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Subject: Dairy lagoon liner information

Hi,

Dennis recently asked me to find the New Mexico Environment Department (NMED) requirements for clay-lined dairy lagoons. As you know I used to work for NMED and was involved in developing ground water protection requirements for dairies. In trying to find the clay liner information, I've collected a lot of information that you might find useful. Most of it comes from New Mexico, but I've also included links to NRCS technical material.

I could not find the specific clay liner guidelines because NMED no longer allows their use for dairy process water.. The new "Dairy Rule" requires use of synthetic HDPE liners. I've included summary clay liner language below, to give you an idea of installation requirements, and specific installation language is available in the other sources. Note though that NMED now requires synthetic liners.

At the bottom of this list are a few links to the history of the new "Dairy Rule" and related testimony. In short, in 2010 the dairy industry in NM requested that the New Mexico Environment Department (NMED) develop a rule specific to dairies. It was very controversial but in the end they did put a strong rule in place. The testimony provides context for rule development and arguments from both the industry and environmental perspectives.

Happy reading,

Karma

Summary NMED liner language for clay liners:
Clay-lined lagoons must be constructed, at minimum, in accordance with all criteria listed in *NMED Guidelines for Liner Material and Construction of Clay Lined Lagoons* and meet or exceed specifications in the NRCS Agricultural Waste Management Handbook, Chapter 10, Appendix D. General minimum requirements state that saturated hydraulic conductivity of the liner material must be no greater than 1.0×10^{-7}cm/sec for each 6-inch lift at 90% Standard Proctor Density (ASTM D-422). Liner material must have a maximum particle size of 4 millimeters, at least 50% of the material must pass a #200 sieve, and the soil must have a minimum plasticity index of 10%. The GWQB permit requires that the liner be installed in 6-inch lifts compacted at each layer. Current GWQB guidelines require a minimum liner thickness of 12 inches, however new guidelines will specify the thickness of clay liners adjusted for the maximum depth of wastewater the lagoon is designed to contain. Table 1 shows the GWQB's clay lining thickness guidance based on depth of the storage pond.

** This paragraph is from the ***Unified Guidance for Dairies Subject to State Ground Water Discharge Permits and Federal Concentrated Animal Feeding Operation Permits,"*** the product of a collaboration I led in 2004 between NMED, NRCS, NMSU, and EPA to clarify requirements for dairy operators. It is a little outdated now but contains a lot of relevant

information.

Below is a comparison of NMED, NRCS and EPA requirements for diaries, also a product of this work group:

gwqb-cnmp-cafoComparechartdraft8.pdf gwqb-cnmp-cafoComparechartdraft8.pdf

NMED Monitoring well guidelines:
http://www.nmenv.state.nm.us/gwb/documents/MonitoringWellGuidelinesFINAL-March2011.pdf

NMED Synthetic liner guidelines:
http://www.nmenv.state.nm.us/gwb/documents/Synthetic_Liner_Guidelines_rev00_5-07.pdf

NMSU Dairy Technical and Regulatory Guidance for New Mexico
A wealth of information on dairies and environmental impacts. This includes a sample NMED ground water permit.
http://aces.nmsu.edu/pubs/_circulars/CR_639.pdf

NRCS Ag Waste Management Handbook, Appendix 10D, "Design and Construction Guidelines for Waste Impoundments Lined with Clay or Amendment-Treated Soils
http://www.northstoningtonct.gov/Pages/NStoningtonCT_BC/ASC/docs/AgricultureDocument.pdf

The history of the new "Dairy Rule"
NMED Direct Testimony and Proposed Dairy Rule (NOI Attachment 8)-
ftp://ftp.nmenv.state.nm.us/www/gwb/ProposedDairyRegs/NOIAttachment8-ProposedRule+Testimony/NOIAttachment8-ProposedRule+Testimony2.pdf

NMED Exhibits for Direct Testimony (NOI Attachment 9)
ftp://ftp.nmenv.state.nm.us/www/gwb/ProposedDairyRegs/NOIAttachment9-Exhibits/

NMED Rebuttal Testimony (Attachment 3 - rebuttal to industry direct testimony - starts with PDF pg 88) (Attachment 4 – rebuttal to coalition direct testimony – starts pdf pg 206) (Exhibits start pg 226)
ftp://ftp.nmenv.state.nm.us/www/WQCC/DairyRegs/NMEDRebuttalNOI3-29-10.pdf

WQCC Original Dairy Rule Hearing - Pleading log -
http://www.nmenv.state.nm.us/OOTS/HearingOfficer/DairyRegs/NMED-WQCC-DairyPleadingLog.htm

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