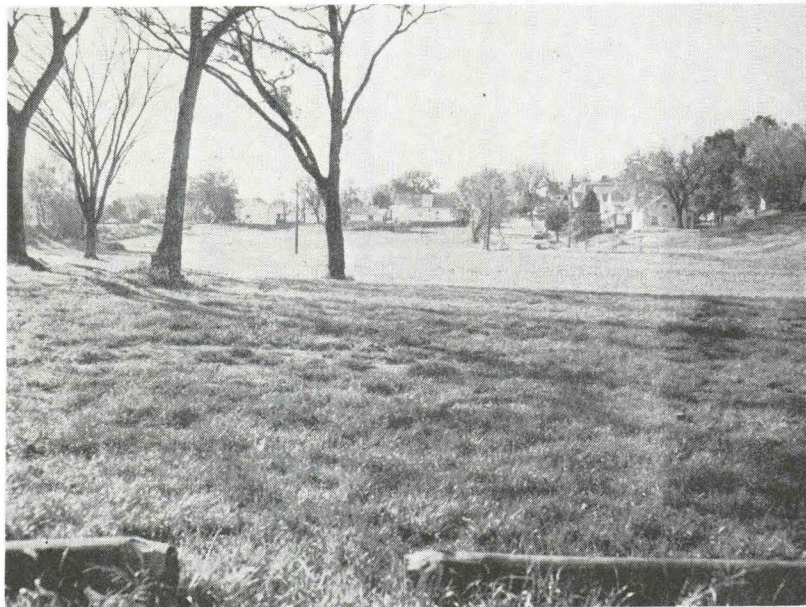


Figure 16

Planning a Sanitary Landfill

A sanitary landfill is an engineering project. When sound engineering principles are applied, the result will be a successful operation and in most cases will save money. Most operational problems can be prevented in the initial development stages. This is easier and more economical than correcting the defects once the operation has begun.

The first step toward the ultimate goal of establishing a sanitary landfill operation, of course, is the initial planning phase. The preliminary planning develops the basic groundwork for the actual engineering phases of site selection, design and operation. Advanced planning should include consideration of: a competent designer, a public information program; a survey of solid waste practices and possible sites; the method of financing; the ultimate use of the completed site; and site zoning arrangements.

Competent Designer. Engineering knowledge and experience in sanitary landfill site selection, design, and operation are essential requirements of the individual or agency chosen to develop the sanitary landfill. If the planning or operating agency does not have this engineering experience and competence, every effort should be made to obtain the services of the best engineering consultant available. Although a sanitary landfill is considered the most inexpensive of the approved methods of disposal, it is a mistake to assume that a successful operation requires little skill or knowledge of design and operation. The selection of an engineer or consultant is a poor place to attempt to economize. The money spent for the services

of a competent designer will be realized in a sanitary landfill operation which is successful and acceptable to the public.

Public Information Program. Unfortunately, many citizens associate impressions of open-burning dumps with sanitary landfills. Usually, the planning of a sanitary landfill meets with some public opposition unless the operating agency has conducted acceptable operations elsewhere.

Preliminary planning should include an active public information program to explain to the public what makes a sanitary landfill work well and what benefits can be expected. In many communities, public acceptance of a sanitary landfill site is the most important factor in deciding whether it will exist -- or not. Moreover, it is very useful in gaining public support and most helpful to a designer to have the final use of the landfill area determined in advance. An architectural rendering or a model of the completed site, as a park, playground, golf course, or other planned use, is a good public relations tool. When opposition is exceptionally strong to the proposed sanitary landfill, it is well to consider the installation of a temporary pilot operation to illustrate a good sanitary landfill, while soliciting newspaper and TV support and possibly even hiring professional public relations services for the program. It is well to remember, however, that the public will soon discover any discrepancies between the public information program and actual operations. Operations must be exemplary in order to gain public support.

Other Considerations. The responsible officials in the preliminary planning phase must decide how the initial cost and the operating costs of the sanitary landfill will be financed. These officials should also investigate the amount and reliability of available data concerning the quantity and characteristics of the solid wastes to be handled. If sufficient and reliable data necessary for proper site selection and design are not available, arrangements should be made to survey the area generating solid wastes to procure the necessary information. If at all possible, the ultimate use of the completed landfill site should be decided during the initial planning stage. As stated previously, knowing the final use of the site will permit the designer to plan more effectively and will be useful for gaining public support for the project. In many instances, zoning restrictions have interfered with the development of an area for a sanitary landfill. Many legal problems can be avoided if preliminary planning includes arrangements for zoning potential areas for sanitary landfill operations and ultimate site use.

Selecting a Site

An important engineering step toward establishing an acceptable sanitary landfill operation is site selection. As with the preliminary planning phase, proper site selection can eliminate many future operational problems. Most of the many factors to be considered when selecting a sanitary landfill site will require technical know-how, a knowledge of equipment, and experience, and so it bears repeating that a well qualified individual or agency should be responsible for site selection.

Land Requirement. The land area -- or more important the volume of space required -- is primarily dependent upon the character and quantity of the solid wastes, the efficiency of compaction of the wastes, the depth of the fill, and the desired life of the landfill. Data on the quantity and character of residential, commercial, and industrial solid wastes to be landfilled are therefore necessary for estimating the space required. In estimating volume requirements, volume reduction of the solid wastes due to compaction must be considered. The desired life of the landfill is another major factor in determining the total volume required.

The volume requirement for a sanitary landfill should be determined using the specific data and information available for each individual project. As a rough rule of thumb, however, about 7 acre-feet (11,293 cu. yds.) per 10,000 population per year is frequently used.

Zoning Restrictions. A survey conducted by the American Public Works Association in 1956 indicated that a high percentage of cities are restricted in the acquisition of disposal sites by their zoning ordinances.² Consequently, before a full-scale investigation of a potential site is undertaken, all zoning ordinances should be reviewed and cleared or changed to eliminate any legalities which could prevent or indefinitely hold up the use of a particular parcel of land for a sanitary landfill. Advance planning to zone the potential landfill site areas for sanitary landfill operation can circumvent many of these problems.

Accessibility. It is important to select a site that truck traffic can easily reach on highways or arterial streets. Sites requiring the trucks to travel through residential areas will normally draw many complaints, and such sites should be avoided.

The roads to the site should be of such width and construction to handle all sizes of trucks when fully loaded, during all weather conditions. Such problems as narrow bridges, low underpasses, and steep grades on the access routes should also be investigated. Since the site should be accessible at all times it is desirable to have several access routes so that if one route is temporarily unusable, the site can still be used.

Haul Distance. The haul distance is an important economic factor in selection of the sanitary landfill site. The economic distance to the site will vary from locality to locality depending upon capacity of collection vehicles, hauling time, and size and methods of the collection agency. The larger the quantity of refuse hauled per trip and the shorter the hauling time due to express roads, freeways, etc., the greater the distance the solid wastes can be hauled for the same cost.

Cover Material. The availability of cover material is another economic factor to consider when choosing the site, for the cost of hauling cover material to the site can be excessive. It is desirable, therefore, to select a site that has cover material available or close by to keep these costs at a minimum.

The field investigation of the potential site should include soil analysis to determine the suitability and the quantity of soil available for cover material. Soil with good workability and compaction characteristics is the most desirable cover material. Sandy loam is considered to be excellent since it contains about 50 to 60 per cent sand, the remainder is clay and silt in equal amounts with good workability and compaction qualities.

Geology. The potential danger of ground and surface water pollution resulting from the landfill cannot be overlooked. Solid wastes ordinarily contain many contaminants and often infectious materials. These can produce serious health hazards or nuisances if permitted to enter water supplies. Site selection should include a geological investigation of the site, which can be run in conjunction with the cover material field investigation, to determine the potential of either ground or surface water pollution. The ground water table must be located and information obtained on the historical high ground water level and on the general movement of the ground water.

The geological investigation should also examine the topography of the site itself and the surrounding area for potential flooding conditions of the site during heavy rains and snow melts. Flooding and surface water drainage can quickly erode the cover material and the refuse fill. Special attention should be given to low-lying sites that might be drainage basins for surrounding areas. Sites located near rivers, streams or lakes also

deserve careful scrutiny. Generally, a landfill should not be located in a flood plain because of the water pollution hazard, and because such sites are unusable both during, and for a period following, flood conditions.

Climate. In some locations, climate conditions are important considerations in site selection and may even dictate the method of operation. In an extremely cold locality, a site requiring excavation of trenches and cover material may become a problem because of the frost during the winter months. However, a site requiring excavation operations can be used in a wintry locale if special operating procedures are planned in advance to cope with the expected problems; the trenches and cover material may be excavated during the summer months to carry the operation through the winter period.

In areas receiving considerable rainfall, a low-lying site may not be desirable because of flooding and continual muddy working conditions. In rainy areas, a site high in relation to the surrounding area, with good drainage features, is desirable.

In windy locales, a site surrounded by natural windbreaks will help to contain loose paper, thus reducing the amount of this material which may be blown off the site.

Fire Control Facilities. Although there is little chance of fire at a sanitary landfill when operated in accordance with good practices, a sanitary landfill site should be provided with suitable fire protection. Despite the

fact that fires can usually be extinguished by smothering with a blanket of earth, all sites should have water available for fire control. Special consideration for fire control facilities should be given to sanitary landfills located relatively close to residential or commercial structures and in extremely dry areas where the fire could spread quickly and do extensive damage if not brought under control immediately.

Designing a Sanitary Landfill

The design and operational steps during development of the sanitary landfill are not distinct phases. Basic knowledge and experience in the operational aspects of a sanitary landfill are necessary for the design phase. In essence, the design phase develops the plan of operation. It consists primarily of determining the operational plan and preparing the necessary detailed plans and specifications for construction and operation. Good plans and specifications are essential for estimating costs, bids for contracts, and for operational control and inspection.

Plans. Detailed plans should be prepared showing the existing topography and the designed contours of the completed landfill. As mentioned above, in the planning section, it is extremely helpful to the designer when designing the final ground elevations, if the use of the completed landfill has been previously determined. The plans should show the overall plan for landfilling, the drainage features, location of the cover material, and the wet weather operation site. The plans should also detail all construction features such as access roads, personnel and equipment facilities, scales,

fencing, signs, water lines and other utilities.

Specifications. The plans should be complemented with a set of specifications for construction and operation. Construction specifications cover the construction materials, workmanship, and equipment. The operating specifications should detail the method of operation including the weighing of the wastes, the cross-sectioning of the site at definite time intervals, the thickness of cover material, the depth of lifts and cells, compaction, and wet weather operating procedures.

Operating a Sanitary Landfill

The importance of the appearance of the sanitary landfill during operation cannot be overly stressed. The operation is the only phase of the project that is seen by the public. Consequently, public acceptance of the entire project -- the planning, design and operation -- will be based solely on the operation.

There are many factors involved in the operation of a sanitary landfill. A well-operated sanitary landfill is the goal of the planner, designer, and operator and, therefore, each must have a thorough knowledge of all the factors to guide him in achieving this goal.

Supervision. A clean, orderly, and economic operation requires constant and competent supervision. It is also important to employ only experienced or adequately trained personnel to operate a sanitary landfill.

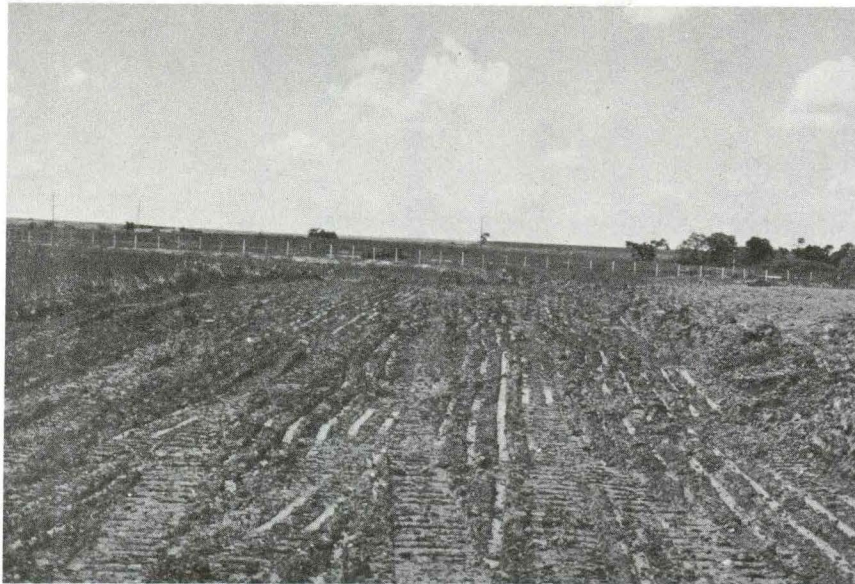


Figure 17

Operating Records. For continuing evaluation and future planning, detailed records should be kept of the sanitary landfill operations. Records should be kept of the incoming material: the weights, the type, and the origin. Any deviation from the plan of operation should also be recorded. Topographic surveys of the landfill should be made regularly to determine the rate of space utilization. The incoming-material data and the topographic surveys can be used to determine the amount of material generated per capita, compaction, land use, operation efficiency, and to estimate the degree of decomposition and eventual settlement. Good cost-accounting records should be maintained, including the initial cost of the land and equipment, and the operating cost of the labor, equipment, equipment maintenance, depreciation, etc. These data are necessary for budgetary planning, for determining the cost rates for users, and for comparison with other operations, justifying expenditures, and estimating the efficiency of operation.

Directions. Sanitary landfills, particularly those open to the public, need directional signs and markers on nearby highways to help speed traffic movement. At the entrance to the site, a large legible sign should be posted to inform the public of the hours of operation, cost of disposal, and rules and regulations (such as, "only covered trucks permitted"). At large sanitary landfill operations, signs should also be used on the site to direct the users to the unloading area.



Figure 18



Figure 19

On-Site Roads. The on-site roads to the unloading area should be of all-weather construction and wide enough to permit easy two-way truck travel. Road grades should be designed for the largest fully loaded trucks to travel at a reasonable rate. It is particularly important at large sites that traffic in and out of the area should flow smoothly.

Methods. Sanitary landfilling consists of the basic operations of spreading, compacting, and covering. Over the years, two general methods of landfilling have evolved: the area method, and the trench method. Some schools of thought also mention a third, the slope, or ramp, method. In many operations, a slope, or ramp, is used in combination with the area or trench methods. For this reason, three methods will be described: area landfill, trench landfill, and the ramp, or slope, method.

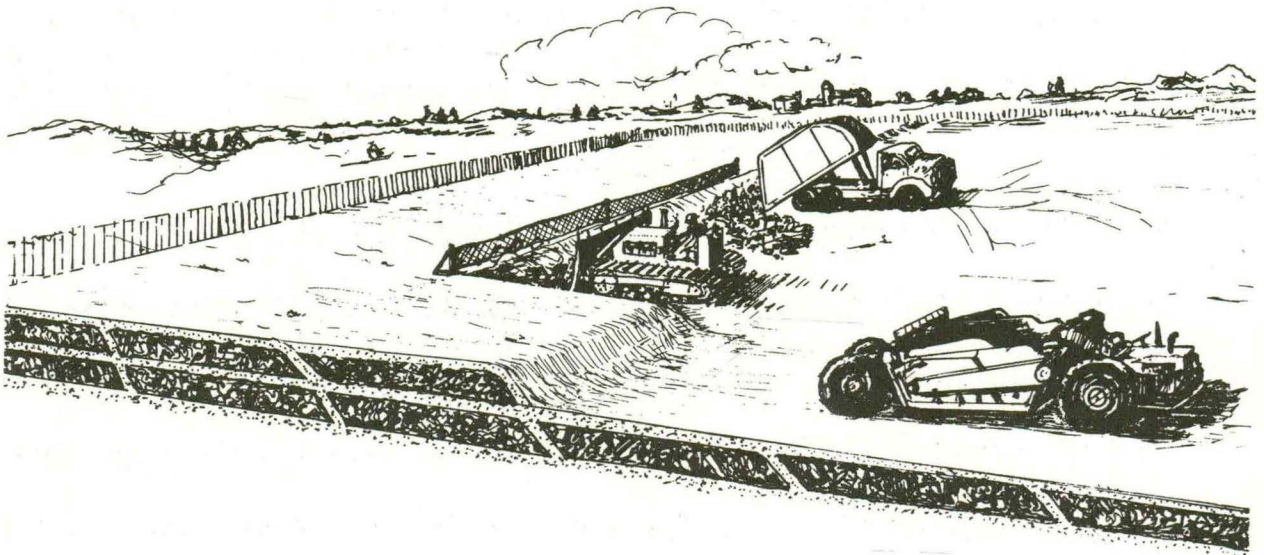


Figure 20: THE AREA METHOD. The area method, the bulldozer is spreading and compacting a load of solid wastes. The scraper (foreground) is used to haul the cover material at the end of the day's operations. Note the portable fences that catch any blowing debris; these are used with any landfill method, whenever necessary.

In the area landfill, the solid wastes are placed on the land; a bulldozer or similar equipment spreads and compacts the wastes; then the wastes are covered with a layer of earth; and finally the earth cover is compacted. The area method is best suited for marshes, flat areas, or gently sloping land and is also used in quarries, ravines, valleys or where other suitable land depressions exist. Normally, the earth cover material is hauled in or

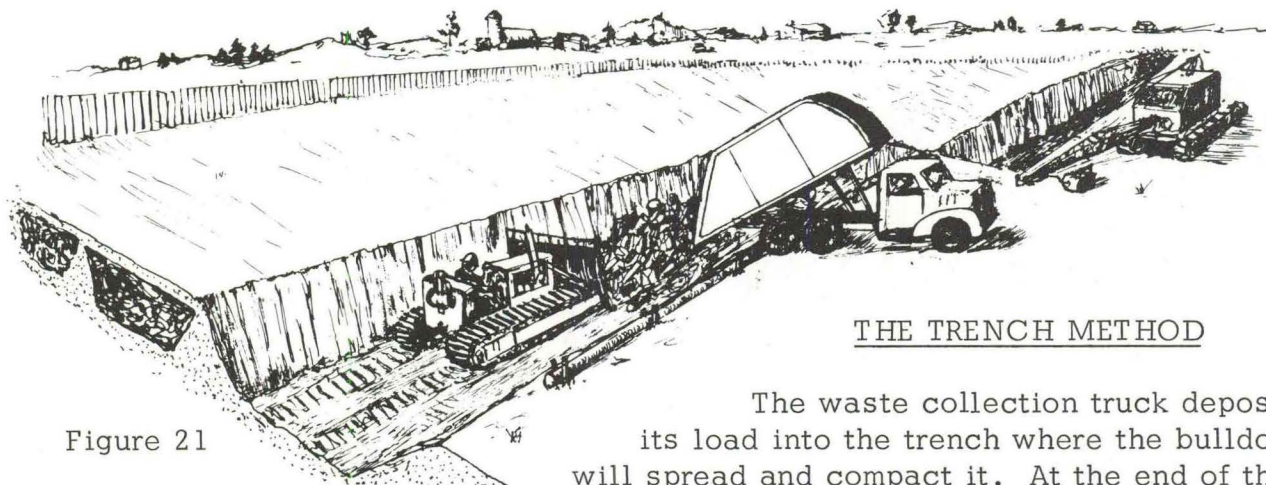


Figure 21

THE TRENCH METHOD

The waste collection truck deposits its load into the trench where the bulldozer will spread and compact it. At the end of the day the dragline will excavate soil from the future trench, and this soil will be used as the daily cover material. Trenches can also be excavated with a front-end loader, bulldozer, or scraper.

In a trench landfill, a trench is cut in the ground and the solid wastes are placed in the trench. The solid wastes are then spread in thin layers, compacted, and covered with earth excavated from the trench. The trench method is best suited for flat or gently sloping land where the water table is not near the ground surface. The advantage is that normally the material excavated from the trench can be used for cover with a minimum of hauling. A disadvantage is that more than one piece of equipment may be necessary.

In the ramp or slope method (a variation of the area and trench landfills), the solid wastes are dumped on the side of an existing slope. After

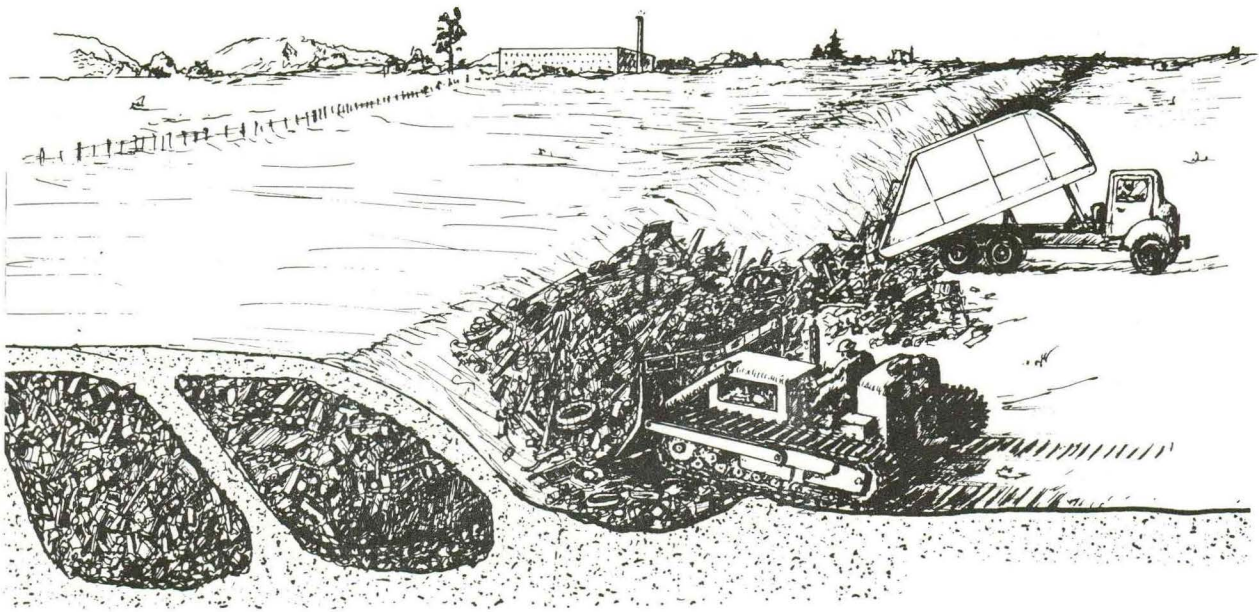


Figure 22

RAMP METHOD

spreading the material in thin layers on the slope, the bulldozing equipment compacts it. The cover material, usually obtained just ahead of the working face, is spread on the ramp and compacted. As a method of landfilling, this variation is generally suited to all areas. Having the advantage of utilizing only one piece of equipment to perform all operations makes the ramp or slope method of landfill particularly applicable to smaller operations. The slope, or ramp, is commonly used in the area and trench landfill and is illustrated above.

Compaction. Solid wastes should be placed at the top or base of the working face, spread in thin layers about two feet thick, and compacted. If a slope, or ramp, is used, better compaction will normally result if the

wastes are spread and compacted from the base upwards. The degree of compaction is dependent on the character of the solid wastes, the weight and type of compacting equipment, and the number of passes the equipment makes over the material. The actual density of the landfill can be determined from operating records and data. The degree of compaction is a useful tool to determine the rate of space usage, expected life of the landfill, and the overall efficiency of the operation.

Working Face. The size of the working face of the landfill operation is determined by the rate of unloading of the incoming vehicles. The working face should be as narrow as possible to minimize the exposed area, but not so small as to interfere with the unloading operations and the movement of landfill equipment. A minimum width of the working face should be approximately twice the width of the tractor to allow the tractor to move from side to side thus compacting the entire exposed surface.

Depth of Cells. Cell depth is the thickness of the solid wastes layer measured perpendicular to the working slope where the equipment travels. The depth of cells is determined largely by the size of the operation, the elevation desired of the completed fill, the depth of the trench or depression to be filled, and in some cases, the amount of cover material available. Eight feet is generally recommended as a maximum single cell depth because deeper cells usually result in fills that have excessive settlement and surface cracking. However, the cell depth of presently operated sanitary landfills varies from two feet to fifteen feet or more.

Cover. The compacted solid wastes should be covered at the conclusion of each day's operation, or more frequently if necessary, with a minimum of 6 inches of compacted earth. Because of its workability and compaction characteristics, a sandy loam soil is the most desirable cover material. But, if sandy loam is not available on the site, it may be necessary to adjust the covering procedures to the type of cover material available or to haul in more suitable cover material. The cover is necessary to prevent insect and rodent infestation, blowing paper, fires, the attraction of gulls, and the release of gas and odors.

For daily cover, a minimum of 6 inches of compacted sandy loam is recommended. For intermediate cover on lifts which will not have additional lifts placed on them within a year, a minimum of 12 inches of compacted sandy loam is recommended. A minimum of 2 feet of compacted sandy loam is recommended for the final cover. The final cover should be placed over the fill as soon as possible to help assure that wind and water erosion does not expose the wastes. Where trees will be planted on the completed fill, a depth of 3 or more feet of compacted earth has been found necessary.

Large Bulky Items. Large bulky items such as car bodies, refrigerators, water heaters, and tree stumps, can be handled routinely with other solid wastes at large landfills that use heavy equipment. At small landfills where light equipment is normally used, special provisions may be necessary to handle bulky items. A separate unloading area at the site or an alternate

site, operated in a sanitary manner, should be utilized for the disposal of bulky items that cannot be handled routinely with the other solid wastes.

Blowing Paper. In a 1959 survey of sanitary landfill operations by the American Society of Civil Engineers, the operating problem most frequently reported was that of blowing paper.³ The common method of controlling blowing paper is with a combination of permanent and portable fences. Unfortunately, under certain wind conditions the paper may blow up and over the fences, so that fences do not provide complete control. Prompt compaction and covering are also useful in controlling windblown paper. It is important, therefore, that the designer consider the prevailing wind direction when designing the operation.

Maintenance. Routine maintenance will be required to maintain a clean, orderly, and acceptable operation and site. It is important, particularly at public sanitary landfills, to cut the grass and weeds, pick up the scattered paper, maintain good access roads, control dust, and maintain clean and attractive employee and public facilities.



Figure 23

Drainage. To prevent ponding on the landfill surface with resultant excessive seepage into the landfill, drainage must be provided. This will prevent runoff water from eroding the cover material and exposing the wastes. Drainage must be provided both during the filling operation and for the completed landfill. Good drainage will usually require periodic regrading of the site, and the use of culverts or grassed waterways. It is recommended that the slope of the surface of the completed fill be a minimum of 1 per cent. Since the landfill will undergo uneven settlement, it may be necessary to design the original slope for more than 1 per cent to maintain a 1 per cent slope after settlement. To prevent erosion, however, steel slopes should be avoided.

Winter Operations. Experience has shown that with good planning and proper operating techniques, a sanitary landfill can be operated throughout even the severe winters of North Dakota. Where the trench method of landfill is used, the trenches should be excavated before the cold weather season. It may be necessary to stockpile cover material and cover it with straw, leaves, or other material to prevent freezing. The material should be piled loosely with minimum compaction. All snow and ice should be removed from the trenches before use; it is good practice to use snow fences to protect the access roads. Also, a well-constructed, heated, tractor cab enables the operator to work efficiently during the cold weather.

Wet Weather Operation. Wet weather can seriously hamper the operations of a sanitary landfill by making the soil too soft, mucky, or slippery

for equipment operation. Wet weather can also seriously interfere with trenching, covering, and general traffic flow to and from the working face. For these reasons, all-weather access roads and drainage should be built. In many cases, it is advantageous to stockpile such materials as concrete rubble, broken asphalt pavement, stone, etc., for use on the site roads during wet weather. This will minimize the cost of constructing and maintaining hard-surface roads to the unloading area. It is also desirable to provide a temporary wet weather landfill area adjacent to the all-weather road. Such sites are used only during the wet weather periods when the normal working area is not accessible.

Particular attention must be given to landfills when the trench method is being used. If pumping or good drainage is not provided, the trenches will fill with water, resulting in possible ground or surface water pollution and complete shut-down of the operation.

Salvage Operation. The American Society of Civil Engineers has stated that generally the most objectionable disposal sites from the standpoint of appearance are those where the salvage activity is the greatest.¹ To ensure clean and orderly sites and to prevent landfills from looking like open dumps, salvage operations should be prohibited at all sanitary landfill sites.

Public Health and Nuisance Aspects

Vector Control. In a properly operated and maintained sanitary landfill, insects and rodents are not a problem. Well-compacted wastes and

cover material are the most important factors in achieving vector control. Six inches of compacted earth cover is recommended for preventing the emergence of houseflies from the fill. Good compaction of the cover material also discourages rodents from burrowing through the cover material. Good housekeeping and daily covering of the solid wastes are musts for vector control.

Water Pollution. Under certain geological conditions, the burial of solid wastes is a real potential for chemical and bacteriological pollution of ground and surface water. Several investigations of the pollution of ground water from sanitary landfills have indicated that if a sanitary landfill is intermittently or continuously in contact with ground water, the ground water can become grossly polluted and unfit for domestic or irrigational use. Proper planning and site selection, however, combined with good engineering design and operation of the sanitary landfill can normally eliminate the possibility of either surface or ground water pollution. Some of the common preventative measures used are: (1) locating the site at a safe distance from streams, lakes, wells, and other water sources; (2) avoiding site location above the kind of subsurface stratification that will lead the leachate from the landfill to water sources, i.e., fractured limestone; (3) using an earth cover that is nearly impervious; (4) providing suitable drainage trenches to carry the surface water away from the site.

Air Pollution. Air pollution caused by smoke should not occur. No burning should be permitted at a properly operated sanitary landfill. If a

fire does occur, it should be extinguished immediately.

Dust. Dust is a nuisance that may occur at a sanitary landfill operation in dry weather. Dust generated at the unloading area can be controlled by sprinkling the unloading area and the deposited refuse with water. Other dust control measures are the planting of grass or other vegetation on the finished fill and the application of water, road oil, or calcium chloride to the access roads.

Odors. Odors are a nuisance rather than a public health hazard. Odorous gases usually result from anaerobic digestion of putrescible material. The best control for odors is rapid and continuous coverage of solid wastes during the day and sealing surface cracks of the completed area of the landfill to prevent emissions of large concentrations of odorous gases.

Wildlife. Bird, particularly gulls, and other wildlife are common at open and burning dumps. There is little exposed food to attract wildlife at sanitary landfills. Most good sanitary landfill operations are free from these nuisances; however, there is no guarantee that all sanitary landfills will be completely free of wildlife. To keep the number of gulls and other wildlife to a minimum, the site should be kept clean, and the solid wastes should be covered promptly with earth.

Gas Production. Gas produced within a sanitary landfill consists chiefly of methane, nitrogen, carbon dioxide, hydrogen, and hydrogen sulfide. Methane gas is explosive and can be a hazard if accumulated in

enclosed spaces. At landfills where methane and other gases are a problem, the gases should be dissipated into the atmosphere.

Hazardous Materials. Although it is not common practice, hazardous materials such as sewage solids, radioactive wastes, pathologic wastes, explosive materials, and chemicals can be disposed of at landfill sites under special conditions. The special provisions for handling and disposing of these materials will depend on local conditions. These materials may require individual handling and disposal in a special area separate from the main operating area. The necessary provisions should be considered during the design phase and, if appropriate, be included in the operational specifications.

Equipment

A wide variety of equipment is on the market today from which to select the proper type and size needed for an efficient operation. The size, the type, and the amount of equipment required at a sanitary landfill depend on the size and methods of operation and to some degree on the experience and preference of the designer and equipment operators.

Type. The most common equipment used on sanitary landfills is the crawler or rubber-tired tractor. The tractor can be used with a dozer blade, trash blade, or front-end loader. A tractor is versatile and can normally perform all the operations: the spreading, compacting, covering, trenching, and even the hauling, of the cover material. The decision on whether to select a rubber-tire or a crawler-type tractor, and a dozer blade, trash

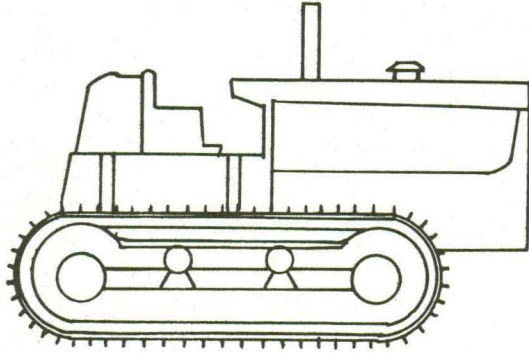
blade, or front-end loader, must be based on the existing conditions at each individual site.

Other equipment used at sanitary landfills are scrapers, compactors, draglines, rippers, and graders. This type of equipment is normally found only at large sanitary landfills where specialized equipment increases the overall efficiency.

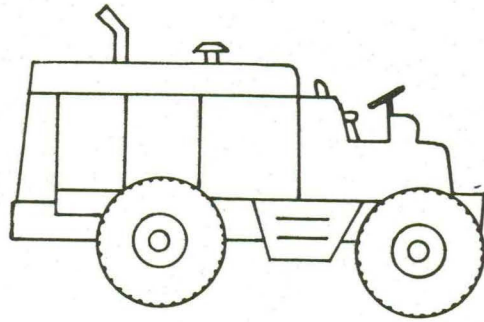
Size. The size of the equipment is dependent primarily on the size of the operation. Small sanitary landfills for communities of 15,000 people or less or sanitary landfills handling 40 tons of solid wastes per day or less can operate successfully with one tractor of the 5 to 15-ton range. Heavier equipment in the 15 to 30-ton range or larger can handle more refuse and achieve better compaction. Heavy equipment is recommended for sanitary landfill sites serving more than 15,000 people or handling more than 40 tons per day.

Amount. Sanitary landfills servicing 50,000 people or less or handling about 115 tons or less of solid wastes normally can manage well with one piece of equipment. At these small sites where only one piece of equipment is used, provisions must be made for standby equipment. It is preferable that a second piece of equipment be purchased and used for replacement during breakdown and routine maintenance periods of the regular equipment. Arrangements can normally be made, however, with another public agency or private concern for the use or rental of replacement equipment on short notice in case of a breakdown of the regular equipment.

STANDARD LANDFILL EQUIPMENT

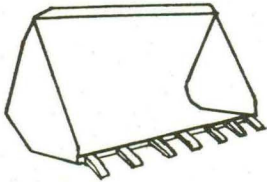


CRAWLER TRACTOR

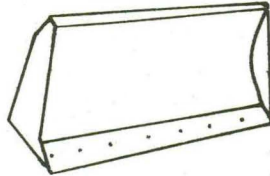


RUBBER-TIRED TRACTOR

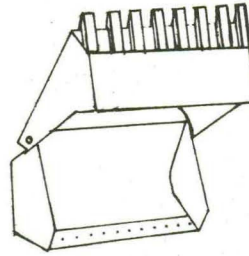
FRONT-END ACCESSORIES



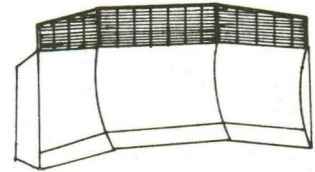
BUCKET



DOZER BLADE



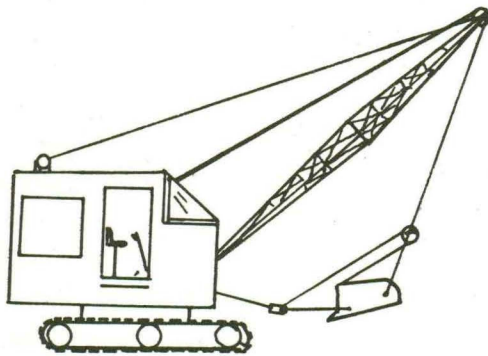
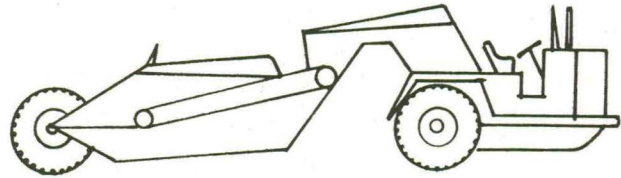
MULTIPURPOSE
BUCKET



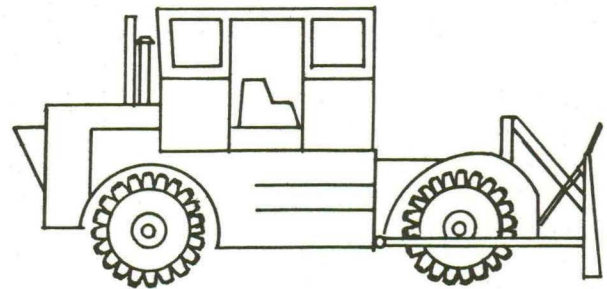
LANDFILL BLADE

SPECIALIZED EQUIPMENT

SCRAPER



DRAGLINE



STEEL-WHEEL COMPACTOR

Figure 24

Table 1. AVERAGE EQUIPMENT REQUIREMENTS

Population	Daily Tonnage	Equipment			Accessory*
		No.	Type	Size in lbs.	
0 to 15,000	0 to 40	1	Tractor crawler or rubber-tired	10,000 to 30,000	Dozer blade Front-end loader (1 to 2 yd) Trash Blade
15,000 to 50,000	40 to 130	1	Tractor crawler or rubber-tired	30,000 to 60,000	Dozer blade Front-end loader (2 to 4 yd) Bullclam Trash blade
50,000 to 100,000	130 to 260	*	Scraper Dragline Water truck	30,000 or more	Dozer blade Front-end loader (2 to 5 yd) Bullclam Trash blade
		1 to 2	Tractor crawler or rubber-tired		
100,000 or more	260 or more	2	Tractor crawler or rubber-tired	45,000 or more	Dozer blade Front-end loader Bullclam Trash blade
		*	Scraper Dragline Steel wheel compactor Road grader Water truck		

*Optional. Dependent on individual need.

At large sanitary landfills serving more than 100,000 people or handling more than 260 tons of solid wastes per day, more than one piece of equipment will be required. At these sites, specialized equipment can be utilized to increase efficiency and minimize costs. Table 1 is offered as a general guide for the selection of the type, size, and amount of equipment for various sizes of sanitary landfills.

Facilities

Small sanitary landfill operations will usually require only a small building for storing hand tools, equipment, parts, etc., and a small shelter with sanitary facilities for the employees or a single building to serve both purposes.

Large sanitary landfill operations should have a maintenance and storage garage for the equipment, and an administrative-type building. If the scales are not adjacent to the administrative building, a scale house may also be needed. Sanitary facilities should be available for both employees and the public. In addition, it is recommended that locker rooms and showers be provided for the employees.

Costs

The cost of a sanitary landfill consists of the initial investment for land, equipment, and construction features, and the operating costs.

Initial Investment. The magnitude of the initial investment depends on the size and sophistication of the landfill. A typical breakdown of the items that will normally make up the initial investment is as follows:

1. Land
2. Planning and designing
 - a. Consultant
 - b. Solid wastes survey
 - c. Site investigation
 - d. Design, plans, specifications
3. Construction
 - a. Access roads
 - b. Utilities -- water, electricity, telephone, etc.
 - c. Shelter and storage facilities
 - d. Scales
 - e. Fencing
 - f. Miscellaneous -- signs, site clearing
4. Equipment

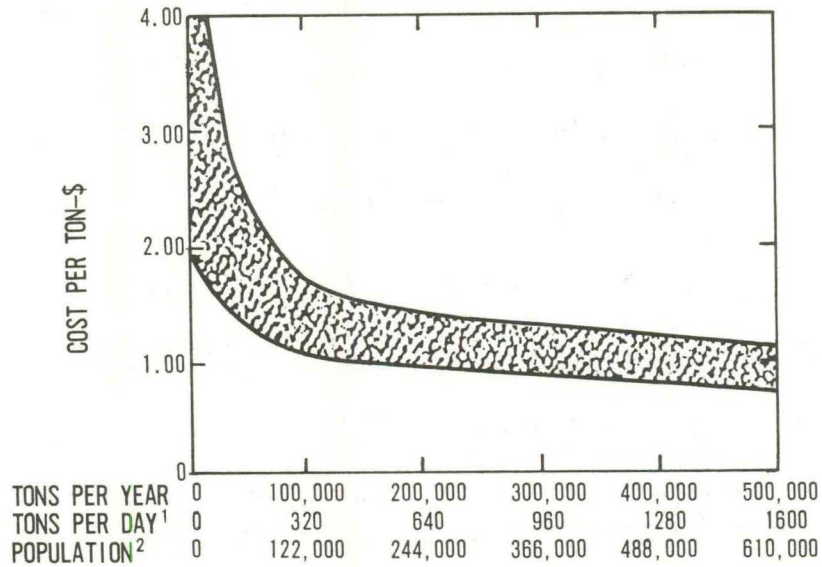
Generally, the major portion of the initial investment will be for the purchase of the land and equipment. Often a sizeable part of the initial investment for land and equipment can be recovered through the development or use of the land and the salvage value of the equipment. If moneys are not available for the proposed investment, consideration should be made of leasing either the land or equipment or both to spread the cost over the operation.

Operation Cost. The operating cost of a sanitary landfill depends on the cost of labor and equipment, the method of operation, and the efficiency of the operation. The principal items that make up the operating cost are as follows:

1. Personnel -- salaries and fringe benefits
2. Equipment
 - a. Operating expenses -- gas, oil, etc.
 - b. Maintenance and repair
 - c. Rental, depreciation, or amortization
3. Cover material -- material and haul costs
4. Administration and overhead
5. Miscellaneous -- tools, utilities, insurance, maintenance to roads, fences, facilities, etc.

Labor wages will amount to about 40 to 50 per cent of the total operating cost. Equipment will make up 30 to 40 per cent; cover material, administration, overhead, and miscellaneous will amount to about 20 per cent.

Figure 25 charts the operating costs per ton versus the amount of solid wastes handled in tons and the population equivalent. The unit operating cost of a small operation handling 50,000 tons per year or less varies from \$1.25 to approximately \$5.00 per ton. This wide range is primarily due to the low efficiency of the smaller operations which are normally operated on a part-time basis. Full-time personnel, full-time use of the equipment, specialized equipment, better management, and other factors that lead to high efficiency are possible at large sanitary landfill operations. The increased efficiency results in lower unit cost of disposal. The unit cost of a large landfill handling 50,000 tons or more per year will generally fall between \$0.75 to \$2.00 per ton.



¹Based on 6-day work week.

²Based on national average of 4.5 lbs per person per calendar day.

Figure 25: SANITARY LANDFILL OPERATING COSTS

To compare the true cost of sanitary landfilling with that of incineration or composting, it is essential that the costs and returns of the initial investments and the hauling costs be included along with the disposal costs. The hauling costs of a collection system that uses the sanitary landfill disposal method may be higher than the hauling costs of a system using incineration or composting, since sanitary landfills are generally located further from the waste-generating area than are incinerators or compost plants. In contrast to the possibility of higher hauling costs, a sanitary landfill may increase the value of a plot of unusable land by converting the site to a playground, golf course, park, etc., thereby obtaining a major investment cost advantage over incineration and composting.

Completed Sanitary Landfill

Decomposition. Information available on the decomposition of buried material in a sanitary landfill indicates that it is extremely difficult to predict the time required for complete decomposition. Many items, particularly paper, have been found unchanged in landfills that had been completed for 15 to 25 years. The rate of decomposition is primarily dependent upon the moisture content and generally takes place at a very slow rate.

Decomposition of the wastes will result in the production of gases, principally methane, carbon dioxide, nitrogen, hydrogen, and hydrogen sulfide. The amount of gas produced during any time interval is dependent upon the rate of gas production; it will usually reach a peak within the first 2 years and then slowly taper off. Methane gas causes the most concern because of its explosive character. Precautions should be taken to prevent the gas from seeping into sewers or other structures located on or near the landfill.

Settlement. Settlement of the landfill is dependent on the depth of the fill, composition, compaction of the material, moisture content, and other factors. Studies have indicated that approximately 90 per cent of the total settlement will occur in the first 2 to 5 years. The final 10 per cent will occur over a long-range period.

Underground Fires. Although underground fires rarely occur in a completed landfill, the possibility does exist. All underground fires should be

dug up and extinguished. The cell construction feature of a sanitary landfill helps to confine and restrict the spread of the fire should one occur.

Maintenance. Completed landfills will generally require maintenance because of differential settlement. The maintenance will consist primarily of resloping the surface to maintain good drainage and filling in small depressions that result from uneven settlement.

Uses. Most completed landfill sites are used for recreational purposes such as parks, playgrounds, and golf courses. Completed landfills are also used for parking and storage areas and botanical gardens. Because of settling and gas problems, construction of buildings on completed landfills generally has been avoided; in several locations, however, one-story rambling-type buildings and airport runways for light aircraft have been constructed directly on sanitary landfills. In such cases, it is important for the designer to avoid concentrated foundation loading which can result in uneven settlement and cracking of the structure; and the designer must provide the means to allow the gas to dissipate to the atmosphere and not into the structure. However, multi-store buildings can be built over completed landfills, using steel and concrete pilings and special engineering design.

Advantages

The sanitary landfill has many advantages not common to other methods of disposal.

1. Where land is available, the sanitary landfill is usually the most economical method of solid waste disposal.

2. The initial investment is low compared to that of other disposal methods.
3. A sanitary landfill is a complete or final disposal method as compared to incineration and composting where residue, quenching water, unusable materials, etc., remain and require further disposal.
4. A sanitary landfill can be put into operation within a short period of time.
5. A sanitary landfill can receive all types of solid wastes, eliminating the necessity of separate collections.
6. A sanitary landfill is flexible; increased quantities of solid wastes can be disposed of with little additional personnel and equipment.
7. Submarginal land may be reclaimed for use as parking lots, playgrounds, golf courses, airports, etc.

Disadvantages

1. In highly populated areas, suitable land may not be available within economical hauling distance.
2. If proper sanitary landfill standards are not adhered to, the operation may result in an open dump.
3. Location of sanitary landfills in residential areas can result in extreme public opposition.

4. A completed landfill will settle and require periodic maintenance.
5. Special design and construction must be utilized for buildings constructed on completed landfill because of the settlement factor.
6. Methane, an explosive gas, and the other gases produced from the decomposition of the wastes may become a hazard or nuisance problem and interfere with the use of the completed landfill.

PHS Sanitary Landfill Projects

The Solid Waste Disposal Act of 1965 provided funds for surveys, demonstrations, studies, and investigations of new and improved technology of solid waste disposal. The Act authorized awards up to two-thirds the cost of the project and the awards are made by the Solid Wastes Program, National Center for Urban and Industrial Health, U.S. Public Health Service. A recent publication describing funded solid wastes demonstration projects, including those related to sanitary landfills, is available from the Solid Wastes Program.

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SECTION II -- INTERGOVERNMENTAL APPROACH TO SOLID WASTE MANAGEMENT

The intergovernmental approach to problem solving is not new to Iowa's political subdivisions. Many counties and cities have entered into agreements for the purpose of preparing and carrying out comprehensive plans for areawide development. These cooperative undertakings have been propagated by the realization that problems common to all municipalities in an area can be solved more effectively through a regional approach. The problem of efficient and effective collection and disposing of solid waste is a problem that lends itself to an intergovernmental, areawide solution. Some of the advantages cited by using this approach are:

Cost Savings: the unit cost for the disposal of a large volume of solid waste is less, and the duplication of engineering, overhead, equipment, labor and supervision is eliminated. [2] [5] [8] Also, an agency having areawide jurisdiction can consider more sites than a single municipality, thereby relieving the necessity to use the more costly method of incineration simply because suitable landfill sites may not be available within a municipality. [8]

Funding: in the Federal Solid Waste Disposal Act of 1965, Congress instructed the Secretary of the Department of Health, Education and Welfare to

"....encourage cooperative activities by the states and local governments in connection with solid-waste disposal programs; encourage, where practicable, interstate, interlocal, and regional

planning for, and the conduct of interstate, interlocal, and regional solid-waste disposal programs...."*

As an inducement for governments to approach the solid waste problem in this manner, a bill now before the U.S. Congress** providing grants for planning and construction of solid waste disposal and resource recovery facilities stipulates an increase from 66-2/3% for planning by a single municipality to 75% for planning of an area including more than one municipality. Further, a project that would serve an area containing more than one municipality would be eligible for a construction grant of 50% as compared to a 25% construction grant for a project serving a single municipality.

Administration: Even though municipalities are reluctant to relinquish any prerogatives to organizations not under the sole control of the municipality, an areawide agency would relieve local authorities of the additional burden of operating disposal departments [2] as well as eliminating the necessity of locating a disposal facility within its boundaries which could create considerable citizen opposition. [1]

Coordination: Perhaps most important, an areawide, intergovernmental approach to solid waste management can be closely coordinated and integrated with comprehensive community planning. Indeed, it may be of even more importance that planning and performance in any functional service area be

*See Appendix IV for text of Act.

**"Resource Recovery Act of 1969," S.2005, 91st Congress, 1st.

coordinated with the planning and performance of other functions, than it be administered by an areawide agency; especially when the service affects physical development. [1] [5] [8]

Establishing an Areawide Solid Waste Management Agency: With the passage of the "Intergovernmental Cooperation Act" (Chapter 28E, Code of Iowa, 1966)* in 1965, the General Assembly gave Iowa's political subdivisions the legal means to exercise jointly those governmental powers which they are authorized to exercise singularly. Specifically,

Any public agency of this state may enter into an agreement with one (1) or more public or private agencies for joint or cooperative action pursuant to the provisions of this Act, including the creation of a separate entity to carry out the purpose of the agreement.

Under this Act, an intergovernmental agreement may provide for the creation of a separate entity in which case the agreement must specify:

- (1) Its duration.
- (2) The precise organization, composition and nature of any separate legal or administrative entity created thereby together with the powers delegated thereto, provided such entity may be legally created.
- (3) Its purpose or purposes.
- (4) The manner of financing the joint or cooperative undertaking and of establishing and maintaining a budget therefor.

*See Appendix V for text of Chapter 28E.

- (5) The permissible method or methods to be employed in accomplishing the partial or complete termination of the agreement and for disposing of property upon such partial or complete termination.
- (6) Any other necessary and proper manners.

or if the agreement does not provide for a separate legal entity, it must also include:

- (1) Provision for an administrator or a joint board responsible for administering the joint or cooperative undertaking. In case of a joint board, public agencies party to the agreement shall be represented.
- (2) The manner of acquiring, holding and disposing of real and personal property used in the joint or cooperative undertaking.

For the precise form and wording as well as the action necessary to enter the agreement into force, each participant should consult its own municipal attorney.

SOURCES OF FINANCING

(1) Public Agencies who are participants in the agreement may, under the "Intergovernmental Cooperation Act":

....appropriate funds....sell, lease, give or otherwise supply the administrative joint board or other legal or administrative entity created to operate the joint or cooperative undertaking by providing such personnel or services therefore as may be within its legal power to furnish.

This source is especially valuable during the organizational and planning phases.

(2) Revenue Bonds now may be issued by legal or administrative entities that are created by such agreements. Chapter 236, Acts of the Sixty-third General Assembly, 1st Session, * allows these entities to issue revenue bonds:

....to provide all or any part of the funds required to finance the cost of the acquisition, construction, reconstruction, repair, extension or improvement of any project or projects or other purposes authorized under this chapter and such costs shall include, but shall not be limited to, administrative expenses, acquisition and construction costs, engineering, fiscal or financial and legal expenses, surveys, plans and specifications, interest during construction, reconstruction, repair, extension or improvement or acquisition of the project or projects, initial reserve funds, acquisition of real or personal property, including franchises, and such other costs as are necessary and incidental to the construction, reconstruction, repair, extension or improvement, or acquisition of such project or projects and the financing thereof.

The revenue bonds may be retired by collecting from the public agencies participating in the agreement, private organizations and individuals, rates

*See Appendix VI for text of Chapter 236.

tolls , fees , rentals or other charges for services and facilities .

(3) Federal-Aid Programs provide another source of financing through loans and grants for the planning and construction of solid waste disposal facilities . One frequently used federal-aid program for these purposes is the Solid Waste Disposal Program authorized under Title II of Public Law 89-272 , "Solid Waste Disposal Act ." Under the terms of this Act , the Department of Health , Education and Welfare provides financial assistance to , among others , state and local agencies of government for surveys , planning and projects which advance research and demonstrate improved methods of disposing of solid wastes . Grants under this program may be made up to two-thirds of the cost of a project . This program is administered by the Public Health Service , Consumer Protection and Environmental Health Service , Department of Health , Education and Welfare . Application kits for grants are available from :

Environmental Control Administration
Consumer Protection and Environmental Health Service
222 East Central Parkway
Cincinnati, Ohio 45202

The federal "701" Comprehensive Planning Assistance Program , the federal "702" Advances for Public Works Planning and the federal Public Facility Loan Program have also been utilized , in part , to study , plan and construct solid waste disposal facilities .

A Beginning

Because it is important that planning for the disposal of solid wastes on a regional basis be integrated with comprehensive community planning ,

logical places for efforts to begin are the regional planning commissions across Iowa. They are the agencies having the authority and experience to plan comprehensively and their membership is areawide. Those counties and communities not members of regional planning organizations may obtain technical assistance in establishing such an organization from the Planning Division of the Iowa Development Commission.

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Health Planning Guide (September, 1967).

APPENDICES

- I. "Rules and Regulations Relating to Air Pollution Control" - Iowa Air Pollution Control Commission
"Guide Policies Relating to Municipal Refuse Disposal" - Iowa State Department of Health
- II. Iowa Air Pollution Control Law
- III. Iowa Water Pollution Control Act
- IV. Federal Solid Waste Disposal Act
- V. Chapter 28E, Code of Iowa
- VI. Chapter 236, Acts of the Sixty-third General Assembly, 1st Session
- VII. Chapter 394, Code of Iowa

APPENDIX I

IOWA AIR POLLUTION CONTROL COMMISSION
IOWA STATE DEPARTMENT OF HEALTH
Lucas State Office Building
Des Moines, Iowa 50319

Pursuant to authority of section 4.3 and section 4.5 of Chapter 162, Acts of the Sixty-second General Assembly, the following rules relating to abatement and prevention of air pollution by control of open burning are adopted.

(Effective April 10, 1969)

RULES AND REGULATIONS RELATING TO
AIR POLLUTION CONTROL

CHAPTER 1
DEFINITIONS

1.1 (Ch. 162, 62GA) General

1.1(1) Meaning. For the purpose of these rules and regulations, the following terms shall have the meaning indicated in this chapter. The definitions set out in section 2 of Chapter 162, Acts of the 62nd General Assembly, shall be considered to be incorporated verbatim in these rules.

1.1(2) Scope. No attempt is made to define ordinary words which are used in accordance with their established dictionary meaning, except where the context otherwise requires and it is necessary to define the meaning as used in these rules and regulations to avoid misunderstanding.

1.2 (Ch. 162, 62GA) Definition of terms

1.2(1) Backyard Burning. The burning of rubbish originating on the premises by individuals domiciled on the premises.

1.2(2) Chimney or stack. Any flue, conduit, or duct permitting the discharge or passage of air contaminants into the open air, or constructed or arranged for this purpose.

1.2(3) Garbage. All solid and semi-solid putrescible and non-putrescible animal and vegetable wastes resulting from the handling, preparing, cooking, storing, and serving of food or of material intended for use as food, but excluding recognized industrial byproducts.

1.2(4) Open burning. Any burning of combustible materials wherein the products of combustion are emitted into the open air without passing through a chimney or stack.

1.2(5) Refuse. Garbage, rubbish, and all other putrescible and non-putrescible wastes, except sewage and water-carried trade wastes.

1.2(6) Rubbish. All waste materials of non-putrescible nature.

1.2(7) Salvage operations. Any business, industry, or trade engaged wholly or in part in salvaging or reclaiming any produce or material, including, but not limited to, chemicals, drums, metals, motor vehicles, or shipping containers.

1.2(8) Trade waste. All solid or liquid material or rubbish resulting from building operations, construction, or the conduct of any business, industry, or trade, including, but not limited to, chemicals, cinders, grease, paint, plastic products, and other forms of liquid or solid waste materials.

CHAPTER 2 OPEN BURNING

2.1 (Ch. 162, 62GA) Open burning

2.1(1) Open burning of refuse. No person shall allow, cause, or permit open burning of refuse, including trade wastes, except as provided in subsections 2.1(3) and 2.1(4).

2.1(2) Salvage by burning. No person shall conduct a salvage operation by open burning, except as provided in subsection 2.1(3).

2.1(3) Variances. Any person wishing to engage in the open burning of trade wastes, or in a salvage operation by open burning, may make application for a variance.

a. Application for variance. Each application for such variance shall be submitted to the Technical Secretary, accompanied by an affidavit stating the following:

(1) The name, address, and telephone number of the person submitting the affidavit or, if such person is a legal entity, the name and address of the individual authorized to accept services of process on its behalf and the name of the official in charge of the premises where refuse or trade wastes are to be burned, or salvage operations by open burning are to be performed.

(2) The type of business activity involved.

(3) The proposed operating practice, including the type and quantity of trade waste scheduled for disposal by open burning, or the type and number of items scheduled for salvage by open burning.

(4) Whether the open burning is to be conducted in a single instance, intermittently, or continuously.

(5) The exact location where open burning is proposed for disposal of rubbish or trade waste, or for salvage by open burning.

(6) The procedures to be followed to minimize air pollution.

(7) Reasons why no other method can be used for disposal of the trade waste without resulting in a hazard to health or property.

2.1(4) Exemptions. The conditions listed below are exempted from these rules and regulations.

a. Cooking of food. Open fires used only for the cooking of food for human consumption, or for recreational purposes, except for the premises of permanent commercial establishments.

b. Premise fires. Backyard burning, not including garbage, at dwellings of four (4) family units or less. The adoption of more restrictive ordinances or regulations of a governing body of the political subdivision relating to control of backyard burning shall not be precluded by these rules and regulations. Unless otherwise provided by ordinance or regulation, fires for the open burning of plant material grown on the premises or deposited thereon by the elements shall be permitted.

c. Diseased trees. The burning of diseased trees. However, when the burning of diseased trees causes air pollution, the Commission may take appropriate action to secure relocation of the burning operations.

d. Disaster rubbish. The open burning of rubbish produced during community disasters in cases where an officially declared emergency condition exists.

e. Flare stacks. Flare stacks for the combustion of waste gases.

f. Training fires. Fires set for the purpose of bona fide instruction and training of public or industrial employees in the methods of fighting fires.

g. Clearing and grubbing rubbish. The open burning of combustible materials produced in clearing, grubbing, and construction operations, provided that such burning shall be limited to areas located at least one-fourth (1/4) mile from any inhabited building.

2.1(5) Compliance. Nothing in these rules and regulations is intended to permit any practice which is a violation of any statute, ordinance, or regulation.

2.1(6) Effective date. Governmental bodies conducting refuse disposal operations by burning shall submit to the Commission proposals for meeting these rules and regulations within six (6) months after the effective date, and shall comply with these rules and regulations within twelve (12) months after the effective date.

These rules are intended to implement subsection 4.3 and subsection 4.5 of Chapter 162, Acts of the 62nd General Assembly.

These rules shall be effective April 10, 1969.

Iowa State Department of Health
Environmental Engineering Service

GUIDE POLICIES RELATING TO

MUNICIPAL REFUSE DISPOSAL

A. DEFINITIONS

1. Refuse - Refuse includes garbage, rubbish, and all other putrescible and non-putrescible wastes, except sewage and water-carried industrial wastes, from all public and private establishments and residences.

2. Garbage - Garbage includes all solid and semi-solid putrescible animal and vegetable wastes resulting from the handling, preparing, cooking, storing, serving, and consuming of food or of material intended for use as food; and all offal; but excluding recognized industrial byproducts; and shall include all such substances from all public and private establishments and residences.

3. Putrescible Wastes - Putrescible wastes include all animal and vegetable wastes that are subject to decay, including animals and fowl which may have died or been killed for purposes other than food.

4. Offal - Offal includes waste animal matter from butcher shops, slaughter houses, and packing plants.

5. Rubbish - Rubbish includes all waste materials of non-putrescible nature.

6. Paunch Manure - Paunch manure includes the contents of the digestive systems of slaughtered animals, and related liquids and organic materials such as tissue, grease, and similar items.

B. STORAGE OF REFUSE

1. Garbage -- All garbage shall be stored on the premises in containers which shall be water-tight, rust-resistant, insect and rodent proof, and equipped with a tight fitting cover of the same material which shall not be removed except when depositing or removing the contents of the container.

Every such container shall be located in areas which are well-drained, reasonably dry, and easily kept in a clean and nuisance-free condition.

2. Rubbish - All rubbish, except tree limbs, brush, and similar large items, shall be stored on the premises in containers of such design and construction that they can be maintained in a clean and nuisance-free condition. Containers for ashes shall be of fireproof construction.

Every rubbish container shall be so located and maintained that fire hazards and rodent harborages are prevented.

C. COLLECTION OF REFUSE

1. Frequency - All refuse shall be collected at sufficiently frequent intervals to prevent a nuisance, preferably once a week.

2. Collection Vehicles - The collection of all refuse shall be by means of covered vehicles of such construction as to be readily cleanable, and to prevent the spillage of refuse on alleys, streets, or highways during loading and transportation to the disposal area. Collection vehicles shall be maintained such that all refuse is removed, and not allowed to be carried over from one working day to the next.

3. Permits for Private Refuse Collectors - No person, firm or corporation shall provide a custom refuse collection service who does not possess a permit or license from the local board of health, or other appropriate local officials.

D. DISPOSAL OF REFUSE

1. Methods - All disposal of refuse shall be by a method or methods that provide the maximum practicable rodent, insect, and nuisance control. The sanitary methods of refuse disposal include the sanitary landfill, incineration, and garbage grinding for disposal into the public or private sewer system.

2. Sanitary Landfill - In the sanitary landfill method, refuse shall be deposited at a suitable site, compacted, and covered with compacted earth at the end of each working day.

a. Site - The site of every sanitary landfill shall be such that no pollution of surface waters or ground waters used as a source of potable supply in the vicinity will result from run-off or seepage. Every sanitary landfill site shall have sufficient material available for effective covering and compacting all finished surfaces each working day. The cover material shall be of a type that compacts to provide a tight seal without cracking excessively when dry, and that is relatively free from putrescible materials and large objects.

Every such site shall be provided with an all-weather access road, suitable for travel by loaded vehicles. Every such site shall be provided with fencing and locked gates suitable for the control of access to the site, and to the fill area.

Every such site shall be graded and provided with drainage facilities to drain off surface water to minimize run-off onto and into the fill, to prevent erosion, and to prevent the collection of standing water.

b. Facilities - Every sanitary landfill operation shall be provided with equipment adequate for the excavation, compaction, and covering procedures required.

c. Operation - At every sanitary landfill, arrangements shall be made to assure the unloading of refuse at the open face of the fill either by supervisory personnel, or by the placement of stationary or portable fencing.

At every sanitary landfill, the deposited refuse shall be uniformly distributed, and compacted in layers with a height and an operating face slope which will permit thorough compaction, to produce cells that do not exceed 8 feet in depth.

The open face of every landfill shall be covered with at least 6 inches of compacted cover material at the end of each working day. When each landfill site has been completed, a final cover of at least 24 inches of compacted material, free from cracks and extrusions of refuse, shall be provided.

Special arrangements shall be made at every landfill site for the disposal of large items, and of hazardous materials such as waste chemicals and similar items. Paunch manure shall not be placed in a landfill operated for the disposal of garbage.

The scattering of paper from every landfill site shall be controlled. The burning of any combustible material shall be severely restricted at every landfill site; and the burning of certain combustible materials not readily incorporated in the fill shall be limited to isolated areas under the supervision of landfill personnel.

Suitable measures shall be provided to control insects and rodents at each landfill site. When evidences of insect and rodent infestations are noted at any such site, supplementary vector control measures, such as the use of insecticides and rodenticides, shall be applied.

Standards specifying the uses to which a completed site may be put, including the type of structure permitted to be erected, shall be established by the appropriate local officials.

3. Incineration - In the incineration method, all refuse shall be deposited at a suitable site and placed in equipment that will destroy all organic materials by burning. Every municipally or privately owned incinerator used for disposal of garbage shall incorporate the use of an auxiliary fuel, or be constructed and operated to prevent smoke and odor. Every incinerator shall be designed to require minimum labor for stocking and ash removal.

a. Site - The site of every public incinerator shall be so located that smoke and odor nuisances will be prevented. Every such site shall be provided with an all-weather access road suitable for travel by loaded vehicles. Every such site shall be provided with fencing and locked gates suitable for control of access to the site and to the unloading area, and regulation of the unloading of refuse.

b. Operation - At every incinerator, adequate supervisory personnel shall be on duty at all times of operation. Arrangements shall be made to assure the unloading of refuse at the point or points designated for this purpose.

Provisions shall be made for the proper charging of refuse to, and temperature control at, every incinerator, to assure maximum efficiency in the burning of the refuse.

Every incinerator, including the unloading area and the charging floor, shall be maintained in a clean and nuisance-free condition at all times. The accumulation of putrescible refuse, rubbish, and reclaimed materials shall be strictly controlled to prevent odor nuisances, harboring of insects and rodents, scattering of material by the wind, or interference with the operation of the site.

The disposal of ashes produced at every such incinerator shall conform with good sanitary practice, such that excessive dust, smoke, or odors are not produced.

4. Garbage grinding - In the grinding method, all garbage and rubbish shall be collected separately, or separated after collection; and the garbage shall be passed through mechanical grinding equipment which discharges into a sanitary sewerage system.

a. Individual Grinders - When garbage grinders are installed in residences or institutions on an individual basis, provisions shall be made for the storage of rubbish at every such installation as specified in Section B,2 above; for the collection of said rubbish at every such installation as specified in Section C, above; and for the disposal of said rubbish from each such installation as specified in Section D,2 or Section D,3 above.

b. Centralized Grinders - Every garbage grinding unit designed, installed, and operated for the grinding of garbage from all or portions of a community, under either private or governmental ownership, shall be so located, installed, and operated that it will be maintained in a sanitary and nuisance-free condition at all times.

Every such garbage grinder shall discharge into a sewerage system in such a manner that no part of the receiving system will be overloaded. Every

such grinder shall be provided with a water supply of sufficient volume and pressure for adequate flushing of solids during grinding and cleaning of equipment. Every connection to a potable water supply serving any such grinder shall be provided adequate protection against backflow or back-siphonage.

At every such grinder, arrangements shall be made to assure the unloading of garbage at the point or points designated for this purpose, and the proper charging of garbage into the grinder to assure adequate operation of the unit. Operation of every such grinder shall be scheduled such that the necessity for storing of garbage at the site will be eliminated or minimized. All refuse that is withheld from any such grinder for any reason, including reclaimed or salvaged items, shall be removed promptly for proper disposal as specified in Section D,2 or Section D,3 above; and no such material shall be stored on the site from one day to the next.

5. Open Dump - In cases where refuse disposal is by means of an open dump, rather than one of the sanitary methods of disposal listed above, the following measures shall apply.

a. Location - The site of every open dump shall be sufficiently isolated from residences, public roads, parks, cemeteries, or any occupied area under other ownership, to minimize the creation of nuisances relating to insects, odor, rodents, smoke, or the scattering of refuse. No open dump shall be located on ground that is subject to overflow by any stream or other body of water.

b. Dumping - Indiscriminate dumping shall be prohibited at every such installation. Dumping shall be permitted only at certain times, and shall be directed to certain portions of the dump, to provide for the filling of the area used in an orderly manner.

c. Covering - The area containing refuse at every such dump shall be leveled off and an earthen cover placed over the dumped material at least once each week, in such a manner that the breeding of rats and flies shall be prevented.

d. Separation of Material - Efforts shall be made at every such dump to provide separation of combustible material, and to have it burned promptly, under supervision, at every such dump, to reduce spontaneous combustion in the entire dump.

e. Enclosures - The dump area at every such installation shall be enclosed with fences to prevent the scattering of paper.

f. Insect Control - The dump area at every such installation shall be sprayed with an insecticide at least once a week during the fly season in such a manner that adequate fly control is provided.

g. Rodent Control - Efforts shall be made at every such dump to control the breeding and the harborage of rats and other rodents. When necessary, these activities shall include the use of rodenticides and trapping.

E. OTHER REGULATIONS

1. Feeding of Garbage to Animals - The feeding of garbage to animals comes under the jurisdiction of the State Department of Agriculture as specified in Chapter 163, Code of Iowa.

2. Dead Animals - Disposal of dead animals comes under the jurisdiction of the State Department of Agriculture as specified in Chapter 167, Code of Iowa.

3. Depositing of Refuse on Highways - The depositing or the throwing of refuse on any highway is classified as a misdemeanor in Chapter 321, Code of Iowa, which comes under the jurisdiction of the State Department of Public Safety.

4. Disposal of Refuse in Streams Prohibited - The disposal of any dead animals, night soil, or garbage into any river, well, spring, cistern, reservoir, stream, or pond, or in or upon any land adjoining, which is subject to overflow is prohibited under the provisions of Section 732.3, Code of Iowa.

PUBLIC DISPOSAL GROUNDS
Code of Iowa, 1966

332.31 Need determined. The board of supervisors of any county may determine that a public disposal ground is needed in their county and may make a finding as to where such disposal ground shall be located.

332.32 Tax levy. Said boards may within their respective jurisdictions make a determination of which townships of the county will be best served by such disposal ground and levy a tax of not to exceed one-fourth mill on all the property in said townships outside the incorporated limits of any city or town for the purpose of acquiring and maintaining such disposal grounds. Such funds shall be placed in a township dump fund.

332.33 Rules. The board of supervisors may make such rules and regulations for the use of such disposal grounds as it shall deem necessary, and may adopt and enter into contractual agreements with cities and towns for the use of such disposal grounds. Any funds derived from such agreements shall be placed in the township dump fund established for that purpose and none other.

332.34 Contractual agreements. The county boards of supervisors may enter into contractual agreements with cities and towns, or with private corporations and persons for the use by residents of the county residing outside of incorporated cities or towns, of dumps, disposal grounds, and sanitary landfills owned or operated by cities, towns, private corporations or private individuals, and that funds from the township dump fund may be used for such purpose. County board of supervisors may also use funds from said township fund, for the purpose of acquiring, constructing, operating, and maintaining, sanitary landfills.

APPENDIX II

IOWA AIR POLLUTION CONTROL LAW

Chapter 162
Acts of the Sixty-second General Assembly
of the State of Iowa

(Effective July 1, 1967)

WHEREAS, it is hereby declared to be the public policy of this state to achieve and maintain reasonable levels of air quality, and to prevent the discharge of air contaminants into the outside atmosphere which will cause air pollution and create a public nuisance; and

WHEREAS, it is the intent and purpose of this Act to maintain purity of the air resources of the state consistent with the protection of the normal health and physical property of the state, maximum employment, and the full industrial development of the state; and

WHEREAS, it also is the purpose of this Act to provide for a coordinated statewide program of air pollution prevention, abatement and control for an appropriate distribution of responsibilities among the state and political subdivisions, for the procedures for cooperation across jurisdictional lines in dealing with problems of air pollution not confined within single jurisdictions, and for a framework within which all values may be balanced for the public interest; and

WHEREAS, the commission hereby established shall seek the accomplishment of these objectives through the prevention, abatement, and control of air pollution by practicable and reasonable methods; NOW, THEREFORE,

Be It enacted by the General Assembly of the State of Iowa;

Title*

SECTION 1. This Act shall be known as the "Iowa Air Pollution Control Act."

Definitions

SEC. 2. When used in this Act, unless the context otherwise requires:

*Section headings not a part of enrolled bill

1. "Air contaminant" means dust, fume, mist, smoke, other particulate matter, gas, vapor (except water vapor), odorous substance, or any combination thereof.

2. "Air contaminant source" means any and all sources of emission of air contaminants whether privately or publicly owned or operated.

a. Air contaminant source includes, but is not limited to, all types of businesses, commercial and industrial plants, works, shops, and stores, heating and power plants and stations, buildings, and other structures of all types including single and multiple family residences, office buildings, hotels, restaurants, schools, hospitals, churches and other institutional buildings, automobiles, trucks, tractors, buses, aircraft, and other motor vehicles, garages, vending and service locations and stations, railroad locomotives, ships, boats, and other water-borne craft, portable fuel-burning equipment, indoor and outdoor incinerators of all types, refuse dumps and piles, and all stack and other chimney outlets from any of the foregoing.

3. "Air pollution" means presence in the outdoor atmosphere of one (1) or more air contaminants in sufficient quantities and of such characteristics and duration as is injurious to normal human, plant, or animal life, or to property, or which unreasonably interferes with the enjoyment of life and property.

4. "Atmosphere" means all space outside of buildings, stacks or exterior ducts.

5. "Commissioner" means the commissioner of public health.

6. "Commission" means the air pollution control commission created by this Act.

7. "Department" means the state department of health.

8. "Emission" means a release of one (1) or more air contaminants into outside atmosphere.

9. "Technical secretary" means the technical secretary of the commission.

10. "Person" means an individual, partnership, copartnership, cooperative, firm, company, public or private corporation, political subdivision, agency of the state, trust, estate, joint stock company, or any other legal entity, or their legal representative, agent or assigns.

11. "Political subdivision" means any municipality, township, or county, or district, or authority, or any portion, or combination of two (2) or more thereof.

Air pollution control commission

SEC. 3. There is hereby created and established the Iowa air pollution control commission. The commission is established within the department of health to perform the functions specified for it in this Act.

1. The commission shall consist of the commissioner of public health and eight (8) additional members having competence appropriate to service in the field of air pollution, to be appointed by the governor. One (1) member shall be a registered professional engineer as defined in section one hundred fourteen point two (114.2) of the Code. One (1) member shall be a physician

licensed in compliance with section one hundred forty-eight point three (148.3) of the Code who shall be experienced in the field of industrial medicine. One (1) member shall be actively engaged in the management of a private manufacturing concern. One (1) member shall be selected from individuals representative of a field directly related to the conservation of natural resources or agriculture. One (1) member shall be representative of labor. One (1) member shall be engaged in or be a representative of a political subdivision government or urban or regional planning commission. Two (2) members shall be selected at large.

2. Members appointed to the commission shall serve for terms of four (4) years, except when appointed to fill an unexpired term, and until appointment of their successors, except that the terms of those first appointed shall be as designated by the governor at the time of appointment as follows:

a. Four (4) members shall serve from the date of appointment until June 30, 1969. Four (4) members shall serve from the date of appointment until June 30, 1971.

b. If a vacancy occurs in the appointed membership, the governor shall appoint a member for the remaining portion of the unexpired term created by the vacancy. The governor may remove any appointed member for cause.

3. The members of the commission shall receive no compensation for their services, but shall be reimbursed for travel and other expenses necessarily incurred in the performance of their duties.

4. The commission shall hold at least four (4) regular meetings each calendar year at a place and time to be fixed by the commission. Special meetings may be called by the chairman or by four (4) members of the commission upon delivery of written notice to the office of each member of the commission. Any five members present at any regular or special meeting shall constitute a quorum.

5. Except as otherwise specified in this Act, at least a quorum must be present at any meeting to validate any action taken by the commission at such meeting, and a majority of members present shall determine issues; provided, however, that any rule or regulation or amendment or repeal thereof shall not be deemed operative until it shall have been approved in writing by at least five members of the commission.

6. The commission shall select at its first meeting one (1) of its members to serve as chairman, and another of its members to serve as vice-chairman. At the first regular meeting in each calendar year thereafter, a chairman and a vice-chairman for the ensuing year shall be elected. The department shall furnish the services of a technical secretary to the commission. The technical secretary shall be a technically qualified engineer and shall receive no additional compensation for such services.

Powers and duties of commission

SEC. 4. The commission is hereby given and charged with the following powers and duties:

1. The commission, through the department, shall have general supervision over administration and enforcement of all laws relating to air pollution.

2. To develop and prepare a comprehensive plan or plans for the abatement, control, and prevention of air pollution in this state, recognizing varying requirements for different areas in the state.

3. To adopt, amend and promulgate rules and regulations pertaining to the evaluation, abatement, control, and prevention of air pollution consistent with the intent and purpose of this Act after at least sixty (60) days public notice and public hearings.

4. To establish, repeal, or modify air quality standards for the atmosphere of this state as a whole or any part thereof on the basis of providing air quality necessary to minimize air pollution consistent with the purposes of this Act after at least sixty (60) days public notice and public hearings.

5. To establish, repeal, or modify emission standards relating to the maximum quantities of air contamination that may be emitted from any air contaminant source; and requirements for open burning, including the prohibition thereof, for this state as a whole, after at least sixty (60) days public notice and public hearings.

6. To consider complaints of conditions reported to, or considered likely to, constitute air pollution; and instruct the department to conduct investigations of such complaints upon receipt of the written petition of any state agency, the governing body of any political subdivision, a local board of health, or twenty-five (25) affected residents of the state.

7. To hold such public hearings except when the evidence to be received is confidential pursuant to section eight (8) of this Act, in addition to those otherwise required by this Act, as it may deem advisable and necessary to accomplish the purposes of this Act, and in connection therewith is authorized to issue subpoenas requiring the attendance of witnesses and the production of evidence pertinent to such hearings. All hearings shall be held before at least a quorum of the commission.

a. If any person refuses to obey a subpoena issued under this Act, the district court of the county where the proceeding is pending shall have jurisdiction, upon application of the commission, or its authorized representative, or the technical secretary, to issue to such person an order requiring him to appear and testify or produce evidence, and any failure to obey such order of the court may be punished by said court as a contempt thereof.

8. To issue or enter such order or determination as may be necessary to effectuate this Act. If a condition of air pollution, as defined herein, is found to exist, such order may require the taking of such action as is indicated by the circumstances to cause the abatement or control of such condition.

a. In making orders and determinations, the commission shall take into consideration all the facts and circumstances bearing upon the reasonableness of the emissions involved, including, but not limited to: the character and degree of injury to, or interference with, the protection of the health and the physical property of the public; the practicability of reducing or limiting the emissions from such air pollution source; and the suitability or unsuitability

of the air pollution sources to the area in which located.

b. Any such order or determination may include such advisory recommendation as is deemed appropriate for the control of emissions from any air contaminant source and the reduction of the emission of air contaminants.

9. Cause to be instituted, in the name of the state, in a court of competent jurisdiction, legal proceedings to compel compliance with any order or determination entered by the commission.

10. To classify air contaminant sources according to levels and types of emissions, and other characteristics which relate to air pollution, and may require, by rule and regulation, reporting for any such class or classes of information including location, size, and height of contaminant outlets, fuels used, the nature and the time periods of emissions, and such other information as is relevant to air pollution.

Classifications made pursuant to this paragraph may be for application to the state as a whole, or to any designated area of the state, and shall be made with special reference to effects on health, economic, and social factors, and physical effects on property.

11. To require, by rules and regulations promulgated hereunder, notice of the construction or the installation of any equipment which may cause or contribute to air pollution as defined herein; and the submission to the department of plans and specifications, or such other information as is deemed necessary, for installation of equipment from which air contaminants may be emitted to the atmosphere and related control equipment.

Such standards, rules or regulations shall not specify any particular method to be used to reduce undesirable levels of emissions, nor type, design, or method of installation of any equipment to be used to reduce said levels of emissions, nor the type, design, or method of installation or type of construction of any manufacturing processes or kinds of equipment, nor specify the kind or composition of fuels permitted to be sold, stored, or used.

Nothing herein shall prevent the commission from giving technical advice pertaining to the construction or installation of any equipment or any other recommendation.

The order of determination of the commission may include such advisory recommendation as the commission may deem appropriate for the control of emissions from any air-contaminant source and the reduction of the emission of air contaminants.

12. Review and evaluate local air pollution control programs conducted by political subdivisions of the state with respect to whether such programs are not inconsistent with the provisions and purposes of this Act, and any rules and regulations promulgated thereunder.

13. Represent the state in any and all matters pertaining to plans, procedures, negotiations, and agreements for interstate compacts relating to the control of air pollution.

14. Advise, consult, and cooperate with other agencies of the state, political subdivisions, industries, other states, interstate or interlocal agencies, the federal government, and with affected groups in the control of air contamination sources within the state.

15. Encourage voluntary cooperation by persons or other affected groups in restoring and preserving a reasonable quality of air within the state.

16. Encourage political subdivisions to handle air pollution problems within their respective jurisdictions to the greatest extent possible.

17. Provide technical assistance to political subdivisions requesting such aid for the furtherance of air pollution control.

18. Collect and disseminate information, and conduct educational and training programs, relating to air pollution and its abatement prevention, and control.

Health department duties

SEC. 5. The department shall:

1. Provide to the commission such facilities and services as may be needed in conducting the activities specified herein.

2. Publish and administer the rules, regulations, and standards promulgated hereunder. The department shall furnish a copy of such rules, regulations, or standards adopted hereunder to any citizen upon request.

3. Provide such technical, scientific, and other services as may be required for the purpose of effectuating the provisions of this Act from funds appropriated and available for the purposes of this Act.

4. Conduct such correspondence and related activities in the interim between meetings of the commission, make or arrange for such inspections and investigations, and assemble or prepare such data and reports as the commission may request.

5. Conduct investigations of complaints received directly or referred by the commission, or such other investigations as are deemed necessary to effectuate the provision of this Act; and participate, on behalf of the state, in hearings before the commission.

6. Enter at all reasonable times in and upon any private or public property except private dwellings for the purpose of investigating an actual or possible source of air pollution, or of ascertaining the state of compliance with this Act or rules and regulations promulgated hereunder.

a. No person shall refuse entry or access to any authorized representative of the department who requests entry for the purpose of an investigation, and who presents appropriate credentials; nor shall any person obstruct, hamper, or interfere with any such investigation.

b. If requested, the owner or operator of the premises shall receive a report setting forth levels of emissions and any other facts found which relate to compliance status.

7. Grant, modify, or deny permits, under the direction of the commission, for the installation of new equipment capable of emitting air contaminants to

produce air pollution as defined herein, and for related control equipment, subject to pertinent rules and regulations promulgated hereunder. The department shall furnish necessary forms to be executed in making application for such permits.

a. No equipment which may cause or contribute to air pollution as defined herein, or which is intended primarily to prevent or to control the emission of air contaminants, shall be installed, altered in such a way that it significantly affects operational efficiency, or placed in use unless a permit has been issued for such equipment.

b. The condition of expected performance must be reasonably detailed in the permit unless it is agreed between the commission and the permit holder that a condition of development and adjustment exists.

c. Upon denial of such a permit, the person applying for such permit shall be notified of such denial and informed of the reason or reasons therefor, and such person shall be entitled to a hearing before the commission in accordance with section four (4), subsection seven (7) of this Act.

8. Determine by field studies and sampling the quality of atmosphere and the degree of air pollution in this state and the several parts hereof.

9. Conduct and encourage studies, investigations, and research relating to air pollution and its causes, effects, abatement, control, and prevention.

10. Accept, receive, and administer grants or other funds or gifts from public or private agencies, including the federal government, for the purpose of conducting any of the functions of this Act.

11. Employ and compensate, within appropriations available pursuant to the Iowa merit system, and prescribe the duties of such consultants and technical assistants on a full or part-time basis as may be necessary to carry out the provisions of this Act.

Interior air pollution not included

SEC. 6. Nothing contained in this Act shall be deemed to grant to the commission or the department any authority or jurisdiction with respect to air pollution existing solely within residences; or solely within commercial and industrial plants, works, or shops under the jurisdiction of chapter ninety-one (91) of the Code; or to affect the relations between employers and employees with respect to, or arising out of, any condition of air pollution.

Assistance of other agencies

SEC. 7. The commission and the department may request and receive assistance from any other agency, department, or educational institution of the state, or political subdivision thereof, when it is deemed necessary or beneficial by the commission or the department in effectuating the purposes of this Act. The department may reimburse such agencies for special expense resulting from expenditures not normally a part of the operating expenses of any such agency.

Information confidential

SEC. 8. Information received by the commission or the department through filed reports, inspections, or as otherwise authorized under this Act concerning trade secrets, secret industrial processes, or other privileged communications shall not be disclosed or opened to public inspection, except as may be necessary in a proceeding concerning a violation of the Act or of any rules and regulations promulgated thereunder, or as otherwise authorized or ordered by appropriate court action or proceedings. Nothing herein shall be construed to prevent the commission or the department from compiling or publishing analyses or summaries relating to the general condition of the atmosphere; provided that such analyses or summaries do not reveal any information otherwise confidential under this section.

Notice and orders to violators

SEC. 9. Whenever the commission has evidence that a violation of any provision of this Act, or rule, regulation, or standard promulgated hereunder has occurred, it may cause written notice to be served upon the alleged violator or violators by certified mail. The notice shall specify the provision of this Act, rule, regulation, or standard alleged to be violated, and the facts alleged to constitute a violation thereof, and may include an order that necessary corrective action be taken within a reasonable time.

1. Any such order shall become final unless, no later than thirty (30) days after the date the notice and order are received, the person or persons named therein request a hearing before the commission. In lieu of an order, the commission may require that the alleged violator or violators appear before the commission for a hearing at a time and place specified in the notice and answer the charges. Such hearings shall be held at such place as the commission shall determine.

2. The alleged violator or violators may file a written answer to a notice of violation or order and may appear in person at such hearing or by representative, with or without counsel, and may make oral argument, offer testimony, and cross examine witnesses. The testimony taken at the hearing shall be under oath and recorded, and copies of the transcript shall be furnished to the alleged violator or violators upon his request and at his expense.

3. If after a hearing held pursuant to subsection one (1) of this section, the commission finds that a violation or violations have occurred, it shall affirm or modify its order previously issued, or issue an appropriate order or orders for the prevention, abatement, or control of the emissions or air pollution involved. If after hearing on an order, the commission finds that no violation is occurring, it shall rescind the order. Any order issued as part of a notice or after hearing shall prescribe the date or dates by which violation or violations shall cease and may prescribe time tables for necessary action in preventing, abating or controlling the emissions or air pollution.

4. Nothing in this Act shall prevent the commission and the department from making efforts to obtain voluntary compliance through warning, conference, or any other appropriate means.

5. If the commission, its technical secretary, or the commissioner has evidence that any person is causing or contributing to air pollution and that such pollution creates an emergency requiring immediate action to protect the public health and safety, or property, either may, without notice or hearing, issue an emergency order reciting that an emergency exists and requiring such person or persons to reduce or discontinue immediately the emission of air contaminants. Such order shall be effective immediately. Upon issuance of such order the commission or its authorized representative shall fix a place and time of hearing, such hearing to be held before the commission not later than twenty-four (24) hours thereafter. Not more than twenty-four (24) hours from the commencement of such hearing, the commission shall affirm, modify, or set aside such order.

Appeal from order

SEC. 10. An appeal may be taken by any aggrieved party from any order issued or entered as provided in section nine (9) to the district court of the county in which the alleged offense was committed. Notice of appeal from an order shall be served upon the commission or the technical secretary by certified mail or by personal service. Failure to serve such notice of appeal within thirty (30) days after receipt of the order shall operate as a waiver of the right to appeal. An order by the commission shall not be stayed by an appeal except by order of the district court after hearing for good cause shown by the aggrieved party. The hearing on appeal shall be tried as a suit in equity and shall be de novo. The court may receive additional testimony and evidence and may affirm, modify, or reverse the order of the commission.

Application for injunction

SEC. 11. If measures to prevent or correct air pollution which is in violation of any rule or regulation promulgated by the commission are not taken in accordance with an order of the commission, or if the commission or its authorized representative has evidence that an emergency exists by reason of air pollution, requiring immediate action to protect the public health or property, the attorney general shall, upon receiving a request from the commission or its authorized representative, bring an action in the name of the state for an injunction to prevent any further or continued violation of such rule or regulation or such order. In an action for a temporary injunction brought pursuant to this section, any previous findings of the commission, after due notice and hearing, shall be prima facie evidence of the fact or facts found therein.

Burden of proof

SEC. 12. In all proceedings with respect to any alleged violation of the provisions of this Act or any rule or regulation promulgated hereunder, the burden of proof shall be upon the commission except in an action for a temporary injunction as provided for in section eleven (11) of this Act.

Application for variance

SEC. 13. Any person who owns or is in control of any plant, building, structure, process, or equipment may apply for a variance from rules, regulations, or standards governing the quality, nature, duration, or extent of emissions by filing an application with the technical secretary. The application shall be accompanied by such information and data as the commission may require.

1. The department shall promptly investigate such application and make a recommendation to the commission as to the disposition thereof. The commission may grant such variance if it finds that:

a. The emissions occurring or proposed to occur do not endanger or tend to endanger human health or safety or property; and

b. Compliance with the rules, regulations, or standards from which variance is sought would produce serious hardship without equal or greater benefits to the public.

2. A hearing shall be held if the commission in its discretion concludes that a hearing will be advisable. The person applying for a variance may request a review hearing before the commission if his application is denied.

3. In determining under what conditions and to what extent a variance from this Act or rule or regulation hereunder may be granted, the commission shall give due recognition to the progress which the person requesting such variance shall have made in eliminating or preventing air pollution. In such a case, the commission shall consider the reasonableness of granting a variance, conditioned upon such person effecting a partial abatement of the particular air pollution over a period of time which it shall consider reasonable under the circumstances, or the commission in conformity with the intent and purpose of this Act to protect health and property, may prescribe other and different requirements with which the person who received such variance shall comply.

4. Any variance granted shall be granted for such period of time, not exceeding one (1) year, as shall be specified by the commission at the time of the grant of such variance. Any variance may be granted by the commission upon the condition that the person who received it shall make such periodic reports to the commission as the commission shall specify as to the progress which such person shall have made toward compliance with any rule or regulation as to which a variance has been granted. Such variance may be extended from year to year by affirmative action of the commission.

Pollution control programs by subdivisions

SEC. 14. 1. Any political subdivision is hereby authorized, in addition to any other power vested by law, to conduct an air pollution control program within the boundaries of its jurisdiction, and to conduct air pollution control programs jointly with other political subdivisions of this state or of other states; provided that every joint program shall be established and administered in accordance with the provisions of chapter twenty-eight E (28E) of the Code. In conducting such programs, political subdivisions shall have the power and the authority to adopt and enforce rules, regulations, or standards for the purpose of securing and maintaining adequate air quality within the respective jurisdictions.

2. If the board of supervisors in any county establishes an air-pollution program and has obtained a certificate of acceptance, the agency implementing the program shall have jurisdiction over and may regulate air pollution within the county including any incorporated areas therein unless and until such incorporated areas shall obtain a certificate of acceptance as a joint or separate agency.

Acceptance of program by commission

SEC. 15. When an air pollution control program conducted by a political subdivision, or combination of two (2) or more political subdivisions, is deemed upon review in accordance with section four (4), subsection twelve (12), of this Act to be consistent with the provisions of this Act or rules and regulations promulgated thereunder, the commission shall accept such program in lieu of administration of the regulatory provisions of this Act by the state within the jurisdiction involved. Nothing contained herein shall be construed to limit the power of the commission to take emergency action under the provisions of section nine (9), subsection five (5), of this Act.

1. In evaluating such a local air pollution control program, consideration shall be given to whether such program provides for the following:
 - a. Ordinances, rules, regulations, or standards establishing requirements consistent with, or more strict than, those imposed by this Act or rules, regulations, and standards promulgated thereunder;
 - b. Enforcement of such requirements by appropriate administrative and judicial process; and
 - c. Administrative organization, staff, financial, and other resources necessary to carry out its program effectively and efficiently.

2. When a local air pollution control program has been deemed to be consistent with the provisions of this Act, the commission shall issue a certificate of acceptance to the appropriate local agency.

- a. Any political subdivision desiring a certificate of acceptance shall make application for such certificate to the technical secretary on such forms as the commission may prescribe.

b. The technical secretary shall investigate promptly such application, and make a recommendation to the commission as to the disposition thereof. Upon receiving an affirmative recommendation from the technical secretary, the commission may grant such certificate without a hearing. If the recommendation is against the granting of a certificate of acceptance, or if the commission in its discretion concludes that a hearing is advisable, the political subdivision shall be entitled to a hearing as provided in section nine (9) of this Act on the questions as to whether the local program is substantially consistent with the provisions of this Act or rules and regulations promulgated thereunder, and whether the local ordinance or regulation is being enforced. The burden of proof thereof shall be upon the political subdivision.

c. If the commission shall determine at any time that a local program is being conducted by a political subdivision holding a certificate of acceptance in a manner inconsistent with the substantive provisions of this Act or rules and regulations promulgated thereunder, the commission shall provide to the political subdivision a notice reciting the deviations from the standards and the corrective measures to be completed within a reasonable period of time. If the commission finds, after such period of time, that the political subdivision has failed to take the specified corrective action, the commission shall suspend the certificate of acceptance and shall administer the regulatory provisions of this Act in such political subdivision until such standards are met. Upon receipt of evidence that is deemed to show correction of the cause of such suspension, the commission shall reinstate a suspended certificate of acceptance, and the political subdivision shall resume the regulatory functions involved upon receipt of appropriate notice from the commission. In cases where the certificate of acceptance is suspended, the political subdivision shall be entitled to a hearing as specified in section nine (9) of this Act.

d. Nothing in this Act shall be construed to supersede the jurisdiction of any local air pollution control program in operation on the effective date of this Act; provided that within two (2) years from such date any such program shall meet all requirements of this Act for a local air pollution control program and an application for a certificate of acceptance is submitted to the technical secretary.

Violation of orders

SEC. 16. In the event the commission shall determine that any final order or determination made by it is being violated, the commission may cause to have instituted a civil action in any court of competent jurisdiction for injunctive relief to prevent any further violation of such final order or determination or for the assessment of such penalty not to exceed two hundred (200) dollars per day for each day such violation continues as the court may deem proper, or both. It shall be the duty of the attorney general to bring such actions at the request of the commission in the name of the people of the state of Iowa.

Failure to act by commission within 60 days

SEC. 17. Upon the failure of the technical secretary to take action within sixty (60) days after an application for installation permit or variance, or upon the failure of the commission to enter a final order or determination within sixty (60) days after the final argument in any hearing under section nine (9) of this Act, the person seeking any of such actions shall be entitled to treat for all purposes such failure to act as grant of the requested permit or variance, or of a finding favorable to the respondent in any hearing under section nine (9) of this Act, as the case may be.

No fees

SEC. 18. No fees shall be charged by the technical secretary or the commission for the performance of any of their respective functions under this Act.

No interference with other functions of health department

SEC. 19. The powers, duties, and functions vested in the commission under the provisions of this Act shall not be construed to affect in any manner the powers, duties, and functions vested in the department under any other provisions of law.

MISCELLANEOUS PROVISIONS

The following section of the Code of Iowa also has been amended by Chapter 162, Acts of the 62nd General Assembly:

263.8 Reports-tests. Such examination shall be made without charge, except for transportation and actual cost of examination, not to exceed two dollars for each. A copy of each epidemiological examination and investigation shall be promptly sent to the state department of health.

In addition to its regular work, the laboratory shall perform without charge all bacteriological, serological, and epidemiological examinations and investigations which may be required by the state department of health or the Iowa water pollution control commission and said department shall establish rules therefor.

The laboratory also shall perform all laboratory examinations and studies that may be required by the state department of health and the air pollution control commission. The laboratory is authorized to perform such laboratory examinations relating to air contaminants as may be requested by political subdivisions or other persons, and the laboratory is hereby authorized to charge political subdivisions or other persons fees covering transportation of samples and the actual costs of examinations performed upon their request.

APPENDIX III

IOWA WATER POLLUTION CONTROL LAW

Chapter 455B
Code of Iowa, 1966

- 455B.1 Statement of policy.
- 455B.2 Definitions.
- 455B.3 Commission created.
- 455B.4 Membership.
- 455B.5 Terms.
- 455B.6 Vacancies--removal of member.
- 455B.7 Compensation.
- 455B.8 Organization.
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- 455B.10 Investigations.
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- 455B.12 Scope of investigation.
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- 455B.14 Permission to enter lands or waters.
- 455B.15 Hearings.
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- 455B.17 Notice of hearing--orders--records.
- 455B.18 Appeal.
- 455B.19 Transcript on appeal.
- 455B.20 Stay order.
- 455B.21 Conclusiveness of action.
- 455B.22 Trial term.
- 455B.23 Injunction.
- 455B.24 Contempt--penalty.
- 455B.25 Unlawful acts.
- 455B.26 Plans of every disposal system to be filed.
- 455B.27 Assistance by governmental agencies.
- 455B.28 Discharge of waste into lakes.

455B.1 Statement of policy. Whereas the pollution of the waters of this state constitutes a menace to public health and welfare, creates public nuisances, is harmful to wildlife, fish and aquatic life, and impairs domestic, agricultural, industrial, recreational and other legitimate beneficial uses of water, and whereas the problem of water pollution in this state is closely related to the problem of water pollution in adjoining states, it is hereby declared to be the public policy of this state to conserve the waters of the state

and to protect, maintain and improve the quality thereof for public water supplies, for the propagation of wildlife, fish and aquatic life, and for domestic, agricultural, industrial, recreational and other legitimate (beneficial) uses; to provide that no waste be discharged into any waters of the state without first being given the degree of treatment necessary to protect the legitimate (beneficial) uses of such waters; to provide for the prevention, abatement and control of new, increasing, potential, or existing water pollution; and to co-operate with other agencies of the state, agencies of other states and the federal government in carrying out these objectives.

455B.2 Definitions. When used in this chapter:

1. "Sewage" means the water-carried waste products from residences, public buildings, institutions, or other buildings, including the bodily discharges from human beings or animals together with such ground water infiltration and surface water as may be present.

2. "Industrial waste" means any liquid, gaseous or solid waste substance resulting from any process of industry, manufacturing, trade or business or from the development of any natural resource.

3. "Other waste" means garbage, municipal refuse, lime, sand, ashes, offal, oil, tar, chemicals and all other substances which are not sewage or industrial waste which may pollute the waters of the state.

4. "Pollution" means the contamination of any waters of the state so as to create a nuisance or render such waters unclean, noxious or impure so as to be actually harmful, detrimental or injurious to public health, safety or welfare, to domestic, commercial, industrial, agricultural or recreational use or to livestock, wild animals, birds, fish or other aquatic life.

5. "Sewer system" means pipe lines or conduits, pumping stations, force mains and all other constructions, devices and appliances appurtenant thereto used for conducting sewage or industrial waste or other wastes to a point of ultimate disposal.

6. "Treatment works" means any plant, disposal field, lagoon, holding or flow regulating basin, pumping station, or other works installed for the purpose of treating, stabilizing or disposing of sewage, industrial waste or other wastes.

7. "Disposal system" means a system for disposing of sewage, industrial waste and other wastes and includes sewer systems, treatment works, and dispersal systems.

8. "Waters of the state" means all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, reservoirs, aquifers, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface or underground, natural or artificial, public or private, which are contained within, flow through or border upon the state or any portion thereof.

9. "Person" means the state or any agency or institution thereof, any municipality, governmental subdivision, public or private corporation, individual, partnership, or other entity and includes any officer or governing or managing body of any municipality, governmental subdivision or public or private corporation.

10. "Commission" means the Iowa water pollution control commission.

455B.3 Commission created. There is hereby created and established the Iowa water pollution control commission. The commission is established as an agency of the state government to prevent, abate, or control the pollution of the waters of the state.

455B.4 Membership. The commission shall consist of nine members as follows:

1. The commissioner of public health.
2. The director of the state conservation commission.
3. The director of the Iowa natural resources council.
4. A member from the staff of one of the universities or colleges of the state who has technical background, training and knowledge in the field of water pollution.
5. The secretary of agriculture.
6. Four electors of the state who shall be selected from the state at large solely with regard to their qualifications and fitness to discharge the duties of office without regard to their political affiliation. Of these four, one shall represent industry, one shall represent municipal government, one shall be an owner-operator farmer, and one shall represent the public at large.

455B.5 Terms. The members of the commission not holding public office shall be appointed by the governor for overlapping terms of six years. The members of the first commission not holding public office shall be appointed for the following terms: two electors for a term to expire July 1, 1967; two electors for a term to expire July 1, 1969; and a member of one of the state universities for a term to expire July 1, 1971. Said terms shall begin immediately upon the appointment. Thereafter the term of each member of the commission shall be six years.

455B.6 Vacancies--removal of member. Any vacancy or vacancies on the commission which may occur shall be filled by appointment by the governor for the unexpired portion of the regular term.

The governor may remove any member of the commission for malfeasance in office or for any cause that renders him ineligible for membership or incapable or unfit to discharge the duties of his office and his removal when so made shall be final.

455B.7 Compensation. Each member of the commission, not otherwise in the full-time employment of any public body, shall receive the sum of twenty-five dollars for each day actually and necessarily employed in the discharge of official duties and each member of the commission shall be entitled to receive the amount of his traveling and other necessary expenses actually incurred while engaged in the performance of any official duties when so authorized by the commission. No member of the commission shall have any

direct financial interest in any of the operations of the commission, nor may any member participate in making any decision in which he may have a personal interest.

455B.8 Organization. The commission shall organize by the election of a chairman and other officers deemed necessary and the state department of health shall provide the services of a technical secretary to the commission and shall hold quarterly regular meetings each calendar year on the last Monday of each quarter and at such other times and places as it may deem necessary. The chairman and other officers shall be elected annually. Meetings may be called by the chairman at any time and shall be called as soon as possible by the chairman on the written request of four members of the commission. The majority of the commission shall constitute a quorum and the concurrence of a majority of the commission in any matter within its duties shall be required for its determination.

455B.9 Powers and duties. The commission is hereby given and charged with the following powers and duties:

1. The commission through the state department of health shall have general supervision over administration and enforcement of all laws relating to the pollution of any water of the state, except as provided in section 135.11.

2. To develop comprehensive plans and programs for the prevention, control and abatement of new, increasing, potential, or existing pollution of the waters of the state.

3. The commission may cause the state department of health to conduct investigations upon the written petition of:

- a. The governing body of any city or town.
- b. The local board of health.
- c. The supervisors of any county.
- d. Twenty-five residents of the state.
- e. Any state agency or agencies.

4. To adopt, modify, or repeal such reasonable quality standards for any waters of the state in relation to the public use to which they are or may be put as it shall deem necessary for the purposes of this chapter.

Provided that where the quality of water is inter-related to the quantity of water the concurrence of the Iowa natural resources council shall be secured for the adoption, modification or repeal of such standards, prior to the effective date thereof.

5. To require plans and specifications for disposal systems or any part thereof to be submitted to them for approval or disapproval by the state department of health.

6. To direct the state department of health to issue, revoke, modify, or deny permits, under such conditions as it may prescribe for the prevention or abatement of pollution, for the discharge of sewage, industrial waste or other wastes or for the installation or operation of disposal systems or parts thereof.

7. Existing permits shall be recognized by the commission for the continuance of every disposal system now operating under legal authority. However, the

commission may modify or revoke such permit in the same manner as other permits.

8. To prescribe rules and regulations for the conduct of the commission and other matters within the scope of the powers granted to and imposed upon it.

9. The commission shall co-operate with other state or interstate water pollution control agencies in establishing standards, objectives or criteria for quality of interstate waters originating or flowing through this state.

10. To hold such hearings as it may deem advisable and necessary for the discharge of its duties and to authorize any member, employee or agent to hold such hearings.

455B.10 Investigations. The state department of health shall conduct such investigations as may be necessary to carry out the provisions of this chapter.

455B.11 Orders. The state department of health in accordance with the direction and policies of the commission may issue, modify, or revoke such orders as may be required for the prevention or discontinuance of the discharge of sewage, industrial waste or other wastes in any waters of the state resulting in pollution in excess of the applicable quality standard established by the commission.

455B.12 Scope of investigation. Whenever an investigation is made, it shall be full and complete and may include such engineering studies, bacteriological, biological, and chemical analyses of the water and location and character of the source or sources of contamination as may be necessary. If pollution is found to exist, taking into consideration the criteria set forth in section 455B.13, the commission shall first notify the alleged offender and by informal negotiation attempt to resolve the problem and failing to do so within fourteen days, up to and during which time neither the commission, nor any member of the commission, nor its staff or employees shall make any public statement regarding the firm or individual as an alleged offender, shall then make an order fixing the time and place of hearing which shall be not later than twenty days thereafter. Such hearing shall be public and shall be conducted so far as possible in the same manner as a court hearing and every alleged offender shall have the right to appear, be represented by counsel, present testimony and examine witnesses.

455B.13 Quality standards. In adopting, modifying, or repealing quality standards for any waters of the state, the commission shall give consideration to:

1. The protection of the public health;
2. The size, depth, surface area covered, volume, direction and rate of flow, stream gradient, and temperature of the water;
3. The character and uses of the land area bordering said waters;
4. The uses which have been made, are being made, or may be made of said waters for public, private, or domestic water supplies, irrigation; live-stock watering; propagation of wildlife, fish, and other aquatic life; bathing,

swimming, boating, or other recreational activity; transportation; and disposal of sewage and wastes;

5. The extent of contamination resulting from natural causes including the mineral and chemical characteristics;

6. The extent to which floatable or settleable solids may be permitted;

7. The extent to which suspended solids, colloids, or a combination of solids with other suspended substances may be permitted;

8. The extent to which bacteria and other biological organisms may be permitted;

9. The amount of dissolved oxygen that is to be present and the extent of the oxygen demanding substances which may be permitted;

10. The extent to which toxic substances, chemicals or deleterious conditions may be permitted;

11. The need for standards for effluents from disposal systems.

455B.14 Permission to enter lands or waters. The commission, its agents, and employees of the state department of health may enter upon any lands or waters in the state and bordering on the state, for the purpose of making any investigation, examination, survey, or study concerning the quality or pollution of such waters.

455B.15 Hearings. When the commission or state department of health conducts any hearing or investigation, any member of the commission or any employee or agent authorized in writing by the commission or employee of the state department of health may administer oaths, examine witnesses and issue, in the name of the commission, subpoenas requiring the attendance and testimony of witnesses and the production of evidence relevant to any matter involved in such hearing or investigation. Witnesses shall receive the same fees and mileage as in civil actions.

455B.16 Subpoena. If any person refuses to obey a subpoena issued under this chapter, the district court of the county where the proceeding is pending shall have jurisdiction, upon application of the commission or its authorized member, employee, or agent, to issue to such person an order requiring him to appear and testify or produce evidence and any failure to obey such order of the court may be punished by said court as a contempt thereof.

455B.17 Notice of hearing--orders--records.

1. Notice of the time and place of hearing shall be served upon each alleged offender at least ten days before said hearing. Such notice shall be in the manner required for the service of notice of the commencement of an ordinary action in a court of record.

2. Notwithstanding the provisions of subsection 1 the commission or state department of health, when it has first been determined that an emergency exists respecting any matter affecting or likely to affect the public health, may

make a temporary order without notice and without hearing. A copy of such temporary order shall be served as provided in subsection 1. Any such temporary order entered by the commission or the state department of health, shall be binding and effective immediately until such order is reviewed by a hearing or is modified or reversed by the court.

3. After such hearing the commission may, if it finds the alleged offender is guilty of the charges, enter an order directing such person to desist in the practice found to be the cause of such pollution, taking into account the use to which the water is being or may be put or the commission upon the recommendation of the state department of health may order a change in the method of discharging sewage, industrial wastes and other wastes into the water so that the same will not result in pollution and the method shall be in compliance with the effluent or water quality standards adopted by the commission.

4. If any such change is ordered, unless such practice is rendering such water dangerous to the public health, a reasonable time shall be granted to the offender in which to put in use the method ordered.

5. The commission shall keep a complete record of such proceedings, including all the evidence taken, and such record shall be open to public inspection. However, it shall be unlawful for any person in connection with his duties or employment by the commission, to make public or give any information relating to secret processes or methods of manufacture or production at any public hearing or otherwise, and all such information shall be kept strictly confidential.

455B.18 Appeal. An appeal may be taken by any aggrieved party from any order entered in such proceedings to the district court of the county in which the alleged offense was committed or such final order was entered. Such appeal shall be perfected by serving a written notice on the chairman of the commission within thirty days of the entry of such order. The hearing on appeal shall be tried as a suit in equity and shall be de novo. The court may receive additional testimony and may affirm, modify or reverse the order of the commission. The setting aside of such order by the court shall not preclude the commission from again instituting proceedings against the same person if the commission feels that the public health is endangered.

455B.19 Transcript on appeal. Within thirty days after an application for an appeal is filed with the commission, it shall make, certify and file in the office of the clerk of the court to which an appeal is taken a full and complete transcript of all documents and papers relating to the case including a copy of the order, rule, regulation or decision appealed from and a copy of any findings of fact, rulings or conclusions of law made by the commission in the matter.

455B.20 Stay order. Action of the commission shall not be stayed by an appeal except by order of the court for good cause shown by the appellant. The

granting of a stay may be conditioned upon the furnishing by the appellant of such reasonable security as the court may direct. A stay may be vacated on application of the commission or any other party after hearing by the court.

455B.21 Conclusiveness of action. If no appeal is taken from an order, rule, regulation, or other decision of the commission as provided by this chapter, or if the action of the commission is affirmed on appeal, the action of the commission in the matter involved shall be deemed conclusive and the validity and reasonableness thereof shall not be raised in any other action or proceeding, but this shall not preclude the commission from modifying or rescinding its action.

455B.22 Trial term. The first term after appeal is taken shall be the trial term.

455B.23 Injunction. Any person, firm, corporation, municipality, or any officer or agent thereof causing pollution as defined in section 455B.2 of any waters of the state or placing or causing to be placed any sewage, industrial waste, or other wastes in a location where they will probably cause pollution of any waters of the state may be enjoined from continuing such action.

It shall be the duty of the attorney general, only upon the request of the commission, to bring an action for an injunction against any person, firm, corporation, municipality, or agent thereof violating the provisions of this section. In any such action, any previous findings of the commission after due notice and hearing shall be prima-facie evidence of the fact or facts found therein.

455B.24 Contempt--penalty. Failure to obey any order issued under the provisions of this chapter made by the commission with reference to matters pertaining to the pollution of waters of the state shall constitute prima-facie evidence of contempt. In such event the commission may certify to the district court of the county in which such alleged disobedience occurred the fact of such failure. The District court after notice, as prescribed by the court, to the parties in interest shall then proceed to hear the matter and if it finds that the order was lawful and reasonable it shall order the party to comply with the order. If the person fails to comply with the court order, he shall be punished for contempt.

Any person, firm, corporation, or any officer or agent thereof found guilty of contempt under this section shall be fined in a sum not to exceed one hundred dollars for each offense. The penalties provided in this section shall be considered as additional to any penalty which may be imposed under the law relative to nuisances or any other statute relating to the pollution of waters of the state and a conviction under this section shall not be a bar to prosecution under any other penal statute.

455B.25 Unlawful acts.

1. It shall be unlawful to carry on any of the following activities without first securing a written permit from the state department of health as may be required by the commission for the disposal of all sewage, industrial waste, or other wastes which are or may be discharged into the waters of the state.

a. The construction, installation or modification of any disposal system or part thereof or any extension or addition thereto.

b. The construction or use of any new outlet for the discharge of any sewage or wastes directly into the waters of the state. However, no permit shall be required for any new disposal system or extension or addition to any existing disposal system that received only domestic or sanitary sewage from a building, housing or occupied by fifteen persons or less.

2. Plans and specifications for any waste disposal system covered by subsection 1 of this section shall be submitted to the commission before a written permit may be issued and the construction of any such waste disposal system shall be in accordance with plans and specifications as approved by the state department of public health. If it is necessary or desirable to make material changes in such plans or specifications, revised plans or specifications together with reasons for the proposed changes must be submitted to the commission for a supplemental written permit.

Any person convicted of violating this section shall be fined in a sum not to exceed one thousand dollars.

455B.26 Plans of every disposal system to be filed. The commission may require the owner of a waste disposal system, discharging sewage or wastes into any of the waters of the state to file with it complete plans of the whole or any part of such system and any other information and records concerning the installation and operation of such system.

455B.27 Assistance by governmental agencies. The commission and the state department of health may request and receive from any department, division, board, bureau, commission, public body, or agency of the state, or of any political subdivision thereof, or from any organization, incorporated or unincorporated, which has for its object the control or use of any of the water resources of the state, such assistance and data as will enable the commission or department to properly carry out its activities and effectuate its purposes under the provisions of this chapter. The commission or department shall reimburse such agencies for special expense resulting from expenditures not normally a part of the operating expenses of any such agency.

455B.28 Discharge of waste into lakes. No sewage, industrial waste or other wastes whether treated or untreated shall be discharged directly into any state-owned natural or artificial lake but this section shall not be construed to prohibit the discharge of adequately treated sewage or industrial wastes into a stream tributary to a lake upon the written permission of the commission.

MISCELLANEOUS PROVISIONS

135.11 Powers and duties. The commissioner of public health shall be the head of the "State Department of Health," which shall:

7. Make inspections of the public water supplies, sewer systems sewage treatment plants, and garbage and refuse disposal plants throughout the state, and direct the method of installation and operation of the same.

455A.25 When permit required. For the purpose of administering sections 455A.19 to 455A.32, inclusive, a permit as herein provided shall be required for the following:

3. Any person who diverts water or any material from the surface directly into any underground watercourse or basin. Provided, however, that any diversion of water or material from the surface directly into any underground watercourse or basin existing upon May 16, 1957 shall not require a permit if said diversion does not create waste or pollution. No permit shall be issued under this subsection until the approval of the Iowa water pollution control commission has been obtained.

469.6 Certificate of approval. No permit shall be granted for the construction or operation of a dam where the water is to be used for manufacturing purposes, except to develop power, until a certificate of the Iowa water pollution control commission has been filed with the council showing its approval of the use of the water for the purposes specified in the application.

469.7 Application for certificate. When it is proposed to use the water for manufacturing purposes, except to develop power, or for condensation purposes, application must be made to the Iowa water pollution control commission, accompanied by a description of the proposed use of the water and what, if any, substances are to be deposited in such water and chemical changes made in the same, and such other information as the department of health may require to enable it to determine the advisability of the issuance of such certificate.

469.8 Granting or refusing. If the Iowa water pollution control commission is satisfied that the use of the water in any such project will not cause pollution of the same or render it materially unwholesome or impure, or deleterious to fish life, it may issue a certificate, and if it is not so satisfied, it shall refuse to issue same.

APPENDIX IV

SOLID WASTE DISPOSAL ACT

Public Law 89-272, 79 Stat. 992 (1965), as last amended by
P. L. 90-574 (1968).

TITLE II -- SOLID WASTE DISPOSAL

SHORT TITLE

Sec. 201. This title (hereinafter referred to as "this Act") may be cited as the "Solid Waste Disposal Act."

FINDINGS AND PURPOSES

Sec. 202. (a) The Congress finds--

(1) that the continuing technological progress and improvement in methods of manufacture, packaging, and marketing of consumer products has resulted in an ever-mounting increase, and in a change in the characteristics, of the mass of material discarded by the purchaser of such products;

(2) that the economic and population growth of our Nation, and the improvements in the standard of living enjoyed by our population, have required increased industrial production to meet our needs, and have made necessary the demolition of old buildings, the construction of new buildings, and the provision of highways and other avenues of transportation, which, together with related industrial, commercial, and agricultural operations, have resulted in a rising tide of scrap, discarded, and waste materials;

(3) that the continuing concentration of our population in expanding metropolitan and other urban areas has presented these communities with serious financial, management, intergovernmental, and technical problems in the disposal of solid wastes resulting from the industrial, commercial, domestic, and other activities carried on in such areas;

(4) that inefficient and improper methods of disposal of solid wastes result in scenic blights, create serious hazards to the public health, including pollution of air and water resources, accident hazards, and increase in rodent and insect vectors of disease, have an adverse effect on land values, create public nuisances, otherwise interfere with community life and development;

(5) that the failure or inability to salvage and reuse such materials economically results in the unnecessary waste and depletion of our natural resources; and

(6) that while the collection and disposal of solid wastes should continue to be primarily the function of State, regional, and local agencies, the problems of waste disposal as set forth above have become a matter national in scope and in concern and necessitate Federal action through financial and technical assistance and leadership in the development, demonstration, and

application of new and improved methods and processes to reduce the amount of waste and unsalvageable materials and to provide for proper and economical solid-waste disposal practices.

(b) The purposes of this Act therefore are--

(1) to initiate and accelerate a national research and development program for new and improved methods of proper and economic solid-waste disposal, including studies directed toward the conservation of natural resources by reducing the amount of waste and unsalvageable materials and by recovery and utilization of potential resources in solid wastes; and

(2) to provide technical and financial assistance to State and local governments and interstate agencies in the planning, development, and conduct of solid-waste disposal programs.

DEFINITIONS

Sec. 203. When used in this Act--

(1) The term "Secretary" means the Secretary of Health, Education, and Welfare; except that such term means the Secretary of the Interior with respect to problems of solid waste resulting from the extraction, processing, or utilization of minerals or fossil fuels where the generation, production, or reuse of such waste is or may be controlled within the extraction, processing, or utilization facility or facilities and where such control is a feature of the technology or economy of the operation of such facility or facilities.

(2) The term "State" means a State, the District of Columbia, the Commonwealth of Puerto Rico, the Virgin Islands, Guam, and American Samoa.

(3) The term "interstate agency" means an agency of two or more municipalities in different States, or an agency established by two or more States, with authority to provide for the disposal of solid wastes and serving two or more municipalities located in different States.

(4) The term "solid waste" means garbage, refuse, and other discarded solid materials, including solid-waste materials resulting from industrial, commercial, and agricultural operations, and from community activities, but does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial waste water effluents, dissolved materials in irrigation return flows or other common water pollutants.

(5) The term "solid-waste disposal" means the collection, storage, treatment, utilization, processing, or final disposal of solid waste.

(6) The term "construction," with respect to any project of construction under this Act, means (A) the erection or building of new structures and acquisition of lands or interests therein, or the acquisition, replacement, expansion, remodeling, alteration, modernization, or extension of existing structures, and (B) the acquisition and installation of initial equipment of, or required in connection with, new or newly acquired structures or the expanded, remodeled, altered, modernized or extended part of existing structures (including trucks and other motor vehicles, and tractors, cranes, and other

machinery) necessary for the proper utilization and operation of the facility after completion of the project; and includes preliminary planning to determine the economic and engineering feasibility and the public health and safety aspects of the project, the engineering, architectural, legal, fiscal, and economic investigations and studies, and any surveys, designs, plans, working drawings, specifications, and other action necessary for the carrying out of the project, and (C) the inspection and supervision of the process of carrying out the project to completion.

RESEARCH, DEMONSTRATIONS, TRAINING, AND OTHER ACTIVITIES

Sec. 204. (a) The Secretary shall conduct, and encourage, cooperate with, and render financial and other assistance to appropriate public (whether Federal, State, interstate, or local) authorities, agencies, and institutions, private agencies and institutions, and individuals in the conduct of, and promote the coordination of, research, investigations, experiments, training, demonstrations, surveys, and studies relating to the operation and financing of solid-waste disposal programs, the development and application of new and improved methods of solid-waste disposal (including devices and facilities therefor), and the reduction of the amount of such waste and un-salvageable waste materials.

(b) In carrying out the provisions of the preceding subsection, the Secretary is authorized to--

(1) collect and make available, through publications and other appropriate means, the results of, and other information pertaining to, such research and other activities, including appropriate recommendations in connection therewith;

(2) cooperate with public and private agencies, institutions, and organizations, and with any industries involved, in the preparation and the conduct of such research and other activities; and

(3) make grants-in-aid to public or private agencies and institutions and to individuals for research, training projects, surveys, and demonstrations (including construction of facilities), and provide for the conduct of research, training, surveys, and demonstrations by contract with public or private agencies and institutions and with individuals; and such contracts for research or demonstrations or both (including contracts for construction) may be made in accordance with and subject to the limitations provided with respect to research contracts of the military departments in title 10, United States Code, section 2353, except that the determination, approval, and certification required thereby shall be made by the Secretary.

(c) Any grant, agreement, or contract made or entered into under this section shall contain provisions effective to insure that all information, uses, processes, patents and other developments resulting from any activity undertaken pursuant to such grant, agreement, or contract will be made readily available on fair and equitable terms to industries utilizing methods of solid-waste disposal and industries engaging in furnishing devices, facilities, equipment, and supplies to be used in connection with solid-waste disposal.

In carrying out the provisions of this section, the Secretary and each department, agency, and officer of the Federal Government having functions or duties under this Act shall make use of and adhere to the Statement of Government Patent Policy which was promulgated by the President in his memorandum of October 10, 1963. (3 CFR, 1963 Supp., p. 238)

(d) Notwithstanding any other provision of this Act, the United States shall not make any grant to pay more than two-thirds of the cost of construction of any facility under this Act.

INTERSTATE AND INTERLOCAL COOPERATION

Sec. 205. The Secretary shall encourage cooperative activities by the States and local governments in connection with solid-waste disposal programs; encourage, where practicable, interstate, interlocal, and regional planning for, and the conduct of, interstate, interlocal, and regional solid-waste disposal programs; and encourage the enactment of improved and, so far as practicable, uniform State and local laws governing solid-waste disposal.

GRANTS FOR STATE AND INTERSTATE PLANNING

Sec. 206. (a) The Secretary may from time to time, upon such terms and conditions consistent with this section as he finds appropriate to carry out the purposes of this Act, make grants to State and interstate agencies of not to exceed 50 per centum of the cost of making surveys of solid-waste disposal practices and problems within the jurisdictional areas of such States or agencies, and of developing solid-waste disposal plans for such areas.

(b) In order to be eligible for a grant under this section the State, or the interstate agency, must submit an application therefor which--

(1) designates or establishes a single State agency (which may be an interdepartmental agency) or, in the case of an interstate agency, such interstate agency, as the sole agency for carrying out the purposes of this section;

(2) indicates the manner in which provision will be made to assure full consideration of all aspects of planning essential to statewide planning (or in the case of an interstate agency jurisdictionwide planning) for proper and effective solid-waste disposal consistent with the protection of the public health, including such factors as population growth, urban and metropolitan development, land use planning, water pollution control, air pollution control, and the feasibility of regional disposal programs;

(3) sets forth its plans for expenditure of such grant, which plans provide reasonable assurance of carrying out the purposes of this section;

(4) provides for submission of a final report of the activities of the State or interstate agency in carrying out the purposes of this section, and for the submission of such other reports, in such form and containing such information, as the Secretary may from time to time find necessary for carrying out the purposes of this section and for keeping such records and affording such access thereto as he may find necessary to assure the correctness and verification of such reports; and

(5) provides for such fiscal-control and fund-accounting procedures as may be necessary to assure proper disbursement of and accounting for funds paid to the State or interstate agency under this section.

(c) The Secretary shall make a grant under this section only if he finds that there is satisfactory assurance that the planning of solid-waste disposal will be coordinated, so far as practicable, with other related State, interstate, regional, and local planning activities, including those financed in part with funds pursuant to section 701 of the Housing Act of 1954.

LABOR STANDARDS

Sec. 207. No grant for a project of construction under this Act shall be made unless the Secretary finds that the application contains or is supported by reasonable assurance that all laborers and mechanics employed by contractors or subcontractors on projects of the type covered by the Davis-Bacon Act, as amended (40 U.S.C. 276A--276A-5), will be paid wages at rates not less than those prevailing on similar work in the locality as determined by the Secretary of Labor in accordance with that Act; and the Secretary of Labor shall have with respect to the labor standards specified in this section the authority and functions set forth in Reorganization Plan Numbered 14 of 1950 (15 F.R. 3176; 5 U.S.C. 133z-15) and section 2 of the Act of June 13, 1934, as amended (40 U.S.C. 276c).

OTHER AUTHORITY NOT AFFECTED

Sec. 208. This Act shall not be construed as superseding or limiting the authorities and responsibilities, under any other provisions of law, of the Secretary of Health, Education and Welfare, the Secretary of the Interior, or any other federal officer, department or agency.

PAYMENTS

Sec. 209. Payments of grants under this Act may be made (after necessary adjustment on account of previously made underpayments or overpayments) in advance or by way of reimbursement, and in such installments and on such conditions as the Secretary may determine.

APPROPRIATIONS

Sec. 210. (a) There is hereby authorized to be appropriated to the Secretary of Health, Education, and Welfare, to carry out this Act, not to exceed \$7,000,000 for the fiscal year ending June 30, 1966, not to exceed \$14,000,000 for the fiscal year ending June 30, 1967, not to exceed \$19,200,000 for the fiscal year ending June 30, 1968, not to exceed \$20,000,000 for the fiscal year ending June 30, 1969, and not to exceed \$19,750,000 for the fiscal year ending June 30, 1970.

(b) There is hereby authorized to be appropriated to the Secretary of the Interior, to carry out this Act, not to exceed \$3,000,000 for the fiscal year ending June 30, 1966, not to exceed \$6,000,000 for the fiscal year ending

June 30, 1967, not to exceed \$10,800,000 for the fiscal year ending June 30, 1968, not to exceed \$12,500,000 for the fiscal year ending June 30, 1969, and not to exceed \$12,250,000 for the fiscal year ending June 30, 1970.

APPENDIX V

CHAPTER 28E

JOINT EXERCISE OF GOVERNMENTAL POWERS

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28E.1 Purpose. The purpose of this chapter is to permit state and local governments in Iowa to make efficient use of their powers by enabling them to provide joint services and facilities with other agencies and to co-operate in other ways of mutual advantage. This chapter shall be liberally construed to that end.

28E.2 Definitions. For the purposes of this chapter, the term "public agency" shall mean any political subdivision of this state; any agency of the state government or of the United States; and any political subdivision of another state. The term "state" shall mean a state of the United States and the District of Columbia. The term "private agency" shall mean an individual and any form of business organization authorized under the laws of this or any other state.

28E.3 Joint exercise of powers. Any power or powers, privileges or authority exercised or capable of exercise by a public agency of this state may be exercised and enjoyed jointly with any other public agency of this state having such power or powers, privilege or authority, and jointly with any public agency of any other state or of the United States to the extent that laws of such other state or of the United States permit such joint exercise or enjoyment. Any agency of the state government when acting jointly with any public agency may exercise and enjoy all of the powers, privileges and authority conferred by this chapter upon a public agency.

28E.4 Agreement with other agencies. Any public agency of this state may enter into an agreement with one or more public or private agencies for joint or co-operative action pursuant to the provisions of this chapter, including the creation of a separate entity to carry out the purpose of the agreement. Appropriate action by ordinance, resolution or otherwise pursuant to law of the governing bodies involved shall be necessary before any such agreement may enter into force.

28E.5 Specifications. Any such agreement shall specify the following:

1. Its duration.
2. The precise organization, composition and nature of any separate legal or administrative entity created thereby together with the powers delegated thereto, provided such entity may be legally created.
3. Its purpose or purposes.
4. The manner of financing the joint or co-operative undertaking and of establishing and maintaining a budget therefor.
5. The permissible method or methods to be employed in accomplishing the partial or complete termination of the agreement and for disposing of property upon such partial or complete termination.
6. Any other necessary and proper matters.

28E.6 Additional provisions. If the agreement does not establish a separate legal entity to conduct the joint or co-operative undertaking, the agreement shall also include:

1. Provision for an administrator or a joint board responsible for administering the joint or co-operative undertaking. In the case of a joint board, public agencies party to the agreement shall be represented.
2. The manner of acquiring, holding and disposing of real and personal property used in the joint or co-operative undertaking.

28E.7 Obligations not excused. No agreement made pursuant to this chapter shall relieve any public agency of any obligation or responsibility imposed upon it by law except that to the extent of actual and timely performance thereof by a joint board or other legal or administrative entity created by an agreement made hereunder, said performance may be offered in satisfaction of the obligation or responsibility.

28E.8 Filing and recording. Before entry into force, an agreement made pursuant to this chapter shall be filed with the secretary of state and recorded with the county auditor. (28E.8 Amended. Ch. 99, Section 1 -- 62 GA.)

28E.9 Status of interstate agreement. If an agreement entered into pursuant to this chapter is between or among one or more public agencies of this state and one or more public agencies of another state or of the United States said agreement shall have the status of an interstate compact. Such agreements shall, before entry into force, be approved by the attorney general who shall determine whether the agreement is in proper form and compatible with the laws of this state.

In any case or controversy involving performance or interpretation thereof or liability thereunder, the public agencies party thereto shall be real parties in interest, and the state may maintain an action to recoup or otherwise make itself whole for any damages or liability which it may incur by reason of being joined as a party therein. Such action shall be maintainable against any public

agency or agencies whose default, failure of performance, or other conduct caused or contributed to the incurring of damage or liability by the state.

28E.10 Approval of statutory officer. If an agreement made pursuant to this chapter shall deal in whole or in part with the provision of services or facilities with regard to which an officer or agency of the state has constitutional or statutory powers of control, the agreement shall, as a condition precedent to its entry into force, be submitted to the state officer or agency having such power of control and shall be approved or disapproved by him or it as to all matters within his or its jurisdiction.

28E.11 Agency to furnish aid. Any public agency entering into an agreement pursuant to this chapter may appropriate funds and may sell, lease, give, or otherwise supply the administrative joint board or other legal or administrative entity created to operate the joint or co-operative undertaking by providing such personnel or services therefor as may be within its legal power to furnish.

28E.12 Contract with other agencies. Any one or more public agencies may contract with any one or more other public agencies to perform any governmental service, activity, or undertaking which any of the public agencies entering into the contract is authorized by law to perform, provided that such contract shall be authorized by the governing body of each party to the contract. Such contract shall set forth fully the purposes, powers, rights, objectives, and responsibilities of the contracting parties.

28E.13 Powers are additional to others. The powers granted by this chapter shall be in addition to any specific grant for intergovernmental agreements and contracts.

28E.14 No limitation on contract. Any contract or agreement authorized by this chapter shall not be limited as to period of existence, except as may be limited by the agreement or contract itself.

APPENDIX VI

Chapter 236

Acts of the Sixty-third General Assembly, 1st Session

Section 1. Code 1966 is hereby amended by adding the following new chapter:

"Section 1. Scope of chapter. This chapter is intended to provide a means for the joint financing by public agencies of works or facilities enumerated in section three hundred ninety-four point one (394.1) of the Code. The provisions of this chapter shall be deemed to apply to the acquisition, construction, reconstruction, operation, repair, extension or improvement of such works or facilities, by a separate administrative or legal entity created pursuant to chapter twenty-eight E (28E) of the Code.

Sec. 2. Definitions. The terms 'public agency', 'state', and 'private agency' shall have the meanings prescribed by section twenty-eight E point two (28E.2) of the Code. The term 'project' or 'projects' shall mean any works or facilities referred to in section three hundred ninety-four point one (394.1) of the Code and shall include all property real and personal, pertinent thereto or connected with such project or projects, and the existing works or facilities, if any, to which such project or projects are an extension, addition, betterment or improvement.

Sec. 3. Revenue bonds. An entity created to carry out an agreement authorizing the joint exercise of those governmental powers enumerated in section three hundred ninety-four point one (394.1) of the Code shall have power to construct, acquire, repair, improve, expand, operate and maintain a project or projects necessary to carry out the purposes of such agreement, and to issue from time to time revenue bonds payable from the revenues derived from such project or projects, or any combination of such projects, to finance the cost or part of the cost of the acquisition, construction, reconstruction, repair, extension or improvement of such project or projects, including the acquisition for the purposes of such agreement, of any property, real or personal or mixed therefor. The power of the entity to issue revenue bonds shall not be exercised until authorized by resolution or ordinance duly adopted by each of the public agencies participating in such agreement. Public agencies participating in such an agreement may not withdraw or in any way terminate, amend, or modify in any manner to the detriment of the bondholders said agreement if revenue bonds or obligations issued in anticipation of the issuance of said revenue bonds have been issued and are then outstanding and unpaid as provided for herein. Any revenue bonds for the payment and discharge of which, upon maturity or upon redemption prior to maturity, provision has been made through the setting apart in a reserve fund or special trust

account created pursuant to this chapter to insure the payment thereof, of moneys sufficient for that purpose or through the irrevocable segregation for that purpose in a sinking fund or other fund or trust account of moneys sufficient therefor, shall be deemed to be no longer outstanding and unpaid within the meaning of any provision of this chapter.

Sec. 4. Use of proceeds: negotiability. Revenue bonds may be issued, as provided in section three (3) of this Act, to provide all or any part of the funds required to finance the cost of the acquisition, construction, reconstruction, repair, extension or improvement of any project or projects or other purposes authorized under this chapter and such cost shall include, but shall not be limited to, administrative expenses, acquisition and construction costs, engineering, fiscal or financial and legal expenses, surveys, plans and specifications, interest during such construction, reconstruction, repair, extension or improvement or acquisition and for one year after completion of such construction, reconstruction, repair, extension or improvement or after acquisition of the project or projects, initial reserve funds, acquisition of real or personal property, including franchises, and such other costs as are necessary and incidental to the construction, reconstruction, repair, extension or improvement, or acquisition of such project or projects and the financing thereof. Such an entity shall have the power to retain and enter into agreements with engineers, fiscal agents, financial advisers, attorneys, architects or other consultants or advisers for planning, supervision and financing of such project or projects upon such terms and conditions as shall be deemed advisable and in the best interest of the entity. Bonds issued under the provisions of this chapter are declared to be investment securities under the laws of the state of Iowa.

Sec. 5. Source of payment: rates and charges, pledge of revenues. Such an entity shall have the power to pledge all or part of the net revenues of a project or projects to the payment of the principal of and interest on the bonds issued pursuant to this chapter and shall provide by resolution authorizing the issuance of said bonds that such net revenues of the project or projects shall be set apart in a sinking fund for that purpose and kept separate and distinct from all other revenues of the entity. The principal of and interest on the bonds so issued shall be secured by a pledge of such net revenues of the project or projects in the manner and to the extent provided in the resolution authorizing the issuance of said bonds.

Such an entity shall have the power to fix, establish and maintain such rates, tolls, fees, rentals or other charges and collect the same from the public agencies participating in the agreement or from private agencies or persons for the payment of the services and facilities provided by said project or projects. Such rates, tolls, fees, rentals or other charges shall be so fixed, established and maintained and revised from time to time whenever necessary as will always provide revenues sufficient to pay the cost of maintaining, repairing and operating the project or projects, to pay the principal of and interest of the bonds

then outstanding which are payable therefrom as the same become due and payable, to provide adequate and sufficient reserves therefor, to provide for replacements, depreciations and necessary extensions and enlargements and to provide a margin of safety for the making of such payments and providing such reserves. Notwithstanding the foregoing such an entity shall have the further right to pledge to the payment of the bonds issued pursuant to this chapter, in addition to the net revenues of the project or projects pledged therefor, such other moneys that it may have and which are lawfully available therefor.

In order to pay the rates, tolls, fees, rentals or other charges levied against a public agency by an entity for the payment of the services and facilities provided by a project or projects authorized by this chapter, public agencies participating in such an agreement shall have the power by ordinance to fix, establish and maintain, rates or other charges for the use of and the services and facilities rendered by said project or projects. Such rates or charges may be so fixed, established and maintained and revised from time to time whenever necessary as will always provide such public agencies with sufficient revenue to pay the rates, tolls, fees, rentals or other charges levied against it by the entity for the payments of the services and facilities provided by said project or projects. All such rates or charges to be paid by the owners of real property, if not paid as by the ordinance provided, when due, shall constitute a lien upon such real property served by such project or projects, and shall be collected in the same manner as general taxes.

Sec. 6. Bonds not debts of the public agencies. The principal of and interest on the bonds issued by an entity under the provisions of this chapter shall be payable solely from and secured by the net revenues of the project or projects and from other funds of the entity lawfully available therefor as provided in section five (5) of this Act and said bonds shall not in any respect be a general obligation of any public agency participating in said entity nor shall the entity or any public agency participating in said entity be in any manner liable by reason of such net revenues or other funds being insufficient to pay said bonds. All bonds issued by the entity shall contain a recital on their face that neither the payment of the principal nor any part thereof nor any interest thereon constitutes a debt, liability or obligation of any of the public agencies participating in the agreement creating such entity or of the entity itself, except that the entity shall be liable for the payment of such bonds from the net revenues derived from the project or projects and from the other moneys lawfully available therefor and pledged thereto pursuant to the provisions of the resolution which authorized their issuance. Said bonds issued by the entity shall be authorized by resolution which may be adopted at the same meeting at which it was introduced by a majority of the members of the governing body of the entity. The terms, conditions and provisions for the authorization, issuance, sale, and security of said bonds and of the holders thereof shall be set forth in said resolution.

Sec. 7. Operation of project. Such an entity shall operate, maintain and preserve the project or projects in good repair and working order, and shall operate the project or projects in an efficient and economical manner, provided, however, that the entity may lease or rent the project or projects or any part thereof, or otherwise provide for the operation of the project or projects or any part thereof in such manner and upon such terms as the governing body of the entity shall direct.

Sec. 8. Details of revenue bonds. Revenue bonds issued pursuant to the provisions of this chapter shall bear interest at a rate or rates not exceeding six percentum per annum, may be in one or more series, may bear such date or dates, may mature at such time or times not exceeding forty years from their respective dates, may be payable in such medium of payment, at such place or places within the state, may carry such registration privileges, may be subject to such terms of prior redemption, with or without premium, may be executed in such manner, may contain such terms, covenants and conditions, and may be in such form otherwise, as such resolution or subsequent resolutions shall provide.

Sec. 9. Issuance of bond anticipation notes. Such an entity shall have the power, at any time and from time to time after the issuance of bonds thereof shall have been authorized, to borrow money for the purposes for which such bonds are to be issued in anticipation of the receipt of the proceeds of the sale of such bonds and within the authorized maximum amount of such bond issue. Any such loan shall be paid within three years after the date of the initial loan. Bond anticipation notes shall be issued for all moneys so borrowed under the provisions of this section, and such notes may be renewed from time to time, but all such renewal notes shall mature within the time above limited for the payment of the initial loan. Such notes shall be authorized by resolution of the governing body of the entity and shall be in such denomination or denominations, shall bear interest at such rate or rates not exceeding the maximum rate permitted by the resolution authorizing the issuance of the bonds, shall be in such form and shall be executed in such manner, all as such entity shall prescribe. If such notes shall be renewal notes, they may be exchanged for notes then outstanding on such terms as the governing body of the entity shall determine. The governing body of the entity may, in its discretion, retire any such notes from the revenues derived from the project or projects or from such other moneys of the entity which are lawfully available therefor or from a combination of each, in lieu of retiring them by means of bond proceeds, provided, however, that before the retirement of such notes by any means other than the issuance of bonds it shall amend or repeal the resolution authorizing the issuance of the bonds in anticipation of the proceeds of the sale of which such notes shall have been issued so as to reduce the authorized amount of the bond issue by the amount of the notes so retired. Such amendatory or repealing resolution shall take effect upon its passage.

Sec. 10. Refunding bonds. Refunding bonds may be issued by an entity in a principal amount sufficient to provide funds for the payment (including premium, if any) of bonds issued by said entity pursuant to the provisions of this chapter to be refunded thereby and the interest thereon and in addition for the payment of all expenses incident to the calling, retiring, or paying of such outstanding bonds to be refunded, such refunding bonds may also finance the construction of a project or projects authorized by this Act or the improvement, addition, betterment or extension of an existing project or projects so authorized. Said refunding bonds shall not be issued to refund the principal of and interest on any bonds to be refunded unless such bonds mature or are redeemable under their terms within ten years from the date of delivery of the refunding bonds. The proceeds of said refunding bonds to be used for the payment of the principal of, interest on and redemption premiums, if any, on said bonds to be refunded which will not be due and payable immediately shall be deposited in trust for the sole purpose of making such payments in a bank or trust company within the state. Any moneys in such trust fund, prior to the date such funds will be needed for the payment of such principal of, interest on and redemption premiums, if any, of such outstanding bonds to be refunded, may be invested or reinvested as provided in the resolution authorizing said refunding bonds. Refunding bonds shall be issued in the same manner and detail as revenue bonds herein authorized.

Sec. 11. Eminent domain. Any public agency participating in an agreement authorizing the joint exercise of governmental powers pursuant to this Act may exercise its power of eminent domain to acquire interests in property, under provisions of law then in effect and applicable to such public agency, for the use of the entity created to carry out such agreement. Any interests in property so acquired shall be deemed acquired for a public purpose of the condemning public agency, and the payment of the costs of such acquisition may be made pursuant to such agreement or to any separate agreement between or among said public agency and such entity or the other public agencies participating in such entity or any of them. Upon payment of such costs, any property so acquired shall be and become the property of the entity."

APPENDIX VII

Chapter 394, Code of Iowa

SELF-LIQUIDATING IMPROVEMENTS

- 394.1 Sewage treatment plants--acquisition--bonds.
- 394.2 Wharves, docks or piers.
- 394.3 Supervision and control.
- 394.4 Applicable statutes.
- 394.5 Garbage disposal plants--fees.
- 394.6 Self-liquidating contracts--bonds.
- 394.7 Previous proceedings--other funds.
- 394.8 Pledge of net earnings.
- 394.9 Self-liquidating rates--lien on premises.
- 394.10 Chapter applicable to municipal docks.
- 394.11 Scope of chapter.
- 394.12 Refunding bonds authorized.

394.1 Sewage treatment plants--acquisition--bonds. Cities and towns and sanitary districts incorporated under the provisions of chapter 358 are hereby authorized and empowered to own, acquire, purchase, construct, equip, extend and improve, operate, and maintain within and/or without the corporate limits of such city or town or sanitary districts, works and facilities useful and convenient for the collection, treatment, purification and disposal in a sanitary manner of the liquid and solid waste, sewage, and industrial waste of any such city or town, also swimming pools and/or golf courses, and shall have authority to acquire by gift, grant, purchase, or condemnation, or otherwise, all necessary lands, rights of way, and property therefor, within or without the said city or town or sanitary districts, to purchase and acquire an interest in the works and facilities which are owned by another city or town and which are to be jointly used by the respective municipalities, and to issue revenue bonds to pay all or any part of the cost of acquiring, purchasing or constructing such works and facilities, including the amount agreed upon for the purchase and acquisition by a city or town of an interest in the works and facilities which are owned by another city or town and which are to be jointly used by the respective municipalities.

394.2 Wharves, docks or piers. Cities and towns are also hereby authorized and empowered to own, acquire, construct, equip, operate, and maintain within and/or without the corporate limits of such city or town, wharves, docks, and/or piers, including the grading and filling of lands under their control, when the same are authorized by a majority of voters after the proposition of such project shall have been submitted to an election to be called and

conducted as required by the statutes regulating elections relating to the authorization and issuance of bonds by cities and towns for similar purposes, provided, however, no election shall be necessary unless demanded by a petition signed by fifteen percent of the voters at the last preceding municipal election filed within sixty days following the publication of an ordinance adopted for the issuance of such bonds, and to issue revenue bonds to pay all or any part of the costs of such improvement.

394.3 Supervision and control. The construction, acquisition, improvement, equipment, custody, operation, and maintenance of any such works for the collection, treatment, or disposal of sewage, swimming pools, golf courses, wharves, docks, or piers, and the collection of revenues therefrom, for the service rendered thereby, shall be under the supervision and control of the city or town, or in the case of sewage treatment plants in any sanitary district by the trustees of such sanitary district; and the work of construction shall be done by hand labor so far as is practicable.

394.4 Applicable statutes. Chapter 23 of the Code, except sections 23.12 to 23.16, inclusive, shall be applicable to contracts for the improvements herein provided for.

394.5 Garbage disposal plants--fees. Cities and towns may by ordinance provide a schedule of fees to be charged for the collection and disposal of garbage and may pay the cost of construction, extending, repairing, maintaining and operating garbage disposal plants and/or incinerating plants out of the earnings of such plant; revenue bonds, payable solely and only out of the earnings of such plant, may be issued in the manner provided in this chapter.

394.6 Self-liquidating contracts--bonds. Cities and towns and sanitary districts incorporated under the provisions of chapter 358, are authorized to borrow money from the federal government or an agency thereof for the purpose of constructing and operating the improvements referred to in this chapter, including the grading and filling of lands under their control, by issuing revenue bonds, payable as hereinafter provided, and deliver such bonds to the federal government or an agency thereof; or such cities and towns and sanitary districts may borrow money by issuing revenue bonds, payable as hereinafter provided, and to deliver such bonds to the contractor or contractors in payment for the construction of any improvements referred to in this chapter; or such cities and towns and sanitary districts may sell such bonds at a public sale upon the same conditions provided by chapter 75, insofar as the provisions of said chapter 75 are otherwise applicable to bonds issued by such cities and towns and sanitary districts, and may use the proceeds from the sale of such bonds to pay all or any part of the cost of construction of said improvements. As evidence of such loan, such city or town or sanitary district may issue its

bonds payable solely and only from the revenues derived from such improvement. Such bonds may be issued in such amounts as may be necessary to provide sufficient funds to pay all the costs of construction, including engineering, legal and other expenses, together with interest to a date six months subsequent to the estimated date of completion. Bonds issued under the provisions of this chapter are declared to be negotiable instruments, shall be executed by the mayor and clerk of the municipality or the trustees of the sanitary district and shall be sealed with the corporate seal of the municipality or sanitary district. The principal and interest of said bonds shall be payable solely and only from the special fund herein provided for such payment, and said bonds shall not, in any respect, be a general obligation of such city or town or sanitary district, nor shall they be payable in any manner by taxation, nor shall the municipality or sanitary district be in any manner liable by reason of the earnings being insufficient to pay said bonds. All the details pertaining to the issuance of such bonds and the terms and conditions thereof, shall be determined by ordinance of the municipality or sanitary district. Cities and towns may also borrow money and issue revenue bonds pursuant to the provisions of this chapter for the purpose of purchasing and acquiring works and facilities useful and convenient for the collection, treatment, purification and disposal in a sanitary manner of the liquid and solid waste, sewage and industrial waste of any such city or town and for the purpose of purchasing and acquiring an interest in any such works and facilities which are owned by another city or town and which are to be jointly used by the respective municipalities. Such bonds may be delivered to the seller of such works and facilities or to the municipality selling an interest in its sewage works and facilities in payment of the purchase price, or such bonds may be sold at public sale in the manner provided by chapter 75 and the proceeds from such sale applied to the payment of the purchase price.

394.7 Previous proceedings--other funds. This chapter shall be deemed to apply to all proceedings heretofore taken by cities and towns for the construction of any improvement provided for herein, notwithstanding that a portion of the funds for the construction of any such improvement shall have been derived from sources other than the issuance of bonds hereunder.

394.8 Pledge of net earnings. Before the issuance of any such bonds, the council of the municipality by ordinance shall pledge the net earnings of the works to the payment of said bonds and the interest thereon, and shall provide that the same shall be set apart as a sinking fund for that purpose.

394.9 Self-liquidating rates--lien on premises. The city or town council shall have power by ordinance, to establish and maintain just and equitable rates or charges for the use of and the service rendered by such works, to be paid by the owner of each and every lot, parcel of real estate, or building that is connected with and uses such works, by or through any part of the sewage system of the city or town, or that in any way uses or is served by

such works, and may change and readjust such rates or charges from time to time and to charge and collect proper rates and charges for landing, wharfage, dockage, swimming, and golfing. Such rates or charges shall be sufficient in each year for the payment of the proper and reasonable expenses of operation, repair, replacements, and maintenance of the works, and for the payment of the sums herein required to be paid into a sinking fund, which said fund shall be sufficient to meet the principal and interest and other charges, except rates or charges for the use of swimming pools and golf courses, of the bonded indebtedness provided for herein. All such rates or charges if not paid as by the ordinance provided, when due, shall constitute a lien upon the premises served by such works, and shall be collected in the same manner as taxes.

394.10 Chapter applicable to municipal docks. All of the provisions of this chapter relating to the borrowing of money, and issuing revenue bonds for wharves, docks and piers, including the grading and filling of lands, and for the payment thereof, shall be applicable to chapter 384.

394.11 Scope of chapter. The provisions of this chapter shall be deemed to apply to the construction, equipment, operation and maintenance of any sewage treatment plant or plants, by any sanitary district operating under the provisions of chapter 358; and any such sanitary district may, in addition, use the power conferred upon it by chapter 358 to apply any of the provisions of this chapter relating to the construction, equipment, operation and maintenance of any sewage treatment plant or plants of such sanitary district, or any combination of the power relating to sewage treatment plants granted such sanitary district by the provisions of this chapter and chapter 358.

394.12 Refunding bonds authorized. Cities and towns are hereby authorized to issue from time to time negotiable interest bearing refunding bonds to refund at maturity or pursuant to redemption provisions or at any time before maturity with the consent of the holders thereof a like principal amount of outstanding revenue bonds or obligations previously issued by such municipalities pursuant to the provisions of this chapter to pay the cost of acquiring, constructing, equipping, extending or improving works and facilities useful and convenient for the collection, treatment, purification and disposal in a sanitary manner of the liquid and solid waste, sewage and industrial waste of any such city or town. All such refunding bonds shall comply with the pertinent provisions of this chapter and may be made subject to redemption in such manner and upon such terms, with or without premium, as is stated on the face thereof. Such refunding bonds shall be payable only from the net earnings of such works and facilities and shall not constitute a general obligation of any such city or town or be payable in any manner by taxation. Such refunding bonds may be issued in exchange for the outstanding bonds or obligations to be refunded or such refunding bonds may be sold and the proceeds thereof applied to the payment of such outstanding bonds or obligations.

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