



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY  
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TTY 711 or 800-833-6388 (For the Speech or Hearing Impaired)

September 14, 2004

Ms. Sally Bredeweg  
Natural Resources Conservation Service  
316 W. Boone Ave, Suite 450  
Spokane, WA 99201

RE: Draft NRCS Washington Conservation Practice Standard #313, Waste Storage Facility.

Dear Sally:

Please accept these written comments on the Washington Waste Storage Facility Conservation Practice #313, dated September 2004. I cannot attend the 9/15/04 meeting to discuss this draft standard due to a previously scheduled commitment.

The draft Conservation Practice #313, September 2004, if implemented, will help those who operate waste storage facilities to meet the requirements of the Washington Water Quality Standards. The highlighted sections in red and blue help to ensure that Washington's regulatory standards are met. The federal standard, without these additions, will not ensure that Washington's requirements for water quality or dam safety are met.

#### **Washington Water Quality Standard for Waste Storage Facilities**

The Water Quality Standards for Ground Waters of the State of Washington, Chapter 173-200 WAC, require the protection of the ground water quality to protect a variety of current and future beneficial uses. Shallow ground water is frequently used as the source for private domestic water supply wells, especially in rural areas; therefore, the appropriate beneficial use standard for the protection of shallow ground water is drinking water. In addition to the specific standards for drinking water, the State's anti-degradation policy [WAC 173-200-030] requires that existing ground water quality be protected. Waste storage facilities must be designed, built and operated to protect existing ground water quality.

#### **Permeability vs. Specific Discharge**

Misunderstandings of the difference between permeability and specific discharge may contribute to some confusion. The Department of Ecology uses soil permeability as the performance standard for lagoon liners. Many NRCS practices refer to specific discharge in their criteria. Both permeability and specific discharge are frequently reported in units of cm/sec. Permeability is a measure of the soil/liner's properties as liquid passes through. Specific discharge includes liner thickness and head on the liner along with the permeability to predict the amount of water that would pass through. The NRCS Agricultural Waste Management Field Handbook, Appendix 10D provides a conversion between the two on page 10D-7. This conversion



calculates that a liner with a permeability of  $1 \times 10^{-7}$  cm/sec, in a pond with liquid 9 feet deep and a 1 foot thick liner, the specific discharge would be  $1 \times 10^{-6}$  cm/sec. If the depth of liquid is greater, or the liner thinner, the specific discharge would be larger though the permeability would remain the same.

### **Manure Lagoon Standards**

For your reference, I have attached a copy of a letter outlining dairy lagoon standards that Ecology sent to Larry Johnson, NRCS, on January 23, 2002. Modeling results presented at the Manure Lagoon Workgroup meeting, on March 29, 2004, suggest that the standards outlined in this letter may not always be protective of ground water quality, though Ecology does not suggest that the standards be reexamined at this time. Below I will briefly touch on the points in the letter.

1. The maximum recommended lagoon liner permeability for manure lagoons should be  $1 \times 10^{-6}$  cm/sec, with the assumption that manure sealing will provide approximately an order of magnitude of additional protection resulting in a liner permeability of  $1 \times 10^{-7}$  cm/sec.
2. Manure lagoons with a single liner must have a minimum of 2 feet of vertical separation between the bottom of the lagoon and the top of the highest seasonal water table. In areas with high seasonal ground water, additional soil should be used to create an above ground lagoon which maintains this 2 foot separation.
3. A lagoon with a double liner, including a collection layer between the liners and a system to return any leakage to the lagoon, would be considered a non-discharging design that could be constructed with less than 2 feet of separation or with a base below the seasonal high water table. Design considerations for lagoons constructed below seasonal high water must include protection of the liner from uplift during times of high water table. A more thorough description of the design considerations is included in Ecology's January 23, 2002 letter.
4. The importance of construction quality control and quality assurance cannot be overstated. The only way to ensure that a facility will perform as designed is to include an inspection and testing program during construction. The EPA guidance document, *Quality Assurance and Quality Control for Waste Containment Facilities* (EPA/600/R-93/182) presents the state of the practice for construction quality assurance at these facilities and should be followed.

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Thank you for the opportunity to comment on this draft conservation practice. It is unfortunate that the meeting to discuss this standard was scheduled for a time when I am not available. I will be happy get together at some time when I am available to discuss these comments further. Please contact me at 360-407-7221 if you have any questions or if I can provide additional assistance.

Sincerely,

A handwritten signature in cursive script that reads "John Stormon".

John Stormon  
Hydrogeologist  
Water Quality Program

cc: Nora Mena, WSDA