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Joint Study Committee on Sludge

FINAL REPORT

HOUSE RESEARCH OFFICE
GEORGIA HOUSE OF REPRESENTATIVES

Committee Members

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Representative, District 128

Honorable Lynmore James
Representative, District 140

Honorable Curtis Jenkins
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Senator, District 36

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Senator, District 3

Table of Contents

Background

Sewage sludge is currently defined in Georgia law as "the solid or semisolid residue generated at a wastewater treatment or pretreatment plant." The term does not include the effluent from the plant which is released after treatment; sludge is, in fact, the pollutants and solid matter which are removed from wastewater in the treatment process.

Sludge is disposed of in many ways in Georgia. It may be landfilled or monofilled; it may also be incinerated. Recent trends in environmental protection have encouraged the "beneficial reuse" of wastewater treatment plant sludges. These beneficial reuses involve applying sludge to land or agricultural crops in some way. It may be directly applied to the land or injected underneath the surface. Sludge may also be dewatered, heat treated, or pelletized in order to assure easier marketability. Finally, sludge may be composted with other organic materials, a process that further reduces the pathogens that may be contained in the sludge, as well as rendering it less pungent in smell.

Although land application of wastewater treatment plant sludge has been a standard practice in Georgia for some years, it is only recently that it has begun to generate considerable controversy. The most recent controversy concerned the City of Macon Water Authority and a land application project it has planned in neighboring Crawford County. When the Macon Water Authority purchased 4500 acres of farmland in Crawford County with the intention of turning it into a designated land application site, the citizens of Crawford County rebelled against the notion of accepting waste from a larger, more industrialized county.

House Bill 1280, introduced in the 1992 legislative session, attempted to address this problem. This bill would have prohibited the storage, discharge, or disposal of sludge in any county other than the county in which it was generated, unless the governing authority of the accepting county issues its approval. Assigned to the House Natural Resources Committee, the bill was never placed on the committee's agenda and died at the end of that session.

By the time of the 1993 session of the General Assembly, the Macon Water Authority had begun land application projects in several other counties, including Houston County, home of House Majority Leader Larry Walker. Representative Walker and Representative Robert Ray, who represents Crawford County, joined forces with representatives of the other affected counties, and together they introduced HB 228 in the early days of the 1993 session. Although the bill was originally written to allow counties to refuse to accept sludge generated outside their boundaries, this provision was deleted from the final version of the bill. As passed, the bill provides authority to a local jurisdiction in which a sludge land application site is located to assess fees for

environmental monitoring of the site. The fees may be assessed by the local authority against both the generator of the sludge and the owner of the land application site. The local government is implicitly given authority to determine a "reasonable" fee. Payment must be made in advance; failure to do so is grounds for an injunction to halt the activity. In its definition of "sludge," the bill specifically excludes sludge that is further treated by composting or heat treating. Anyone operating a sludge land application must also secure EPD approval prior to beginning. The bill also requires the Board of Natural Resources to adopt technical regulations for sludge land application and procedural regulations for approval of land application systems. Finally, the bill provides for civil and criminal penalties for violations of board regulations or permit requirements.

On the same day that HB 228 was introduced, its three primary sponsors also introduced House Resolution 66. It also passed during the 1993 session. This resolution created the Joint Study Committee on Sludge, to be composed of three members of the House of Representatives and three members of the Senate. As charged in the resolution, the committee was to study the latest technological advances in the disposal and use of sludge and the environmental impact of the various methods of disposal and uses.

This report documents the activities, findings, and recommendations of that study committee.

State and Federal Regulations

State Regulations

Sludge disposal is largely regulated through water pollution control permits issued by the Georgia Environmental Protection Division. HB 228 regulates only land applications. EPD is currently in the process of seeking authority from the federal EPA to manage the nationally mandated sludge program outlined in 40 CFR Part 503, otherwise known as the 503 rule. The provisions of the 503 rule are outlined below.

New state regulations, now out for public comment, will incorporate the federal regulations. A hearing on these regulations has been set for January 10 ,1994. These proposed state regulations are a little stricter than the federal 503 rule. Some industrial generators come under state regulations that would not be included under federal regulations.

Sludge composting, if conducted by a party who did not generate the sludge, is regulated by the land protection branch of EPD through a solids handling permit. If the municipal wastewater treatment plant composts on site, it is regulated by the Water Protection Branch of EPD through water pollution control permits. If the composted material is to be used as fertilizer, it is also regulated by the Department of Agriculture.

Federal Regulations

The federal regulations governing sewage sludge were issued in November, 1992, and appear in 40 CFR Part 503.

According to EPA figures, the new regulations will apply to approximately 7,500 publicly owned treatment plants, 1,700 privately owned and federal plants, and nearly 6,000 septage haulers. These regulations set the minimum requirements; states and local governments may impose stricter standards if they chose.

The rule addresses three types of sludge management practices: land application, surface disposal, and incineration.[1] In addition, the rule includes sections setting standards for reduction of pathogens and vector (flies, rodents, etc.) attraction reduction; procedures to determine annual application rates; and pathogen treatment processes. The rule does not establish requirements for industrial wastewater facilities, incinerator ash, drinking water treatment sludge, or commercial and industrial

[1] This summary of the 503 regulation is largely borrowed from an article written by Frank Post of the Water Environment Federation. Publication unknown, provided by Wayne Walkip.

septage. In most cases, the rule is self-implementing, meaning it can be enforced against violators whether or not they have been issued permits.

Land Application: The land application provisions apply to liquid and dewatered sludge, composted sludge, and chemically stabilized sludge. Acceptable management practices are delineated; sludge may not be applied to flooded, frozen, or snow-covered fields. A ten-meter barrier must exist between the sludge application site and any body of water. Treatment plants must have sludges analyzed at least once annually, with actual monitoring frequency to be determined according to annual sludge production. Plants producing less than 290 metric tons per year will be monitored annually; plants producing 290 to 1,500 metric tons will be monitored quarterly; those producing between 1,500 and 15,000 metric tons per year will be monitored six times per year; and production of over 15,000 metric tons per year will require monthly analysis. Ten targeted heavy metals have pollutant levels listed for ceiling concentrations, cumulative pollutant loading rates, annual pollutant loading rates, and pollutant numerical requirements for clean sludge.

Surface Disposal: This section of the rule provides requirements for landfilling sludge in lined or unlined monofills (sludge-only landfills). Only three metals--arsenic, chromium, and nickel--have listed concentration limits. The rule also requires a 150 meter buffer zone from the property line boundary of the disposal site. Limits on management practices include:

- No adverse impact to endangered species or their habitats.
- No impact on wetlands or flood plains; no location on fault lines.
- Run-off collection systems must be operated and maintained.
- Monitoring frequency is the same as for land applications, with additional air monitoring required at the site and at the property line boundary.

Incineration: This regulation covers only the burning of sewage sludge alone; it does not regulate hazardous sludge or facilities burning sludge and solid waste together. Pollutant limits are placed on beryllium and mercury; lead is also evaluated on a daily average. Daily concentrations for arsenic, cadmium, chromium, and nickel are evaluated in the daily sludge feed. A limit of 100 parts per million for hydrocarbons has been established in the exit gas. The frequency of monitoring is the same as for land application and surface disposal.

Pathogen and Vector Attraction Reduction: This section of the rule explains how sludge is classified as either Class A or Class B in relation to pathogens.. Class A sludges have a high degree of treatment and pathogen numbers are very low. A list of practices to attain Class A--Processes that Further Reduce Pathogens--is included. Class B pathogen reduction practices--Processes that Significantly Reduce

Pathogens--are site management requirements, such as limitations about crop harvesting, public access, and animal grazing.

Vector Attraction Reductions must be met for both Class A and Class B sludges. This may be accomplished by obtaining a 38 percent volatile reduction with either anaerobic or aerobic digestion.

Meetings, Hearings and Activities

First Meeting--September 28, 1993--Atlanta, Georgia

At its first meeting, held at the state capitol, the committee was addressed by a number of individuals representing many different interest groups, including a number of private citizens concerned about sludge disposal practices in their communities.

Environment: Several officials of Georgia's Environmental Protection Division were present at the meeting, including Harold Reheis, the director of EPD, and Alan Hallam, chief of the Water Protection Branch. Mr. Reheis, noting that better information is available for municipal wastewater treatment facilities than for industrial pretreatment facilities, presented the committee with a fact sheet on sludge generators. (See the "Issues and Findings" section in this report.) Mr. Reheis also provided the committee with a complete list of the major municipal facilities, including their methods of disposal and the amounts of sludge removed per day. (See "Appendix A" in this report.)

Agriculture: Both Dr. William Segars of the University of Georgia Cooperative Extension Service and Ron Conley, Assistant Commissioner of the Plant Industry Division of the Georgia Department of Agriculture, addressed the committee on the use of sludge as a nitrogen resource and the need, as with commercial fertilizers, for proper agricultural application. Mr. Conley also noted that if sludge is to be used agriculturally, it must meet USDA requirements.

Private citizens: Numerous private citizens also attended the meeting and voiced their concerns about sludge disposal. Several residents of northwest Atlanta noted problems with the R. M. Clayton wastewater treatment plant, which treats approximately 100 million gallons of wastewater per day and incinerates most of the sludge in an on-site incinerator. This incinerator has been blamed for numerous environmental problems in the area, including high levels of lead in the soil. All residents urged the committee to find new ways to ensure that industrial wastewater and its inherent contaminants are not mixed with the more benign municipal sewage. Only then will the sludge be considered safe for beneficial reuse.

Commercial interests: Mr. Earle Vick of ERTH Group, Inc., also addressed the committee to explain his sludge composting business. Now producing 200 tons per day, Mr. Vick's facility in Plains, Georgia, has a permitted capacity of 500 tons per day. He hopes to expand to meet demand of 1,000 tons per day. Mr. Vick also distributed information packets regarding his facility and the product produced there. This information is detailed more specifically in the section of this report dealing with the November 11th meeting and tour of his plant.

Sludge generators: Last to address the committee was a member of the sludge generating community, Mr. Wayne Waldrip assistant superintendent of the City of Cartersville Water Department and a member of the Georgia Water Pollution Control Association. Mr. Waldrip, noting that "biosolids" is the nomenclature now preferred by water pollution professionals, also presented the committee with a biosolids fact sheet and other information about sewage treatment, biosolids production, and the Cartersville sludge management program. (See Appendix "B.")

Second Meeting--October 19, 1993--Macon, Georgia

The second meeting of the study committee took place at Macon College. As with the first meeting, numerous public officials were on hand to answer questions as the members heard testimony from a number of citizens concerned about the disposal of sewage sludge in their counties. Again present were Dr. Bill Segars from the University of Georgia's Cooperative Extension Service and Alan Hallam, Branch Chief of Water Protection at EPD. Also in attendance were Mr. Gene Holcomb from the Macon Water Authority and Mr. Earle Vick of ERTH Group, Inc.

Macon Water Authority: Mr. Holcomb explained the Macon Water Authority's sludge management program and included some history of the dispute between the water authority and residents of neighboring counties. The water authority has two state-of-the-art wastewater treatment plants serving Bibb County and part of Jones County. One of the two plants also utilizes a secondary digestion chamber, which reduces the pathogens and vector attraction potential of the sludge.

According to the conditions of their permit, the water authority must test samples of the sludge on a weekly basis, and must send a sample each month to a laboratory recommended by EPD. The results of these tests have always indicated that the sludge is well within permit limits. The authority scans for 129 priority pollutants, not only the ten required by EPD. One sample costs about $300. Their permits for discharge have been consistent with standards, and their sludge has consistently met 503 standards for metals.

Sludge character, barring aberrations, does not change greatly from day to day. If there were an aberration, the plant would be able to identify it due to the living nature of the system. Oxygen uptake would decrease, and organisms that digest the wastes would die. Although the plants utilize a 30 to 60 day digestion process, still, any biosolids not meeting standards would already have been applied by the time test results are returned. EPD requirements stipulate that sludge cannot be stored unless it is protected under a shed. Since the two plants produce about 3,000 wet tons of sludge each month, or about 5,500 dry tons per year, storing is not feasible.

In 1960, the Macon Water Authority began land applying sludge on its own property. Last year they applied 73 tons (wet). They have also used landfilling and incineration

Issues and Findings

Origination and Volume of Sludge Produced

Statistics for the State of Georgia: According to EPD calculations:

- There are 117 major municipal treatment plants, serving 90 percent of Georgia's wastewater generators, and generating approximately 1 million pounds of sludge every day. EPD classifies the major municipal plants as those treating at least 1 million gallons of wastewater per day.

- Of that 1 million pounds of sludge generated each day, EPD estimates that 23 percent is being beneficially reused, with 19 percent used in land applications and 4 percent either pelletized or composted.

- Of the other 77 percent, about half is landfilled and half is incinerated. Of interest to note is the fact that only six plants are incinerating 39 percent of the sludge, while another 67 percent of those 117 plants are landfilling the remaining 38 percent of the sludge.

- EPD has no estimate on the amount of sludge being generated by the 58 major industrial pretreatment plants. However, estimates indicate that only about 17 percent of those industrial plants utilize land application for their sludge. The other 83 percent utilize other methods of disposal, including landfilling, incineration, or storage in on-site lagoons.

National statistics: Figures from the federal EPA indicate:

- Each year approximately 13,000 to 15,000 publicly owned water treatment plants across the nation generate 110 to 150 million wet metric tons of sewage sludge.

- Most of the sludge is landfilled or incinerated. Only about 30 percent is beneficially reused, either through land application or conversion into fertilizer.

- Over the next ten to twenty years, the volume of sewage sludge produced is expected to rise due to stricter wastewater treatment requirements, more efficient treatment plants, and increases in population.

Disposal Options

Landfilling: Many communities in Georgia still view landfills as their primary disposal option for sewage sludge. According to EPD figures, about 67 percent of the major municipal facilities still landfill sludge. This option will become less and less viable over time as landfill space becomes more scarce and expensive. Perhaps the greatest problem with this method, however, is that it isolates a potentially valuable plant nutrient resource.

Incineration: EPD lists six municipal waste water treatment facilities that incinerate sludge. Most of those are in the metro-Atlanta area; one is in Savannah. After incineration, about a third of the volume of the sludge remains as ash which must still be landfilled. At the first meeting of the study committee, residents living near one of the Atlanta incinerators gave examples of the problems inherent in incineration. This facility, the R. M. Clayton wastewater treatment plant, treats approximately 100 million gallons of wastewater per day and incinerates most of the sludge. This incinerator has been blamed for high levels of lead in the soil and other problems with air inversions and "sludge fog." The R. M. Clayton plant serves the Chattahoochee Industrial Area and is located in one of the oldest and most industrial areas of the city. According to the residents' attestations, most of the industrial facilities located in this area are fitted with old, outdated pollution control equipment and mix their industrial wastes with the municipal sewage treated at R.M. Clayton. When these toxins and metals are burned, many are released to the air and eventually deposited in the soil.

Land application of sludge

Information provided by Mr. Waldrip indicates that only 50,000 acres of land are needed to consume, at agronomic rates, all the biosolids produced in Georgia in one year. This represents less than .5 percent of the state's farmlands.

Approximately 25 percent of the major municipal wastewater treatment plants in Georgia engage in land application of sludge. Although many experts agree that land application is an excellent method of reusing sludges, all assert that it must be done properly to be successful. Of major concern to the public are potential problems with pathogens, odor, and vector attraction. However, more serious concerns are aquifer contamination, nitrogen overloading, and bioaccumulation of heavy metals.

Agronomic rates vs. designated sites: One important distinction to make in regard to land application is that between land application at agronomic rates and land application done on designated sites. Applying sludge at agronomic rates means applying it no more frequently than it can be utilized by the plants for food, maintaining ideal nutrient loadings for the crops being grown. Usually, sludge applied

agronomically is either sold or given to the local farmers. Sludge applied at a dedicated site is not applied at agronomic rates, and grass or hay is usually the only crop being grown. Dedicated sites are usually owned by the sludge generator, who uses the land solely for its benefits as a disposal site. Although the land might be suitable for grazing, it may also overloaded with nitrogen or other plant nutrients. Alan Hallam, EPD water protection chief, assured the committee that the site life of a dedicated site is not established to allow application until the site cannot be used for anything anymore. Limits are set at beneficial levels, over a 20 year consideration of site life. All levels are set site by site. The federal 503 rule is a guideline, not the standard for each site.

Suitable soils: Dr. Bill Segars, in speaking on the university's previous land application testing in Griffin, Georgia, on Piedmont soils, expressed some reservation about using land application on coastal plains soils because of the leaching possibilities. He also noted that little research is available on the long-term affects of land application or repeated land application in which all previous applications are not yet broken down. One Macon resident, a geotechnical engineer who works with sludges, attested that no land application should take place in the Macon area, due to the porous soils of the area and the significant ground water recharge areas located there.

Public perception: Public perception problems continue to be a major impediment to land application. Even when safe sludge is applied at safe rates and in geologically suitable areas, public relations problems still abound. People are just not comfortable with the idea of spreading human excrement around in their yards and fields, imagining it to be filthy smelling and filled with disease. Although raw sludge is indeed odiferous and potentially pathogenic, sludge that has been aerobically digested, as in the Cartersville plant, contains only a humus-like, earthy smell. And, as Martha Prothro, Deputy Assistant Administrator for Water at the federal EPA, mentioned in her statement on the newly promulgated rules on pathogens, practices that reduce pathogens to safe levels are already widely observed and utilized by those municipalities that beneficially reuse their sludge. "In fact," she noted, "in all the years that properly treated biosolids have been applied to the land, we have been unable to find one documented case of any illness or disease that resulted. After treating or composting, biosolids are actually safer than, say, cow manure."

Composting of sludge

Composting of sewage sludges essentially involves mixing the sludge with other organic materials, such as sawdust, wood chips, or peanut hulls, and allowing the entire mixture to decompose together. Although it may not be significantly safer than other properly treated sludge, the addition of other organic matter tends to make it more acceptable to the public at large. When composted sludge is sold as fertilizer, it must meet USDA requirements for labeling and plant nutritive value.

Mr. Earle Vick's facility in Plains is the only commercial sludge composting facility in Georgia. The resulting product is marketed as "ERTH Food" and sold as an organic fertilizer. A step-by-step description of the procedure is included in Appendix C.

The Clayton County Water Authority operates the only publicly owned composting facility. This facility has been in operation for over ten years, producing and marketing both a compost-type soil conditioner and a fertilizer known as Agri Plus 650.

The City of Brunswick was also recently approved for a compost facility.

Private individuals or companies operating sludge composting facilities must obtain waste handling permits from the Land Protection Branch of EPD. Public water treatment plants who wish to compost must obtain permits or permit modifications through the Water Protection Branch of EPD.

Enforcement

EPD requirements for monitoring of sludge match those of the federal 503 regulations. Municipal sludges must be analyzed at least once a year, with some large producers subject to monitoring as frequently as once a month. EPD does not conduct these tests itself; they are conducted by a laboratory hired by the wastewater treatment plant. At times, EPD may cross-check the sample results, if there is suspicion of a problem.

Testing of application site soils is also conducted. If soils show contamination, this may also cause EPD to conduct its own sample.

Although, as Mr. Reheis informed the committee, most environmental monitoring conducted around the country is done by the permittee itself, many citizens do not like or trust the concept of self-monitoring. Additionally, although the committee was repeatedly told by water department officials that the character of sludge does not vary greatly from day to day, the less frequent monitoring schemes most agreed were not adequate to assuage the public's fears.

Although EPD has legal authority to fine up to $50,000 per day for violations under the Georgia Water Quality Control Act, this authority is rarely invoked on sludge-related issues. One EPD regulator seemed to confirm these enforcement weaknesses when he stated that there have been no sludge related consents orders yet issued by EPD.

Industrial Sludges and Pretreatment

Industrial pretreatment programs exist in 45 municipalities in Georgia. In the remaining areas, the state pretreatment program is in effect. Many citizens feel that the existing pretreatment programs are inadequate and do not go far enough to address the problems caused by industrial chemicals in municipal sewage systems.

Additionally, industrial sludges created at the pretreatment plants are exempt from most state and federal laws and regulations, including the federal 503 regulations and the cross-county restrictions contained in HB 228. Nonetheless, 17 industrial pretreatment plants engage in land application. Three of them land apply their sludges in a county other than the one in which they are located. (See Appendix "D.")

Agricultural Concerns

The primary benefit of incorporating sewage sludge into soil is the nitrogen resource it offers. This is also the greatest limiting factor, as sludge must be applied at rates allowing plants to utilize the nitrogen without overloading the soil. If nitrogen levels are controlled, then other nutrients will not reach toxic levels. Sludges are low in potassium, unlike animal manures. Co-composting sludge with animal manures should be explored as a possible way to balance nutrient levels.

As Wayne Waldrip pointed out in his fact sheet on biosolids, five of the ten metals regulated in the 503 rule are required plant nutrients. Only in abnormally high levels are they toxic.

Dr. Bill Segars and his colleagues at the Cooperative Extension Service work with farmers to determine correct application rates. They also provide analytical services to determine the nutrient value of the sludge and make recommendations and to proper crop selection, looking both at environmental protection and economic viability. However, they are looking to EPD to determine the acceptability of the sludge and analyze for any chemical or industrial contamination that might make the sludge unsuitable for agricultural use.

GW&PCA RESIDUALS RECYCLING COMMITTEE
SEEKING DOWN-TO-EARTH METHODS
FOR RESIDUALS UTILIZATION

WALDRIP'S NOTES ON SEWAGE TREATMENT & BIOSOLIDS PRODUCTION

Most communities and many industries use the activated sludge process to treat their wastewater. As the name implies, activated sludge is "activated" with living micro-organisms. These microbes occur naturally in the soils and streams of our environment and in the activated sludge process they are cultured in a dense broth within a treatment unit called an "aeration basin."

The organisms in the activated sludge process are comprised primarily of bacteria and protozoans and live in the presence of free oxygen in the aeration basin. They are not disease-causing agents but are the "decomposer" class of micro-organisms that are able to biodegrade organic waste material.

In the treatment plant, wastewater is mixed and aerated in this broth of decomposers, allowing the microbes to use the waste organic matter contained in the community sewage as a food source. This results in a net growth of the activated sludge mass as the organic waste material is consumed.

The activated sludge is then separated from the wastewater in a clarifier (settling tank). The clear, treated water overflows from the surface of this tank, chlorine is added to it for disinfection, and the treated effluent is finally discharged into the receiving stream without polluting it.

Most of the settled sludge is returned to the head of the treatment plant to be blended with more incoming sewage, but a small portion of this growing sludge mass is pumped to digestion tanks for further treatment and stabilization.

This rich, humus material, now digested and stabilized and within EPA's regulations, can at this point be called biosolids. Further thickening or dewatering prepares the biosolids to be land applied as a liquid slurry or as a simisolid cake. Biosolids slurries are about 5% solids while cakes are about 20% solids by weight.

Biosolids are extremely beneficial in agriculture because they contain most of the essential plant micronutrients in a well-balanced, organically-bound package. Commercial fertilizers may be used to supplement the N-P-K macronutrient requirements of a crop.

Appendix "A"

NAME	FLOW MGD	METHOD OF DISPOSAL	AMOUNT REMOVED(Lbs/day)
ADAIRSVILLE NORTH	1.00		
ALBANY	20.0	LA-A	10985
AMERICUS MILL CRK	4.40	LF	3200
ATHENS CEDAR CREEK	2.00	LF	1725
ATHENS MIDDLE OCONEE	4.00	LF	3282
ATHENS NORTH OCONEE	10.7	LF	6683
ATLANTA UTOY CREEK	37.0	INC/LF	47093
ATLANTA R M CLAYTON	101.	INC/LF	237836
ATLANTA SOUTH RIVER	41.0	INC/LF	8800
AUGUSTA WPCP	46.1	LA-A	18567
BAINBRIDGE WPCP	2.50	LF	1475
BARNESVILLE GORDON RD	1.20	LF	576
BLAKELY WPCP	1.31	LA/LF	0
BRUNSWICK ACADEMY CR	13.5	LA-A	12854
BUFORD SOUTHSIDE	2.00	LF	3338
CAIRO WPCP	2.00	LF	3077
CALHOUN WPCP	12.0	LF	25279
CAMILLA WPCP	3.00	LF	1100
CANTON WPCP	1.89	LF	6000
CARTERSVILLE WPCP	10.0	LA-D+A	5275
CEDARTOWN WPCP	2.50	LA-A	1800
CHATSWORTH WPCP	3.00	LF	770
CHEROKEE CO. WATER & SEWER	2.00	LF	809
WALKER COUNTY WPCP	3.50	LF	1223
CLAYTON CO NORTHEAST	4.00	P/C	4176
COBB CO NOONDAY	12.0	LF-INC	15943
COBB CO NORTHWEST	4.00	LF	2616
COBB CO SOUTH	32.0	P	40000
COBB CO R L SUTTON	40.0	INC	50952
COLUMBIA CO SAV. RIVER	1.50	LF	89
COLUMBIA CO REED	2.55	LF	2619
COLUMBIA CO CRAWFORD	1.00	LF	213
COLUMBUS SOUTH	40.0	LA-D	36100
COMMERCE NORTHSIDE	1.05	LF	
CONYERS ALMAND BRANCH	1.25	LF	2253
CONYERS QUIGG BRANCH	2.00	LF	3249
CORDELE WPCP	5.00	LF	1110
CORNELIA WPCP	3.00	LF	147
DAWSON WPCP	2.50	LF	620
DECATUR CO IND. AIRPARK	1.00	LF	990
DEKALB CO POLEBRIDGE CR	20.0	LA-D	13242
DEKALB CO SNAPFINGER CR	36.0	LF	80238
DOUGLAS SOUTHEAST	4.00	LA-A	750
DOUGLASVILLE SOUTH WPCP	3.25	LF	47777
DOUGLASVILLE SWEETWATER	3.00	LF	1039
DUBLIN WPCP	4.00	LF	
ELLIJAY WPCP	2.50	LF	6203
FAYETTEVILLE WHITEWATER	1.25	LA-A	1379
FITZGERALD C.A.NEWCOMER	6.00	LF-LA-A	794
FORT OGLETHORPE WPCP	2.00	LF	1377
FORT VALLEY WPCP	2.20	LF	409
FULTON CO BIG CREEK	11.0	LF	

TRENTON WPCP	1.00	LF	
TRION WPCP	5.00	LA-A	15000
TYBEE ISLAND	1.00	LF	182
VALDOSTA MUD CREEK	3.22	LF	1973
VALDOSTA WITHLACOOCHEE	12.0	LF	3715
VIDALIA WPCP	1.88		1020
WARNER ROBINS HORSE	3.00	LA	272
WARNER ROBINS SANDY RUN	8.00	LA	3950
WASHINGTON WPCP	4.00	LF	2634
WAYCROSS WPCP	6.70	LF	2220
WAYNESBORO WPCP	2.0	LF*	
WEST POINT WPCP	1.00	LF	132
2220			
WAYNESBORO WPCP	2.0	LF*	
WEST POINT WPCP	1.00	LF	132
2220			
WAYNESBORO WPCP	2.0	LF*	
WEST POINT WPCP	1.00	LF	132
2220			
WAYNESBORO WPCP	2.0	LF*	
WEST POINT WPCP	1.00	LF	132

ERTH GROUP, INC.

SLUDGE Recycling Procedure.

Step One.

Negotiate contract between the Provider and ERTH Group, Inc. to receive their Biosolids.

The tipping fee paid to ERTH Group, Inc. to receive sludge biosolids depends on;

1) the percent of solids,
2) the distance from plant (freight),
3) the type of container needed to transport sludge safely to our plants,
4) the approval of DNR for us to receive sludge from that particular provider and,
5) the analysis provided to us from the producer to determine if it is acceptable to us.

Step Two.

1) Acceptable sludge is picked up in approved containers and transported to our plant in Plains, GA - Webster County, by our own fleet of trucks using our own drivers (this gives us better control for dependability and safety) in transportation.

2) When sludge arrives at our plant a sample of each load is taken by our technition to determine the solid content, another sample to send to State approved lab to run complete analysis of the contents to guarantee we are not getting sludge that does not come up to our safety specifications.

Step Three.

Sludge is dumped on a covered concrete floor surrounded by a drain indention to catch any run-off (thus far we have not had any leachate) and carried to a holding pond. If any accumulates in the pond it would be pumped out with D.N.R. approved systems and sprayed on the forest land on our site over a large area.

Step Four.

1) A bulking agent (we use peanut hulls) is added to the sludge and both go through mixing equipment to assure consistency of mix.

2) The mixture is then placed on the composting pad in a mound and interlaced

Recommendations

Industrial pretreatment programs

Require statewide monitoring and enforcement of strict industrial pretreatment programs to remove metals from industrial wastewater before it is released to the municipal wastewater treatment plant.

EPD inspections

Require EPD to conduct unannounced inspections of sludge produced in municipal plants. Devote employees to this job. Establish fees on permits sufficient to cover the costs of new employees.

Enforcement

Increase penalties and utilize sanctions with severity sufficient to discourage violations of sludge management regulations and standards.

Land application

Prohibit the location of land application designated sites over groundwater recharge areas.

Composting; hierarchy of sludge management practices

Encourage composting to the greatest extent possible. Establish the following hierarchy of sludge management practices: (1) composting; (2) land application at agronomic rates; (3) land application in designated sites; (4) landfilling; (5) incineration.

Sludge incineration

Begin phasing out sludge incinerators as beneficial reuse of sludge increases.

Industrial and Federal Wastewater Facilities (IWP)
Land Application of Sludge

Dundee Mills
Jefferson Mills
Federal Paperboard
Fieldale - Toccoa
Inland-Rome
Seaboard Farms - Canton
Lake Lanier Hatchery
* Gilman Paper Company
* International Bakerage
Southeast Paper
Jockey International
Forstmann - Louisville
Cargill - Buena Vista
Specialty Brands - Meriwether County
Thomaston Mills
Miller Brewing Company
* Georgia Pacific - Cedar Springs

* denotes land application in another county

as disposal methods. Currently, they have applied for a composting permit with EPA and EPD and are hoping for an $8.5 million grant to set up the program. According to Mr. Holcomb's testimony, the water authority has never proposed any land application at greater than agronomic rates. They have tried to apply in Bibb County, but their permit application, submitted to EPD now for six months, has never been approved.

Mr. Holcomb also noted the fact that industrial sludges are exempt from federal sludge legislation and the cross-county restrictions enacted in HB 228 in 1993.

Environmental Groups and Affected Citizens: Mr. Mark Woodall, legislative chair of the Georgia Sierra Club, testified that the Sierra Club is very much opposed to incineration of sludge. They are also opposed to landfilling. He urged the committee to promote composting of sludge.

Brenda Carroll, a resident of Crawford County and an outspoken opponent of the Macon Water Authority's land application attempt there, went on the record to say that she considers land application to be useful if done correctly. However, she is concerned with enforcement of the laws and regulations. She showed the committee photographs of such violations as truck spills and runoff entering waterways. She also noted that EPD does not always enforce its own reporting requirements. In spite of Gene Holcomb's attestations of frequent monitoring, EPD files indicate no submission of test results by the authority for the years 1988-1990.

Susan Hanberry, a Macon resident, also expressed concern with incineration of sludge. Although she too favors composting, she also expressed concern with allowing self-monitoring by sludge generators and with the lax standards and enforcement of industrial pretreatment programs, which often allow sludges to be contaminated with industrial chemicals. Ms. Hanberry also believes toxic organic compounds and radionucleides should be regulated in sludge.

Several other area residents mentioned an opposition to self-monitoring and a concern with contamination of the aquifer that lies below Bibb County. One resident, a geotechnical engineer who works with sludges, attested that no land application should take place in the Macon area, due to the significant ground water recharge areas located there.

Third Meeting--November 11, 1993--Plains, Georgia

TOUR OF ERTH GROUP FACILITY

This meeting of the committee took place at the ERTH Group sludge composting plant and consisted of an informative tour of the plant by Mr. Earle Vick, chairman and CEO of ERTH Group.

Mr. Vick's facility began accepting sludge for the creation of fertilizer in November, 1992, the same month that current federal regulations regarding sludge were issued. He uses only EPD approved sludge that meets all current federal requirements. Although the sludge generators certify the standards of the sludge, every load is again monitored as it enters the plant.

After testing, the sludge is mixed with sawdust, peanut hulls, or wood chips and placed in primary digestion. The process meets and exceeds all EPD and EPA requirements for temperature and time of the static pile. EPA requirements set a minimum temperature of 155° F for a minimum time of three days. Mr. Vick's plant increases that temperature and keeps it constant for 5-10 days.

As noted earlier, the plant produces 200 tons per day of marketable organic fertilizer, with a permitted capacity of 500 tons per day. They are hoping to expand to 1,000 tons per day to meet current demand.

A complete description of the process appears in "Appendix C."

Fourth Meeting--November 22, 1993--Cartersville, Georgia

This meeting water broken up into two parts. The first consisted of a public hearing in Cartersville City Hall. The second part, after lunch, was a tour of the Cartersville wastewater treatment plant and a demonstration of the sludge land application system currently used by the City of Cartersville Water Department.

In attendance at the public hearing were EPD water protection officials Sam Shepherd and Mike Stevens, Georgia Water Pollution Control Association officials Wayne Waldrip and Jack Dozier, and Dr. Bill Segars of the University of Georgia's Cooperative Extension Service.

Dr. Bill Segars spoke on the university's previous land application testing in Griffin, Georgia. This application was done on Piedmont soils, and he expressed some reservation about using land application on coastal plains soils because of the leaching possibilities. He also noted that little research is available on the long-term affects of land application or repeated land application in which all previous applications are not yet broken down.

Jack Dozier presented the committee with his organization's recommendations urging strict enforcement of industrial pretreatment programs and encouraging EPD to adopt and incorporate the federal 503 rules.

Wayne Waldrip, in preparation for the group's tour of the Cartersville wastewater treatment plant, briefed the committee on the plant's processes. He emphasized the

importance of industrial waste monitoring, which is conducted once or twice a month, and sometimes more frequently. This is needed to prevent contamination that would kill the helpful bioorganisms at work in the plant. The plant has a treatment capacity of 1.1 million gallons per day and produces 3 to 4 dry tons of sludge per day. They land apply three to four dry tons per acre, or about two wet tons per acre. (See Appendix "B" for additional information on the Cartersville program.)

Fifth Meeting--November 23, 1993--Atlanta, Georgia

This final meeting took place at the state capitol. Committee members discussed and finalized their recommendations, which are presented in a separate section at the end of this report.