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Kentucky Municipal wastewater Sludge: Generation, Management and Pathogen Reduction

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KENTUCKY MUNICIPAL WASTEWATER SLUDGE

GENERATION, MANAGEMENT and PATHOGEN REDUCTION

by

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for

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PREFACE

The residuals which remain after the treatment of municipal wastewater may be only a small fraction of the wastewater volume, but they can be a significant fraction of the treatment difficulty and cost. These residual mixtures of solids and liquids are often referred to as sewage sludge. Their management has always been a challenge for operators and engineers, but recent regulations in both sludge and solid waste management have increased the need to examine technologies available for controlling biological pathogens in sludge. This document was prepared as part of an investigation into sludge quantities and pathogen reduction. It has been written as an introduction and reference for operators, municipal officials, engineers and regulators as they assess their sludge management options.

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CHAPTER 1. INTRODUCTION

When municipal wastewater is treated, many constituents of the wastewater are modified and concentrated. The residual mixture of solids and liquid, or sludge, is a complex and challenging waste stream. It will contain substances which have an offensive character, it can decompose, it may contain pathogenic organisms and pollutants, and it is present in significant volumes (Metcalf and Eddy, 1992). Wastewater sludges do, however, possess many characteristics which may be useful for amending soil or providing energy. Proper management of sewage sludge requires minimizing negative impacts of sludge on the environment and risks to the health or well-being of populations in a cost-effective manner. In the United States, new regulations for sewage sludge management have increased attention on the technologies which are available for reducing the pathogen content of sludges. Efficient selection and application of these technologies requires both an appreciation for the properties of sludge, and an understanding of the principles behind the processes. This report will try to summarize the quantity of sewage sludge which is generated in Kentucky and analyze some of the options which are available for achieving pathogen reduction. It is based on a review of pertinent literature and discussions with municipal wastewater treatment plant personnel throughout the United States. The authors hope that it will provide a useful introduction to evaluating sludge generation and pathogen reduction.

CHAPTER 2. SEWAGE SLUDGE CHARACTERISTICS

2.1. Sludge Composition

Sewage sludge quantity and quality will reflect the wastewater which was treated and the treatment process employed. Wastewater composition can be somewhat variable, but it represents the nature of the waste sources and collection system. Although most of wastewater is just water, it is usually the other constituents which are of interest with respect to both treatment and residuals management.

Wastewater composition can be generalized by classifying many of the constituents into groups based on biodegradability and size. For example, biochemical oxygen demand (BOD) reflects, to a large part, the quantity of organic matter in the wastewater which is biodegradable under specific conditions. Total suspended solids (TSS) are those solids large enough to be retained on a filter of a specific size. Both of these are heterogenous groups of different wastewater constituents which share these properties. Domestic wastewaters often demonstrate a similarity in the concentrations of these group parameters. Wastewater is also analyzed for the specific constituents, particularly those for which health risks or treatment problems have been identified. The concentrations of these can be much more variable, reflecting sporadic residential use (e.g., lawn care chemicals), commercial, and industrial wastes in the wastewater.

Treatment of municipal wastewater uses a combination of physical, biological and chemical processes. Primary treatment removes wastewater suspended solids through sedimentation. These solids are both organic and inorganic. Secondary treatment processes usually convert soluble and colloidal organic matter to suspended solids through biological activity. These solids can then also be removed through sedimentation. This biological conversion occurs through both microorganism formation and growth and adsorption onto the biological solids. As a result, solids resulting from secondary treatment usually contain a higher organic content.

A portion of the organic matter in sewage sludge is composed of microorganisms such as bacteria, viruses, protozoans, and helminths. Although many of these organisms do not pose a health hazard and are very short-lived, some can be human pathogens. Most of the inorganic constituents of sludges are naturally occurring minerals and precipitates, but they may also be pollutants which pose a risk to human health if improperly managed. Although they may only be a small portion of the total sludge quantity, pathogens and pollutants must be understood and controlled during sludge management.

2.2. Sludge Quantity

Any attempt to evaluate the management of wastewater residuals requires an understanding of the sludge quantity. In sludge, this usually requires relationships between dry solids and total sludge quantities. A dry solid is the residue which remains after all the moisture is removed from a sludge. Although sludge is never completely dry during normal processing, the dry solids quantity provides a useful basis for comparing sludge production because it is relatively conservative during dewatering processes whereas the water content is highly dependent on sludge handling and processing methods. The quantity of dry solids in a sludge can be computed from the solids content on a wet weight basis and the weight of the sludge using

$$\textit{Weight of Dry Solids} = \textit{Wet Sludge Weight} \times \frac{\textit{Solids Content (\% by weight)}}{100}$$

In Figure 1, the relationship between dry solid weight and the weight of sludge at different solids contents is shown. Sludge volume relationships will be similar to the weight relationships shown in Figure 1, but can become more complex at high solids contents if sludge solids are much denser than water or if air filled voids constitute a significant portion of the volume. Other conversion formulas are presented in the Appendix.

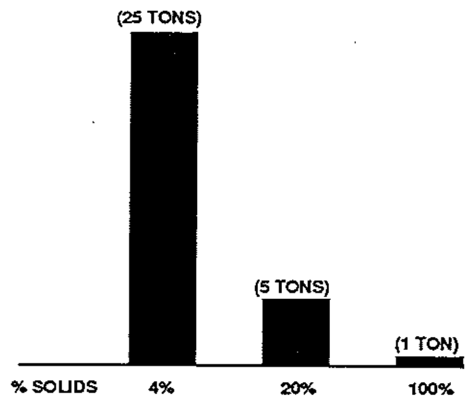


Figure 1. The weight of one ton of dry sludge solids is compared to the weight of corresponding sludge quantities at 4% and 20% solids.

To determine the quantity of solids generated in Kentucky wastewater treatment plants and their distribution throughout the state, a database was developed through a mail survey and follow-up communication with all municipal wastewater treatment plants in Kentucky (KPDES permit holders). Portions of this survey will be summarized in this document, and the complete database is found in Appendix A.

In 1993, almost 63,000 tons of dry sludge solids were removed from municipal wastewater treatment plants in Kentucky. Not surprisingly, the largest quantities of sludge are in those areas of the state with the highest population.

The quantity of sewage sludge which has been removed from different wastewater treatment plants in the state can be shown, as expected, to increase with increasing size of the treatment plant. For example, in Figure 2 the relationship between solids quantities and wastewater flow is shown. The considerable range in solids quantity at a flow rate is thought to reflect variations in treatment methods, operation, wastewater characteristics, and difficulties in assigning an accurate annual sludge removal at some of the facilities.

Data from the sludge survey was used to compare the quantity of solids removed at the different treatment plants per million gallons of wastewater treated. The results, shown in Figure 3 for 149 treatment plants, demonstrate that most of the facilities in the state report a dry solids generation rate which is below 0.8 tons dry solids per million gallons of wastewater treated. The average generation rate for those facilities was 0.49 and the median was 0.32 dry tons per million gallons of wastewater treated. These results are similar to the average 0.6 tons of dry solids per million gallons reported by the USEPA Sludge Task Force (1983), and 0.2 tons per million gallons found in a recent survey of large treatment plants in the northeast U.S. (Hermann and Jeris, 1992). The differences between these numbers, and the range in values for Kentucky wastewater treatment plants does point out the care with which these numbers must be applied. Variation in sludge generation at different facilities should not be surprising as

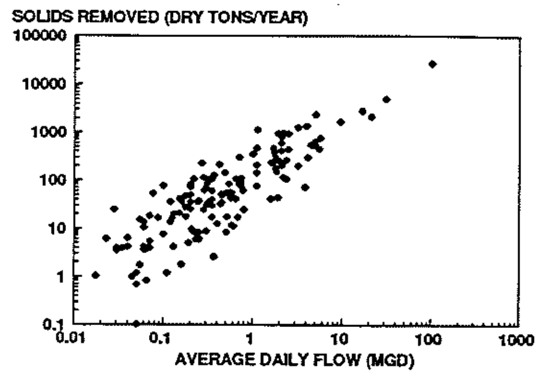


Figure 2. Wastewater sludge solids removed from Kentucky treatment plants.

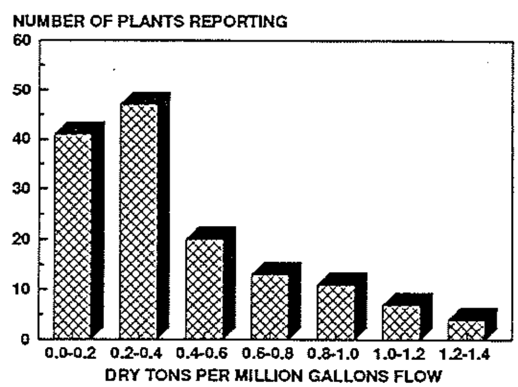


Figure 3. Tons of dry sludge solids removed per million gallons of wastewater treated in Kentucky.

variations in treatment methods, operation and wastewater are always encountered. For example, although the statewide average for BOD and TSS was 194 mg/l and 204 mg/l, respectively, the standard deviation was 102 mg/l for BOD and 179 mg/l for TSS. Other facility variations such as industrial waste and acceptance of septage may also influence these numbers. Sixty-seven treatment plants reportedly accept industrial flow and it averages 24% of their influent, while 63 plants currently accept septage.

A mass balance approach to solids generation quantifies inputs and outputs to the treatment process and solids generation and destruction inside the process. Figure 4 shows a generalized schematic of a very simple mass balance approach, where the entire treatment process is considered as a single box. More refined methods have been described in the literature (Metcalf and Eddy, 1992). The organic matter (e.g., BOD) and suspended solids (e.g., TSS) entering the treatment process are related to sludge solids or effluent composition. The conversion of these quantities to sludge solids is complicated by the biological conversion of both of these groups of compounds, overlapping of some these characteristics of the groups, and differences between different treatment techniques, but expressions which relate BOD and TSS to solids generation have been developed. These expressions are simplifications of complex processes and it may also be necessary to include variables such as residence time of solids in the system and type of treatment process.

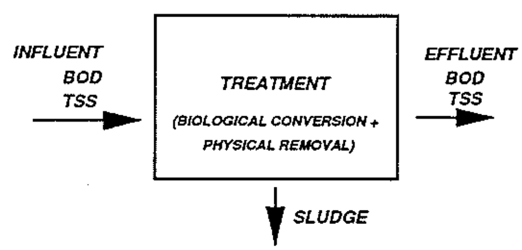


Figure 4. A simplified mass balance approach to sludge generation uses the biochemical oxygen demand (BOD) and total suspended solids (TSS) quantities and relationships for their conversion and removal.

CHAPTER 3. SLUDGE MANAGEMENT AND USE IN KENTUCKY

In Kentucky, the sludge generated during the treatment of municipal wastewater is managed and used in several different ways. In Figure 5, management options reported by 217 plants in the sludge survey are shown. Many plants currently report more than one option for their sludge. As a result, the totals in Figure 5 exceed the total number of plants which reported that information. It is likely that all of these methods will be affected in some way by the new regulations for landfilling and sludge management.

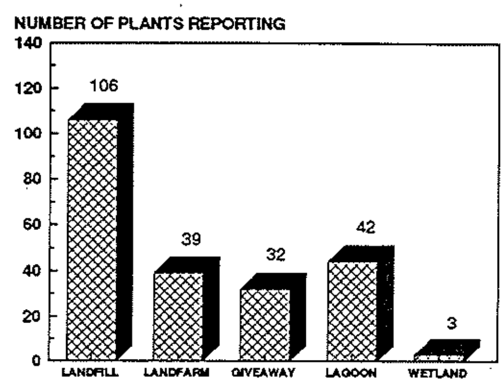


Figure 5. Comparison of sludge end-uses reported at Kentucky wastewater treatment plants.

In 1993, more than 100 Kentucky wastewater treatment plants landfilled at least a portion of their sludge and in most cases, the sludges were handled as waste material. These facilities generated most of the sludge in the state, a total of 60,000 dry tons of sludge solids annually. Several wastewater facilities processed sludges to be used in combination with soil as a daily cover for landfill waste. Several respondents to the survey expressed concern that new design requirements for landfills have led to an increase in tipping fees and increased hauling distances as landfills have closed. In 1993, tipping fees for Kentucky sludge disposed of at landfills, as reported by the survey respondents, ranged from $10 to almost $60 per ton of sludge, as shown in Figure 6. For a sludge which is 20% solids by weight, five tons of sludge would be required to obtain one ton of dry solids. Using the average landfilling cost of $20/ton of wet sludge, the landfilling of a 20% solid sludge could also be expressed as $100/ton of dry sludge solids. At the same sludge disposal cost, increases in the sludge solids content result in reductions in the cost of disposal when expressed on a dry solids basis. For example, a similar calculation would show that a 33% solids sludge landfilled at $20/ton is a disposal cost of $60 per dry ton.

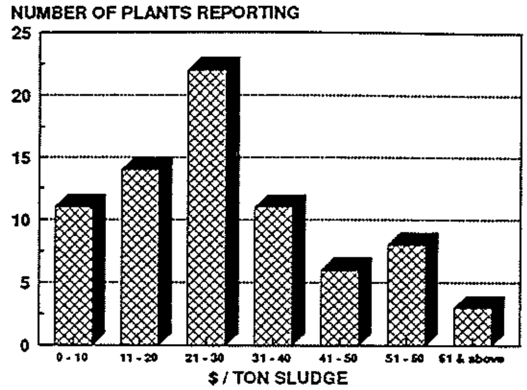


Figure 6. 1993 landfill tipping fees for Kentucky wastewater treatment plants.

Sludge landfarm and give away programs were reported by 39 and 32 plants, respectively, in 1993. Many of these facilities have begun to investigate meeting pathogen reduction requirements of the new regulations. Eighty-one Kentucky wastewater treatment plants indicated that they are interested in landfarming.

Lagoons may also be important in sludge management and almost 50 facilities in Kentucky reported some use of lagoons. In many cases, lagoons provide temporary storage which will eventually require additional handling, although there is evidence that in some facilities, the quantity of sludge will be reduced. The survey information cannot be used to demonstrate such a reduction because sludge storage is practiced in many of these facilities, but it is an area of on-going research (Keeling, 1994).

CHAPTER 4. MUNICIPAL WASTEWATER RESIDUALS REGULATION

An important aspect of sludge management is the new regulation for the use and disposal of sewage sludge, 40 CFR 503. This regulation signals the federal government's intent to promote and encourage reuse of wastewater residuals when of acceptable quality, and is expected to increase interest in land application and other beneficial practices. The regulation focuses on three aspects to minimize potential negative impacts during management: pathogen content, attractiveness to vectors, and pollutants. The rule was based on an analysis of the different pathways that components of residuals could take after final use. The following is only a brief introduction to the rule, and interested readers should examine other references that are available (USEPA, 1992). In addition to federal regulation, state and local governments may also regulate sludge management. In Kentucky, sludge use and disposal is regulated by the Kentucky Department for Environmental Protection. Several counties also have rules governing use of sludge. Before deciding on a sludge management option, contact local and state authorities to determine all applicable requirements.

4.1. Pathogen Reduction

Biological pathogens can be components of wastewater residuals and they can be reduced through a variety of different processing methods. The 503 regulations identify two degrees of pathogen reduction: Class A and Class B. Class A sludges have very low levels of pathogens and can be applied to land with fewer restrictions than a Class B. Class A sludges are those which have met the appropriate pathogen criteria or have been processed using methods which have been designated as a PFRP (Processes to Further Reduce Pathogens) or equivalent. All residuals which are applied to land must at least meet Class B; if they are applied to lawns and home gardens or are sold or given away in bags, they must meet the Class A pathogen reduction.

Many Kentucky wastewater treatment plants currently process sludges to achieve at least some degree of pathogen reduction. Survey respondents indicated that nine facilities currently achieve a PFRP and sixty facilities achieve PSRP during treatment and sludge processing.

4.2. Vector Attraction

If the residuals are attractive to vectors (including birds, rodents, insects), these vectors could transport potentially harmful sludge constituents to nearby populations. To prevent this from happening, the sludge rule requires that residuals either be made less attractive to vectors or be managed in a way which does not permit vector contact. Vector attractiveness can be reduced through a variety of processing techniques, and vector contact can be minimized by subsurface injection, incorporation into soil shortly after application, or landfilling.

4.3. Pollutant Content

Pollutants in the residuals from the treatment of wastewater can limit potential uses. Unlike many other residual components, many pollutants are not reduced through natural activity in the soil and can accumulate to levels which might be undesirable if not controlled. The 503 rule establishes two levels of pollutant concentration in sludges: ceiling and high quality. If pollutant concentrations are below the high quality limits, the sludge can be used in a variety of ways. Provided appropriate vector and pathogen requirements are also met, they can be applied to lawns or gardens or sold in bags. If the concentrations of pollutants are below the ceiling values, but above the high quality limits, the sludges can be applied to land only after using a cumulative loading criteria. If the pollutant concentrations exceed the ceiling levels, the sludges should probably be managed through methods other than land application.

Record keeping requirements are more stringent for solids which do not meet the high quality limits. Even if pollutant concentrations are below the ceiling levels, once they are in excess of the high quality level, annual whole sludge application rates must be monitored to ensure that the annual pollutant loads are not greater than those permitted.

Table 1. Sludge Pollutant Limits

Pollutant	Ceiling (mg/kg)	High Quality (mg/kg)
Arsenic	75	41
Cadmium	85	39
Chromium	3000	1200
Copper	4300	1500
Lead	840	300
Mercury	57	17
Molybdenum	75	18
Nickel	420	420
Selenium	100	36
Zinc	7500	2800

CHAPTER 5. SLUDGE PROCESSING FOR PATHOGEN REDUCTION

Pathogen reduction is a key feature of the current sludge regulations and sludge management may require processing to reduce viable pathogens. The method and amount of pathogen reduction will depend to a large extent on the anticipated final use of the solid residuals. This section will summarize some of the available technologies for pathogen reduction and discuss characteristics of several processes which may determine their suitability for meeting the needs of individual treatment plants. The findings are based on an examination of current literature and discussions with plant operators. These sources were also used to identify those technologies which have been sufficiently developed to warrant review.

Many processing options can reduce pathogen content of sewage sludge. For example, biological activity, drying, heat, pH changes, and high temperatures all act to alter the viability of pathogens. The following discussion will focus on several pathogen reduction methods for sludges. The criteria for selecting these methods was that they be able to meet the most stringent pathogen reduction level (Class A), that they be appropriate for smaller wastewater treatment plants, and that data be available from currently operating facilities. While there are significant advantages in achieving Class A pathogen reduction, crop land application, which is the most common, and often least expensive beneficial reuse alternative, in most cases only requires meeting Class B pathogen reduction limits. The advantage of Class A pathogen reduction should be weighed against the additional costs of Class A treatment technologies. Where cultivated acreage is relatively scarce, such as the eastern coal field region of Kentucky, the advantages of Class A treatment may be greater.

Based on discussions with operators and regulators, the following pathogen reduction methods were selected for examination:

- composting
- alkaline stabilization
- heat drying/pelletization
- thermophilic aerobic digestion

Although these do not represent all the possible pathogen reduction methods which meet the above criteria, it is hoped that they provide a framework within which other methods can also be compared.

5.1. COMPOSTING

5.1.1. Introduction

Composting is the biological decomposition of organic material under controlled temperature, oxygen, and moisture conditions. Both digested and undigested primary and secondary sludges have been successfully composted. To assist in the biological processing, bulking agents such as wood chips, sawdust, or finished compost are blended with the sludge to increase porosity and absorb moisture. Various methods are then employed to assist converting the blended sludge into a biologically stable, humus-like material. Such composted sludge can be used to improve the physical properties of soil, including its water retention, aggregation and aeration. As a soil amendment, composted sludge is often used in gardens, nurseries, parks and for re-vegetation of disturbed lands.

Composting can lead to a substantial volume reduction because organic sludge solids are biologically degraded. Depending on the degradability of additives (e.g., bulking agents), volume reductions can range from 35% (using slowly degraded wood) to 73% (using shredded mixed paper waste) of the original volume (Smith and Anderson, 1994)

Some of the principle concerns with composting sludge have been the issues of public health and odor generation. The heat generated during composting is capable of killing all four groups of pathogens present in sewage sludge, although the efficiency of pathogen destruction depends on "the ability of the process to subject the sludge to uniformly high temperatures" (Corbitt, 1990) Sewage sludge contains compounds which during decomposition can produce unpleasant odors. Proper process design and management can minimize, although not completely eliminate odor production (Benedict, 1986).

5.1.2. Composting Methods and Conditions

Most sludge composting operations use one of three principal methods:

- static pile
- windrow
- in-vessel.

The results of a recent survey provided a breakdown of active sludge composting processes by the number of plants which employ each method. The results are shown in Figure 7.

The static pile method, currently the most widely used in the United States, was developed by the U.S. Department of Agriculture at Beltsville, Maryland. The aerated static pile method uses forced air to supply oxygen and remove excess moisture. Perforated plastic pipe covered with a porous bulking agent is commonly used to distribute air. Blended sludge is placed over that system in piles seven to eight feet high and of varying widths. Once placed, the piles are covered with either bulking material or finished compost to provide insulation and odor control (Figure 8).

In windrow composting, windrows of blended sludge are mechanically turned to provide oxygen and control temperature. The windrows range from three to seven feet high depending on the type of equipment used to turn the compost (Figure 8). The length of the windrow will vary according to the size constraints of the composting site. Facilities in warm climates with average rainfalls have been successful with placing windrows in the open air. Those facilities located in cold climates or with excessive rainfall often place the windrows in a covered or sheltered area to allow better control of moisture and temperature. The windrows must be turned periodically to replenish oxygen depleted during decomposition of the organic fraction and to control temperature. The frequency of turning will determine the amount of time required for complete decomposition of organics in the sludge. In general, the more frequently the compost is turned, the faster the rate of decomposition.

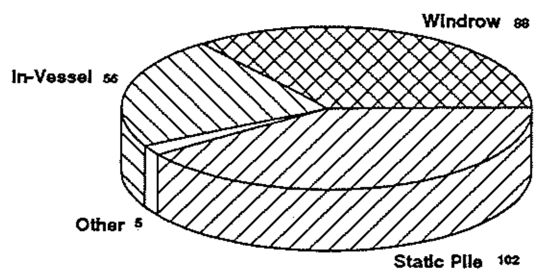
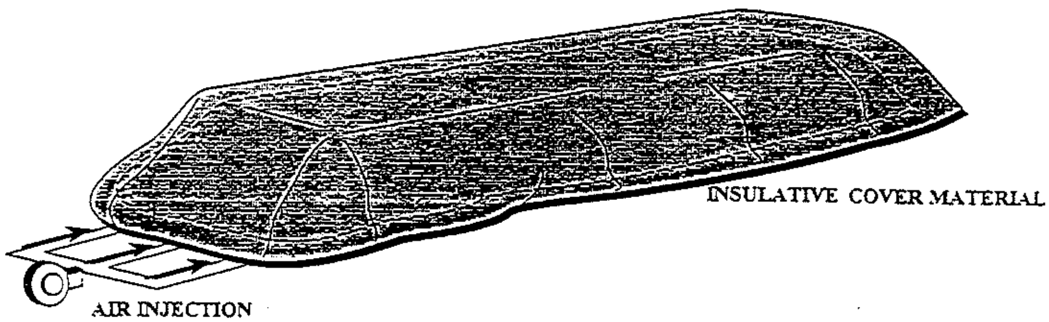
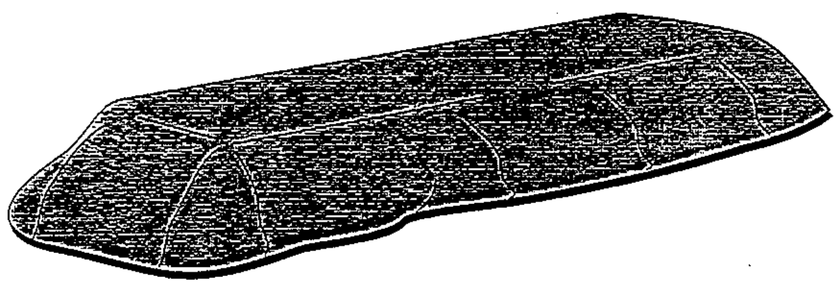


Figure 7. Results of a recent survey of sludge composting facilities showing the number of plants employing each method (Biocycle, 1992).

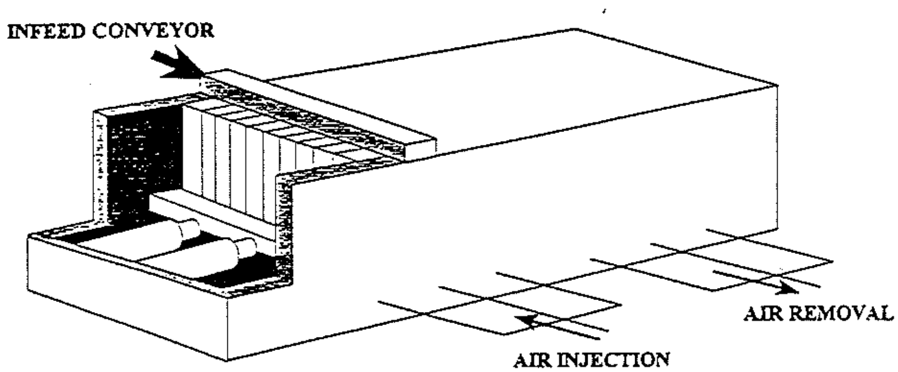
The in-vessel composting method uses enclosed containers or vessels to create a controlled decomposition environment. Most common of these are agitated or mechanically mixed reactors. The sludge and bulking agent is placed in the reactor and periodically mixed to provide oxygen and distribute moisture. The controlled conditions of an in-vessel system generally provide an accelerated rate of decomposition as compared to windrow or static pile methods. Because the composting occurs within a closed reactor, in-vessel systems may also allow for more efficient control of odors.



AERATED STATIC PILE METHOD



WINDROW COMPOSTING



IN-VESSEL COMPOSTING

Figure 8. Schematic of three sludge composting variations.

5.1.3. Composting Parameters

In order to assure efficient composting, several important parameters must be understood and controlled:

- Oxygen Content
- Temperature
- Moisture Content
- Carbon/Nitrogen Ratio
- Particle Size

An adequate supply of oxygen must be available in the compost for sufficient aerobic decomposition to take place. Microorganisms responsible for the decomposition of the organic fraction of compost require oxygen for survival and growth.

To achieve pathogen reduction through composting, elevated temperatures between 55°C and 60°C are required (Burnham et al.. 1992; USEPA, 1986, 1987; Benedict, et al., 1986; Finstein, et al., 1986; Andrews, et al., 1991; Corbitt, 1990; and McGhee, 1991). Temperatures in excess of 60°C can reduce biological activity, while temperatures below 55°C may not sufficiently destroy pathogens (Burnham et al., 1992). Compost samples which have been taken from low-temperature (25°C to 45°C) areas of a pile reportedly had a much greater microbial activity than did samples from high temperature (60°C to 75°C) areas (USEPA, 1986).

Aerobic decomposition also requires adequate moisture. Sources state that the optimum moisture content for composting sludge is "less than 60 percent but more than 40 percent" (McGhee, 1991). Because most sludges have a moisture content of between 75 to 95 percent after thickening and dewatering, moisture content is usually further reduced through the addition of a bulking agent. Several facilities which were contacted as part of this study reported that moisture control was a critical operating parameter in sludge composting.

The balance between the amount of available carbon and nitrogen is important in ensuring successful biological decomposition. This balance can be described with the C/N ratio. Sewage sludges typically have low C/N values, indicating an excess of nitrogen. In contrast, wood waste and paper have generally higher ratios. Other organic wastes, such as food and grass clippings can also have a low C/N ratio. Composting with a low C/N ratio may lead to odor production, while a ratio which is too high may result in slow decomposition.

The particle size of the bulking agent is important for both mixing and decomposition. Reducing bulking agent particle size creates greater available surface area, a more homogeneous sludge/bulking agent mixture, and may increase the rate of decomposition. The desired particle size of the bulking agent may also govern the type of equipment which is necessary for processing.

Based on a review of the literature, examples of typical values for these and various other composting parameters are listed in Table 2.

Table 2. Typical Sludge Composting Conditions*

Optimum Temperature	55°C to 60°C
Optimum Moisture	40% to 60%
pH	6 to 7.5
Carbon to Nitrogen Ratio	25 to 30
Particle Size	1" to 3"

*adapted from USEPA, 1987; McGhee, 1991; Andrews et al., 1991; Corbitt, 1990.

5.1.4. Bulking Agents

An important issue to address when considering sludge composting is the availability of bulking agents to blend with the sludge. Bulking agents ensure adequate porosity and moisture content which is important to maintaining active decomposition. To help minimize the cost of composting, attention should be given to the use of locally available materials. It became apparent in discussions with sludge compostors, that many readily available, local materials, including some that would normally be landfilled, have properties that make them excellent bulking agents.

Yard Waste: Yard waste may include grass clippings, brush, leaves and tree trimmings. As more states are banning or actively discouraging the disposal of yard waste in landfills, the option of composting sludge together with yard waste is becoming increasingly popular. One survey found more than

70 projects were using or planned to use yard waste as part of their composting mix in 1990 compared to only a few such projects 3 years earlier.

Some sludge/yard waste composting facilities are operated in conjunction with municipal landfills. Although landfills may accept a variety of mixed yard wastes, including leaves, grass, brush and tree trimmings, the type of yard waste used in composting will depend on the composting equipment, sludge type and the individual process. Flexibility in preparation of the composting mixture may be important in using yard wastes. For example, several operators reported difficulties controlling the moisture content of the compost when using mixed yard waste. Most minimized this problem by keeping tree trimming waste separate from mixed yard waste and varying the components in the overall mix depending on the amount of moisture present.

Paper Waste: A facility in North Carolina successfully used mixed paper waste, diverted from the municipal solid waste-stream, as a bulking agent (Smith and Anderson, 1994). Mixed paper, consisting of hard to market paper grades, constitutes 15% - 20% of most municipal solid waste streams. Results of the North Carolina project showed a 70% reduction in volume, Class A pathogen reduction, and a dark colored product resembling topsoil. Problems they reported with this bulking agent included finding equipment to shred the paper and controlling wind-blown paper.

Wood-Chips and Sawdust: Some operators of small plants have found it to be more economical to purchase bulking agents such as wood chips or sawdust rather then processing their own. These operators report that although yard waste was available, the high initial cost of processing equipment made it more economical to purchase processed wood. Operators have also reduced the high capital costs of processing equipment by forming cooperatives with other communities and sharing processing equipment.

5.1.5. COMPOSTING VARIATIONS

An attempt was made to identify sludge composting facilities throughout the U.S. which were currently operational, of medium size and employing the range of composting techniques. Discussions with operators indicated an overall satisfaction with the process. Eighty percent of the plant operators contacted were able to achieve a high degree of pathogen reduction (e.g., Class A) with the other twenty percent meeting a lower reduction (e.g., Class B). Some characteristics of the facilities which were contacted are summarized in Table 3.

Outside of individual process variations (windrow, static pile, in-vessel), the greatest variations between facilities were the bulking agents used. Regional characteristics seem to have an influence on the availability of some materials such as sawdust or wood-ash. Several operators have found it advantageous to have the flexibility to use materials such as yard wastes when they are available. Other variations which were described include:

- Separate stockpiles of yard and wood waste.
- Possible further de-watering of the sludge prior to composting.
- Re-use of bulking agents by screening the finished compost
- Use of enclosed buildings for composting operations.

One example is Yorktown Heights, NY which is in an area that generates a large volume of leaves in the fall of the year. Initial attempts at using leaves as a bulking agent for sludge composting resulted in excessive moisture in the windrows. They found that further dewatering of their raw sludge was necessary before they could obtain optimum moisture in the compost.

Available equipment and facilities are also important variables when considering composting for sludge processing. Facilities that were not initially successful composting outdoors have converted unused equipment buildings and garages into compost facilities. Most of the plant operators interviewed do not have, or intend to purchase specialized compost turning equipment. Plant operators have found that front-end loaders and backhoes, although slower, are reasonably efficient.

Most plant operators agree that optimizing a composting system is a trial and error process and successful composting may require a willingness to experiment with different conditions. Even the slightest change in one component (e.g., moisture content or bulking agent) can have a significant effect on the final product. Careful research should be conducted prior to the implementation of a composting operation to evaluate markets for the final product, availability of bulking agents, and the need for additional equipment.

5.1.6. Composting Costs

One area of discussion with existing sludge composting operations was the cost of the process. The costs associated with composting operations will be dependent on factors such as:

- use of existing facilities and equipment
- size of the treatment plant
- availability and cost of bulking materials.

Those composting facilities which could report a unit cost for composting sludge indicated the range of costs which are summarized in Figure 9. Some of the variation in composting costs can be found by looking closely at the individual processes and plant location. Plants A and B are located in the southeast United States. Both facilities use processed yard waste as a bulking agent with the windrow composting method. Plants C and D, which are located in the northeast and mid-west respectively, both use aerated static pile composting. Plant E, located in the northeast, uses an in-vessel system and purchases wood ash and sawdust as bulking agents. Process type can also influence overall operating costs. Plants that use the in-vessel and aerated static pile method may incur additional operating costs because of equipment maintenance on blowers and agitators. Land requirements for windrow composting should also be a concern. Facilities that use windrow composting must also consider the cost of windrow turners and loading equipment. The use of existing facilities and equipment also impacted the range of unit costs reported. For instance, some small composting operations use road maintenance equipment such as front-end loaders and backhoes to turn and move windrow compost, thus eliminating the need for specialized equipment.

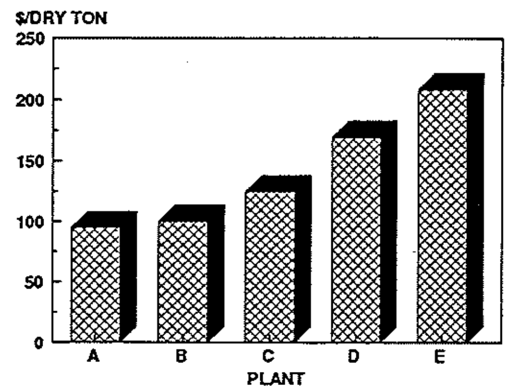


Figure 9. Comparison of sludge composting costs reported per dry ton of sludge solids processed.

Most of the composting operations contacted have successful give-away programs with little or no long term stockpiling. Two of the plants contacted were able to charge a nominal fee for the finished compost (\$10 - \$15 /yd^3), but most of the facilities interviewed did not expect revenues from the sale of compost to cover their operating costs. The compost is often given to the public or used by municipal governments in the parks and landscaping departments. These and other results from the interviews are summarized in Table 3.

Table 3. Municipal Wastewater Composting Operations Surveyed

Facility	Plant Size (Sludge)	Process	Bulking Agent(s)	Product End Use
Manchester, NY	0.45 mgd (2-4 dry ton/month)	Aerated Static Pile	Wood Chips	Give Away to Residents
Plymouth, NH	0.7 mgd (20 dry ton/month)	In-Vessel	Sawdust, Wood Ash	Give Away to Residents and Highway Dept.
Mackinac Island, MI	1.0 mgd (400 wet ton/year)	Windrow	Currently looking (horse manure failed)	
Yorktown Heights, MY	1.5 mgd (75 yd^3/month)	Windrow	Leaves, Yard Waste	Give Away to Residents
Nantuckett Island, MA	1.6 mgd (7.5-30 dry ton/month)	Aerated Static Pile	Wood Chips	Sold to Residents ($15/$yd^3$)
Scottsboro, AL	4.5 mgd	Windrow	Mixed Yard Waste	Landfill Daily Cover
Fairfield, CN	9.0 mgd	In-Vessel	Ground Landscape Waste	Landfill Soil Amendment
Longmont, CO	11.5 mgd (134 dry ton/month)	Aerated Static Pile	Wood Chips	Give Away to Public Works
Myrtle Beach	12.0 mgd (70 dry ton/month)	Windrow	Mixed Yard Waste	Solid to Public ($10/$yd^3$)

5.2. ALKALINE STABILIZATION

5.2.1. Introduction

Lime has long been used to deodorize, disinfect, and enhance the dewatering characteristics of wastewater solids. Alkaline stabilization is the process of adding an alkaline agent (e.g., quick lime, hydrated lime, flyash, cement kiln dust) to wastewater sludge in quantities sufficient to raise and hold the pH for a specified time period. Sludge so stabilized may have a reduced number and a reduced regrowth of pathogenic and odor-producing organisms. Heat is also usually important to reducing pathogen viability in the sludge. Heat is either generated by combination of sludge with the alkaline amendment, and it may be added externally.

Alkaline stabilization may require less overall space compared to static pile or windrow composting and less capital investment compared to heat-drying/pelletization processes. Disadvantages associated with alkaline stabilization are the generation of odors and an increase in sludge solid weight.

5.2.2. Alkaline Amendments

A variety of compounds have been used as alkaline agents for sludge stabilization. One of the most common is quicklime or calcium oxide (CaO). The addition of quicklime has a two-fold effect on pathogen reduction. Quicklime has the capability to raise the pH to 12 and also generates heat which reduces pathogen viability (Burnham et al., 1992).

In recent years Cement Kiln Dust (CKD) and Lime Kiln Dust (LKD) have gained acceptance as alternatives to lime in alkaline stabilization processes. CKD and LKD are by-products of the cement and lime manufacturing industries. They posses some alkaline properties similar to lime. In addition, their large surface areas may give them better absorption and drying capabilities. In processes that use CKD or LKD, quicklime may also be added to ensure that the desired pH and temperature is attained.

5.2.3. Stabilization Criteria

Contact time, pH and temperature are the three primary factors to consider in using alkaline stabilization processes for pathogen reduction. They can determine whether the product will be Class A or Class B with respect to pathogens. The actual alkaline dosage required for each process will depend on factors such as the type and chemical composition of the sludge, the sludge solids content and the alkaline agent used.

When lime addition raises and maintains the pH of the sludge at 12 for a contact period of 2 hours, pathogens and microorganisms are sufficiently inactivated or destroyed to qualify the process as a PSRP. Sludge stabilized through a PSRP is a Class B product. Several variations of the alkaline stabilization process have been able to produce a Class A product, for example, one manufacturer describes a process which uses "a minimum dose of 6% lime, plus the addition of 20% to 40% cement or lime kiln dust and maintenance of a 50% total solids sludge at pH above 12 for three days or dried to 65% total solid" (Burnham et al., 1992). There are several process-patented or proprietary alkaline stabilization processes currently in use and meeting Class A pathogen reduction. Other facilities have or are conducting research and testing to develop processes for their facilities which will achieve Class A pathogen reduction.

Charlotte-Mecklenburg Utility Department in North Carolina examined the quantity of alkaline amendment which might be necessary to achieve Class A pathogen reduction and form a useful product. They tested quicklime, blends of agricultural lime and quicklime, and blends of LKD and quicklime. Quicklime (87% CaO) at dosages of 1.9/1 lb lime/lb dry solids) produced a pH greater than 12 and a temperature greater than 70 C. A LKD and quicklime blend (42% CaO) was dosed at 2.9/1 (lb/lb) and quicklime/aglime at a dose of 3.1/1 (lb/lb) (Black and Veatch, 1993). Sieger et al. (1993) report that somewhat lower quantities of lime may be required to achieve Class A pathogen reduction, and other processes use supplemental heat to reduce the necessary quantity of alkaline amendment required. In all cases, however, the quantities of alkaline amendment have a significant impact on the physical and chemical characteristics of the product and ultimately its utility for the different end uses.

It is not the intent of this report to describe in detail all of the different process variations of achieving a higher degree of pathogen reduction using alkaline amendments. However, based on a review of several process variations and discussions with existing facilities, it appears that most of the alkaline stabilization processes which achieve class A pathogen reduction employ at least one of the following:

- Alkaline dosages (by weight) of at least 2-3/1 (alkaline/dry sludge solid)
- Temperatures greater than 70 C.
- Accelerated drying using alkaline addition or supplemental heat.

Based on a review of the literature and discussions with personnel at facilities which use this technology, it is also apparent that the nature of the final product is very dependent on the stabilization process. Care must be exercised in selecting a process not only for pathogen reduction, but for suitability of the product for the desired end-use.

5.2.4. Use of Alkaline Stabilized Sludge

The process used to stabilize the sludge and consequently the classification of the end product determines what if any restrictions are placed on the use of the final product. Class A material has few restrictions on food crop usage or public contact whereas a Class B product has more restrictions on food crop usage and public access. Alkaline stabilization can meet Class A pathogen reduction and combine the benefits of organic matter and alkaline content for soil improvement. Many treatment plant operators currently give the stabilized product away and in some cases deliver and land apply it free of charge. These facilities hope to establish the benefits of the product, build a customer base and eventually create a demand for the product. Many of the treatment plants that use alkaline stabilization are located in agricultural regions where lime products have the potential to be commercially valuable. Stabilized sludge may also offer benefits in reclaiming disturbed lands. At solids contents greater than 50%, processed sludge can be spread and manipulated much like topsoil. Most operators agree however that the potential revenue generated from the sale of the finished product does not currently cover the cost of processing.

Landfills are also using alkaline stabilized sludge, either as a soil amendment or as a daily cover for the waste. Cover material requirements can be quite substantial and alkaline stabilized sludge mixed with native soils at ratios of 2:1 to 5:1 have been used (Mendenhall et al. 1992). Alkaline stabilized sludge products can also be mixed with topsoil and used to enhance vegetative growth on completed areas of final cover.

5.2.5. Alkaline Stabilization Costs

A phone survey of facilities currently using alkaline stabilization to achieve Class A pathogen reduction indicated an overall satisfaction with the process and the results. More that half of those contacted currently use a proprietary process. Costs for alkaline stabilization processes will vary depending on the type and quantity of alkaline agent used, current facilities and equipment which might be available, and costs associated with proprietary processes.

Based on the results of the phone interviews, the cost of sludge processing by alkaline addition varied depending on the individual process used and, to some extent, location. Not all of the facilities interviewed were able to break down their sludge processing costs completely. A summary of reported cost data from plants that tracked sludge processing costs is shown in Figure 10. The range in sludge processing costs associated with alkaline stabilization reflect some variations in how the costs were determined. For example, Plant G uses a private contractor for its sludge processing. The contractor charges $265 per dry ton which includes thickening, dewatering and alkaline stabilization. The final sludge product is sold to local farmers as a liming agent for $3 /ton, and is used as landfill daily cover. Plant F uses excess amounts of blended quicklime and lime kiln dust to produce a class A product and to further dry the sludge. This results in a product that can be easily spread on agricultural land by conventional equipment. Plant E has a very seasonal waste water flow. They purchase a pre-blended alkaline agent and use excess amounts to produce a class A product. They also use excess lime to dry the sludge to a spreadable consistency. Plant D is currently in a pilot study using a proprietary system. Plants A, B and C all use another proprietary process and all produce a class A product. Additional information from the facilities contacted is summarized in Table 4.

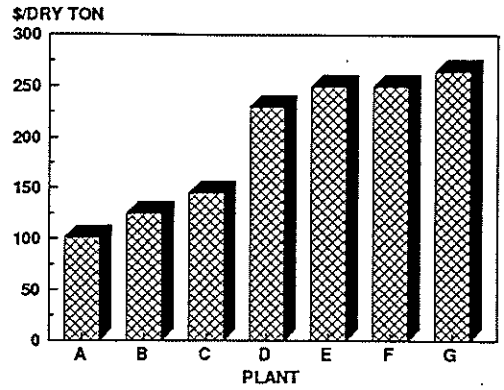


Figure 10. Comparison of costs for sludge processing using alkaline addition.

Currently few of the facilities contacted have been able to generate any revenue from selling the final product. Many are able to eliminate tipping fees normally assessed for landfilling sludge by using their product as landfill daily cover. Most of the facilities indicated that having a marketable end-product weighed heavily on their decision to use the alkaline stabilization process.

Table 4. Municipal Wastewater Alkaline Stabilization Operations Surveyed

Facility	Plant Size (Sludge)	Alkaline Agent(s)	Product End Use
Troy, IL	0.7 mgd (3.5 dry ton/month)	Cement Kiln Dust	Landfill Cover
Easley, SC	1.5 mgd (16.7 dry ton/month)	Blended Alkaline Agent	Landfill Cover
Circleville, OH	2.0 mdg (18 dry ton/month)	Cement Kiln Dust	Ag Soil Amendment
Boone, IO	2.0 mgd (25 dry ton/month)	Cement Kiln Dust	Ag Soil Amendment
Penn Township, PN	2.2 mgd (29 dry ton/month)	Lime Kiln Dust	Ag Soil Amendment
Galion, OH	2.5 mgd (40 dry ton/month)	Cement Kiln Dust	Ag Soil Amendment
Maggie Valley, NC	3.5 mgd	Cement Kiln Dust	Soil Amendment
Tarpon Springs, FL	4.0 mgd	Cement Kiln Dust	Land Applied
Norfolk, NB	5.0 mgd	Cement Kiln Dust	Ag Soil Amendment
Barberton, OH	5.25 mgd	Quicklime	Ag Soil Amendment
Fort Smith, AK	10.0 mgd (300 dry ton/month)	Cement Kiln Dust	Ag Soil Amendment
Kent Co, DL	15.0 mgd (420 dry ton/month)		Soil Amendment
Lexington, KY	22.3 mgd (200 dry ton/month)	Cement Kiln Dust	Landfill Cover
Charlotte, NC	80.0 mgd	Kiln Dust and Quicklime	Ag Soil Amendment

5.3. HEAT DRYING AND PELLETIZATION

5.3.1. Introduction

Heat drying of sludge, often to form pellets, is a sludge processing alternative which achieves a high pathogen reduction through a combination of drying and high temperatures. In terms of pathogen reduction, these methods are distinct from air drying processes both in terms of water removal and pathogen reduction.

5.3.2. Heat Drying Methods

Dryers that have been employed in sludge processing include: spray, rotary, flash and the patented Carver-Greenfield process (Metcalf and Eddy, 1991). Spray dryers atomize liquid sludge into a spray which is dried. Rotary dryers use a heated drum containing the sludge which revolves as it is heated. Flash dryers expose fine sludge particles to hot gases to evaporate moisture and heat the particles. The Carver-Greenfield process mixes sludge with hot oil and the water is boiled from the oil. The resulting mixture is centrifuged to separate the oil from the sludge solids.

5.3.3. Use of Pelletized Sludge

Producing heat dried pellets may be an advantage in marketing the product. Milwaukee has used heat drying methods for years, and successfully markets both directly to users and to fertilizer blenders. One facility which uses heat drying to process sludge is the Clayton County Water Authority of Clayton County, Georgia. The pelletized sludge is marketed as Agri-Plus 650 which is a registered fertilizer with an analysis of 6-5-0 (N-P-K). The pellets are then marketed to the Florida citrus growers and used as a base material for more complete fertilizers. A recent evaluation of potential markets for pelletized sludge performed by a Florida municipality indicated a growing market for the "low value" pelletized products for use by agricultural end users, but a relative saturation of the "high value" market which is retailed to homeowners and turf applicators (Wohlgemuth, 1993).

5.3.4. Heat Drying Costs

The heat drying and pelletization process requires substantial capital investment. Only a few of these plants are in operation in the United States and three facilities were contacted regarding their use of the method. Personnel at those facilities indicated that they were producing a Class A product and were satisfied with the processing technique. The costs shown in Figure 11 demonstrate a significant range in unit costs for heat drying. It appeared that plant C included costs for other aspects of sludge handling and processing in addition to the pelletization.

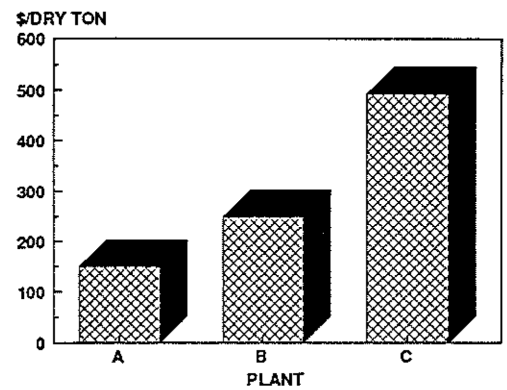


Figure 11. Comparison of sludge processing costs for heat drying/pelletization.

Based on discussions with users of heat drying technology and a review of the literature, it does appear that product marketing should be an important consideration when evaluating the use of heat drying. One plant operator interviewed indicated that they were having some problems finding local markets for the final product and that costs to transport it to other areas could be substantial.

5.4. THERMOPHILIC AEROBIC DIGESTION

5.4.1. Introduction

Thermophilic aerobic digestion is an emerging technology in the United States. The autothermal thermophilic aerobic digestion (ATAD) process obtains pathogen reduction by using heat generated during aerobic digestion. The ATAD technology has been refined in Germany were there are currently 35 full-scale operating facilities (EPA, 1990).

5.4.2. Aerobic Digestion Methods

Most ATAD systems are two-stage processes that use aerobic digestion in the thermophilic temperature range (40°C to 80°C). Insulated digestors capture and retain heat produced during digestion. Although supplementary heat systems can be installed, most systems are able to maintain thermophilic conditions without it. First stage temperatures range between 40°C to 50°C with the second stage operating between 50°C to 65°C (EPA, 1990).

ATAD systems are commonly operated in a batch mode with average detention times in each reactor of almost 24 hours and are charged daily. The aeration system inside each reactor may use both spiral and circulation aerators. A tangentially mounted spiral aerator provides vertical and horizontal mixing and a centrally mounted circulation aerator prevents settling in the center of the tank. The net effect is that the final flow pattern represents a spiral. Specialized foam controllers break up and densify the foam layer created by the mixing of the substrate. The foam controllers allow for improved oxygen utilization and better insulative characteristics of the densified foam. (Schwhinning et al., 1993). An example ATAD flow scheme is shown in Figure 12.

The ATAD process can achieve Class A pathogen reduction. Other

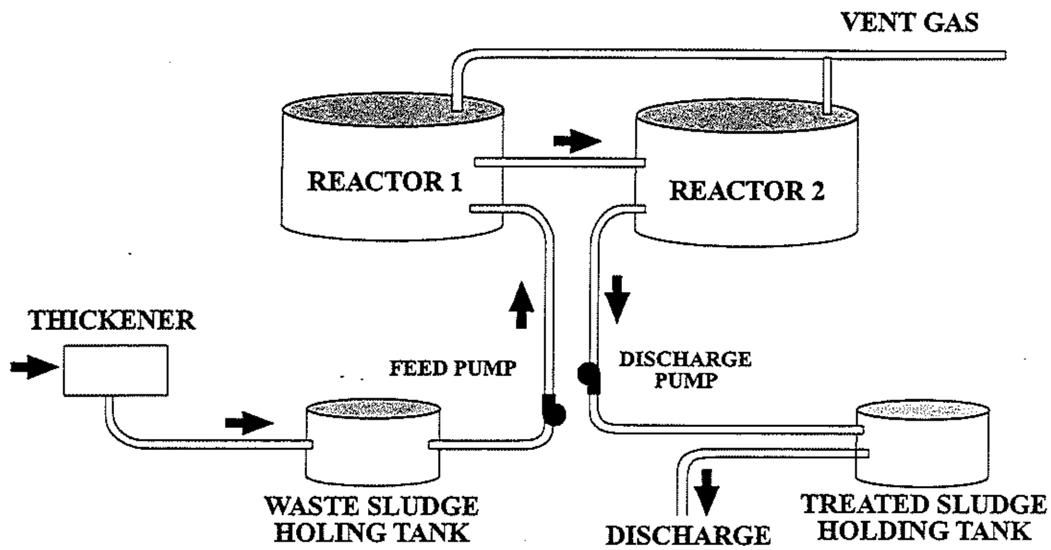


Figure 12. Schematic of ATAD sludge process (adapted from Kruger)

reported benefits of the ATAD process include low tank, space, monitoring and staffing requirements (EPA, 1990).

5.4.3. Thermophilic Aerobic Digestion Costs

No currently operating ATAD facilities were found in the United States. Several municipalities contacted, Grand Chute-Menasha, WI, and Franklin TN, are currently constructing facilities which will be operating before the end of 1994. The USEPA (1990) and Vik and Kirk (1993) summarize estimates of the process costs based on European experiences.

6. SUMMARY

The quantities of sludge generated and the variations in potential processing technologies for pathogen reduction pose a challenge to those engaged in municipal wastewater sludge management. In Kentucky alone, 50,000 tons of dry sludge solids are generated annually during the treatment of municipal wastewater. Currently, the great majority of these solids are landfilled, but the results of a statewide survey indicate continued interest in other management options.

A review of the literature and discussions with wastewater treatment personnel has suggested that some key factors which should be considered when evaluating sludge management options include:

- Land Requirements
- Equipment Requirements
- Availability of Required Additives
- Desired Product End Use

The extent to which these factors influence the implementation of a particular processing technology can vary, but in all cases, they will influence the cost and application.

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APPENDIX

KENTUCKY MUNICIPAL WASTEWATER TREATMENT PLANT SLUDGE SURVEY

CONTENTS

INTRODUCTION

A survey of sludge removal and management at municipal wastewater treatment plants in Kentucky was conducted by the Department of Civil Engineering at the University of Kentucky. The survey was made using both a mailed form and follow-up phone communication through a period from June, 1993 to April, 1994. The results of that survey were compiled using a spreadsheet program and are available on diskette. The results of the survey are also presented in the six Tables which follow.

DATA REDUCTION METHODS

The data which was collected during the course of this survey often had to be converted into consistent units. Below is a brief summary of the conversions which were employed.

Sludge Solids Content

If the percentage of solids in the sludge was not provided but the dewatering method was known, then a typical number was assumed from the following:

Dewatering method	% Solids
Sand drying beds	35
Screw press	20
Vacuum beds	13
Belt press	18
Vacuum filter	20

Conversion to Dry Tons of Sludge Solids

The following describe the calculations used to compute dry tons sludge per year for each plant:

(a) If the sludge was reported in **dewatered tons/month**:

(dewatered tons/month)*(% solids/100)*(12 months/year) = dry tons/year

(b) If the sludge was reported in **dewatered yd^3/month**:

(dewatered yd^3/month)*(% solids/100)*(27 ft^3/yd^3)*(7.48 gallons/ft^3)*(8.34 lbs/gallon)*(1 ton/2000 lbs)*(12 months/year) = dry tons/year

(***Note**: assuming that the density of sludge is approximately equal to water, then 1 gallon of sludge = 1 gallon of water = 8.34 pounds)

(c) If the sludge was reported in **dewatered gallons/month**:

(dewatered gallons/month)*(% solids/100)*(8.34 lbs/gallon)*(1 ton/2000 lbs)*(12 months/year) = dry tons/year

(d) If the sludge was reported in **liquid tons/month**:

(liquid tons/month)*(% solids/100)*(12 months/year) = dry tons/year

(e) If the sludge was reported in **liquid gallons/month:**

(liquid gallons/month)*(% solids/100)*(8.34 lbs/gallon)*(1 ton/2000 lbs)*(12 months/year) = dry tons/year

Table A-1. Annual Sludge Generation Ranked by Solids Quantity

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities: tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0022411	Morris Forman WWTP	2280 DRY			43	27360.0	101.8	0.736
0021466	Campbell Kenton SD#1 Dry Creek	930			45.3	5055.5	31.1	0.445
0021504	West Hickman Creek WWTP	1100			22	2904.0	16.6	0.479
0020711	Henderson WWTP		955		25	2412.8	5	1.322
0021491	Town Branch WWTP	1000			18	2160.0	21	0.282
0020095	Owensboro West WWTP	650			22	1716.0	9.5	0.495
0022373	Ashland Environmental Control			736200	3.7	1363.1	4	0.934
0054437	Campbellsville STP		800		16	1293.6	3.2	1.108
0020044	Mt. Sterling WWTP	273.3			35	1147.9	1.125	2.795
0062995	Jamestown STP		800		12	970.2	2.2	1.208
0073377	Owensboro East WWTP	575			14	966.0	2.5	1.059
0021067	Lawrenceburg WWTP			54167	35	948.7	1.9	1.368
0022853	Richmond Tates Creek WWTP			35000	45	788.1	2.1	1.028
0022861	Frankfort WWTP	64.4 DRY			16	772.8	5.64	0.375
0022799	Paducah STP	403			13.5	652.9	4.96	0.361
0022390	Radcliff WWTP		173		35	611.9	2.075	0.808
0022942	Madisonville WWTP	258			18	557.3	4.5	0.339
0022039	Valley Creek(Elizabethtown)WWTP		325		16.1	528.8	5	0.290
0020427	Shelbyville STP		104		45	473.0	1.1	1.178
0026611	Somerset STP			375000	2.5	469.1	1.7	0.756
0022403	Bowling Green WWTP	175			22	462.0	5.5	0.230
0066532	Hammond Wood STP Hopkinsville			50000	18	450.4	2.5	0.494
0020133	Corbin WWTP	52			66.4	414.3	2.06	0.551
0021164	Glasgow STP #2			380000	2	380.3	1.723	0.605
0020877	Russellville STP	86			35	361.2	1.02	0.970
0090654	Paris STP	160			18	345.6	1	0.947
0072885	Middlesboro WWTP			250000	2.5	312.8	1.8	0.476
0072761	Murray Municipal Util.			264000	2.28	301.2	4.12	0.200
0027421	Harrodsburg STP	125			20	300.0	0.7	1.174
0020150	Georgetown WWTP No. 1			210000	2.5	262.7	2.36	0.305
0021270	London WWTP			189000	2.7	255.4	1.79	0.391
0079898	Berea STP	140			15	252.0	2	0.345
0020036	Nicholasville WWTP	86			22.5	232.2	1.6	0.398
0091561	Caveland Sanitation Auth.	64			30	230.4	0.265	2.382
0020001	LaGrange STP	60			30	216.0	0.42	1.409
0048348	Greenup Co. Environmental Comm.	50			35	210.0	1.1	0.523
0022845	Richmond Dreaming Creek WWTP			165000	2.5	206.4	2.1	0.269
0057193	Danville STP			160000	2.5	200.2	3.2	0.171
0020621	Versailles WWTP			90000	4	180.1	1.8	0.274
0023388	Hopkinsville STP	62			21	156.2	1.86	0.230

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities: tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0021008	Williamstown WWTP			146000	2	146.1	0.488	0.820
0020079	Hazard STP			72000	4	144.1	1.1	0.359
0033847	Monticello WWTP		36		35	127.3	0.367	0.951
0052752	Morehead WWTP		65		18	118.2	2.2	0.147
0020931	Grayson WWTP	52			18	112.3	0.282	1.091
0028401	Princeton WWTP			109833	2	109.9	0.737	0.409
0021024	Morgantown STP	26			35	109.2	0.343	0.872
0041190	Boyd & Greenup Co. SD #1	30			30	108.0	0.65	0.455
0021211	Mayfield POTW		30.5		35	107.9	2.383	0.124
0024317	Columbia STP		30		35	106.1	0.35	0.831
0020974	Lancaster STP		30		35	106.1	0.3	0.969
0023183	Whitesburg STP	25			35	105.0	0.22	1.308
0022934	Leitchfield WWTP	7.5 DRY			2.5	90.0	0.72	0.342
0033804	Mt. Washington STP			4833	35	84.6	0.54	0.429
0020907	Springfield STP	20			35	84.0	0.307	0.750
0020923	Carlisle WWTP			80000	2	80.1	0.2	1.097
0024619	Stanford STP	19			35	79.8	0.6979	0.313
0020257	Maysville STP		12		63	76.4	1.1	0.190
0021474	Brandenburg WWTP		25		30	75.8	0.1	2.077
0021288	Jackson STP	24			25	72.0	0.3	0.658
0037991	Winchester STP	15			40	72.0	3.82	0.052
0023442	Elkton STP		20		35	70.7	0.2	0.969
0026549	Lebanon STP	32			18	69.1	0.75	0.252
0082007	Georgetown WWTP No. 2			50000	2.5	62.6	0.772	0.222
0021229	Flemingsburg WWTP			36333	3.4	61.8	0.287	0.590
0027961	Louisa STP	12.5			40	60.0	0.35	0.470
0023370	Cynthiana STP		20		28	56.6	0.56	0.277
0025291	Pikeville WWTP	23			20	55.2	0.5	0.302
0029122	Manchester Water and Sewer	25			18	54.0	0.581	0.255
0033774	Booneville STP	SEE COMMENTS ON SLUDGE			30	53.1	0.076	1.914
0028428	Wilmore WWTP			85000	1.2	51.0	0.44	0.318
0023868	Dawson Springs STP	12			35	50.4	0.2	0.690
0024988	Vine Grove WWTP			31900	3	47.9	0.45	0.292
0039756	Walton STP			59250	1.59	47.1	0.176	0.734
0027456	Franklin STP			35000	2.5	43.8	1.9	0.063
0033553	Wurtland WWTP	20			18	43.2	0.85	0.139
0020010	Greenville STP			42000	2	42.0	0.568	0.203
0026701	Cloverport STP	10			35	42.0	0.15	0.767
0025810	McCracken Co. SD#3 Reidland	10			35	42.0	0.651	0.177
0021440	Morganfield STP	10			35	42.0	1.6	0.072

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities tons	Monthly Sludge Quantities cubic yards	Monthly Sludge Quantities gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0027359	Shepherdsville STP			40000	2	40.0	0.35	0.313
0021482	Falmouth WWTP	9			35	37.8	0.25	0.414
0021148	Sebree STP			18333.33	4	36.7	0.16	0.628
0028363	Hardinsburg WWTP			36000	2	36.0	0.2	0.494
0024058	Pineville STP			24000	3	36.0	0.32	0.308
0069736	Montgomery S.D. #2	12			25	36.0	0.12	0.822
0021202	Auburn STP	67000 gallons(3%) to landfarm, 21 yd^3(2.5%) landfill				35.0	0.24	0.400
0023540	Central City STP	8.33			35	35.0	0.45	0.213
0025909	Irvine STP			16000	4	32.0	0.431	0.204
0020702	Tompkinsville WWTP			25000	2.5	31.3	0.335	0.256
0034428	Stanton STP			24700	2.5	30.9	0.3	0.282
0029106	Prospect STP North&South H. Cr			10000	6	30.0	0.35	0.235
0025925	Olive Hill STP		8		35	28.3	0.175	0.443
0028410	Midway STP	6			35	25.2	0.2	0.345
0028703	Parklake STP			5000	10	25.0	0.028	2.448
0024783	Scottsville WWTP			20000	2.5	25.0	0.787	0.087
0024295	Albany STP			18750	2.6	24.4	0.28	0.239
0047431	Brodhead STP	5			35	21.0	0.15	0.384
0020613	Livermore WWTP	5			35	21.0	0.15	0.384
0039021	Bancroft STP			10000	4	20.0	0.13	0.422
0021016	Hardin STP			18000	2	18.0	0.07	0.705
0021121	Beattyville STP		5		35	17.7	0.18	0.269
0020061	Marion, City of		5		35	17.7	0.51	0.095
0020265	Carrollton Util. STP	8			18	17.3	0.35	0.135
0020630	Paintsville STP	8			18	17.3	0.673	0.070
0063649	Guthrie WWTP	4			35	16.8	0.125	0.368
0065889	Simpsonville STP	4			35	16.8	0.0869	0.530
0066541	Salem STP		3.75		40	15.2	0.055	0.755
0026093	Harlan STP			11000	2.5	13.8	0.12	0.314
0028321	Campbellsburg STP		3.33		40	13.5	0.06	0.615
0026891	Cadiz STP	3			35	12.6	0.4	0.086
0089567	West Liberty STP	2.5			40	12.0	0.575	0.057
0038571	Jenkins STP	2.67			35	11.2	0.6	0.051
0050512	Stamping Ground STP		15		7	10.6	0.06	0.485
0020125	Calhoun WWTP		2.7		35	9.6	0.207	0.126
0026883	Eminence STP			6250	2.8	8.8	0.3	0.080
0024694	Mt. Vernon STP	2			35	8.4	0.22	0.105
0027413	Prestonsburg WWTP	2			35	8.4	0.5	0.046
0094056	Oak Grove STP			5556	3	8.3	0.25	0.091
0020419	Kuttawa STP	0.625			N/A	7.5	0.1	0.205

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities: tons	Monthly Sludge Quantities: cubic yards	Monthly Sludge Quantities: gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0090719	Bradfordsville STP			4167	3	6.3	0.04	0.428
0020982	Trenton STP			6000	2	6.0	0.023	0.715
0023841	Greensburg WWTP	0.5 DRY			35	6.0	0.25	0.066
0026867	Salyersville STP	0.5 DRY			20	6.0	0.23	0.071
0072044	Caneyville STP	1.5			30	5.4	0.07	0.211
0040143	Taylorsville STP			5000	2	5.0	0.19	0.072
0020885	Adairville WWTP	1			35	4.2	0.13	0.089
0034436	Bloomfield STP	1			35	4.2	0.06	0.192
0024546	Marshall Co. SD #1	1			35	4.2	0.04	0.288
0040584	Frenchburg STP	0.833			40	4.0	0.07	0.156
0027227	Lake City STP	0.833			40	4.0	0.03	0.365
0040703	Livingston STP	0.833			40	4.0	N/A	
0024279	Lynch STP	0.833			40	4.0	0.035	0.313
0020940	Millersburg WWTP			5000	1.5	3.8	0.065	0.158
0066575	Drakesboro STP	1			30	3.6	0.06	0.164
0021245	Hyden STP	0.833			35	3.5	0.03	0.320
0026379	Hodgenville POTW	12.7			1.7	2.6	0.367	0.019
0025241	Lewisport STP	0.5			30	1.8	0.159	0.031
0091634	Crittenden STP			1000	3.5	1.8	0.055	0.087
0042854	Caney Creek W.D. Pippa Pass	0.416			35	1.7	N/A	
0027405	Fleming Neon STP	0.25			40	1.2	0.11	0.030
0092436	Irvington STP	0.25			40	1.2	0.05	0.066
0025755	Benham WWTP	0.25			35	1.1	0.0175	0.164
0026115	Loyall STP	1 DRY			N/A	1.0	0.045	0.061
0031755	Munfordville STP	0.2			35	0.8	0.065	0.035
0055271	Symsonia STP	0.167			35	0.7	0.05	0.038
0027685	Hindman STP	0.021			40	0.1	0.05	0.006
0088625	Milton STP	0.015			35	0.1	0.08	0.002
0029548	Arlington STP	0.00416			35	0.0	0.035	0.001
0021237	Bardstown WWTP	None	None	None	N/A	0.0	1.6	0.000
0069825	Bedford STP	None	None	None	N/A	0.0	0.15	0.000
0021172	Benton STP	None	None	None	N/A	0.0	0.55	0.000
0036501	Berrytown STP MSD	See Morris Forman MSD for sludge information				0.0		
0025232	Brooksville STP	N/A	N/A	N/A	N/A	0.0	0.053	0.000
0021130	Calvert City STP	None	None	None	N/A	0.0	0.225	0.000
0035467	Catlettsburg WWTP	None	None	None	N/A	0.0	0.25	0.000
0028096	Clay Lagoon	N/A	N/A	N/A	N/A	0.0	0.045	0.000
0025275	Clinton STP	None	None	None	N/A	0.0	Varies	
0065897	Crab Orchard WWTP	N/A	N/A	N/A	N/A	0.0	0.089	0.000
0066591	Crofton STP	None	None	None	N/A	0.0	0.12	0.000

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities: tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0027979	Eddyville STP	None	None	None	N/A	0.0	0.13	0.000
0028100	Edmonton STP	Very small			N/A	0.0	0.2	0.000
0020958	Elkhorn City STP	Sludge held in digester - no sludge disposal			N/A	0.0	0.059	0.000
0053562	Fancy Farm Water Dist. STP	None	None	None	N/A	0.0	0.03	0.000
0054801	Fordsville STP	None	None	None	N/A	0.0	0.05	0.000
0026913	Fulton STP	None	None	None	N/A	0.0	0.37	0.000
0025798	Hartford STP	None	None	None	N/A	0.0	0.1	0.000
0020087	Hawesville STP	None	None	None	N/A	0.0	0.1	0.000
0028371	Hazel STP	None	None	None	N/A	0.0	0.05	0.000
0020893	Lacenter STP	None	None	None	N/A	0.0	N/A	
0025828	McCracken Co. SD #4 Woodlawn	N/A	N/A	N/A	N/A	0.0	0.446	0.000
0031828	New Castle WWTP	N/A			N/A	0.0	0.15	0.000
0034126	New Haven STP	None	None	None	N/A	0.0	0.065	0.000
0028312	Owenton STP	None	None	None	N/A	0.0	0.19	0.000
0024287	Owingsville STP	None	None	None	N/A	0.0	0.2	0.000
0024813	Pembroke STP	No sludge produced			N/A	0.0	0.065	0.000
0028355	Perryville STP	None	None	None	N/A	0.0	0.06	0.000
0094447	Science Hill STP	None	None	None	35	0.0	0.022	0.000
0025836	Smithland STP	None	None	None	N/A	0.0	0.07	0.000
0025895	Sturgis WWTP	N/A	N/A	N/A	N/A	0.0	0.2	0.000
0025844	Uniontown STP	None	None	None	N/A	0.0	0.016	0.000
0028118	Warsaw STP	None	None	None	N/A	0.0	0.08	0.000
0054941	Whitesville STP	None	None	None	N/A	0.0	0.075	0.000
0025933	Wickliffe STP	None	None	None	N/A	0.0	0.185	0.000
0025852	Wingo STP	None	None	None	N/A	0.0	0.1	0.000
0021261	Augusta STP	No sludge numbers provided to DOW call			40		0.175	0.000
0024082	Barbourville STP	None	None	None	N/A		0.5	0.000
0020915	Bardwell STP	No sludge info. - new drying beds			30		0.06	0.000
0025747	Barlow STP	Sludge taken to Lacenter STP		1800	N/A		0.05	0.000
0023191	Beaver Dam STP	Sludge # provided goes into lagoon			N/A		0.4	0.000
0023396	Brownsville STP*	N/A	N/A	N/A	N/A		0.129	0.000
0036854	Burkesville STP	No sludge information available			35		0.2	0.000
0021041	Butler STP	No sludge numbers provided to DOW call			40		0.25	0.000
0026069	Campton STP	Remodeled system - no sludge information			30		0.085	0.000
0071854	Centertown WWTP	Sludge sent to Greenville WWTP		2500	N/A		0.028	0.000
0090590	Clarkson STP	None	None	None	N/A		0.02	0.000
0025119	Clay City STP	New plant - no sludge data			N/A		0.1	0.000
0021571	Cumberland STP	No sludge information available at this time			N/A		0.5	0.000
0095940	Estill Co. Water Dist. STP	NO INFORMATION AVAILABLE AT THIS TIME - BEGAN OPERATIONS IN JANUARY OF THIS YEAR						
0073091	Evarts STP	No sludge data available to DOW call			40		0.12	0.000

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities: tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0095257	Gamaliel WWTP							
0096890	Ghent STP							
0044261	Glenview Bluff STP MSD	See Morris Forman MSD for sludge information						
0096881	Green Co. S.D. #1							
0026450	Greenup STP	New operation - no sludge data			N/A		0.15	0.000
0028436	Hickman East Lagoon	Has new Bilac system, NO INFORMATION AVAILABLE AT THIS TIME						
0039764	Hickman West Lagoon	Will be rerouted to East Lagoon, used as a holding tank, NO INFORMATION AVAILABLE						
0022420	Hite Creek STP MSD	See Morris Forman MSD for sludge information						
0079316	Inez STP*	N/A	N/A	N/A	N/A		0.26	0.000
0066605	Island WWTP	No sludge information available			N/A		0.025	0.000
0025194	Jeffersontown STP MSD	See Morris Forman MSD for sludge information						
0033791	Kevil STP	No actual numbers provided for any questions						
0040851	Lebanon Junction STP	% solids/dewatering data not pr		2000	N/A		0.11	0.000
0024881	Lewisburg STP	N/A	N/A	N/A	35		0.18	0.000
0026921	Martin STP*	N/A	N/A	N/A	N/A		0.15	0.000
0034444	McKee STP	New Expansion - No reliable sludge data			30		0.14	
0036510	Muddy Fork STP MSD	See Morris Forman MSD for sludge information						
0031836	North Middletown STP	Picked up survey, should be returning it						
0066583	Nortonville STP	N/A	N/A	N/A	N/A		0.135	0.000
0021296	Providence STP	New plant - No sludge information					0.35	0.000
0091731	Sacramento STP	No sludge numbers - lagoon system						
0081868	Sadieville STP*	N/A	N/A	N/A	N/A		0.0334	0.000
0052264	Sandy Hook STP	No sludge data available			35		0.06	0.000
0088421	Sharpsburg STP	No sludge data available to DOW call			N/A		0.04	0.000
0026131	South Shore STP	New plant - no sludge data			N/A		0.183	0.000
0077801	Southern Campbell Co. Ind Pk	No response to survey or DOW calls						
0021512	Vanceburg WWTP	SEE COMMENTS			35		0.241	0.000
0060259	Vicco STP	No sludge data provided to DOW call			40		0.15	0.000
0078956	West County STP MSD	See Morris Forman MSD for sludge information						
0022152	West Point STP	None			35		0.08	0.000
0079332	Wheelwright Lower Burton STP	No response to survey or DOW calls						
0028789	Wheelwright STP	Reported unknown sludge data to DOW call			35		0.225	0.000
0028347	Williamsburg STP	Could not provide any sludge data			N/A		1.0221	0.000
0022926	Worthington WWTP	See comments!!		10000	N/A		0.13	0.000
					TOTAL	62946.82		

Table A-2. Annual Sludge Generation Ranked Alphabetically

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0020885	Adairville WWTP	1			35	4.2	0.13	0.089
0024295	Albany STP			18750	2.6	24.4	0.28	0.239
0029548	Arlington STP	0.00416			35	0.0	0.035	0.001
0022373	Ashland Environmental Control			736200	3.7	1363.1	4	0.934
0021202	Auburn STP	67000 gallons(3%) to landfarm, 21 yd^3(2.5%) landfill				35.0	0.24	0.400
0021261	Augusta STP	No sludge numbers provided to DOW call			40		0.175	0.000
0039021	Bancroft STP			10000	4	20.0	0.13	0.422
0024082	Barbourville STP	None	None	None	N/A		0.5	0.000
0021237	Bardstown WWTP	None	None	None	N/A	0.0	1.6	0.000
0020915	Bardwell STP	No sludge info. - new drying beds			30		0.06	0.000
0025747	Barlow STP	Sludge taken to Lacenter STP		1800	N/A		0.05	0.000
0021121	Beattyville STP		5		35	17.7	0.18	0.269
0023191	Beaver Dam STP	Sludge # provided goes into lagoon			N/A		0.4	0.000
0069825	Bedford STP	None	None	None	N/A	0.0	0.15	0.000
0025755	Benham WWTP	0.25			35	1.1	0.0175	0.164
0021172	Benton STP	None	None	None	N/A	0.0	0.55	0.000
0079898	Berea STP	140			15	252.0	2	0.345
0036501	Berrytown STP MSD	See Morris Forman MSD for sludge information				0.0		
0034436	Bloomfield STP	1			35	4.2	0.06	0.192
0033774	Booneville STP	SEE COMMENTS ON SLUDGE			30	53.1	0.076	1.914
0022403	Bowling Green WWTP	175			22	462.0	5.5	0.230
0041190	Boyd & Greenup Co. SD #1	30			30	108.0	0.65	0.455
0090719	Bradfordsville STP			4167	3	6.3	0.04	0.428
0021474	Brandenburg WWTP		25		30	75.8	0.1	2.077
0047431	Brodhead STP	5			35	21.0	0.15	0.384
0025232	Brooksville STP	N/A	N/A	N/A	N/A	0.0	0.053	0.000
0023396	Brownsville STP*	N/A	N/A	N/A	N/A		0.129	0.000
0036854	Burkesville STP	No sludge information available			35		0.2	0.000
0021041	Butler STP	No sludge numbers provided to DOW call			40		0.25	0.000
0026891	Cadiz STP	3			35	12.6	0.4	0.086
0020125	Calhoun WWTP		2.7		35	9.6	0.207	0.126
0021130	Calvert City STP	None	None	None	N/A	0.0	0.225	0.000
0021466	Campbell Kenton SD#1 Dry Creek	930			45.3	5055.5	31.1	0.445
0028321	Campbellsburg STP		3.33		40	13.5	0.06	0.615
0054437	Campbellsville STP		800		16	1293.6	3.2	1.108
0026069	Campton STP	Remodeled system - no sludge information			30		0.085	0.000
0042854	Caney Creek W.D. Pippa Pass	0.416			35	1.7	N/A	
0072044	Caneyville STP	1.5			30	5.4	0.07	0.211
0020923	Carlisle WWTP			80000	2	80.1	0.2	1.097
0020265	Carrollton Util. STP	8			18	17.3	0.35	0.135

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities tons	Monthly Sludge Quantities cubic yards	Monthly Sludge Quantities gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0035467	Catlettsburg WWTP	None	None	None	N/A	0.0	0.25	0.000
0091561	Caveland Sanitation Auth.	64			30	230.4	0.265	2.382
0071854	Centertown WWTP	Sludge sent to Greenville WWTP		2500	N/A		0.028	0.000
0023540	Central City STP	8.33			35	35.0	0.45	0.213
0090590	Clarkson STP	None	None	None	N/A		0.02	0.000
0025119	Clay City STP	New plant - no sludge data			N/A		0.1	0.000
0028096	Clay Lagoon	N/A	N/A	N/A	N/A	0.0	0.045	0.000
0025275	Clinton STP	None	None	None	N/A	0.0	Varies	
0026701	Cloverport STP	10			35	42.0	0.15	0.767
0024317	Columbia STP		30		35	106.1	0.35	0.831
0020133	Corbin WWTP	52			66.4	414.3	2.06	0.551
0065897	Crab Orchard WWTP	N/A	N/A	N/A	N/A	0.0	0.089	0.000
0091634	Crittenden STP			1000	3.5	1.8	0.055	0.087
0066591	Crofton STP	None	None	None	N/A	0.0	0.12	0.000
0021571	Cumberland STP	No sludge information available at this time			N/A		0.5	0.000
0023370	Cynthiana STP		20		28	56.6	0.56	0.277
0057193	Danville STP			160000	2.5	200.2	3.2	0.171
0023868	Dawson Springs STP	12			35	50.4	0.2	0.690
0066575	Drakesboro STP	1			30	3.6	0.06	0.164
0027979	Eddyville STP	None	None	None	N/A	0.0	0.13	0.000
0028100	Edmonton STP	Very small			N/A	0.0	0.2	0.000
0020958	Elkhorn City STP	Sludge held in digester - no sludge disposal			N/A	0.0	0.059	0.000
0023442	Elkton STP		20		35	70.7	0.2	0.969
0026883	Eminence STP			6250	2.8	8.8	0.3	0.080
0095940	Estill Co. Water Dist. STP	NO INFORMATION AVAILABLE AT THIS TIME - BEGAN OPERATIONS IN JANUARY OF THIS YEAR						
0073091	Evarts STP	No sludge data available to DOW call			40		0.12	0.000
0021482	Falmouth WWTP	9			35	37.8	0.25	0.414
0053562	Fancy Farm Water Dist. STP	None	None	None	N/A	0.0	0.03	0.000
0027405	Fleming Neon STP	0.25			40	1.2	0.11	0.030
0021229	Flemingsburg WWTP			36333	3.4	61.8	0.287	0.590
0054801	Fordsville STP	None	None	None	N/A	0.0	0.05	0.000
0022861	Frankfort WWTP	64.4 DRY			16	772.8	5.64	0.375
0027456	Franklin STP			35000	2.5	43.8	1.9	0.063
0040584	Frenchburg STP	0.833			40	4.0	0.07	0.156
0026913	Fulton STP	None	None	None	N/A	0.0	0.37	0.000
0095257	Gamaliel WWTP							
0020150	Georgetown WWTP No. 1			210000	2.5	262.7	2.36	0.305
0082007	Georgetown WWTP No. 2			50000	2.5	62.6	0.772	0.222
0096890	Ghent STP							
0021164	Glasgow STP #2			380000	2	380.3	1.723	0.605

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0044261	Glenview Bluff STP MSD	See Morris Forman MSD for sludge information						
0020931	Grayson WWTP	52			18	112.3	0.282	1.091
0096881	Green Co. S.D. #1							
0023841	Greensburg WWTP	0.5 DRY			35	6.0	0.25	0.066
0048348	Greenup Co. Environmental Comm.	50			35	210.0	1.1	0.523
0026450	Greenup STP	New operation - no sludge data			N/A		0.15	0.000
0020010	Greenville STP			42000	2	42.0	0.568	0.203
0063649	Guthrie WWTP	4			35	16.8	0.125	0.368
0066532	Hammond Wood STP Hopkinsville			50000	18	450.4	2.5	0.494
0021016	Hardin STP			18000	2	18.0	0.07	0.705
0028363	Hardinsburg WWTP			36000	2	36.0	0.2	0.494
0026093	Harlan STP			11000	2.5	13.8	0.12	0.314
0027421	Harrodsburg STP	125			20	300.0	0.7	1.174
0025798	Hartford STP	None	None	None	N/A	0.0	0.1	0.000
0020087	Hawesville STP	None	None	None	N/A	0.0	0.1	0.000
0020079	Hazard STP			72000	4	144.1	1.1	0.359
0028371	Hazel STP	None	None	None	N/A	0.0	0.05	0.000
0020711	Henderson WWTP		955		25	2412.8	5	1.322
0028436	Hickman East Lagoon	Has new Bilac system, NO INFORMATION AVAILABLE AT THIS TIME						
0039764	Hickman West Lagoon	Will be rerouted to East Lagoon, used as a holding tank, NO INFORMATION AVAILABLE						
0027685	Hindman STP	0.021			40	0.1	0.05	0.006
0022420	Hite Creek STP MSD	See Morris Forman MSD for sludge information						
0026379	Hodgenville POTW	12.7			1.7	2.6	0.367	0.019
0023388	Hopkinsville STP	62			21	156.2	1.86	0.230
0021245	Hyden STP	0.833			35	3.5	0.03	0.320
0079316	Inez STP*	N/A	N/A	N/A	N/A		0.26	0.000
0025909	Irvine STP			16000	4	32.0	0.431	0.204
0092436	Irvington STP	0.25			40	1.2	0.05	0.066
0066605	Island WWTP	No sludge information available			N/A		0.025	0.000
0021288	Jackson STP	24			25	72.0	0.3	0.658
0062995	Jamestown STP		800		12	970.2	2.2	1.208
0025194	Jeffersontown STP MSD	See Morris Forman MSD for sludge information						
0038571	Jenkins STP	2.67			35	11.2	0.6	0.051
0033791	Kevil STP	No actual numbers provided for any questions						
0020419	Kuttawa STP	0.625			N/A	7.5	0.1	0.205
0020893	Lacenter STP	None	None	None	N/A	0.0	N/A	
0020001	LaGrange STP	60			30	216.0	0.42	1.409
0027227	Lake City STP	0.833			40	4.0	0.03	0.365
0020974	Lancaster STP		30		35	106.1	0.3	0.969
0021067	Lawrenceburg WWTP			54167	35	948.7	1.9	1.368

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0040851	Lebanon Junction STP	% solids/dewatering data not pr		2000	N/A		0.11	0.000
0026549	Lebanon STP	32			18	69.1	0.75	0.252
0022934	Leitchfield WWTP	7.5 DRY			2.5	90.0	0.72	0.342
0024881	Lewisburg STP	N/A	N/A	N/A	35		0.18	0.000
0025241	Lewisport STP	0.5			30	1.8	0.159	0.031
0020613	Livermore WWTP	5			35	21.0	0.15	0.384
0040703	Livingston STP	0.833			40	4.0	N/A	
0021270	London WWTP			189000	2.7	255.4	1.79	0.391
0027961	Louisa STP	12.5			40	60.0	0.35	0.470
0026115	Loyall STP	1 DRY			N/A	1.0	0.045	0.061
0024279	Lynch STP	0.833			40	4.0	0.035	0.313
0022942	Madisonville WWTP	258			18	557.3	4.5	0.339
0029122	Manchester Water and Sewer	25			18	54.0	0.581	0.255
0020061	Marion, City of		5		35	17.7	0.51	0.095
0024546	Marshall Co. SD #1	1			35	4.2	0.04	0.288
0026921	Martin STP*	N/A	N/A	N/A	N/A		0.15	0.000
0021211	Mayfield POTW		30.5		35	107.9	2.383	0.124
0020257	Maysville STP		12		63	76.4	1.1	0.190
0025828	McCracken Co. SD #4 Woodlawn	N/A	N/A	N/A	N/A	0.0	0.446	0.000
0025810	McCracken Co. SD#3 Reidland	10			35	42.0	0.651	0.177
0034444	McKee STP	New Expansion - No reliable sludge data			30		0.14	
0072885	Middlesboro WWTP			250000	2.5	312.8	1.8	0.476
0028410	Midway STP	6			35	25.2	0.2	0.345
0020940	Millersburg WWTP			5000	1.5	3.8	0.065	0.158
0088625	Milton STP	0.015			35	0.1	0.08	0.002
0069736	Montgomery S.D. #2	12			25	36.0	0.12	0.822
0033847	Monticello WWTP		36		35	127.3	0.367	0.951
0052752	Morehead WWTP		65		18	118.2	2.2	0.147
0021440	Morganfield STP	10			35	42.0	1.6	0.072
0021024	Morgantown STP	26			35	109.2	0.343	0.872
0022411	Morris Forman WWTP	2280 DRY			43	27360.0	101.8	0.736
0020044	Mt. Sterling WWTP	273.3			35	1147.9	1.125	2.795
0024694	Mt. Vernon STP	2			35	8.4	0.22	0.105
0033804	Mt. Washington STP			4833	35	84.6	0.54	0.429
0036510	Muddy Fork STP MSD	See Morris Forman MSD for sludge information						
0031755	Munfordville STP	0.2			35	0.8	0.065	0.035
0072761	Murray Municipal Util.			264000	2.28	301.2	4.12	0.200
0031828	New Castle WWTP	N/A			N/A	0.0	0.15	0.000
0034126	New Haven STP	None	None	None	N/A	0.0	0.065	0.000
0020036	Nicholasville WWTP	86			22.5	232.2	1.6	0.398

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0031836	North Middletown STP	Picked up survey, should be returning it						
0066583	Nortonville STP	N/A	N/A	N/A	N/A		0.135	0.000
0094056	Oak Grove STP			5556	3	8.3	0.25	0.091
0025925	Olive Hill STP		8		35	28.3	0.175	0.443
0073377	Owensboro East WWTP	575			14	966.0	2.5	1.059
0020095	Owensboro West WWTP	650			22	1716.0	9.5	0.495
0028312	Owenton STP	None	None	None	N/A	0.0	0.19	0.000
0024287	Owingsville STP	None	None	None	N/A	0.0	0.2	0.000
0022799	Paducah STP	403			13.5	652.9	4.96	0.361
0020630	Paintsville STP	8			18	17.3	0.673	0.070
0090654	Paris STP	160			18	345.6	1	0.947
0028703	Parklake STP			5000	10	25.0	0.028	2.448
0024813	Pembroke STP	No sludge produced			N/A	0.0	0.065	0.000
0028355	Perryville STP	None	None	None	N/A	0.0	0.06	0.000
0025291	Pikeville WWTP	23			20	55.2	0.5	0.302
0024058	Pineville STP			24000	3	36.0	0.32	0.308
0027413	Prestonsburg WWTP	2			35	8.4	0.5	0.046
0028401	Princeton WWTP			109833	2	109.9	0.737	0.409
0029106	Prospect STP North&South H. Cr			10000	6	30.0	0.35	0.235
0021296	Providence STP	New plant - No sludge information					0.35	0.000
0022390	Radcliff WWTP		173		35	611.9	2.075	0.808
0022845	Richmond Dreaming Creek WWTP			165000	2.5	206.4	2.1	0.269
0022853	Richmond Tates Creek WWTP			35000	45	788.1	2.1	1.028
0020877	Russellville STP	86			35	361.2	1.02	0.970
0091731	Sacramento STP	No sludge numbers - lagoon system						
0081868	Sadieville STP*	N/A	N/A	N/A	N/A		0.0334	0.000
0066541	Salem STP		3.75		40	15.2	0.055	0.755
0026867	Salyersville STP	0.5 DRY			20	6.0	0.23	0.071
0052264	Sandy Hook STP	No sludge data available			35		0.06	0.000
0094447	Science Hill STP	None	None	None	35	0.0	0.022	0.000
0024783	Scottsville WWTP			20000	2.5	25.0	0.787	0.087
0021148	Sebree STP			18333.33	4	36.7	0.16	0.628
0088421	Sharpsburg STP	No sludge data available to DOW call			N/A		0.04	0.000
0020427	Shelbyville STP		104		45	473.0	1.1	1.178
0027359	Shepherdsville STP			40000	2	40.0	0.35	0.313
0065889	Simpsonville STP	4			35	16.8	0.0869	0.530
0025836	Smithland STP	None	None	None	N/A	0.0	0.07	0.000
0026611	Somerset STP			375000	2.5	469.1	1.7	0.756
0026131	South Shore STP	New plant - no sludge data			N/A		0.183	0.000
0077801	Southern Campbell Co. Ind Pk	No response to survey or DOW calls						

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Monthly Sludge Quantities: tons	cubic yards	gallons	Solids Content (%)	Dry Tons sludge/ Year	AVG MGD	Dry Tons sludge/ MG
0020907	Springfield STP	20			35	84.0	0.307	0.750
0050512	Stamping Ground STP		15		7	10.6	0.06	0.485
0024619	Stanford STP	19			35	79.8	0.6979	0.313
0034428	Stanton STP			24700	2.5	30.9	0.3	0.282
0025895	Sturgis WWTP	N/A	N/A	N/A	N/A	0.0	0.2	0.000
0055271	Symsonia STP	0.167			35	0.7	0.05	0.038
0040143	Taylorsville STP			5000	2	5.0	0.19	0.072
0020702	Tompkinsville WWTP			25000	2.5	31.3	0.335	0.256
0021491	Town Branch WWTP	1000			18	2160.0	21	0.282
0020982	Trenton STP			6000	2	6.0	0.023	0.715
0025844	Uniontown STP	None	None	None	N/A	0.0	0.016	0.000
0022039	Valley Creek(Elizabethtown)WWTP		325		16.1	528.8	5	0.290
0021512	Vanceburg WWTP	SEE COMMENTS			35		0.241	0.000
0020621	Versailles WWTP			90000	4	180.1	1.8	0.274
0060259	Vicco STP	No sludge data provided to DOW call			40		0.15	0.000
0024988	Vine Grove WWTP			31900	3	47.9	0.45	0.292
0039756	Walton STP			59250	1.59	47.1	0.176	0.734
0028118	Warsaw STP	None	None	None	N/A	0.0	0.08	0.000
0078956	West County STP MSD	See Morris Forman MSD for sludge information						
0021504	West Hickman Creek WWTP	1100			22	2904.0	16.6	0.479
0089567	West Liberty STP	2.5			40	12.0	0.575	0.057
0022152	West Point STP	None			35		0.08	0.000
0079332	Wheelwright Lower Burton STP	No response to survey or DOW calls						
0028789	Wheelwright STP	Reported unknown sludge data to DOW call			35		0.225	0.000
0023183	Whitesburg STP	25			35	105.0	0.22	1.308
0054941	Whitesville STP	None	None	None	N/A	0.0	0.075	0.000
0025933	Wickliffe STP	None	None	None	N/A	0.0	0.185	0.000
0028347	Williamsburg STP	Could not provide any sludge data			N/A		1.0221	0.000
0021008	Williamstown WWTP			146000	2	146.1	0.488	0.820
0028428	Wilmore WWTP			85000	1.2	51.0	0.44	0.318
0037991	Winchester STP	15			40	72.0	3.82	0.052
0025852	Wingo STP	None	None	None	N/A	0.0	0.1	0.000
0022926	Worthington WWTP	See comments!!		10000	N/A		0.13	0.000
0033553	Wurtland WWTP	20			18	43.2	0.85	0.139
					TOTAL	62946.82		

Table A-3. Treatment Plant Operating Information

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	AVG MGD	Design MGD	Influent CBOD (mg/L)	Influent TSS (mg/L)	Industrial Flow (%)	Industrial CBOD (mg/L)	Secondary Treatment	Dewater Methods	Accept Sludge	Accept Septage
0020885	Adairville WWTP	0.13	0.26	125	125	60	50	Contact Stab.	DryBeds	No	No
0024295	Albany STP	0.28	0.75	180	212	0	0	Ox. ditch	DryBeds	No	Yes
0029548	Arlington STP	0.035	0.07	200	288	0	0	Contact Stab.	DryBeds	No	No
0022373	Ashland Environmental Control	4	11	300	245	20	N/A	Act. sludge	BeltPress	No	No
0021202	Auburn STP	0.24	0.35	524	230	65	654	Trick. filter	DryBeds	No	Yes
0021261	Augusta STP	0.175	0.33	N/A	N/A	0	0	Ext. Aeration	DryBeds	No	No
0039021	Bancroft STP	0.13	0.15	225	185	0	0	Sludgetank	N/A	No	No
0024082	Barbourville STP	0.5	1	112	120	0	0	Lagoons	None	No	Yes
0021237	Bardstown WWTP	1.6	3	335	152	40	Varies	Lagoons	N/A	N/A	N/A
0020915	Bardwell STP	0.06	0.13	190	130	0	0	Ext. Aeration	DryBeds	No	No
0025747	Barlow STP	0.05	0.125	N/A	N/A	N/A	N/A	Imhoff tank	N/A	No	No
0021121	Beattyville STP	0.18	0.135	N/A	N/A	0	0	Act. sludge	DryBeds	No	Yes
0023191	Beaver Dam STP	0.4	0.711	89	135	25	N/A	Biolac system	None	No	No
0069825	Bedford STP	0.15	0.13	N/A	N/A	N/A	N/A	Lagoon	N/A	N/A	N/A
0025755	Benham WWTP	0.0175	0.015	35	63	0	0	Trick. filter	DryBeds	No	No
0021172	Benton STP	0.55	1	160	124	0	0	Wetlands	None	No	No
0079898	Berea STP	2	2.1	70	155	10	N/A	Ox. ditch	BeltPress	No	No
0036501	Berrytown STP MSD										
0034436	Bloomfield STP	0.06	0.15	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	No	No
0033774	Booneville STP	0.076	0.075	160	134	0	0	Ext. Aeration	None	No	No
0022403	Bowling Green WWTP	5.5	10.6	230	350	35	340	N/A	BeltPress	Yes	Yes
0041190	Boyd & Greenup Co. SD #1	0.65	0.75	200	400	0	0	Ext. Aeration	DryBeds	No	No
0090719	Bradfordsville STP	0.04	0.04	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021474	Brandenburg WWTP	0.1	0.192	454	305	N/A	N/A	RBC	DryBeds	No	No
0047431	Brodhead STP	0.15	0.15	130	115	0	0	Ext. Aeration	DryBeds	No	No
0025232	Brooksville STP	0.053	0.125	130	210	0	0	Ext. Aeration	None	No	No
0023396	Brownsville STP*	0.129	0.129	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0036854	Burkesville STP	0.2	0.25	N/A	N/A	0	0	Ox. ditch	DryBeds	No	No
0021041	Butler STP	0.25	0.06	N/A	N/A	N/A	N/A	Act. sludge	DryBeds	No	No
0026891	Cadiz STP	0.4	0.596	150	190	0	0	Ext. Aeration	DryBeds	No	No
0020125	Calhoun WWTP	0.207	0.4	252	143	0	N/A	Ext. Aeration	DryBeds	No	No
0021130	Calvert City STP	0.225	0.39	N/A	N/A	N/A	N/A	Lagoon	N/A	No	No
0021466	Campbell Kenton SD#1 Dry Creek	31.1	46	118	178	20	N/A	Act. sludge	Therm/Vac	Yes	Yes
0028321	Campbellsburg STP	0.06	0.075	N/A	N/A	N/A	N/A	Act. sludge	DryBed	No	No
0054437	Campbellsville STP	3.2	4.2	N/A	N/A	N/A	N/A	Ext. Aeration	BeltPress	No	Yes
0026069	Campton STP	0.085	0.1	91	73	0	0	Ext. Aeration	DryBeds	No	No
0042854	Caney Creek W.D. Pippa Pass	N/A	0.1	8	88	0	0	Ext. Aeration	DryBeds	No	No
0072044	Caneyville STP	0.07	0.1	200	200	0	0	Ext. Aeration	DryBeds	No	No
0020923	Carlisle WWTP	0.2	0.35	350	400	0	0	Ox. ditch	Supernate	No	No
0020265	Carrollton Util. STP	0.35	0.7	202	164	0	0	RBC's	DryBeds	No	No

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	AVG MGD	Design MGD	Influent CBOD (mg/L)	Influent TSS (mg/L)	Industrial Flow (%)	Industrial CBOD (mg/L)	Secondary Treatment	Dewater Methods	Accept Sludge	Accept Septage
0035467	Catlettsburg WWTP	0.25	0.5	150	600	5	N/A	Contact Stab.	Supernate	No	No
0091561	Caveland Sanitation Auth.	0.265	0.88	335	219	23	435	Ext. Aeration	DryBeds	Yes	Yes
0071854	Centertown WWTP	0.028	0.045	N/A	250	0	N/A	RBC's	None	No	No
0023540	Central City STP	0.45	0.973	80	100	0	0	Ox. ditch	DryBeds	No	No
0090590	Clarkson STP	0.02	0.045	250	208	0	0	Lagoon	N/A	No	No
0025119	Clay City STP	0.1	0.2	N/A	N/A	N/A	N/A	N/A	None	No	Yes
0028096	Clay Lagoon	0.045	0.165	140	150	0	0	Lagoons	None	No	No
0025275	Clinton STP	Varies	0.36	177	200	0	0	Lagoons	None	No	No
0026701	Cloverport STP	0.15	0.2	210	110	N/A	N/A	N/A	DryBeds	No	No
0024317	Columbia STP	0.35	0.7	160	160	0	0	Ox. ditch	DryBeds	No	No
0020133	Corbin WWTP	2.06	4.5	137	174	25.5	181	Ext. Aeration	DryBeds	No	No
0065897	Crab Orchard WWTP	0.089	N/A	170	312	0	N/A	Lagoons	N/A	No	No
0091634	Crittenden STP	0.055	0.15	N/A	N/A	N/A	N/A	Ext. Aeration	None	No	No
0066591	Crofton STP	0.12	0.1	N/A	N/A	0	0	Ext. Aeration	None	No	No
0021571	Cumberland STP	0.5	0.5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023370	Cynthiana STP	0.56	1.5	118	169	N/A	N/A	RBC's	BeltPress	No	No
0057193	Danville STP	3.2	3.5	160	160	15	N/A	Ox. ditch	DryBeds	No	Yes
0023868	Dawson Springs STP	0.2	0.364	130	38	0	0	Ox. ditch	DryBeds	No	No
0066575	Drakesboro STP	0.06	0.165	N/A	N/A	0	0	Ox. ditch	DryBeds	No	No
0027979	Eddyville STP	0.13	0.075	200	125	0	0	Lagoons	None	No	No
0028100	Edmonton STP	0.2	0.51	160	180	0	0	Ext. Aeration	None	No	Yes
0020958	Elkhorn City STP	0.059	0.15	95	106	0	0	Ext. Aeration	None	No	Yes
0023442	Elkton STP	0.2	0.272	275	205	50	350	Ox. ditch	DryBeds	No	No
0026883	Eminence STP	0.3	0.22	50	200	5	0	Ext. Aeration	None	No	No
0095940	Estill Co. Water Dist. STP										
0073091	Evarts STP	0.12	0.12	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	No	No
0021482	Falmouth WWTP	0.25	0.39	N/A	N/A	N/A	N/A	Act. sludge	DryBeds	No	No
0053562	Fancy Farm Water Dist. STP	0.03	0.1	170	115	0	0	Lagoons	None	No	No
0027405	Fleming Neon STP	0.11	0.6378	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	No	No
0021229	Flemingsburg WWTP	0.287	0.656	244	262	10	N/A	RBC's	Decanting	Yes	Yes
0054801	Fordsville STP	0.05	0.11	250	300	40	200	Lagoons	None	No	No
0022861	Frankfort WWTP	5.64	6.6	151	178	5	N/A	Ox. ditch	BeltPress	Yes	Yes
0027456	Franklin STP	1.9	3.2	130	170	55-60	Varies	Ext. Aeration	None	No	Yes
0040584	Frenchburg STP	0.07	0.15	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	No	No
0026913	Fulton STP	0.37	0.94	480	110	20-25	2100	Lagoon	None	No	No
0095257	Gamaliel WWTP										
0020150	Georgetown WWTP No. 1	2.36	2.34	162	164	3	162	RBC's	BeltPress	No	Yes
0082007	Georgetown WWTP No. 2	0.772	2.2	90	60	100	90	Ox. ditch	BeltPress	No	No
0096890	Ghent STP										
0021164	Glasgow STP #2	1.723	4	262	180	N/A	123		N/A	No	Yes

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0044261	Glenview Bluff STP MSD										
0020931	Grayson WWTP	0.282	0.966	140	160	0	0	Ox. ditch	BeltPress	No	No
0096881	Green Co. S.D. #1										
0023841	Greensburg WWTP	0.25	0.3	201	173	N/A	N/A	Ext. Aeration	DryBeds	No	No
0048348	Greenup Co. Environmental Comm.	1.1	2.05	169	208	0	0	N/A	DryBeds	No	No
0026450	Greenup STP	0.15	0.2	150	200	0	0	Ext. Aeration	None	No	No
0020010	Greenville STP	0.568	0.73	215	117	0	0	Aerated lagoon	None	No	Yes
0063649	Guthrie WWTP	0.125	0.31	120	140	7	10	Ox. ditch	DryBeds	No	No
0066532	Hammond Wood STP Hopkinsville	2.5	2.96	145	175	60-70	varies	N/A	BeltPress	No	No
0021016	Hardin STP	0.07	0.07	100	90	0	0	Wetlands (2)	Digester	No	No
0028363	Hardinsburg WWTP	0.2	0.11	175	175	1	N/A	Ox. ditch	N/A	No	No
0026093	Harlan STP	0.12	0.5	64	120	0	0	Trick. filter	DryBeds	No	No
0027421	Harrodsburg STP	0.7	2.68	200	156	30	70	RBC's	SandFilt	No	Yes
0025798	Hartford STP	0.1	0.18	N/A	N/A	N/A	N/A	Lagoon	N/A	N/A	N/A
0020087	Hawesville STP	0.1	0.25	N/A	N/A	N/A	N/A	Ext. Aeration	None	No	No
0020079	Hazard STP	1.1	1.5	178	211	N/A	N/A	Trick. filter	DryBeds	No	No
0028371	Hazel STP	0.05	0.038	10	3	0	0	Ox. ditch	None	No	No
0020711	Henderson WWTP	5	7.5	180	267	35	230	Ext. Aeration	BeltPress	No	Yes
0028436	Hickman East Lagoon							Lagoon			
0039764	Hickman West Lagoon							Lagoon			
0027685	Hindman STP	0.05	0.125	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	No	No
0022420	Hite Creek STP MSD										
0026379	Hodgenville POTW	0.367	0.431	120	203	0.1	0	Ox. ditch	None	No	No
0023388	Hopkinsville STP	1.86	2.88	170	167	7	150	N/A	BeltPress	No	Yes
0021245	Hyden STP	0.03	0.08	N/A	N/A	N/A	N/A	Ext. Aeration	DryBed	No	No
0079316	Inez STP*	0.26	0.26	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025909	Irvine STP	0.431	0.6	200	202	0	N/A	Ext. Aeration	None	No	No
0092436	Irvington STP	0.05	0.154	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	No	No
0066605	Island WWTP	0.025	0.128	90	60	0	0	Ox. ditch	N/A	No	No
0021288	Jackson STP	0.3	0.45	120	100	0	0	Act. sludge	DryBeds	Yes	Yes
0062995	Jamestown STP	2.2	2.5	300	200	80	350	Ext. Aeration	FiltPress	No	Yes
0025194	Jeffersontown STP MSD										
0038571	Jenkins STP	0.6	0.6	150	276	0	0	Ox. ditch	DryBeds	No	No
0033791	Kevil STP							Lagoon		No	No
0020419	Kuttawa STP	0.1	0.35	150	120	15	N/A	N/A	N/A	No	No
0020893	Lacenter STP	N/A	0.505	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020001	LaGrange STP	0.42	0.775	267	237	0	N/A	Ox. ditch	DryBeds	No	No
0027227	Lake City STP	0.03	0.3	N/A	N/A	N/A	N/A	Contact Stab.	DryBeds	N/A	N/A
0020974	Lancaster STP	0.3	1	275	200	0	0	Ox. ditch	None	No	No
0021067	Lawrenceburg WWTP	1.9	3.6	250	155	40	N/A	RBC's (4)	DryBeds	No	Yes

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0040851	Lebanon Junction STP	0.11	0.185	N/A	N/A	N/A	N/A	Ext. Aeration	None	No	No
0026549	Lebanon STP	0.75	1	100	180	25	122	Ext. Aeration	BeltPress	Yes	Yes
0022934	Leitchfield WWTP	0.72	1.3	175	170	10	175	Pack Bed Tower	N/A	No	No
0024881	Lewisburg STP	0.18	0.125	N/A	N/A	0	0	Lagoons	DryBeds	No	No
0025241	Lewisport STP	0.159	0.25	N/A	N/A	0	0	Contact Stab.	DryBeds	No	No
0020613	Livermore WWTP	0.15	0.31	60	70	<1	30	Ox. ditch	DryBeds	No	No
0040703	Livingston STP	N/A	0.04	N/A	N/A	N/A	N/A	N/A	DryBeds	N/A	N/A
0021270	London WWTP	1.79	4	288	316	11.6	3184	RBC's	DryBeds	No	Yes
0027961	Louisa STP	0.35	2.5	195	195	0	0	Ext. Aeration	DryBeds	No	Yes
0026115	Loyall STP	0.045	0.185	35	46	0	0	Ext. Aeration	None	No	No
0024279	Lynch STP	0.035	N/A	N/A	N/A	0	0	Trick. filter	DryBeds	No	No
0022942	Madisonville WWTP	4.5	4.5	199	191	10	N/A	Act. sludge	BP/DryBed	Yes	N/A
0029122	Manchester Water and Sewer	0.581	0.581	300	1750	0	0	Ox. ditch	BeltPress	Yes	Yes
0020061	Marion, City of	0.51	0.66	135	128	0	5	Polishing Lag.	DryBeds	No	No
0024546	Marshall Co. SD #1	0.04	0.15	240	150	0	0	Contact Stab.	DryBeds	No	Yes
0026921	Martin STP*	0.15	0.15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021211	Mayfield POTW	2.383	3.1	195	195	11.3	140	Ox. ditch	DryBeds	No	Yes
0020257	Maysville STP	1.1	1.424	190	190	35	190	Ext. Aeration	Digesters	No	Yes
0025828	McCracken Co. SD #4 Woodlawn	0.446	0.91	N/A	128	0	N/A	Lagoon	N/A	N/A	N/A
0025810	McCracken Co. SD#3 Reidland	0.651	0.6	N/A	N/A	0	0	N/A	DryBeds	No	No
0034444	McKee STP	0.14	0.17	200	160	0	0	Ext. Aeration	DryBeds	No	No
0072885	Middlesboro WWTP	1.8	2.8	150	260	6	350	Ox. ditch	BeltPress	Yes	Yes
0028410	Midway STP	0.2	0.253	220	200	0	N/A	RBC's	DryBeds	No	No
0020940	Millersburg WWTP	0.065	0.2	210	200	0	0	Ext. Aeration	Set/Decan	No	No
0088625	Milton STP	0.08	0.164	N/A	450	0	0	Ext. Aeration	DryBeds	No	No
0069736	Montgomery S.D. #2	0.12	0.284	190	190	0	0	Ox. ditch	DryBeds	No	No
0033847	Monticello WWTP	0.367	0.7	593	412	0.09	0.11	Ox. ditch	DryBeds	No	No
0052752	Morehead WWTP	2.2	2.5	125	200	<15	100	Act. sludge	BeltPress	Yes	Yes
0021440	Morganfield STP	1.6	3.5	52	166	0	0	Ext. Aeration	DryBeds	No	Yes
0021024	Morgantown STP	0.343	0.5	180	300	0	0	Aerated lagoon	DryBeds	No	No
0022411	Morris Forman WWTP	101.8	105	305	329	35	N/A	UNOX system	VacFilter	Yes	Yes
0020044	Mt. Sterling WWTP	1.125	3	212	245	5	N/A	Tr.Fil.& RBC's	DryBeds	Yes	Yes
0024694	Mt. Vernon STP	0.22	0.372	260	260	0	0	N/A	DryBeds	No	No
0033804	Mt. Washington STP	0.54	0.9	146	155	0	0	Ext. Aeration	DryBeds	No	No
0036510	Muddy Fork STP MSD										
0031755	Munfordville STP	0.065	0.15	195	130	0	0	Ext. Aeration	DryBeds	No	No
0072761	Murray Municipal Util.	4.12	3.5	250	300	15	N/A	Ox. ditch	FP/DryBed	No	Yes
0031828	New Castle WWTP	0.15	0.295	N/A	N/A	0	0	Lagoon	None	No	No
0034126	New Haven STP	0.065	0.16	270	180	0	0	Lagoons	None	No	No
0020036	Nicholasville WWTP	1.6	2.71	126	235	5.5	220	RBC's	BP/DryBed	No	No

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0031836	North Middletown STP		0.085								
0066583	Nortonville STP	0.135	0.14	200	150	0	0	Lagoons	N/A	No	No
0094056	Oak Grove STP	0.25	N/A	N/A	N/A	N/A	N/A	Ox. ditch	N/A	No	No
0025925	Olive Hill STP	0.175	0.35	100	98	0	0	Ox. ditch	DryBeds	No	No
0073377	Owensboro East WWTP	2.5	6.8	500	300	50	N/A	Ox. ditch	BeltPress	Yes	Yes
0020095	Owensboro West WWTP	9.5	12	275	250	50	N/A	ABF tower	BeltPress	Yes	Yes
0028312	Owenton STP	0.19	0.34	180	190	0	0	Lagoon	None	No	Yes
0024287	Owingsville STP	0.2	0.2	N/A	N/A	N/A	N/A	Lagoon	N/A	N/A	N/A
0022799	Paducah STP	4.96	9	170	170	2.5	N/A	Act. sludge	BP/DryBed	No	Yes
0020630	Paintsville STP	0.673	0.99	305	163	0	0	Ox. ditch	DryBeds	Yes	Yes
0090654	Paris STP	1	2.2	110	140	20	80	Ox. ditch	BeltPress	No	Yes
0028703	Parklake STP	0.028	0.05	200	110	0	0	Ext. Aeration	None	No	No
0024813	Pembroke STP	0.065	0.09	N/A	N/A	N/A	N/A	Wetlands	N/A	No	No
0028355	Perryville STP	0.06	0.1	N/A	N/A	N/A	N/A	Lagoon	N/A	No	No
0025291	Pikeville WWTP	0.5	2	250	300	0	N/A	Ext. Aeration	BeltPress	No	Yes
0024058	Pineville STP	0.32	0.4	N/A	N/A	N/A	N/A	Act. sludge	N/A	No	No
0027413	Prestonsburg WWTP	0.5	1	283	182	0	0	Act. sludge	DryBeds	No	No
0028401	Princeton WWTP	0.737	1.07	157	167	35	<300	Ox. ditch	Set/Decan	No	No
0029106	Prospect STP North&South H. Cr	0.35	0.791	180	230	0	0	Ext. Aeration	None	No	No
0021296	Providence STP	0.35	0.629	122	134	0	0	Ox. ditch	DryBeds	No	Yes
0022390	Radcliff WWTP	2.075	2.81	237	243	0	0	Ox. ditch	DryBeds	No	No
0022845	Richmond Dreaming Creek WWTP	2.1	3.65	167	215	16	N/A	RBC's	BeltPress	No	No
0022853	Richmond Tates Creek WWTP	2.1	2.99	244	131	<1	N/A	RBC's	DryBeds	No	Yes
0020877	Russellville STP	1.02	1.65	N/A	N/A	N/A	N/A	Ox. ditch	DryBeds	No	Yes
0091731	Sacramento STP							Lagoon			
0081868	Sadieville STP*	0.0334	0.0334	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0066541	Salem STP	0.055	0.16	N/A	N/A	N/A	N/A	Ox. ditch	DryBeds	No	No
0026867	Salyersville STP	0.23	0.17	N/A	N/A	0	0	Act. sludge	VertPress	No	Yes
0052264	Sandy Hook STP	0.06	0.075	N/A	N/A	0	0	Ext. Aeration	DryBeds	No	No
0094447	Science Hill STP	0.022	0.15	150	180	0	N/A	Ox. ditch	DryBeds	No	No
0024783	Scottsville WWTP	0.787	0.86	206	202	N/A	N/A	Ox. ditch	GravThick	No	Yes
0021148	Sebree STP	0.16	0.17	N/A	N/A	N/A	N/A	Ext. Aeration	None	No	No
0088421	Sharpsburg STP	0.04	0.07	N/A	N/A	N/A	N/A	Ext. Aeration	None	No	No
0020427	Shelbyville STP	1.1	1.9	206	228	25	N/A	Ext. Aeration	DryBeds	No	Yes
0027359	Shepherdsville STP	0.35	0.7	170	75	0	0	Ext. Aeration	DryBeds	No	No
0065889	Simpsonville STP	0.0869	0.125	460	1410	0	0	Lagoon	N/A	No	No
0025836	Smithland STP	0.07	0.07	200	230	0	0	Lagoon	None	No	No
0026611	Somerset STP	1.7	3	500	125	40	600	Act. sludge	DryBeds	No	Yes
0026131	South Shore STP	0.183	0.39	60	59	0	0	Ox. ditch	Supernate	No	Yes
0077801	Southern Campbell Co. Ind Pk		0.5								

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0020907	Springfield STP	0.307	0.464	300	250	33	300	Ox. ditch	DryBeds	No	No
0050512	Stamping Ground STP	0.06	0.3	300	300	0	0	RBC's	N/A	No	No
0024619	Stanford STP	0.6979	0.8	168	298	0.5	734	Ox. ditch	DryBeds	No	No
0034428	Stanton STP	0.3	0.46	84	252	0	0	Ext. Aeration	DryBeds	No	No
0025895	Sturgis WWTP	0.2	0.5	90	100	N/A	N/A	Lagoon	None	No	No
0055271	Symsonia STP	0.05	0.1	130	130	0	0	Lagoons	DryBeds	No	No
0040143	Taylorsville STP	0.19	0.114	150	80	0	0	Ext. Aeration	None	No	No
0020702	Tompkinsville WWTP	0.335	0.67	183	163	<1	N/A	Ext. Aeration	DryBeds	No	Yes
0021491	Town Branch WWTP	21	30	149	193	10	N/A	Act. sludge	BeltPress	No	Yes
0020982	Trenton STP	0.023	0.125	300	300	0	0	N/A	DryBeds	No	No
0025844	Uniontown STP	0.016	2.5	180	45	0	0	Lagoons	None	No	Yes
0022039	Valley Creek(Elizabethtown)WWTP	5	4.5	100	120	33	N/A	Ox. ditch	DB/Belt	No	Yes
0021512	Vanceburg WWTP	0.241	0.41	N/A	188	<5	N/A	N/A	DryBeds	No	Yes
0020621	Versailles WWTP	1.8	2.04	175	170	35	N/A	Ox. ditch	N/A	No	Yes
0060259	Vicco STP	0.15	0.15	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	N/A	Yes
0024988	Vine Grove WWTP	0.45	0.7145	200	180	0	N/A	Ox. ditch	GravThick	No	No
0039756	Walton STP	0.176	0.225	231	441	0	0	Ext. Aeration	None	No	No
0028118	Warsaw STP	0.08	0.12	N/A	N/A	N/A	N/A	Lagoon	N/A	No	No
0078956	West County STP MSD										
0021504	West Hickman Creek WWTP	16.6	22.3	124	154	1.5	N/A	Act. sludge	BeltPress	No	No
0089567	West Liberty STP	0.575	N/A	N/A	N/A	N/A	N/A	Ox. ditch	DryBeds	No	No
0022152	West Point STP	0.08	0.2	105	188	0	0	Ext. Aeration	DryBeds	No	No
0079332	Wheelwright Lower Burton STP		0.015								
0028789	Wheelwright STP	0.225	0.25	N/A	N/A	N/A	N/A	Ext. Aeration	DryBeds	N/A	N/A
0023183	Whitesburg STP	0.22	0.5	N/A	N/A	N/A	N/A	Act. sludge	DryBeds	No	Yes
0054941	Whitesville STP	0.075	0.1	N/A	N/A	N/A	N/A	Lagoon	N/A	N/A	N/A
0025933	Wickliffe STP	0.185	0.28	N/A	N/A	0	0	Lagoons	None	No	No
0028347	Williamsburg STP	1.0221	0.8	N/A	590	2.9	N/A	Trick. filter	N/A	No	Yes
0021008	Williamstown WWTP	0.488	0.95	120	175	10	65	Ext. Aeration	Decanting	No	Yes
0028428	Wilmore WWTP	0.44	1	240	143	0	0	Ox. ditch	DryBeds	No	No
0037991	Winchester STP	3.82	4	601	259	15	218	Act. sludge	DryBeds	No	Yes
0025852	Wingo STP	0.1	0.07	N/A	N/A	N/A	N/A	Lagoon	N/A	N/A	N/A
0022926	Worthington WWTP	0.13	0.2	165	202	25	N/A	Ext. Aeration	Digester	No	No
0033553	Wurtland WWTP	0.85	1.1	270	40	80	250	A20 process	BeltPress	No	No

Table A-4. Sludge Management Methods

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Dry Tons sludge/ Year	PSRP	PFRP	Land fill	Land farm	Other Plant	Give Away	Lagoon	Landfill Name and Permit Number	Other Plant Name
0020885	Adairville WWTP	4.2	No	No	Yes	No	No	No	No	Southern Sanitation #071.06	N/A
0024295	Albany STP	24.4	No	No	Yes	Yes	No	Yes	No	Pulaski Co. #100-00008	N/A
0029548	Arlington STP	0.0	No	No	No	No	No	Yes	No	N/A	N/A
0022373	Ashland Environmental Control	1363.1	N/A	N/A	Yes	No	No	No	No	Syosset Inc.	N/A
0021202	Auburn STP	35.0	N/A	Yes	Yes	Yes	No	No	No	Russellville	N/A
0021261	Augusta STP		Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0039021	Bancroft STP	20.0	No	No	Yes	No	N/A	No	No	N/A	N/A
0024082	Barbourville STP		No	No	No	No	No	No	Yes	N/A	N/A
0021237	Bardstown WWTP	0.0	N/A	N/A	No	No	No	N/A	Yes	N/A	N/A
0020915	Bardwell STP		No	No	No	No	No	Yes	No	N/A	N/A
0025747	Barlow STP		N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Lacenter STP
0021121	Beattyville STP	17.7	No	No	No	No	No	Yes	No	N/A	N/A
0023191	Beaver Dam STP		N/A	N/A	No	No	No	N/A	Yes	N/A	N/A
0069825	Bedford STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0025755	Benham WWTP	1.1	Yes	Yes	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0021172	Benton STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0079898	Berea STP	252.0	No	No	Yes	No	No	No	No	Rumpke of Ky. - Mt. Sterling	N/A
0036501	Berrytown STP MSD	0.0					Yes				Morris Forman M
0034436	Bloomfield STP	4.2	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0033774	Booneville STP	53.1	No	No	Yes	No	No	No	No	Blueridge landfill #033.24(?)	N/A
0022403	Bowling Green WWTP	462.0	No	Yes	No	Yes	No	Yes	N/A	N/A	N/A
0041190	Boyd & Greenup Co. SD #1	108.0	No	No	Yes	No	No	Yes	No	Addington Env. - Green Valley	N/A
0090719	Bradfordsville STP	6.3	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Lebanon STP
0021474	Brandenburg WWTP	75.8	No	No	Yes	No	No	No	No	Outer Loop #056.28	N/A
0047431	Brodhead STP	21.0	N/A	N/A	No	No	No	Yes	No	N/A	N/A
0025232	Brooksville STP	0.0	No	No	No	No	No	No	No	N/A	N/A
0023396	Brownsville STP*		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0036854	Burkesville STP		No	No	Yes	No	No	No	No	Pulaski Co. #	N/A
0021041	Butler STP		Yes	N/A	Yes	N/A	N/A	N/A	N/A	Rumpke - Pendelton Co.	N/A
0026891	Cadiz STP	12.6	No	No	Yes	No	No	No	No	Hopkinsville #024.10	N/A
0020125	Calhoun WWTP	9.6	No	No	Yes	No	No	No	No	Ohio Co. #092-0010,0159	N/A
0021130	Calvert City STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021466	Campbell Kenton SD#1 Dry Creek	5055.5	N/A	Yes	Yes	No	No	No	No	Bavarian (Walton, Ky.)#008.04	N/A
0028321	Campbellsburg STP	13.5	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Medora - Jackson Co.	N/A
0054437	Campbellsville STP	1293.6	No	No	Yes	N/A	N/A	N/A	N/A	Tri-County Stamford	N/A
0026069	Campton STP		Yes	No	No	No	No	Yes	No	N/A	N/A
0042854	Caney Creek W.D. Pippa Pass	1.7	N/A	N/A	No	Yes	No	No	No	N/A	N/A
0072044	Caneyville STP	5.4	N/A	N/A	No	No	No	Yes	No	N/A	N/A
0020923	Carlisle WWTP	80.1	Yes	No	No	Yes	No	N/A	N/A	N/A	N/A
0020265	Carrollton Util. STP	17.3	Yes	No	Yes	Yes	No	No	No	Laidlaw #112-00002	N/A

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Dry Tons sludge/ Year	PSRP	PFRP	Land fill	Land farm	Other Plant	Give Away	Lagoon	Landfill Name and Permit Number	Other Plant Name
0035467	Catlettsburg WWTP	0.0	No	No	No	No	No	N/A	N/A	N/A	N/A
0091561	Caveland Sanitation Auth.	230.4	No	No	Yes	No	No	No	No	Glasgow Landfill #?	N/A
0071854	Centertown WWTP		No	No	No	No	Yes	No	No	N/A	Greenville WWTP
0023540	Central City STP	35.0	Yes	No	Yes	No	No	No	No	Ohio Co. #0644	N/A
0090590	Clarkson STP		N/A	N/A	No	No	No	No	Yes	N/A	N/A
0025119	Clay City STP		Yes	N/A	Yes	N/A	N/A	N/A	N/A	Blue Ridge - Irvin	N/A
0028096	Clay Lagoon	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0025275	Clinton STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0026701	Cloverport STP	42.0	Yes	No	Yes	N/A	N/A	N/A	N/A	Hancock Co. - Hawesville	N/A
0024317	Columbia STP	106.1	No	No	Yes	No	No	No	No	N/A	N/A
0020133	Corbin WWTP	414.3	No	No	Yes	No	No	No	No	E.R. Hopper & Son #063.03	N/A
0065897	Crab Orchard WWTP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0091634	Crittenden STP	1.8	No	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Dry Creek STD
0066591	Crofton STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0021571	Cumberland STP		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023370	Cynthiana STP	56.6	No	No	Yes	No	No	No	No	Rumpke - Butler #096.01	N/A
0057193	Danville STP	200.2	Yes	No	Yes	Yes	No	No	Yes	Tri K landfill #69.04	N/A
0023868	Dawson Springs STP	50.4	N/A	No	Yes	No	No	No	No	Dozit - Union County #	N/A
0066575	Drakesboro STP	3.6	Yes	N/A	Yes	No	No	No	No	Ohio Co. #047.10	N/A
0027979	Eddyville STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0028100	Edmonton STP	0.0	No	No	No	No	No	No	No	N/A	N/A
0020958	Elkhorn City STP	0.0	N/A	N/A	No	No	Yes	No	No	N/A	N/A
0023442	Elkton STP	70.7	No	No	Yes	No	No	No	No	Logan Co. #071.06	N/A
0026883	Eminence STP	8.8	N/A	N/A	No	Yes	No	No	Yes*	N/A	N/A
0095940	Estill Co. Water Dist. STP										
0073091	Evarts STP		N/A	N/A	Yes	N/A	N/A	N/A	N/A	Landfill in Corbin (?)	N/A
0021482	Falmouth WWTP	37.8	No	No	Yes	No	No	No	No	Rumpke Mark Kreinbrink	N/A
0053562	Fancy Farm Water Dist. STP	0.0	No	No	Yes	No	No	No	Yes	Union City, Tenn. (only once)	N/A
0027405	Fleming Neon STP	1.2	No	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0021229	Flemingsburg WWTP	61.8	Yes	N/A	N/A	Yes	No	Yes	N/A	N/A	N/A
0054801	Fordsville STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0022861	Frankfort WWTP	772.8	No	No	Yes	No	No	No	No	BFI Benson Valley #037.09	N/A
0027456	Franklin STP	43.8	Yes	No	Yes	Yes	No	No	No	Southern Sanitation (winter)	N/A
0040584	Frenchburg STP	4.0	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0026913	Fulton STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0095257	Gamaliel WWTP										
0020150	Georgetown WWTP No. 1	262.7	No	No	Yes	No	No	No	No	Benson Valley #037.09	N/A
0082007	Georgetown WWTP No. 2	62.6	No	No	Yes	No	No	No	No	Benson Valley #037.09	N/A
0096890	Ghent STP										
0021164	Glasgow STP #2	380.3	Yes	N/A	Yes	Yes	No	No	No	Glasgow #005-00001	N/A

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Dry Tons sludge/ Year	PSRP	PFRP	Land fill	Land farm	Other Plant	Give Away	Lagoon	Landfill Name and Permit Number	Other Plant Name
0044261	Glenview Bluff STP MSD						Yes				Morris Forman M
0020931	Grayson WWTP	112.3	No	No	No	No	Yes	No	No	N/A	Addington Env.
0096881	Green Co. S.D. #1										
0023841	Greensburg WWTP	6.0	No	No	N/A	Yes	No	No	No	N/A	N/A
0048348	Greenup Co. Environmental Comm.	210.0	No	No	Yes	No	No	No	No	Green Valley Environ. Corp.	N/A
0026450	Greenup STP		N/A	N/A	No	No	Yes	No	No	N/A	Portsmouth, Ohi
0020010	Greenville STP	42.0	Yes	No	No	Yes	No	No	Yes	N/A	N/A
0063649	Guthrie WWTP	16.8	No	No	Yes	No	No	No	No	Southern Sanitation #071.06	N/A
0066532	Hammond Wood STP Hopkinsville	450.4	No	No	Yes	No	No	No	No	City of Hopkinsville #024.10	N/A
0021016	Hardin STP	18.0	No	No	No	No	Yes	No	No	N/A	Murray STP
0028363	Hardinsburg WWTP	36.0	Yes	N/A	No	Yes	No	N/A	N/A	N/A	N/A
0026093	Harlan STP	13.8	No	No	Yes	No	No	Yes	No	HSI picks up sludge	N/A
0027421	Harrodsburg STP	300.0	No	No	Yes	No	No	No	No	Tri K landfill #69.04	N/A
0025798	Hartford STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020087	Hawesville STP	0.0	Yes	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0020079	Hazard STP	144.1	Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A
0028371	Hazel STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0020711	Henderson WWTP	2412.8	Yes	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A
0028436	Hickman East Lagoon								Yes		
0039764	Hickman West Lagoon								Yes		
0027685	Hindman STP	0.1	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0022420	Hite Creek STP MSD						Yes				Morris Forman M
0026379	Hodgenville POTW	2.6	Yes	No	No	Yes	No	No	No	N/A	N/A
0023388	Hopkinsville STP	156.2	No	No	Yes	No	No	No	No	Hopkinsville #024.10	N/A
0021245	Hyden STP	3.5	No	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A
0079316	Inez STP*		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025909	Irvine STP	32.0	Yes	No	No	N/A	N/A	Yes	N/A	N/A	N/A
0092436	Irvington STP	1.2	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Outer Loop Landfill	N/A
0066605	Island WWTP		N/A	N/A	Yes	No	No	No	No	N/A	N/A
0021288	Jackson STP	72.0	Yes	N/A	Yes	No	No	No	No	Blue ridge - Irvine	N/A
0062995	Jamestown STP	970.2	No	No	Yes	No	No	No	No	Tri-K landfill #69.04	N/A
0025194	Jeffersontown STP MSD						Yes				Morris Forman M
0038571	Jenkins STP	11.2	No	No	Yes	No	No	No	No	Pike Co. - Johns Creek	N/A
0033791	Kevil STP								Yes		
0020419	Kuttawa STP	7.5	No	No	Yes	No	No	No	No	Hopkinsville #024.10	N/A
0020893	Lacenter STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020001	LaGrange STP	216.0	No	No	Yes	No	No	No	No	Present Outer Loop #056.28	N/A
0027227	Lake City STP	4.0	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0020974	Lancaster STP	106.1	No	No	Yes	No	No	No	No	BFI Benson Valley #037.09	N/A
0021067	Lawrenceburg WWTP	948.7	Yes	No	Yes	Yes	No	No	No	Benson Valley #037.09	N/A

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Dry Tons sludge/ Year	PSRP	PFRP	Land fill	Land farm	Other Plant	Give Away	Lagoon	Landfill Name and Permit Number	Other Plant Name
0040851	Lebanon Junction STP		Yes	N/A	N/A	Yes	N/A	N/A	N/A	N/A	N/A
0026549	Lebanon STP	69.1	No	No	Yes	No	No	No	No	Bardstown #090-00010	N/A
0022934	Leitchfield WWTP	90.0	Yes	No	No	Yes	No	No	No	N/A	N/A
0024881	Lewisburg STP		No	No	No	No	No	No	Yes	N/A	N/A
0025241	Lewisport STP	1.8	N/A	N/A	Yes	No	No	No	No	Hancock Co.	N/A
0020613	Livermore WWTP	21.0	No	No	Yes	No	No	No	No	Ohio Co. Balefill (?)	N/A
0040703	Livingston STP	4.0	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0021270	London WWTP	255.4	Yes	Yes	Yes	Yes	No	N/A	N/A	E.R. Hopper,Lily,Ky. #063.03	N/A
0027961	Louisa STP	60.0	Yes	N/A	No	Yes	No	Yes	No	N/A	N/A
0026115	Loyall STP	1.0	No	No	No	Yes	No	No	No	N/A	N/A
0024279	Lynch STP	4.0	Yes	N/A	N/A	No	No	Yes	N/A	N/A	N/A
0022942	Madisonville WWTP	557.3	Yes	No	Yes	No	No	No	No	Dozit Landfill # 113.05	N/A
0029122	Manchester Water and Sewer	54.0	Yes	?	No	No	No	Yes	No	N/A	N/A
0020061	Marion, City of	17.7	No	No	Yes	No	No	Yes	No	#113-00005	N/A
0024546	Marshall Co. SD #1	4.2	No	No	No	No	Yes	No	No	N/A	Murray STP
0026921	Martin STP*		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021211	Mayfield POTW	107.9	No	No	Yes	No	No	No	No	Graves Co. #042.07	N/A
0020257	Maysville STP	76.4	Yes	N/A	Yes	No	No	No	No	East Ky. Power # N/A	N/A
0025828	McCracken Co. SD #4 Woodlawn	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0025810	McCracken Co. SD#3 Reidland	42.0	No	No	Yes	No	No	No	No	McCracken Co. #073.11	N/A
0034444	McKee STP		N/A	N/A	No	Yes	No	Yes	No	N/A	N/A
0072885	Middlesboro WWTP	312.8	No	No	Yes	No	No	No	No	E.R. Hopper & Sons #063.03	N/A
0028410	Midway STP	25.2	No	No	Yes	No	No	No	No	Benson Valley #037.09	N/A
0020940	Millersburg WWTP	3.8	Yes	No	No	Yes	No	No	No	N/A	N/A
0088625	Milton STP	0.1	N/A	N/A	No	Yes	No	No	No	N/A	N/A
0069736	Montgomery S.D. #2	36.0	No	No	Yes	No	No	No	No	Rumpke - Mt. Sterling	N/A
0033847	Monticello WWTP	127.3	No	No	Yes	No	No	No	No	Pulaski Co. #100.08	N/A
0052752	Morehead WWTP	118.2	Yes	No	Yes	No	No	No	No	Rowan Co. Sanitation #107.08	N/A
0021440	Morganfield STP	42.0	No	No	Yes	No	No	No	No	Dozit Landfill #113.05	N/A
0021024	Morgantown STP	109.2	No	No	Yes	No	No	No	Yes	Ohio Co. #047.10	N/A
0022411	Morris Forman WWTP	11764.8	No	Yes	Yes	No	N/A	No	No	Outer Loop-Waste Mgt. #052.28	N/A
0020044	Mt. Sterling WWTP	1147.9	No	No	Yes	No	No	No	No	Rumpke(Montgomery Co.)	N/A
0024694	Mt. Vernon STP	8.4	No	No	Yes	No	No	Yes	No	E.R. Hopper & Sons #063.03	N/A
0033804	Mt. Washington STP	84.6	No	No	Yes	No	Yes	Yes	N/A	Outer Loop #044.33	MSD Louisville
0036510	Muddy Fork STP MSD						Yes				Morris Forman M
0031755	Munfordville STP	0.8	No	No	Yes	No	Occas.	No	No	Ohio Co. #047.10	Caveland Sanita
0072761	Murray Municipal Util.	301.2	Yes	No	No	Yes	No	No	No	N/A	N/A
0031828	New Castle WWTP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0034126	New Haven STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0020036	Nicholasville WWTP	232.2	Yes	No	Yes	No	No	No	No	Benson Valley #037.09	N/A

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KPDES #	Facility Name	Dry Tons sludge/ Year	PSRP	PFRP	Land fill	Land farm	Other Plant	Give Away	Lagoon	Landfill Name and Permit Number	Other Plant Name
0031836	North Middletown STP										
0066583	Nortonville STP		No	No	No	No	No	No	Yes	N/A	N/A
0094056	Oak Grove STP	8.3	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Landfill in future	N/A
0025925	Olive Hill STP	28.3	No	No	Yes	No	No	No	No	Rowan Co. #103-00007	N/A
0073377	Owensboro East WWTP	966.0	No	No	Yes	No	No	No	No	Henderson Co. #051-00007	N/A
0020095	Owensboro West WWTP	1716.0	No	No	Yes	No	No	No	No	Henderson Co. #051-00007	N/A
0028312	Owenton STP	0.0	No	No	No	No	No	No	Yes	N/A	N/A
0024287	Owingsville STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022799	Paducah STP	652.9	Yes	No	Yes	No	No	No	No	McCracken Co. #073.11	N/A
0020630	Paintsville STP	17.3	No	No	Yes	No	No	No	No	Prichard Landfill - WV	N/A
0090654	Paris STP	345.6	No	No	Yes	No	No	No	No	Rumpke-Mt. Sterling	N/A
0028703	Parklake STP	25.0	No	No	No	No	Yes	No	Yes	N/A	Morris Forman M
0024813	Pembroke STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028355	Perryville STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0025291	Pikeville WWTP	55.2	No	No	Yes	No	No	No	No	Pike Co. landfill	N/A
0024058	Pineville STP	36.0	Yes	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Middlesboro
0027413	Prestonsburg WWTP	8.4	No	No	Yes	No	No	Yes	No	Floyd Co. Solid Waste #036.13	N/A
0028401	Princeton WWTP	109.9	Yes	No	No	Yes	No	No	No	N/A	N/A
0029106	Prospect STP North&South H. Cr	30.0	No	No	No	No	Yes	No	No	N/A	Morris Forman M
0021296	Providence STP		No	No	No	Yes	No	No	No	N/A	N/A
0022390	Radcliff WWTP	611.9	No	No	Yes	No	No	No	No	Ohio Co. #047.10	N/A
0022845	Richmond Dreaming Creek WWTP	206.4	Yes	No	Yes	No	No	No	No	Blue Ridge RDF #033-00004	N/A
0022853	Richmond Tates Creek WWTP	788.1	Yes	No	Yes	N/A	No	No	No	Blue Ridge RDF #033-00004	N/A
0020877	Russellville STP	361.2	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Southern Sanitation-Logan Co.	N/A
0091731	Sacramento STP								Yes		
0081868	Sadieville STP*		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0066541	Salem STP	15.2	N/A	N/A	Yes	N/A	N/A	N/A	N/A	Dozit - Morganfield	N/A
0026867	Salyersville STP	6.0	No	No	No	No	No	Yes	No	N/A	N/A
0052264	Sandy Hook STP		No	No	No	Yes	No	No	No	N/A	N/A
0094447	Science Hill STP	0.0	No	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024783	Scottsville WWTP	25.0	No	No	Yes	No	Yes	No	No	Glasgow #005.01	Bowling Green W
0021148	Sebree STP	36.7	Yes	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Owensboro
0088421	Sharpsburg STP		No	N/A	N/A	N/A	Yes	N/A	N/A	N/A	Mt. Sterling ST
0020427	Shelbyville STP	473.0	Yes	No	Yes	No	No	No	No	BFI Benson Valley #037.09	N/A
0027359	Shepherdsville STP	40.0	No	No	No	No	Yes	No	No	N/A	Morris Forman M
0065889	Simpsonville STP	16.8	No	No	Yes	No	No	No	Yes	Benson Valley #037.09	N/A
0025836	Smithland STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0026611	Somerset STP	469.1	N/A	N/A	Yes	Yes	N/A	N/A	Yes	Pulaski Co. #100.08	N/A
0026131	South Shore STP		No	No	No	No	Yes	No	No	N/A	Portsmouth, Ohi
0077801	Southern Campbell Co. Ind Pk										

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Dry Tons sludge/ Year	PSRP	PFRP	Land fill	Land farm	Other Plant	Give Away	Lagoon	Landfill Name and Permit Number	Other Plant Name
0020907	Springfield STP	84.0	Yes	No	Yes	Yes	No	No	No	Nelson Co. #090-0010	N/A
0050512	Stamping Ground STP	10.6	No	No	Yes	No	No	No	No	Benson Valley #037.09	N/A
0024619	Stanford STP	79.8	Yes	No	Yes	No	No	No	No	Tri K #69.04	N/A
0034428	Stanton STP	30.9	Yes	No	Yes	No	No	Yes	No	Blueridge Recyc. Disp.#033.24	N/A
0025895	Sturgis WWTP	0.0	No	N/A	No	No	No	No	Yes	N/A	N/A
0055271	Symsonia STP	0.7	No	No	Yes	No	No	No	Yes	Getting new landfill	N/A
0040143	Taylorsville STP	5.0	N/A	N/A	No	No	Yes	No	No	N/A	Morris Forman M
0020702	Tompkinsville WWTP	31.3	No	No	Yes	No	No	No	No		N/A
0021491	Town Branch WWTP	2160.0	Yes	No	Yes	No	No	No	No	LFUCG Avon #034.07	N/A
0020982	Trenton STP	6.0	No	No	No	Yes	No	No	No	N/A	N/A
0025844	Uniontown STP	0.0	N/A	N/A	N/A	N/A	N/A	No	Yes	N/A	N/A
0022039	Valley Creek(Elizabethtown)WWTP	528.8	Yes	No	Yes	Yes	No	No	No	Bluegrass Industrial	N/A
0021512	Vanceburg WWTP		No	No	N/A	No	No	No	No	N/A	N/A
0020621	Versailles WWTP	180.1	Yes	Yes	No	Yes	No	No	No	N/A	N/A
0060259	Vicco STP		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024988	Vine Grove WWTP	47.9	No	No	No	Yes	No	No	No	N/A	N/A
0039756	Walton STP	47.1	No	No	Yes	No	Yes	No	No	Bavarian landfill - Walton	Dry Creek STP
0028118	Warsaw STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0078956	West County STP MSD						Yes				Morris Forman M
0021504	West Hickman Creek WWTP	2904.0	Yes	Yes	Yes	No	No	No	No	N/A	N/A
0089567	West Liberty STP	12.0	Yes	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0022152	West Point STP		No	No	No	No	No	No	No	N/A	N/A
0079332	Wheelwright Lower Burton STP										
0028789	Wheelwright STP		N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A	N/A
0023183	Whitesburg STP	105.0	Yes	N/A	Yes	N/A	N/A	N/A	N/A	Pike County Landfill	N/A
0054941	Whitesville STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0025933	Wickliffe STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0028347	Williamsburg STP		No	No	Yes	No	No	No	No	Tri County Sanitary #69.04(?)	N/A
0021008	Williamstown WWTP	146.1	Yes	Yes	No	Yes	No	No	No	N/A	N/A
0028428	Wilmore WWTP	51.0	Yes	No	No	Yes	No	No	No	N/A	N/A
0037991	Winchester STP	72.0	Yes	No	Yes	Yes	No	No	Yes	#025.04 (temporary)	N/A
0025852	Wingo STP	0.0	N/A	N/A	N/A	N/A	N/A	N/A	Yes	N/A	N/A
0022926	Worthington WWTP		No	No	Yes	No	Yes	No	No	Green Valley Environmental	CSX Wastewater
0033553	Wurtland WWTP	43.2	No	No	N/A	N/A	Yes	N/A	N/A	N/A	Addington Env.

Table A-5. Sludge Managment Costs

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Landfill Tipping Fee ($/ton)	Landfill Tipping Fee ($/yd^3)	Landfill Tipping Fee ($/gal)	Landfarm Cost ($/ton)	Landfarm Cost ($/gal)	Transport Cost ($/ton)	Transport Cost ($/yd^3)	Transport Cost ($/gal)
0020885	Adairville WWTP	10			N/A	N/A	N/A	N/A	N/A
0024295	Albany STP	N/A	N/A	N/A		0.006	N/A	N/A	N/A
0029548	Arlington STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022373	Ashland Environmental Control	18			N/A	N/A	120/load		
0021202	Auburn STP	70/load				0.04	N/A	N/A	N/A
0021261	Augusta STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0039021	Bancroft STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024082	Barbourville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021237	Bardstown WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020915	Bardwell STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025747	Barlow STP			0.1	N/A	N/A	N/A	N/A	N/A
0021121	Beattyville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023191	Beaver Dam STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0069825	Bedford STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025755	Benham WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021172	Benton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0079898	Berea STP	20.8			N/A	N/A	10		
0036501	Berrytown STP MSD								
0034436	Bloomfield STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0033774	Booneville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022403	Bowling Green WWTP	N/A	N/A	N/A	325		N/A	N/A	N/A
0041190	Boyd & Greenup Co. SD #1	17.5			N/A	N/A	N/A	N/A	N/A
0090719	Bradfordsville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021474	Brandenburg WWTP		15		N/A	N/A	195/load		
0047431	Brodhead STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025232	Brooksville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023396	Brownsville STP*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0036854	Burkesville STP		11.25		N/A	N/A	225/trip		
0021041	Butler STP		7.5		N/A	N/A	N/A	N/A	N/A
0026891	Cadiz STP	13.6			N/A	N/A	N/A	N/A	N/A
0020125	Calhoun WWTP	91/month			N/A	N/A	N/A	N/A	N/A
0021130	Calvert City STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021466	Campbell Kenton SD#1 Dry Creek		7		N/A	N/A	7.89		
0028321	Campbellsburg STP		16.25		N/A	N/A	N/A	N/A	N/A
0054437	Campbellsville STP	12			N/A	N/A	250/load		
0026069	Campton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0042854	Caney Creek W.D. Pippa Pass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0072044	Caneyville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020923	Carlisle WWTP	N/A	N/A	N/A	15000/yr		9000/yr		
0020265	Carrollton Util. STP		8.25		7500/year		N/A	N/A	N/A

Kentucky Wastewater Sludge Survey 1993-1994
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KPDES #	Facility Name	Landfill Tipping Fee ($/ton)	($/yd^3)	($/gal)	Landfarm Cost ($/ton)	($/gal)	Transport Cost ($/ton)	($/yd^3)	($/gal)
0035467	Catlettsburg WWTP	18			N/A	N/A	N/A	N/A	N/A
0091561	Caveland Sanitation Auth.	29.7			N/A	N/A	N/A	N/A	N/A
0071854	Centertown WWTP	N/A	N/A	N/A	N/A	N/A			0.03
0023540	Central City STP	25			N/A	N/A	N/A	N/A	N/A
0090590	Clarkson STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025119	Clay City STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028096	Clay Lagoon	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025275	Clinton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0026701	Cloverport STP	22.4			N/A	N/A	N/A	N/A	N/A
0024317	Columbia STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020133	Corbin WWTP	5			N/A	N/A	N/A	N/A	N/A
0065897	Crab Orchard WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0091634	Crittenden STP			0.077	N/A	N/A	N/A	N/A	N/A
0066591	Crofton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021571	Cumberland STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023370	Cynthiana STP		15		N/A	N/A	30/week		
0057193	Danville STP		16.67		N/A	N/A	N/A	N/A	N/A
0023868	Dawson Springs STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0066575	Drakesboro STP	25			N/A	N/A	N/A	N/A	N/A
0027979	Eddyville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028100	Edmonton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020958	Elkhorn City STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023442	Elkton STP		10		N/A	N/A	N/A	N/A	N/A
0026883	Eminence STP	N/A	N/A	N/A	2500 (engr.)	plus	2000/year	None	None
0095940	Estill Co. Water Dist. STP								
0073091	Evarts STP	35.2			N/A	N/A	N/A	N/A	N/A
0021482	Falmouth WWTP	12			N/A	N/A	N/A	N/A	N/A
0053562	Fancy Farm Water Dist. STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0027405	Fleming Neon STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021229	Flemingsburg WWTP	N/A	N/A	N/A		0.005	N/A	N/A	N/A
0054801	Fordsville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022861	Frankfort WWTP		14		N/A	N/A	13		
0027456	Franklin STP	N/A	N/A	N/A		0.025	N/A	N/A	N/A
0040584	Frenchburg STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0026913	Fulton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0095257	Gamaliel WWTP								
0020150	Georgetown WWTP No. 1	23.25			N/A	N/A	165/load		
0082007	Georgetown WWTP No. 2	23.25			N/A	N/A	165/load		
0096890	Ghent STP								
0021164	Glasgow STP #2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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KPDES #	Facility Name	Landfill Tipping Fee ($/ton)	Landfill Tipping Fee ($/yd^3)	Landfill Tipping Fee ($/gal)	Landfarm Cost ($/ton)	Landfarm Cost ($/gal)	Transport Cost ($/ton)	Transport Cost ($/yd^3)	Transport Cost ($/gal)
0044261	Glenview Bluff STP MSD								
0020931	Grayson WWTP	N/A	N/A	N/A	15		N/A	N/A	N/A
0096881	Green Co. S.D. #1								
0023841	Greensburg WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0048348	Greenup Co. Environmental Comm.	15			N/A	N/A	2		
0026450	Greenup STP			0.055	N/A	N/A			0.02
0020010	Greenville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0063649	Guthrie WWTP	15			N/A	N/A	10		
0066532	Hammond Wood STP Hopkinsville	15			N/A	N/A	N/A	N/A	N/A
0021016	Hardin STP	N/A	N/A	N/A	N/A	N/A			0.033
0028363	Hardinsburg WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0026093	Harlan STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0027421	Harrodsburg STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025798	Hartford STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020087	Hawesville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020079	Hazard STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028371	Hazel STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020711	Henderson WWTP	28			N/A	N/A	N/A	N/A	N/A
0028436	Hickman East Lagoon								
0039764	Hickman West Lagoon								
0027685	Hindman STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022420	Hite Creek STP MSD								
0026379	Hodgenville POTW	N/A	N/A	N/A	605		Included		
0023388	Hopkinsville STP	15			N/A	N/A	N/A	N/A	N/A
0021245	Hyden STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0079316	Inez STP*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025909	Irvine STP	N/A	N/A	N/A	N/A	N/A			40
0092436	Irvington STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0066605	Island WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021288	Jackson STP	7			N/A	N/A	120/truck		
0062995	Jamestown STP		10		N/A	N/A		5	
0025194	Jeffersontown STP MSD								
0038571	Jenkins STP	35			N/A	N/A	N/A	N/A	N/A
0033791	Kevil STP								
0020419	Kuttawa STP	40			N/A	N/A	N/A	N/A	N/A
0020893	Lacenter STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020001	LaGrange STP		25.3		N/A	N/A	35/load		
0027227	Lake City STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020974	Lancaster STP		18		N/A	N/A		20	
0021067	Lawrenceburg WWTP		7		2000/year		included		

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0040851	Lebanon Junction STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0026549	Lebanon STP		3		N/A	N/A	30000		
0022934	Leitchfield WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024881	Lewisburg STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025241	Lewisport STP	0			N/A	N/A	N/A	N/A	N/A
0020613	Livermore WWTP	6			N/A	N/A	N/A	N/A	N/A
0040703	Livingston STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021270	London WWTP	50/load				0.01	N/A	N/A	N/A
0027961	Louisa STP	N/A	N/A	N/A	18		N/A	N/A	N/A
0026115	Loyall STP	N/A	N/A	N/A		0.1	None	None	None
0024279	Lynch STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022942	Madisonville WWTP	23.6			N/A	N/A	N/A	N/A	N/A
0029122	Manchester Water and Sewer	N/A	N/A	N/A	10		N/A	N/A	N/A
0020061	Marion, City of	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024546	Marshall Co. SD #1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0026921	Martin STP*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021211	Mayfield POTW		10		N/A	N/A	N/A	N/A	N/A
0020257	Maysville STP	0			N/A	N/A	N/A	N/A	N/A
0025828	McCracken Co. SD #4 Woodlawn	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025810	McCracken Co. SD#3 Reidland	3.9			N/A	N/A	N/A	N/A	N/A
0034444	McKee STP	N/A	N/A	N/A	N/A	N/A	30		
0072885	Middlesboro WWTP		9		N/A	N/A		4	
0028410	Midway STP	23.25			N/A	N/A	N/A	N/A	N/A
0020940	Millersburg WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0088625	Milton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0069736	Montgomery S.D. #2	16.5			N/A	N/A	N/A	N/A	N/A
0033847	Monticello WWTP		12.5		N/A	N/A	8.5		
0052752	Morehead WWTP		10		N/A	N/A	3		
0021440	Morganfield STP		12		N/A	N/A	N/A	N/A	N/A
0021024	Morgantown STP	25			N/A	N/A	N/A	N/A	N/A
0022411	Morris Forman WWTP	15.6			N/A	N/A	N/A	N/A	N/A
0020044	Mt. Sterling WWTP	0			N/A	N/A	17		
0024694	Mt. Vernon STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0033804	Mt. Washington STP		15		N/A	N/A	N/A	N/A	N/A
0036510	Muddy Fork STP MSD								
0031755	Munfordville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0072761	Murray Municipal Util.	N/A	N/A	N/A	25		None		
0031828	New Castle WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0034126	New Haven STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020036	Nicholasville WWTP		26.1		N/A	N/A	N/A	N/A	N/A

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Landfill Tipping Fee ($/ton)	Landfill Tipping Fee ($/yd^3)	Landfill Tipping Fee ($/gal)	Landfarm Cost ($/ton)	Landfarm Cost ($/gal)	Transport Cost ($/ton)	Transport Cost ($/yd^3)	Transport Cost ($/gal)
0031836	North Middletown STP								
0066583	Nortonville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0094056	Oak Grove STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025925	Olive Hill STP	50 plus dumping fee					N/A	N/A	N/A
0073377	Owensboro East WWTP	10			N/A	N/A	N/A	N/A	N/A
0020095	Owensboro West WWTP	10			N/A	N/A	N/A	N/A	N/A
0028312	Owenton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024287	Owingsville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022799	Paducah STP	26.5			N/A	N/A	4		
0020630	Paintsville STP	35			N/A	N/A	10		
0090654	Paris STP		7.5		N/A	N/A	N/A	N/A	N/A
0028703	Parklake STP	N/A	N/A	N/A	N/A	N/A			0.055
0024813	Pembroke STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028355	Perryville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025291	Pikeville WWTP	22.9			N/A	N/A	N/A	N/A	N/A
0024058	Pineville STP	100/load					155/load		
0027413	Prestonsburg WWTP	10			N/A	N/A	15		
0028401	Princeton WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0029106	Prospect STP North&South H. Cr	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021296	Providence STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022390	Radcliff WWTP		17		N/A	N/A	N/A	N/A	N/A
0022845	Richmond Dreaming Creek WWTP	15			N/A	N/A		2.5	
0022853	Richmond Tates Creek WWTP		15		N/A	N/A		2.5	
0020877	Russellville STP	5.89			N/A	N/A	N/A	N/A	N/A
0091731	Sacramento STP								
0081868	Sadieville STP*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0066541	Salem STP	26.25			N/A	N/A	N/A	N/A	N/A
0026867	Salyersville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0052264	Sandy Hook STP	N/A	N/A	N/A	125/year		N/A	N/A	N/A
0094447	Science Hill STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024783	Scottsville WWTP	29.7				0.06			0.03
0021148	Sebree STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0088421	Sharpsburg STP	25/load			N/A	N/A	N/A	N/A	N/A
0020427	Shelbyville STP		14		N/A	N/A		3.08	
0027359	Shepherdsville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0065889	Simpsonville STP		15		N/A	N/A	N/A	N/A	N/A
0025836	Smithland STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0026611	Somerset STP		9.25			0.02			0.02
0026131	South Shore STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0077801	Southern Campbell Co. Ind Pk								

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Landfill Tipping Fee ($/ton)	($/yd^3)	($/gal)	Landfarm Cost ($/ton)	($/gal)	Transport Cost ($/ton)	($/yd^3)	($/gal)
0020907	Springfield STP	6.4			N/A	N/A	N/A	N/A	N/A
0050512	Stamping Ground STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024619	Stanford STP	60/load			N/A	N/A	N/A	N/A	N/A
0034428	Stanton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025895	Sturgis WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0055271	Symsonia STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0040143	Taylorsville STP	N/A	N/A	N/A	N/A	N/A			0.1
0020702	Tompkinsville WWTP		13.1		N/A	N/A		7	
0021491	Town Branch WWTP	23.25			N/A	N/A	7.5		
0020982	Trenton STP	N/A	N/A	N/A		0.008	N/A	N/A	N/A
0025844	Uniontown STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022039	Valley Creek(Elizabethtown)WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0021512	Vanceburg WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0020621	Versailles WWTP	N/A	N/A	N/A	104		Included		
0060259	Vicco STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0024988	Vine Grove WWTP	N/A	N/A	N/A		0.02	N/A	N/A	N/A
0039756	Walton STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028118	Warsaw STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0078956	West County STP MSD								
0021504	West Hickman Creek WWTP	N/A	N/A	N/A	125		7.5		
0089567	West Liberty STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022152	West Point STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0079332	Wheelwright Lower Burton STP								
0028789	Wheelwright STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0023183	Whitesburg STP	25			N/A	N/A	cityhauls		
0054941	Whitesville STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025933	Wickliffe STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028347	Williamsburg STP	50			N/A	N/A	N/A	N/A	N/A
0021008	Williamstown WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0028428	Wilmore WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0037991	Winchester STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0025852	Wingo STP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0022926	Worthington WWTP	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
0033553	Wurtland WWTP	15			N/A	N/A	N/A	N/A	N/A

Table A-6. Survey Respondent Comments and Contacts

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Other Comments	Contact Name	Contact Phone#
0020885	Adairville WWTP	Analysis is included with survey	Russell Law	5025398661
0024295	Albany STP	Give away program too limited; state should oversee plant construction	Kenneth Hestand	6063878358
0029548	Arlington STP	All sludge placed on plant property	Bobby Gifford	5026552261
0022373	Ashland Environmental Control		Gary Sheffield	6063272064
0021202	Auburn STP	Can get better turnover with landfarming as compared to landfilling	Robert Galvin	5025424475
0021261	Augusta STP		Estill Smith	6067562183
0039021	Bancroft STP		Frank Wethington	5029573360
0024082	Barbourville STP	Plant has sludge pond, no sludge problem,no other disposal method needed	Wayne Moore	6065468211
0021237	Bardstown WWTP	All sludge holding in lagoons, have not handled sludge since opening	Jerry Riley	5023486723
0020915	Bardwell STP	New drying beds,very little sludge produced;good give away program	Michael Hoskins	5026283833
0025747	Barlow STP		Dale Brice	5023343500
0021121	Beattyville STP	New plant is being built in 1994	Delbert Brandenburg	6064645033
0023191	Beaver Dam STP		Wendell Spencer	5022747106
0069825	Bedford STP	No sludge disposal since 1983;3 lagoons(3.8 acre total),8' sludge 1993	Jim Jennings	5022553684
0025755	Benham WWTP	Dry about 3 tons of sludge/year, have success with giveaway program	John Wigington	6068485506
0021172	Benton STP	Efficient lagoon system, is upgraded periodically	Danny Lane	5025278677
0079898	Berea STP	No actual landfarming experience;reviewing several options to landfills	Donald D. Blackburn	6069862341
0036501	Berrytown STP MSD			
0034436	Bloomfield STP		Ben Long	5022528222
0033774	Booneville STP	17.5 dewatered yd^3 are dried on beds at Jackson STP	Jolly Cooper	6065935281
0022403	Bowling Green WWTP	PFRP by N-VIRO soil process;Metals analysis also included w/survey	Charles Maxwell	5027824389
0041190	Boyd & Greenup Co. SD #1	Landfarming requires too much paperwork; give away works well in spring	Steve Bryan	6063250204
0090719	Bradfordsville STP		Shelton Wyser	5023372085
0021474	Brandenburg WWTP	City is building new activated sludge lagoon plant, 95% complete	Thomas M. Curl	5024224981
0047431	Brodhead STP	Have good give away program - used on pasture land	Carlos Caldwell	6067589866
0025232	Brooksville STP	Small amount of sludge is recycled back into the plant	Eddie Mofford	6067352501
0023396	Brownsville STP*		N/A	5025973814
0036854	Burkesville STP	Likes the process of landfarming, may consider a give away program	Steve Capps	5028644141
0021041	Butler STP	Landfarming site closed due to metals	Keith Hendricks	6066545521
0026891	Cadiz STP	Landfarming not financially feasible, too many restrictions	Carrie Darnell	5025226138
0020125	Calhoun WWTP		David Abrams	5022733210
0021130	Calvert City STP	2 cell lagoon, 12' deep, 6-8' sludge accumulation, no sludge removed	Jerry Devine	5023954020
0021466	Campbell Kenton SD#1 Dry Creek	PFRP method is thermal conditioning (also dewatering process)	James Curry	6063312400
0028321	Campbellsburg STP		Peggy Bush	5025326050
0054437	Campbellsville STP	Local opposition to landfarming, permit pending at DWM	Paul Johnson	5024658376
0026069	Campton STP	Have give away at plant, trying to get permit	Garrett Deniston	6066683574
0042854	Caney Creek W.D. Pippa Pass	Sludge cleaned in final clear well-sometimes dispose it themselves	Gary Perry	6063682101
0072044	Caneyville STP		Kevin Shaw	5028799701
0020923	Carlisle WWTP	PSRP requirements met by mixing and adding oxygen	Gene Kelley	6062893713
0020265	Carrollton Util. STP	Keeping up with paperwork makes landfarming difficult	Paul Alexander	5027327065

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: 'N/A' indicates item not answered

KPDES #	Facility Name	Other Comments	Contact Name	Contact Phone#
0035467	Catlettsburg WWTP	All sludge stored in digester; in process of updating facility	Fred Childers	6067395145
0091561	Caveland Sanitation Auth.	Currently studying give away program; averages are from 2 plants at site	David Peterson	5027732887
0071854	Centertown WWTP	Paperwork has prohibited changing to landfarming	Randy Renler	5022325067
0023540	Central City STP	Interested in composting	Jim Brown	5027543066
0090590	Clarkson STP		Carroll Klimlins	5022429442
0025119	Clay City STP	New plant - sludge data not available yet	Gary Carmichael	6066632224
0028096	Clay Lagoon	Have 3 cell lagoon system, no sludge disposal as of this time	Johnnie Smith	5026642444
0025275	Clinton STP	Have 4 lagoons, no noticable increase in sludge blanket depths	Bob Yates, Jr.	5026533621
0026701	Cloverport STP	No sites available for landfarming	Kathy McCoy	5027886632
0024317	Columbia STP	Sinkholes in area make landfarming difficult; have sludge holding tanks	James Murphy	5023843371
0020133	Corbin WWTP	Polymer added to sludge	Lucian G. Muncy	6065284040
0065897	Crab Orchard WWTP	Sewage recirculated every month/discharged into Dix River twice/year	Daniel Neeley	6063557111
0091634	Crittenden STP		Mike Dooley	6064282597
0066591	Crofton STP	Has 3 cell lagoon system - no sludge removed as of this time	Herbert Durham	5024248111
0021571	Cumberland STP	No info. provided for survey	Robert Stearman	6065894022
0023370	Cynthiana STP	Landfarming/Ben. reuse requires too much paperwork, too many regulations	Omer Murphy	6062347156
0057193	Danville STP	9500 gal/day sent to landfill(40%solids), 18000 gal/day landfarmed(2.5%)	Charles Elliot	6062381240
0023868	Dawson Springs STP	Would like to have a give away program if it could be simplified	Kenneth Menser	5027972844
0066575	Drakesboro STP		Denny Bevil	5024768986
0027979	Eddyville STP	Interested in most cost effective sludge disposal option	George Crady	5023882226
0028100	Edmonton STP	Very small amount of sludge produced, placed in holding tank	Malcolm England	5024324844
0020958	Elkhorn City STP	No sludge disposal,all in digester,will use another plant's belt press	Terry Taylor	6067545080
0023442	Elkton STP	Landfarming would require additional testing costs	Bruce Scott	5022655703
0026883	Eminence STP	*Will have lagoon system in future to handle larger flows	William Smith	5028454159
0095940	Estill Co. Water Dist. STP		Everett Murphy	6067233795
0073091	Evarts STP	Harlan Co. hauls sludge to landfill in Corbin	Ron King	6068372477
0021482	Falmouth WWTP		Keith Hendricks	6066545521
0053562	Fancy Farm Water Dist. STP	2 cell lagoon system, sludge pits (w/sand) work well, no sludge removal	Thomas Wilson	5026236376
0027405	Fleming Neon STP	Give away to strip mines, need more drying capacity on beds	David Maggard	6068324913
0021229	Flemingsburg WWTP	Septage sent to digestion process (bypasses primary/sec. treatment)	Dale Clary	6068455711
0054801	Fordsville STP	2 lagoons,0.7 acres each,8 ft.deep, 2-3" sludge, operating since 1983	Bob Armes	5022765268
0022861	Frankfort WWTP	Problems of landfarming are odors and paperwork	Robert L. Oerther	5028752448
0027456	Franklin STP	Currently landfarming on Carter Farm, Simpson County;rents sludge press	Bobby Forshee	5025867944
0040584	Frenchburg STP		Ed Bryant	6067683457
0026913	Fulton STP	Plant has 2 Cell lagoon system, sludge is not removed from plant	Richard Tidwell	5024722434
0095257	Gamaliel WWTP	NOT IN OPERATION UNTIL AUGUST 1, 1993	Thelma Anderson	5024572901
0020150	Georgetown WWTP No. 1	Plant will change to orbal oxidation ditch with grit collection	Donald W. Short	5028637861
0082007	Georgetown WWTP No. 2	Have discussed composting; Toyota Motor Manu. is only customer for plant	Donald W. Short	5028637861
0096890	Ghent STP	NOT IN OPERATION AT THIS TIME		
0021164	Glasgow STP #2	Are currently landfarming	Larry Estes	5026784283

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NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Other Comments	Contact Name	Contact Phone#
0044261	Glenview Bluff STP MSD			
0020931	Grayson WWTP	Sludge is disposed at Addington Environmental for composting	Carlos Stephens	6064746840
0096881	Green Co. S.D. #1	NEW PLANT - NOT IN OPERATION AT THIS TIME	Rick Moon	5029327091
0023841	Greensburg WWTP	Plant will be closed by July and will move into new plant	Eddie D. Wright	5029324298
0048348	Greenup Co. Environmental Comm.	Uses polymer mix to drying beds as dewatering method	O.C. Tackett	6068364600
0026450	Greenup STP	Too many regulations on landfarming; new operation in place at plant	Neal Wright	6064737831
0020010	Greenville STP	Determined that landfarming is a cost effective method of disposal	Steve Quisenberry	5023385260
0063649	Guthrie WWTP	Land owners won't fill out paperwork on landfarming	Tommy L. Mackey	5024832860
0066532	Hammond Wood STP Hopkinsville	Landfarming requires too much paperwork	Raymond Hamby	5028874250
0021016	Hardin STP	Landfarming too expensive - tertiary treatment involves wetland cells	Eddie Washam	5024374361
0028363	Hardinsburg WWTP		Paul B. Danheiser	6062238000
0026093	Harlan STP	Give away program still too small	Jerry Hatmaker	6065735833
0027421	Harrodsburg STP	Hard to find acceptable land for landfarming	Elizabeth Votaw	6067342113
0025798	Hartford STP	2 lagoons, 3-5' deep, 5 acres each, 2' sludge accumulation, no disposal	Leon Gary	5022983101
0020087	Hawesville STP	Sludge in lagoon needs cleaning	Gerald Voyles	5029276282
0020079	Hazard STP		Albert Moore	6064365522
0028371	Hazel STP	Would consider landfarming, if we can get permit	Freddie O'Brian	5024928857
0020711	Henderson WWTP	Average total costs for collected septage is $ 22,260 per year	Michael Skaggs	5028279588
0028436	Hickman East Lagoon	No information due to new plant modifications	Charles Potty	5022362535
0039764	Hickman West Lagoon	No information due to new plant modifications	Charles Potty	5022362535
0027685	Hindman STP	Sludge is delivered to strip mine for reclamation	Michael Webb	6067855544
0022420	Hite Creek STP MSD			
0026379	Hodgenville POTW	Public awareness of landfarm/ben. reuse needed	John A. Cupit	5023588521
0023388	Hopkinsville STP		Raymond Hamby	5028874250
0021245	Hyden STP	Sludge is hauled and spread by city	Kenny Wilson	6066722300
0079316	Inez STP*		Charles Muncie	6062984602
0025909	Irvine STP	Plant has results of sludge metals and pollutant survey for 1991	Lander Stevens	6067232343
0092436	Irvington STP		Robert Board	5025473835
0066605	Island WWTP		Ronald G. Trimble	5024869967
0021288	Jackson STP		John Collins	6066665197
0062995	Jamestown STP		Harold Snodgrass	5026954357
0025194	Jeffersontown STP MSD			
0038571	Jenkins STP		Rufus Stanley	6068324421
0033791	Kevil STP	Please see note on original survey for further information	Laurie Kerykendall	5024623104
0020419	Kuttawa STP		Mark Riley	5023887151
0020893	Lacenter STP	2 treatment lagoons, 6 yrs. old, no sludge removed yet	Howard Graves	5026655162
0020001	LaGrange STP	Used landfarming but travel and regulations made it not beneficial	Roy M. Horton	5022229325
0027227	Lake City STP		N/A	5023628221
0020974	Lancaster STP	Landfarming costs are too high	Millard Rose	6067922162
0021067	Lawrenceburg WWTP	Has had a very good experience with landfarming	Ron McClellan	5028397853

Kentucky Wastewater Sludge Survey 1993-1994
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KPDES #	Facility Name	Other Comments	Contact Name	Contact Phone#
0040851	Lebanon Junction STP		Jim Lucas	5028334311
0026549	Lebanon STP	Too many laws governing landfarming, would like a give away program	Sam Beard	5026926202
0022934	Leitchfield WWTP		Bill Lush	5022593311
0024881	Lewisburg STP	System is small,sludge must be digested completely, no sludge problem	John Spivey	5027554805
0025241	Lewisport STP	Landfarming permit difficult to obtain,landfilling more cost efficient	Wayne Hodskins	5022953324
0020613	Livermore WWTP	Metals have been found to be too high for landfarming	Ronald Dame	5022782113
0040703	Livingston STP		N/A	6064533141
0021270	London WWTP	Landfarming for 12 yrs.,good results,few negatives; Analysis with survey	Buster Long	6068647611
0027961	Louisa STP	Sludge sent to Addington Environmental, costs are half of landfill costs	Don Wellman	6066389879
0026115	Loyall STP	No problems with landfarming due to clean sludge	Clifford Lane	6065736396
0024279	Lynch STP		Danny Whithead	6068482147
0022942	Madisonville WWTP	PSRP requirements met using ultraviolet treatment	Ronald R. Johnson	5028242120
0029122	Manchester Water and Sewer	Have 98% give away program for sludge, very successful;analysis included	John Kelly	6065981851
0020061	Marion, City of	Price quotes should be obtained from City Treasurer's Office	Don Tinsley	5029652525
0024546	Marshall Co. SD #1	Septage numbers involve holding tank waters only	Thomas Harrington	5024749736
0026921	Martin STP*		Bill Hackworth	6062853332
0021211	Mayfield POTW	Septage quantity is septic tank waste	Daniel H. Rogers	5022471506
0020257	Maysville STP	No tipping fee, sludge is mixed with fly ash at landfill	Joel Eachus	6065642514
0025828	McCracken Co. SD #4 Woodlawn	Have 2 stage waste stab. lagoon & UV disinfection-survey does not apply	Shirley Hunt	5024433682
0025810	McCracken Co. SD#3 Reidland		Kevin Davis	5028982443
0034444	McKee STP	Have good give away program,new expansion - no sludge data available	Bill Lynch	6062877052
0072885	Middlesboro WWTP	No experience with landfarming, but shame to bury something beneficial	Arville Anderson	6062487625
0028410	Midway STP	Exploring landfarming, waiting on report from EPA on 503 regs.	Bruce Southworth	6068464114
0020940	Millersburg WWTP	Extended aeration;through modifications, able to meet tertiary limits	Jim W. Ferguson	6064843946
0088625	Milton STP	Landfarming has not been a problem due to remote location of farm	Danny Purvis	5022685267
0069736	Montgomery S.D. #2	Filling out landfarming permit now	Wayne Munday	6064984954
0033847	Monticello WWTP	No experience with landfarming, Leroy Mikel holds license #000173	David L. Edwards	6063488230
0052752	Morehead WWTP	Have landfarming application,regulation changes make method difficult	Bob Williams	6067831502
0021440	Morganfield STP	Trying to landfarm around plant property - too much paperwork	John Coffman	5023891695
0021024	Morgantown STP	Regulations too restrictive on landfarming	Randall Gaskey	5025263623
0022411	Morris Forman WWTP	Landfarming too expensive compared to landfill cost	Richard Hutchison	5025406000
0020044	Mt. Sterling WWTP	Have landfarmed, but now landfilling because of costs	Joe Wilson	6064981988
0024694	Mt. Vernon STP	Have a good give away program	Tyree Gray	6062564150
0033804	Mt. Washington STP		Barry Gentry	5025384781
0036510	Muddy Fork STP MSD			
0031755	Munfordville STP	Landfarming requires too much paperwork	Robert Logsdon	5025245701
0072761	Murray Municipal Util.	Expanding to 5.25 MGD;landfarming for 9 yrs.;metals results included	J.L. Barnett	5027620330
0031828	New Castle WWTP		Tommy Benham	5028455750
0034126	New Haven STP	No industries in area, very small to no sludge produced	Tim Bartley	5025493177
0020036	Nicholasville WWTP	Dewatering methods consist of belt filter press and drying beds	Charles D. Wise	6068851121

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KPDES #	Facility Name	Other Comments	Contact Name	Contact Phone#
0031836	North Middletown STP			
0066583	Nortonville STP	Sludge settles to the number of No.1 Lagoon, on 20 year removal plan	David K. Crick	5026768637
0094056	Oak Grove STP	Built in 1992, will landfill sludge in future	Ace Davies	5024393710
0025925	Olive Hill STP	Undergoing new expansion at plant; would like to use landfarming	Rick Bledsoe	6062862930
0073377	Owensboro East WWTP	Sludge and Septage info. provided for both plants	David W. Hawes	5026878440
0020095	Owensboro West WWTP	Sludge and Septage info. provided for both plants	David W. Hawes	5026878440
0028312	Owenton STP	1 lagoon, 1.8 acres, 20 ft deep, 10" sludge, operation since 1989	Craig Howard	5024843138
0024287	Owingsville STP	No sludge removed from lagoons since 1987 startup	Don Humphries	6066746660
0022799	Paducah STP	City has begun process to be permitted to compost sludge w/yard waste	Kevin L. Murphy	5024448655
0020630	Paintsville STP		Keith Fairchild	6067892635
0090654	Paris STP	Weather causes problems for landfarming	Gayle Guy	6069872116
0028703	Parklake STP		Jack Woolford	5022285240
0024813	Pembroke STP	Artificial wetlands used, will hook into Hopkinsville	Gene Cansler	5024754343
0028355	Perryville STP	3 cell lagoon,old rock quarry,started in 1991,15' deep, no disposal	Robert Riley	6063327682
0025291	Pikeville WWTP	Having problems finding land in Pike Co. for landfarming	Jeffrey T. Greer	6064375121
0024058	Pineville STP	No available land for landfarming	Don Dooley	6063376614
0027413	Prestonsburg WWTP		Bill H. Howard	6068866871
0028401	Princeton WWTP	Use lime stabilization for PSRP;will increase to 1.5 MGD by next year	Virginia G. Routen	5023655276
0029106	Prospect STP North&South H. Cr	RECEIVED ONE SURVEY FOR THREE(??) PLANTS;sludge should be used on land	W.W. Smither	5024562110
0021296	Providence STP	New plant, operating since last year; use reclaimed land for landfarming	Anita Gardner	5026679277
0022390	Radcliff WWTP	Metals analysis included with survey	Julia Cann	5023516466
0022845	Richmond Dreaming Creek WWTP	Alternative methods for primary disposal prove to be too costly	David McCord	6066232323
0022853	Richmond Tates Creek WWTP		David McCord	6066232323
0020877	Russellville STP		Jane Kissbaugh	5027265037
0091731	Sacramento STP	No significant sludge information yet available - new plant	Choyce Barnett	5027365274
0081868	Sadieville STP*		N/A	5028574576
0066541	Salem STP		Doug Slayden	5029882600
0026867	Salyersville STP	Due to location, hard to find suitable site for landfarming	Robert Howard	6063493643
0052264	Sandy Hook STP		David Dennis	6067386489
0094447	Science Hill STP	Plant recently put into operation,low flow and minimal sludge production	Joe Edwin	6064232165
0024783	Scottsville WWTP	Awaiting approval for landfarming	Otis E. Perry, Jr.	5022373396
0021148	Sebree STP		Emory Thomas	5028357501
0088421	Sharpsburg STP		Steve Trepak	6064980166
0020427	Shelbyville STP		Tom Doyle	5026334548
0027359	Shepherdsville STP	Total disposal cost to Morris Forman is $58/1000 gallons	Jeff Wolfolk	5025437339
0065889	Simpsonville STP		Tony Ellis	5027225105
0025836	Smithland STP	1 cell lagoon,6.7 acres,5 ft.deep,no sludge removed in 20 years	Bill Downs	5029282446
0026611	Somerset STP	Using landfarms for surface application&landfill for dry.bed sludges	Joseph B. Brinegar	6066784951
0026131	South Shore STP	Liability too high in landfarming - new plant, no sludge information yet	Lou Bentley	6069326144
0077801	Southern Campbell Co. Ind Pk		Gill Lynn	6062923880

Kentucky Wastewater Sludge Survey 1993-1994
NOTE: "N/A" indicates item not answered

KPDES #	Facility Name	Other Comments	Contact Name	Contact Phone#
0020907	Springfield STP	Landfarming laws are always changing	Thomas Osborne	6063365457
0050512	Stamping Ground STP	Tertiary treatment not in use due to bad design by engineering firm	Jeff Thompson	5025356114
0024619	Stanford STP	Had landfarming permit but lost it due to owner leasing out farm	Alan De Shon	6063654505
0034428	Stanton STP	Landfarming requires a lot of paperwork; will mail results and answers!!	Gloyd Lee	6066636494
0025895	Sturgis WWTP	All sludge stays on site, no industrial discharge to plant	Tony Collins	5023332166
0055271	Symsonia STP	Equipment costs and amount of paperwork make landfarming unattractive	Jim Waid	5028514470
0040143	Taylorsville STP	In process of building lagoon system; Need alternatives to landfilling	Ann Razor	5024773235
0020702	Tompkinsville WWTP	Landfarming permit difficult to get, currently seeking landfill	Randall Hagan	5024878410
0021491	Town Branch WWTP	Producing N-VIRO soil and using as daily landfill cover	Silas B. Mason	6062583460
0020982	Trenton STP	Landfarming works well	Joe Sandifur	5024663332
0025844	Uniontown STP	3 stage lagoons,26 acres total, 6ft.deep, operating since 1973	John Stevens	5028229118
0022039	Valley Creek(Elizabethtown)WWTP		Brian Wren	5027377733
0021512	Vanceburg WWTP	Sludge is stock piled now, plan to use Maysville landfill for disposal	Willard Burriss	6067963034
0020621	Versailles WWTP	Landfarmed for 30 years, permitted for last 9	Jerry Campbell	6068733624
0060259	Vicco STP		Dean Feltner	6064762414
0024988	Vine Grove WWTP	Currently utilize landfarming for sludge disposal	William R. Miller	5028772500
0039756	Walton STP		Brent Henson	6063316674
0028118	Warsaw STP	1 of 3 lagoons in operation, 5 years in service, 6' deep	Eric Moore	6065675937
0078956	West County STP MSD			
0021504	West Hickman Creek WWTP	N-VIRO soil mixed 50/50 with clay and used as daily landfill cover	Silas B. Mason	6062583460
0089567	West Liberty STP	In process of applying for landfarm permits	Steve Phelpy	6067434129
0022152	West Point STP	Have 2 drying beds,1 only 1/3 full,other empty; no sludge disposal yet	Vernon Curle	5029224260
0079332	Wheelwright Lower Burton STP			
0028789	Wheelwright STP	New plant - no sludge produced yet	Gary McCoy	6064524266
0023183	Whitesburg STP	Wants to have give away program	Steve Taylor	6066333710
0054941	Whitesville STP	2 aerated lagoons,0.7 acres each,10-18" sludge 1st lagoon, no disposal	Rich Thompson	5022335666
0025933	Wickliffe STP	2 Lagoons,26 acres total,5 ft deep, no sludge removed, opened 1979	Kurt Alderson	5023353557
0028347	Williamsburg STP	Is having engineers to check on landfarming permit	G.F. Pruwitt	6065496039
0021008	Williamstown WWTP	Extended period before putting sludge in digesters satisfies PFRP	Brian Gatewood	6068244176
0028428	Wilmore WWTP	Positive landfarming experience, some public acceptance problems	Mark Dock	6068584251
0037991	Winchester STP	Using alkaline stabilization,expanding landfarming and plant	Van Bugg/T.M.Wilmoth	6067443031
0025852	Wingo STP	1 lagoon, 7acres, 15' deep, 30 years in service, no sludge disposal	Tim Nucholls	5027538325
0022926	Worthington WWTP	No sludge disposal in 3 years - no current sludge data	Joseph S. Moore	6068367806
0033553	Wurtland WWTP	Addington Resources are used in making compost;see CTI for analyses	W. Larry Hanks	6068365212