July 14, 1995

MEMORANDUM **GMP #74**

To: District Health Directors
District Environmental Health Managers
Office of Environmental Health Services Staff

From: Donald J. Alexander, Director
Division of Onsite Sewage and Water Services

Subject: Spray Irrigation Sewage Systems

Onsite - Spray Irrigation

This GMP addresses only spray irrigation sewage systems which can be permitted under § 2.25 C. of the Sewage Handling and Disposal Regulations. Any other spray irrigation systems must comply with all other applicable regulations and requirements of the Virginia Department of Health and the Virginia Department of Environmental Quality. Spray irrigation systems utilized under this GMP must be designed for no runoff nor discharge to streams.

GMP 74 was made allowable by interagency letters of cooperation between the Virginia Department of Health (VDH) and the Virginia Department of Environmental Quality (VDEQ). Copies of interagency letters of cooperation are present in Appendix 5 and 6.

The content of this GMP includes several aspects which relate to utilization of spray irrigation sewage systems. The contents are as follows:

I. Administrative Aspects
II. Application Process
III. Soil and Site Criteria
IV. Basic Design Criteria
V. Plan Review
VI. Operation and Maintenance Manual
VII. Monitoring of Systems
VIII. Attachments

I. Administrative Aspects

This GMP is designed to allow usage of spray irrigation sewage systems for domestic sewage with flows of less than or equal to 1000 G.P.D. design flow. These systems may be utilized for new construction or repairs of failing sewage disposal systems. For the purpose of this GMP, domestic sewage will generally be considered as wastewater from toilet flushing, bathing, hand washing, and wastes from non-commercial kitchens and laundry facilities. Utilization of spray irrigation systems for treatment and disposal of sewage from anything other than domestic sewage must comply with all other applicable regulations and requirements of the Virginia Department of Health and the Virginia Department of Environmental Quality.

GMP 74 allows installation of spray irrigation sewage systems under Section 2.25.C of the Sewage Handling and Disposal Regulations. Spray irrigation technology has been shown to be a proven technology in Virginia with experimental systems which have been installed. Installation of such systems is allowed in other states as well. Therefore, spray irrigation sewage systems utilizing Section 2.25.C do not require an approved back-up system. The criteria for installation of these systems in Virginia are contained in this GMP.

Any variances, appeals, and other administrative aspects relative to these systems will be handled under the Sewage Handling and Disposal Regulations and related requirements.

II. Application Process

Spray irrigation systems proposed to be used under GMP 74 are to be applied for at the local/district health department. The existing onsite sewage application form, along with an application attachment, will be utilized for these systems. A copy of the application attachment is present in Appendix 1.

Processing of all applications will be under jurisdiction of the local or district health department. Staff from the Office of Environmental Health Services will assist local/district staff when requested. Technical services by OEHS will be provided under aspects of GMP #17 (see Appendix 4).

III. Soil and Site Criteria

The basic soil and site criteria which are to be applied to processing of an application for a spray irrigation sewage system are included in Appendix 2.

IV. Basic Design Criteria

Design criteria are different from other systems discussed in the Sewage Handling and Disposal Regulations. Appendix 2 contains the basic design criteria for domestic sewage spray irrigation systems.

V. Plan Review

Spray irrigation sewage disposal systems permitted under Section 2.25.C will be considered to be Type III sewage disposal systems and require formal plans and specifications to be submitted by a Professional Engineer. Plan review is to be accomplished as per procedures established in GMP 17. A copy of GMP 17 on plan review is attached in Appendix 4 for reference. It is included with this GMP so as not to cause confusion on referencing GMP numbers and possible rescinding of review procedures.

VI. Operation and Maintenance Manual

An Operation and Maintenance Manual is necessary for spray irrigation systems. These systems require more maintenance than typical onsite sewage disposal systems. An acceptable O&M Manual for the individual system installed must be submitted to the local health department prior to the issuance of the operation permit.

VII. Monitoring of Systems

Permitting of spray irrigation systems under Sections 2.25.C of the Sewage Handling and Disposal Regulations must be reported to the Division so that accurate records of permitted systems can be maintained and evaluated on a statewide basis. The number of

permits issued for these systems should be indicated on the OEHS quarterly data report.

Owners must conduct the monitoring required in the Operation and Maintenance Manual and supply the results to the local or district health department. Minimum general monitoring requirements to be included in the O&M Manual are referenced in Appendix 3. The local or district health departments should also conduct monitoring visits of installed spray irrigation systems. Test results which do not meet the O&M parameters are to be reported to the Division so that spray irrigation system function under Section 2.25.C can be evaluated statewide.

An operational contract with a minimum of a Class IV operator must be provided.

VIII. Attachments

Appendix 1	Application Attachment for Spray Irrigation
Appendix 2	General Soil, Site and Design Criteria
Appendix 3	Monitoring
Appendix 4	Plan Review Procedure (GMP #17)
Appendix 5	VDH Interagency Letter of Agreement
Appendix 6	VDEQ Interagency Letter of Agreement

GMP #74
Onsite - Spray Irrigation

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Appendix 3

MONITORING

INFORMAL MONITORING

Test water in final pump chamber for:

Color
Odor
Total Residual Chlorine

FORMAL COMPLIANCE MONITORING

Collection
Once per year at approximately 12 month intervals with spring and early fall as the best time for collection.

Analysis
Analyses to be performed by a wastewater quality laboratory using USEPA methods. Reports of analyses are to be submitted by the laboratory to the local/district health department within ten days of the completion of the examinations.

Test water supplied to spray irrigation area for:

pH
Total Kjeldahl Nitrogen
Fecal Coliform Bacteria
Total Residual Chlorine (if applicable)
Total Suspended Solids
BOD_5

MONITORING

MINIMUM MONITORING SCHEDULE

Biweekly:

Check disinfectant and add as necessary.

Monthly:

Walk over spray area (A) and component (B) and examine areas for:

(A)
1. Ponding of effluent
2. Damage to spray heads
3. Vegetation problems
4. Bad odors
5. Surfacing liquid

(B)
1. Bad odors
2. Surfacing liquids
3. Surface soil collapse
4. Damage to components
5. Alarm system function
6. Disinfection function
7. Informal sampling results recorded

Quarterly:

(A)
1. Monthly monitoring items
2. Proper spray sequence

(B)
1. Monthly monitoring items
2. Proper pump function
3. Proper liquid levels
4. Filter clogging

(To be done by a certified wastewater operator or factory authorized representative)

Biannually:

(A)
1. Erosion

(B)
1. Storage unit capacity

Annually:

Report, including formal sampling, signed by a certified operator will be submitted.

(A)
1. Prepare statement on system function

(B)
1. Collect formal compliance sampling
2. Septic tank build-up

February 22, 1993

Appendix #4 - GMP #17

MEMORANDUM

TO: District Directors
Environmental Health Managers
Environmental Health Supervisors
Environmental Health Project Managers

THROUGH: Robert W. Hicks, Director
Office of Environmental Health Services

FROM: David D. Effert, Technical Services Chief
Division of Onsite Sewage and Water Services

SUBJECT: Plan Review and Evaluation Process for Type II and Type III Onsite Wastewater Treatment Systems

Attached is the strategy for an effective plan review process for Type II and Type III onsite wastewater treatment systems. This strategy was developed to clarify responsibilities with respect to the review of plans and specifications for onsite wastewater treatment systems.

The goal of this strategy is to evaluate Type II and Type III system plans and specifications at the level of authority closest to the authority which issues the construction permit. It is realized, however, that there is not sufficient expertise at the local level to conduct a complete review of all projects. The attached strategy details the responsibility of the local reviewer, and it specifies where the project can be forwarded if additional review is necessary. The strategy also specifies the type of information which must be provided if a project is to be forwarded for review. To assist the local reviewer, a "plan review list", and a "plan review sheet" have been provided.

The plan review strategy was developed within the Division of Onsite Sewage and Water Services with review by the Office of Water Programs. The Office of Water Programs is an integral part of the plan review process for Type II and Type III wastewater treatment systems when additional review of a project is required. The responsibilities of the Environmental Engineering Field Office of Water Programs and the Division of Onsite Sewage and Water Services is clearly addressed in the attached plan review strategy.

The local environmental health specialist is responsible for the review of the site, and the issuance of a construction permit. This Plan Review and Evaluation Process outlines the proper procedure so the environmental health specialist can be assisted in the technical review of the design. A schematic flow diagram has been provided to graphically show how the review process is to proceed.

If you have any questions about this plan review process, please contact David Effert, Technical Services Chief, at
804)786-1750.

Attachment

GMP #17
Sewage - Onsite - Plan Review

cc: DOSWS Staff
Contract Soil Scientists
Cal Sawyer, Ph.D.

Plan Evaluation and Review Process for Type II and Type III Systems

Intent: The goal of this process is to evaluate and review Type II and Type III system plans and specifications at the level of authority closest to the authority which issues the construction permit.

Preliminary Technical Design Conference

A preliminary technical design conference (PTDC) is an essential tool for an efficient and timely technical evaluation of all projects. For major projects, questions and conceptual design criteria can be addressed during this conference. The Division of Onsite Sewage and Water Services (DOSWS) strongly encourages the holding of a (PTDC) to resolve fundamental concerns about the project. Such concerns may include the status of the permit(s), design loadings, treatment and pre-treatment technologies (if required), a discussion of other reviewing agencies which may be involved, and a time frame for the review process. All potential reviewing organizations should be invited to participate in a (PTDC).

Initial Submittal of Plans and Specifications

Four copies of the plans and specifications must be submitted to the local health department for evaluation and review. All project evaluations and reviews must begin with the submittal of plans and specifications to the local health department. The local health department must acknowledge, in writing, receipt of the plans. The local health department should complete a Scope and Detail (S & D) Sheet within 10 days of receipt of the plans and specifications, to determine if the project package is complete. *The S & D Sheet must be filled out if the project is to be forwarded to the Environmental Engineering Field Office of the Office of Water Programs (EEFO-OWP) or the (DOSWS) for evaluation and review.*

Plan Evaluation and Review by the Environmental Health Specialist/Supervisor

A Plan Review Sheet should be completed by the environmental health specialist or the environmental health supervisor. This form allows the environmental health specialist/supervisor to determine if the plans and specifications are adequate, and that the design complies with the requirements of the Sewage Handling and Disposal Regulations.
The plans should be evaluated and reviewed completely to determine their compliance with the regulations. Detailed and legible notes, and all review calculations dealing with the project must be kept.

If the project design does not comply with the regulations, the environmental health specialist or the environmental health supervisor must inform the consultant in a timely manner. When appropriate, copies of correspondence, including review comments, should also be sent to the owner or applicant to keep him informed of the status of the review. The consultant must then submit revised plans and specifications to the environmental specialist/supervisor, or take the steps necessary to bring the project into compliance with the Sewage Handling and Disposal Regulations. When the project complies with the Regulations (site conditions, hydraulic review, and all other regulated factors), the project is approved, and a permit is issued by the local health department.

Plan Evaluation and Review by the District Environmental Health Manager

If the project design is of such a nature that the Environmental Health Specialist/Supervisor feels that a higher level of evaluation and review is necessary, the project must be forwarded to the district environmental health manager. Information to be forwarded must include completed Scope and Detail and Plan Review Sheets; three copies of the plans and specifications; all plan review notes, data sheets, soils information, previous correspondence, product equipment specifications; and recommendations made by the environmental health specialist/supervisor during his review. A memorandum must also be included in this package which specifically identifies the type of review requested. *An incomplete plan review package will immediately be returned to the environmental health specialist/supervisor*. The district environmental health manager will review and comment on the plans and specifications and inform the environmental health specialist/supervisor of the results of the evaluation and review.

If the project design does not comply with the regulations, the district environmental health manager will inform the consultant of the deficiencies of the design in the form of a comment letter addressed to the consultant. Copies of the letter should be sent to the environmental health specialist/supervisor and to all interested parties. It is the responsibility of the environmental health specialist/supervisor to inform the district environmental health manager of anyone who should receive a copy of any comment letters. The consultant must then submit to the district environmental health manager, revised plans and specifications, and/or take the steps necessary to bring the project into compliance with the Sewage Handling and Disposal Regulations. When the project complies with the regulations, the plans and specifications, along with a letter of comment noting the project's compliance (or compliance with minor revisions), must be sent to the local environmental health specialist/supervisor. The environmental health specialist/supervisor must review and evaluate any changes which have been made or are needed to be made (minor revisions), to determine if the revised plans comply with the intent of the originally submitted plans. If they do, the project is approved, and a construction permit is issued by the local health department.

Plan Evaluation and Review by the EEFO-OWP or DOSWS

If the district environmental health manager determines that the project design requires additional review, he will forward the completed Scope and Detail and Plan Review Sheets; three copies of the plans and specifications; all plan review notes, data sheets, soils information, previous correspondence, product equipment specifications; and his recommendations to the appropriate Environmental Engineering Field Office of the Office of

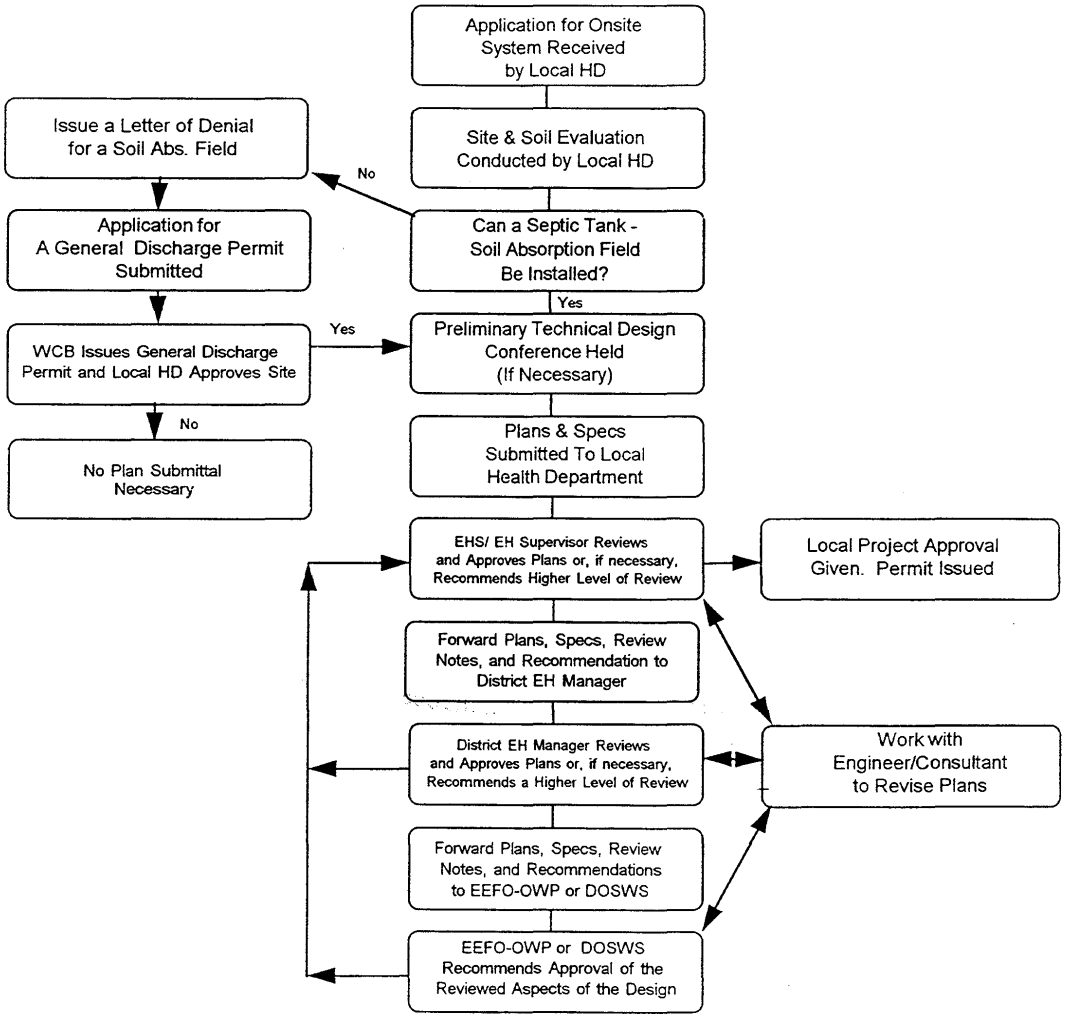
Water Programs (EEFO-OWP). A transmittal memorandum must also be included in this review package. A copy of the transmittal memorandum should be sent to the owner and the engineer so they are aware of the status of the project. This transmittal memorandum must specifically addresses the type of evaluation and review which is being requested. In districts where the EEFO-OWP field office is backlogged and the review process would take more than 60 days, the project design, with supportive information, should be sent to the Division of Onsite Sewage and Water Services (DOSWS) for review. *All of the information needed to conduct an evaluation and review must be included (see above), because an incomplete plan review package will immediately be returned to the district environmental health manager by either EEFO-OWP or DOSWS.*

The EEFO-OWP or DOSWS will review and comment on only those sections of the plans and specifications which they have been asked to evaluate and review. Neither the EEFO-OWP nor the DOSWS will review or comment on the soils or the drainfield design. *The suitability of both the site and the layout of the laterals are local decisions which neither the EEFO-OWP nor the DOSWS address*; they will only review and evaluate the hydraulics of the design. The EEFO-OWP or DOSWS will inform the environmental health specialist/supervisor of the results of the review. When appropriate, copies of all letters should be sent to the owner, applicant or others specified by the environmental health specialist/supervisor.

If the project design does not comply with the regulations, the EEFO-OWP or DOSWS will inform the consultant (and others as needed) of the deficiencies in the design, or the need for additional information. The consultant must then submit to the EEFO-OWP or the DOSWS, revised plans and specifications, and/or take the steps necessary to bring the project into compliance with the Sewage Handling and Disposal Regulations.

When the project design complies with the hydraulic consideration section(s) of the regulations which EEFO-OWP or DOSWS has been asked to review, the plans and specifications, along with a letter of comment noting the project's compliance, must be sent to the local environmental health specialist/supervisor. The environmental health specialist/supervisor must evaluate and review any changes which have been made or are needed to be made (minor revisions), to determine if the revised plans comply with the intent of the originally submitted plans. If they do, the project is approved, and a construction permit is issued by the local health department.

Plan Review Process
For Type II and Type III Systems



PLAN REVIEW SHEET

County/City:_____ Date Received:_____
Project Name:_____ Date of Review:_____
Engineer/Consultant:_____ Reviewer:_____

Items Which Should Be Addressed In The Design

	YES	NO	N/A
1. Estimated flow correct	__	__	__
2. Septic tank size correct		__	__
3. Tees shown in septic tank correct		__	__
4. Estimated percolation rate correct		__	__
5. Square footage of system correct		__	__
6. System sited in proper location		__	__
7. Depth of drainfield (bottom of ditch) correctly indicated on plans, and elevation indicated where necessary		__	__
8. Pump chamber size correct		__	__
a) Access riser		__	__
b) Vent		__	__
c) Union		__	__
d) Check value		__	__
e) Gate value		__	__
f) Pump off chamber floor		__	__
g) Chain or rope for pump removal		__	__
h) Pump down and dosing volume correct		__	__
i) 1/4 day storage provided		__	__
j) Pump curve included with plans		__	__
k) Pump chamber sealed water-tight		__	__
l) Pump brand and model number specified		__	__
m) Pump level controls specified		__	__
n) Pump and alarm on separate electrical circuits		__	__
o) Audio-visual alarm specified		__	__
9. Gravel size correct		__	__
10. Paper or filter fabric over gravel		__	__
11. Thrust blocks at 90 turns on force main		__	__
12. Hole spacing and number of holes correct for laterals		__	__
13. Pressure head adjustment indicated		__	__
14. Lateral number indicated for pressure head adjustment		__	__
15. Outside electrical boxes NEMA III or better		__	__
16. PVC piping primed and glued		__	__
17. Valves outside pump chamber are located in valve boxes		__	__
18. Water well location shown		__	__

SCOPE AND DETAIL REVIEW LIST

County/City:_____ Date Received:_____
Project Name:_____ Date of S & D:_____
Engineer/Consultant: _____ Reviewer:_____

Items Required to Initiate Plan Review

If a "NO" response is given for any required item(s), return the plans and specifications to the consultant.

		YES	NO	N/A
I.	PRELIMINARIES			
	A. Application for onsite system complete?	____	____	required
	B. General Discharge Permit issued?	____	____	____
	C. Preliminary technical design conference held?	____	____	____
II.	GENERAL			
	A. Original PE seal/signature/date (type III systems) on first sheet of plans?	____	____	required
	B. Facsimile PE seal/signature/date (type III systems) on additional sheets?	____	____	required
	C. Original PE seal/signature/date (type III systems) on specifications?	____	____	required
	D. Four sets of plans and specifications provided?	____	____	required
	E. Plans and specifications legible and of an adequate size/scale?	____	____	required
III.	PLANS			
	A. Location of project shown?	____	____	
	B. Site plan with topography provided?	____	____	required
IV.	DESIGN CRITERIA AND CALCULATIONS			
	A. Acceptable design criteria provided?	____	____	required
	B. Acceptable design calculations provided?	____	____	required
	C. Soils reviewed and are adequate for treatment/disposal?	____	____	____

If plans are to be submitted to EEFO-OWP or DOSWS for review, please provide the following information, if appropriate. Check box if item is attached.

(Incomplete projects submitted for review will be returned.)

- ☐ Memorandum specifically identifying the type of review needed **(REQUIRED)**
- ☐ Complete plans and specifications
- ☐ Approved variances
- ☐ Recommended design exemption(s)
- ☐ Soils data
- ☐ O & M manual
- ☐ Other (describe)_____
- ☐ Engineer's/consultants design notes
- ☐ Approved design exemptions
- ☐ In-house review notes (COPIES ONLY)
- ☐ Product literature, i.e., pump curve

_____
Environmental Health Manager Date

APPENDIX 5

COMMONWEALTH of VIRGINIA
Department of Health
P. O BOX 2448
RICHMOND, VA 23218

DONALD R. STERN, M.D., M.P.H.
ACTING STATE HEALTH COMMISSIONER

September 16, 1994

Peter W. Schmidt, Executive Director
Department of Environmental Quality
P.O. Box 10009
Richmond, VA 23240

Dear Mr. Schmidt:

The Virginia Department of Health (VDH) is responsible for the review and evaluation of approximately 32,000 applications for onsite sewage systems per year. The overwhelming majority of these systems are for single family homes. Our goal is to issue an appropriate permit for every site where adequate treatment and disposal can be accomplished. Most of our permits are for conventional septic tank drainfield systems but we also issue permits for elevated sand mounds, low pressure distribution systems, sand filter systems, aerobic treatment units and a variety of experimental systems.

One of the experimental systems that has shown great potential for cost effective onsite wastewater treatment and disposal is spray irrigation. With this letter I am sending a copy of a research report prepared by Virginia Tech that describes their work and findings. I am sure you and your staff will find these results most interesting.

At the present time, the Department of Environmental Quality (DEQ) handles all permitting of spray irrigation systems. The process used is appropriate for commercial and large scale domestic spray irrigation projects but tends to be cumbersome and expensive for individual homeowners and small flow domestic wastewater generators. My comment is offered strictly at face value and is not intended as a criticism of DEQ practices. I realize that the vast majority of spray systems are for large scale wastewater generators which the process serves well. By design and practice VDH is designed to serve individuals, families and small scale wastewater generators.

It appears to me, and I offer for your consideration, that with respect to wastewater treatment and disposal, that DEQ is best suited to serve industry and VDH is best suited to serve individuals. Therefore, I would like to propose a division of customer services whereby VDH would take over all aspects of

permitting small flow spray irrigation systems while DEQ continues to regulate larger wastewater generators. In this manner, the existing resources of the Commonwealth would be used to better serve both customer bases.

Specifically, I would like to propose VDH handle the permitting of all spray irrigation systems that meet the following criteria:

1. Average daily flows of less than or equal to 1,000 gallons per day (GPD).

2. Domestic wastewater only.

3. Only sites that could preclude effluent reaching state waters would be permitted.

Preliminary discussions between Mr. Donald Alexander, on my staff, and Mr. Larry Lawson, on your staff, have shown there is preliminary interest in this concept at both DEQ and VDH. We would be more than willing to include DEQ staff on the planning and development aspects of this proposal if you accept it. In fact we would encourage such cooperation to assure that the missions of both agencies are met.

One of my primary concerns is that of meeting the needs of our customers. Mr. Alexander informs me that we could include spray irrigation under our current onsite sewage regulations (Sewage Handling and Disposal Regulations) and be able to offer the public several important benefits. Among these benefits would be the following:

* Ability to permit some sites that we cannot now permit.

* Reduced permitting costs and elimination of renewal fee costs.

* More timely permitting.

* System designs that meet the needs of residential users.

* One stop permitting for small flow wastewater generators.

As you may know, there is a history of VDH and DEQ cooperating on small flow systems. The sand filter systems and aerobic units mentioned in the first paragraph are handled jointly between DEQ and VDH. DEQ has issued a general permit which establishes discharge limits and appropriate locations where discharges may be introduced into state waters. VDH issues construction and operation permits and conducts routine monitoring.

We view this proposal as a logical expansion of our cooperative oversight arrangement and suggest that it can be accomplished within the framework of our respective grants of authority in the Code of Virginia. We believe this change would benefit the public, provide excellent environmental and public health protection and eliminate some bureaucracy for homeowners. If you would like DEQ to enter into a cooperative agreement, please let me know. I look forward to your response.

Sincerely,

Donald R. Stern, M.D., M.P.H.
Acting State Health Commissioner

APPENDIX 6

11-1 OEHS

Office of Health Commissioner
Ref. To Thorpe
RECEIVED

OCT 26 1994

A.M. P.M.
7 8 9 10 11 12 1 2 3 4 5 6

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

Peter W. Schmidt
Director

OCT 24 1994

P.O. Box 10009
Richmond, Virginia 23240-0009
(804) 762-4000

Donald R. Stern, M.D., M.P.H.
Acting State Health Commissioner
Department of Health
P. O. Box 2448
Richmond, Virginia 23218

Dear Dr. Stern:

I am writing in response to your letter dated September 16, 1994, regarding regulation of the disposal of domestic sewage by spray irrigation systems. The Department is in agreement that this is an activity which can be governed by the regulations of the Department of Health without conflicting with the authority of the Department of Environmental Quality. Therefore, I support your proposal to incorporate this method of sewage disposal into the Health Department's Sewage Handling and Disposal Regulations and pledge the cooperation of my staff in the development of appropriate regulatory language to address this activity.

I have asked Mr. Larry Lawson and his staff to be available to assist your staff in the planning and development of the program. If I can be of further assistance, please let me know. Larry Lawson can be reached at 527-5150.

Sincerely,

Peter Schmidt

Peter W. Schmidt

PWS/jw

cc: Mr. Robert G. Burnley
Mr. James C. Adams
Mr. Larry Lawson

NOV 1994
RECEIVED
Environmental Health