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Certified Public Management (CPM) Project

Improving South Carolina's Industrial Land Application

Program One Element at a Time

Department of Health and Environmental Control

Industrial, Agricultural, & Stormwater Permitting

Division, Bureau of Water

Submitted to

Nathan Strong

S. C. Budget and Control Board

Office of Human Resources

By

Terry L. Davenport

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STATE DOCUMENTS

South Carolina Industrial Land Application Program

The land application program, which is implemented by the Department of Health and Environmental Control (DHEC) through the Bureau of Water (Bureau), began in South Carolina in the early 1970s. The Bureau is responsible for the permitting, compliance, monitoring, and enforcement activities of the land application program. The program addresses the land application of wastewater effluent, non-hazardous sludge, and septage from municipal and industrial wastewater treatment facilities. The Industrial Wastewater Permitting Section of the Industrial, Agricultural, & Stormwater Permitting Division of the Bureau is responsible for permitting industrial facilities that land apply wastewater effluent, non-hazardous sludge, and septage to dedicated surface disposal sites for beneficial use. This is an alternative to wastewater discharges to surface waters or sludge disposal in landfills. Beneficial use is defined as the use of sludge or wastewater through land application for the purpose of soil conditioning, crop or vegetative fertilization, or erosion control in a manner which does not pollute or tend to pollute the environment, pose a risk to human health or cause any deterioration of land surfaces, soils, surface waters or groundwater. These dedicated surface disposal sites are commonly called land application sites.

As part of the Department's 2000-2005 Strategic Plan, the Bureau of Water has committed itself to the following outcome: increase, by 25 percent, the utilization of land application by major surface water dischargers. This outcome will aid the Department in meeting its' strategic goal to reduce the level of pollutants and exposure to contaminants and meet its' long-term goal to protect, continually improve and restore the environment.

To make this outcome a reality, the Bureau is faced with improving the land application program. To improve the program, it would involve addressing many of the

issues facing the following key elements of the program, which are: (1) SCDHEC Regulations 61-9.504 and 505, (2) Informal and Formal Interpretation and Application of Regulation, Guidelines, and Policy, (3) the Land Permit Application, (4) Coordination with other DHEC Programs and other Entities, (5) the Permit Drafting and Issuance Process, (6) Compliance Monitoring, Inspection, and Reporting, (7) Enforcement, and (8) Resources. Some of the issues facing each key element are as follows:

I. SC Regulations 61-9.504 and 505

- A. Regulations are confusing and hard to apply.
- B. Regulations don't address all "common" types of wastewater land application systems.
- C. The basis of some regulation requirements is not known.

II. Informal and Formal Interpretation and Application of Regulation, Guidelines, and Policy

- A. Lack of wastewater strength indicators to determine when wastewater should not be land applied.
- B. Lacks of soil quality indicators to detect adverse soil impacts.
- C. Lack of soil ceiling concentrations for pollutants not regulated by 61-9.503, 504, or 505.
- D. Lack of Soil Sampling and Testing Guidelines including specifying methods and cost.
- E. Lack of guidelines to assure consistent implementation among permit writers.

III. Land Application Submittal Package

- A. No Wastewater Disposal Supplement Form for the ND Permit Application.
- B. Land permit application does not provide all necessary information needed for writing a ND permit.
- C. Lack of a comprehensive application requiring all necessary information to assure properly permitting of the land application system.

IV. Coordination with other DHEC Programs and other Entities

- A. What information must be provided to the Groundwater Quality Section (GWQS) from Industrial Wastewater Permitting Section (IWPS) in order to assist with site evaluation?
- B. What information must be provided to the IWPS from GWQS in order to assist with writing the permit?
- C. Lack of ability to identify and address all issues pertinent to the Groundwater Quality Section.

V. Permit Drafting and Issuance Process

- A. Must use other resources to obtain information not provided by the application submittal package.

- B. Lack of ability to determine whether the ND permits are less or more stringent than the Bureau of Land Waste Management's regulation requirements for the disposal of Solid Waste from an industrial facility, which includes industrial sludge and wastewater.
- C. Lack of a standard boilerplate permit for the land application of wastewater only, sludge only, or a combination of the two.

VI. Compliance Monitoring, Inspection, and Reporting

- A. Lack of ability to track compliance with ND permits.
- B. Lack of ability to enter report information into a database.
- C. Lack of ability to track land application sites that have received CPLR sludge or researched the end of its active life for the land application site.
- D. Lack of agreement between the all areas within the Bureau of who reviews the reports, who enters the information into a tracking system (database), and who reports any violation to enforcement?

VII. Enforcement

- A. Lack of inspection requirements to monitor compliance with ND permits.
- B. Lack of non-compliance indicators to determine when enforcement actions should be taken.

VIII. Resources

- A. No links to websites that will provide additional technical information for the permit writer when writing ND permits.
- B. No links to websites that will provide additional information for the permittee when preparing a land application submittal.

Addressing these issues to improve the program will involve time, research, manpower, and commitment beyond 2005, yet the Bureau must act now if it wishes make the outcome a reality by 2005. Therefore, the Bureau is faced with deciding what actions should be taken to improve the industrial land application program on a short-term basis. Improving the overall program will involve improving each key element of the program, which equates to researching each key element for improvements.

Again, because the Bureau must act now, my research problem has been narrowed down as follows: *What are the best short-term action(s) that can be done to improve the industrial land application program within a six-month time period?* This equates to determining the best short-term actions that can be done to improve each key element of the program. Due to time constraints, I will focus my research efforts to determining the

best short-term action(s) that can be done to improve South Carolina's Land Permit Application over a six-month period, as a pilot project. This pilot project will hopefully be used as a model to improve the other key elements of the land application program.

The SC's land permit application contains data elements that provide the technical information that is used by the permit writer to write and issue a ND permit. For the purpose of my research project, data elements shall mean any information such as questions consisting of one or more words, construction plans, supplement forms, maps, specifications and engineering reports, permit application forms, drawings, plot plans, or design information that provide information to the permit writer.

For the purposes of this research project, the word "best" shall mean an action(s) that can be achieved within a six-month period. The word "action(s)" shall mean the creation, addition, revision, or elimination of data elements that is part of the land permit application. Thus, at the end of my research, I hope to have identified the best short action(s) that can be made to improve the quality of the information provided by the land permit application.

My research will involve both primary and secondary applied research to determine what data elements are or should be explicitly part of the land permit application. My secondary research has involved the review of information from about 50 states' land permit applications, EPA process design manuals, related websites, and other information deemed necessary in an effort to identify data elements that should or could be explicitly part of SC's land permit application. My primary research has involved the development of a survey, which was distributed to the necessary individuals within the Bureau. The goal of the survey was to seek input from these individuals about what data elements they believe should be part of the SC's land application permit

submittal package. The survey consisted of data elements identified from my secondary research, data elements based on SC Regulations (which describes in a general manner the minimum information requirements for applicant), and data elements based on the current SC's land permit application. Based on these factors, the survey was developed from the standpoint that if a new permit application was to be developed what information should the land permit application explicitly provide to the permit writer. The survey consisted of two (2) parts. The first part required the participant to answer yes or no as to whether the shown data elements or similar data elements should be explicitly part of the SC's land permit application. The second part allowed the participant the chance to provide data elements that s/he believes should be explicitly part of the SC's land permit application. The participants are categorized as follows:

Category	Participants	Surveys Returned	% Returned
Permit Writers	9	9	100
Groundwater Quality Section Managers	4	3	75
Senior Technical Advisor	2	0	0
	1	1	100
Total	16	13	81.25

The data elements (DE's) as categorized and survey results are as follows:

Category	Number of DE's	#'s of DE's receiving a "No" Response	Max #'s of Participants Responding with a "No"
Type of Application (Project Status)	5	1	2
Other Permit Information	1	0	0
Applicant, Generator, or Owner Information			
Applicant Business and Contact Information	6	1	3
Consultant Information	4	4	2
Contractor Information	4	4	2
Manufacturing Facility Information	5	4	2
General Information	2	2	9
Treatment Facility Information			
Treatment Facility Information	10	4	6

Land Application Site Information			
Site Identification Number	1	1	1
Site Location Information	6	3	7
Site Ownership	3	1	1
Site Characteristics	15	8	4
Storage On Site	2	2	1
Wells Information	5	3	2
Back Soil Analysis Data	8	8	4
Setbacks	4	4	3
Cumulative Pollutant Loading and Remaining Allotments (CPLR)	5	4	4
Wintertime Land Application			
Winter Land Application	1	1	1
General Information			
General Information	10	9	7
Reclamation Site Information			
Reclamation Site Information	7	7	3
Groundwater Monitoring Information			
Groundwater Monitoring	3	2	4
Groundwater Monitoring Plan	14	10	4
Maps			
Maps	18	9	2
Crop Management Plan			
Crop Management Plan	12	11	4
Wastewater Information			
Wastewater Generated by Process(es)	1	1	2
Effluent Flow Description	3	2	1
Wastewater Analysis	5	4	5
Wastewater Monitoring Frequency	1	1	6
Wastewater Treatment Prior to Discharge	1	1	2
Wastewater Storage Facilities	4	4	3
Wastewater Land Application Info.	7	3	4
Method of Effluent Disposal Being Utilized	6	4	3
General Information	5	5	8
Sludge Information			
General Information	3	3	1
Residuals Handling	10	7	2
Residuals Storage	3	3	1
Transportation	3	3	2
Pathogen/Vector Attraction Reduction	5	5	2
Sludge Analysis Information	5	4	4
Sludge Monitoring Frequency	1	1	5
Land Application Information	6	4	3
Application Appendix			
Appendix	8	8	5

The following are data elements that received seven (which represents the majority vote) or more “no” responses:

Data Element	#’s of No Responses
Do you want the opportunity to review a draft permit prior to public notice? Yes No	9
Method of Latitude/Longitude Determination	7
Describe the procedure for responding to citizen complaints. Include details of any industrial educational programs.	7
List DMR dates and parameters where the facility exceeded the permitted discharge limits (attach additional sheets if necessary).	8

The current SC’s land permit application requires the following information as required by SCDHEC Regulation 61-9.505.21(f):

Project name: Provide the official (legal) name of the WWTP or sludge disposal site.
County: Give county (or counties) where the proposed or existing wastewater treatment facility and/or site is located.
Owner's name, address and telephone number: Provide the name, mailing address and the area code and telephone number of the owner. If the mailing address of the WWTP or site is different from the owner's mailing address, supply this information on an attached sheet of paper.
Project status: Identify if the project is for a new or existing WWTP, or new or existing site. Provide the Land Application or State permit number and identify whether it is for a proposed expansion of either an existing WWTP or a renewal of an issued (if applicable) land disposal permit.
Project description: Specify the type of project and give a brief description of the WWTP or site operation.
Location of the WWTP and land disposal sites: Provide a map or maps showing the location of the WWTP and land disposal site(s). The map(s) shall be an 8 1/2" x 11" photocopy of the applicable portion of a U.S. Geological Survey 7 1/2 minute quad sheet (or a 15 minute quad if a 7 1/2 minute quad is not available). The quad sheet name shall be provided on the copy submitted to the Department. Give the latitude and longitude of the center of the WWTP site and a brief location description of the WWTP site. If the application is for a sludge or septage land application site owned by an entity that does not or will not have a WWTP, indicate "not applicable". For each disposal site, give the size in acres, the latitude and longitude of the center of the site, and a brief location description of the site.
Description of waste to be land applied: Provide a description of the wastewater or sludge to be land applied. State whether the waste is domestic and/or industrial wastewater. If the wastewater is not strictly domestic, give a detailed characterization of the wastewater. If the detailed characterization is contained in a Preliminary Engineering Report (PER) accompanying this application, then state that the information is in the PER.
Volume and quantity of waste to be land applied: Provide the volume in gallons per day and the quantity in pounds per day of the waste to be land applied to each disposal site.
Frequency of application: Provide the proposed frequency application in times per day, week or other period for each disposal site.
Site application rate(s): Provide the proposed application rate in inches per week, pounds per

acre per day (use annual rates for crop uptake) for sludge disposal, or other units as appropriate for each disposal site, whichever is the limiting factor.

Groundwater Quality Monitoring: Identify whether the monitoring is proposed (if required) or existing. Also, provide the number of monitoring wells proposed or existing at each land disposal site.

Residual solids: Identify the proposed or existing sludge disposal method (for wastewater treatment facilities).

Hazardous substances: Identify whether or not the discharge contains a substance that could be considered hazardous as defined under section 101(14) of CERCLA. Provide the substance name, concentration and source.

The survey results strongly suggested that the current SC's land permit application should be revised to include data elements that explicitly request and provide the additional technical information needed to write and issue a ND permit. For instance, although 72.81% (166) of the 228 data elements identified in the survey received a "no" response, only four data elements were rejected by majority vote. **In other words and conclusion, the survey results suggested that the land permit application must be revised to request and provide additional technical information as opposed to what is currently requested and provided.** A side note: Although the Sludge Disposal Supplement for NPDES and ND Permit Applications requests and provides additional information, it will only be completed when sludge is being land applied, not when wastewater is being land applied. Therefore, the survey suggests that the land permit application must be revised to request and provide the necessary information when wastewater is being land applied.

To improve the quality of the information provided by the land permit application, I conclude that the instructions for completing land permit application should be revised to "explicitly" request additional technical information (data elements) related to the questions of the current land permit application. For example, the current land permit application asks as an open-ended question the applicant to describe the waste to

be land applied. Instead of implicitly rely upon the applicant to properly answer and provide the necessary description of waste as determined by the applicant, the Department should explicitly instruct the applicant to provide the necessary technical information (data element) to describe the waste (e.g., analyzed the waste for metals and nutrients). As such, because of the following factors, I believe revising the instructions is the best short-term action that can be done until the Bureau is able to revise the current application to request additional data elements:

- (1) Because the regulations are written from a flexible standpoint, no regulation changes are required, and
- (2) Because the instructions are only being “beef-up (that is, expanding the scope of the question to explicitly request specific data elements related to the question),” no form approval is being requested or required. The “beef-up” instructions should only request explicitly additional technical information related to the question and direct the applicant to attach a separate sheet of paper for the additional information that cannot be written on the current land permit application.

To implement this short-term actions within the next five-months, the following steps should be followed:

- (1) Within the first week of month one (1), a workgroup should be established; the workgroup should consist of individuals from the two permitting sections within the division, the groundwater quality section, and the enforcement and compliance sections.
- (2) For months one and two, the workgroup should review the data elements identified in the survey (especially the data elements that received no or

few “no” responses), review the information the information found in the H drive, and EPA documents.

- (3) For month three, the workgroup should match the data elements identified in item two (2) above with the questions of the current land permit application. Once the matching is completed, the instructions should be reformatted to request the additional technical information. Keep in mind, the goal here is to “beef-up” the instructions in order to request and provide additional technical information related to the current question.
- (4) For month four, print the instruction form with the new instructions and add the “revised” instruction form to the Bureau’s website.
- (5) Month five, implement action.

There will be no cost to implement this action, other than time.

To evaluate whether the above action has improved the land application program, the following data should be collected before implementing the above action (i.e., the five months before the change is implemented) and during the six months after implementing the above action:

- 1) Monitor and record the number of times the permit writer must request additional information in order to evaluate the application.
- 2) Monitor and record the time it takes a permit writer to write and issue the ND permit.

After the first six months, conduct an interview of the participants who participated in the survey to determine whether they believe an improvement has occurred.