Drainfield to Surface Water Setback Distance Subcommittee
Teleconference Meeting Minutes
Wednesday, 01/27/2010, 10:00 am

Teleconference
Date: 2010-01-27
Start: 1000 hours
Attendance:
Boise: AJ Maupin, PE; Joe Canning, PE; Bill Holder, PE;
Hayden: Dick Martindale; George Miles, PE; Allen Worst
Idaho Falls: Nathan Taylor; Brett Skidmore (Building Contractors Association Representative)
Missing: John Corcoran (Realtor Association Representative); Dr. Jim Ippolito, Ph.D. USDA
Guests: Michael McIntyre, DEQ Surface Water Program Manager; Tonia Mitchell, Senior Environmental Hydrogeologist, Groundwater Program

Meeting called to order at 10:00 am.

Past Meeting minutes:

December 2, 2009 Minutes: comment made to include saturated flow required for long distance transport of viruses and bacteria reductions occurring quickly beneath drainfields if unsaturated flow conditions exist. Motion made to approve the minutes as amended, seconded and passed unanimously.

January 6, 2010 Minutes: comment made that the pathogen focus group believes that pathogens will not be a limiting factor in drainfield to surface water setbacks if unsaturated flow conditions are maintained beneath the drainfield. Motion made to approve the minutes as amended, seconded and passed unanimously.

Question & Answers with Ground & Surface Water Program Representatives:

The initial question posed was to the Surface Water Program and asked how modifications to the Surface Water Setback distance, currently specified in the Subsurface Sewage Disposal Rule (IDAPA 58.01.03),would impact the adjacent surface water's Total Maximum Daily Load (TMDL), if one were allocated. The Surface Water Program's responded by stating that if the soils are properly accounted for and suitable setbacks established then any impact should be inconsequential. What has happened in the past is that the Water Advisory Groups (WAG) have allocated the nonpoint source contributions to agriculture and, where present, to subsurface sewage disposal. Unfortunately, there typically was no reserve retained to accommodate for growth. Future modifications to TMDLs may reallocate nonpoint source contributions between agriculture, subsurface sewage and provide an allotment for growth.

A second question inquired about pertinent limits if the surface water body currently does not have a TMDL established. These surface waters will be evaluated on a case by case basis.

It was pointed out that Idaho occupies at least two different ecoregions; the Xeric West (Region III) and the Forested Mountain West (Region II). Concern was voiced about having a single statewide setback distance to surface waters that would be applicable to both ecoregions. Solutions to this situation were presented, such as establishing a conditional statewide setback distance that would be set aside for a more conservative setback distance if a TMDL is established on adjacent surface waters, or employing technology to reduce phosphorus discharge to the environment.

It was pointed out that ground water has a primary water quality standard for nitrates of 10 mg/L and the Onsite Program has the Nutrient – Pathogen (N-P) Study to model nitrate impacts from drainfields. This prompted the question whether nitrate is a concern for Idaho's surface waters? Surface Water program stated that typically Idaho does not have TMDLs for nitrate. The program is not seeing cold water life impacts from nitrates but may see TMDLs for total nitrogen or ammonia in the future.

In summary, pathogens are not expected to be a limiting factor if the vadose zone beneath the drainfield is maintained in an unsaturated flow state, PPCPs & EDCs are currently not regulated and nitrates have a primary ground water quality standard that must not be exceeded but is not expected to impact surface water.

State Drainfield to Surface Water Setback Investigation:

a. **Allen**:
Washington state has 100 foot setbacks from springs and waters used for drinking specified in their regulations. Allen spoke with Washington's Department of Health who indicated that this 100 foot setback has been in place for the past 40 years. No history available supporting why 100 feet was selected.

b. **Dick**:
Utah state's Dave Snyder indicated that the 100 foot setback was established from the old Public Health guide.

Wisconsin administrative code defers to County ordinances, some of which are as low as 50 feet to drinking water sources. No historical information on how separation distances were established.

Massachusetts has setbacks of 400 feet to drinking water reservoirs, 200 feet to streams tributary to drinking water reservoirs, and down to 50 feet for other types of surface waters. They also lacked documentation on how these separation distances were established.

c. Joe:
New Mexico's regulations make a distinction between lined and unlined canals. Separation distances to a lined canal is 10 feet plus the depth of the canal, to an unlined canal 25 feet plus the depth of the canal and 100 feet to surface water.

Arizona established in 1976 a 100 foot setback to live streams for drainfields and septic tanks. Some historical information indicated that their old separation distances were established in an old US Public Health Service Publication 526, and the research may have been completed at the Robert A. Taft Sanitary Engineering Center.

Idaho's separation distances were changed in 1985 from a flat 300 foot requirement to the soil based, incremental system we have today. Reason for change was political and influenced by the various health districts interpretation of the 1978 Rule allowing setbacks to be reduced to 100 feet. It was not uncommon for some health districts to issue subsurface permits as close as 100 feet to surface water while others maintained the Rule required 300 feet. Shelby Brownfield, a past DEQ soil scientist, looked at state's soils and associated setbacks, assisting the decision to maintain 300 feet for coarser, sandy soils, allow reduction to 100 feet for tighter clayey loam soils, and split the difference for the moderate loamy soils.

d. **Bill**: Did not have information on **Virginia's** regulatory setbacks and historical justification.

f. **Nathan**:
Minnesota shares regulation of setbacks between the Minnesota Pollution Control Agency (MPCA) and the Department of Natural Resources (DNR). Their setbacks seem to be based on the classification of adjacent surface water. General setback is 50 feet, recreational development must be 75 feet in remote streams, and varies from 50 feet to 150 feet for other sites. The MPCA requires modeling for any proposed system discharging over 5,000 GPD and closer than 500 feet to surface water. MPCA may require modeling on smaller flows also. Even though Minnesota state law requires a Justification Statement be published in support of these regulations, one was not available. DNR stated that they are currently investigating increasing setbacks to surface water for general development from 50 feet to 75 feet, and making all separation distances to any cold water stream 200 feet to protect their trout fishery. Minnesota is pursuing these increased separation distances due to surface water degradation from onsite wastewater systems adjacent to surface water.

g. **George**:
California has had 100 feet setback for a long time. California's Regional Water Quality Control Boards (WQCB) establish the setbacks. The WQCB may have set this distance due to a reference to the Safe Drinking Water Act (SDWA). Counties can authorize reduced setbacks but they must be approved by the WQCB. Most California Counties will not permit systems in what Idaho classifies as an A type soil. California uses the USDA Soils Triangle but splits it into 4 quadrants. California does rely on percolation tests.

h. **AJ**:
Oregon DEQ took over siting from Oregon's State Board of Health in 1974 and at that time established 100 feet as the surface water setback distance required. Prior to that it had varied from 50 feet to 150 feet. There is still an exception to the 100 foot setback rule, that is for lots platted prior to the May 1, 1973 may have a 50 foot setback. Oregon believes that that 100 foot setback distance was based upon old Public Health Sanitarian manual recommendations.

North Carolina's separation distances vary but are typically 100 feet to streams classified as WS-1, Class I & II reservoirs, public water supply sources, wells and springs. Coastal waters, storm water retention ponds and any lake or pond (not classified as S.A) may be 50 feet. The North Carolina contact was unavailable to discuss historical information for these setbacks.

Colorado counties regulate the drainfield to surface water setback distances. The Colorado contact indicated that most of the counties require 100 feet separation.

George Miles indicated that he believes he knows where he can obtain a copy of the old Public Health Services Publication 526. AJ also indicated that he would look for a copy.

Nathan pointed out that the TGM (page 2-8) indicates that the drainfield to surface water separation distance may be reduced to no less than 100 feet when the stream is a loosing stream or the surface water is sealed off from the ground water so that there is no movement of ground water into surface waters. Dick pointed out that same section indicate that the area's population density and watershed characteristics must be evaluated before issuing a reduction.

Soil & Site Variables Required for Establishing Separation Distances:

Variables useful for determining a site's drainfield setback to surface water distance and how they may be used were both discussed. While these variables may be useful for modeling, they may also be used in establishing matrices that the Health Districts could use during site evaluations to determine the surface water setback distances for drainfields. One subcommittee member indicate that California uses a percolation test and wondered why we could not do the same. It was pointed out that the TGM does allow for percolation / infiltration tests, actually specifying two ASTM specifications to perform infiltration tests, but the Rules specify that the soils be classified per the USDA soil textural classification and the drainfields be sized based upon the rule specified Long Term Application Rate (LTAR); see IDAPA 58.01.03.008.02.b and 008.03.b, respectively. Additionally, the setback distances are also specified based upon the USDA soil textural classification (IDAPA 58.01.03.008.02.d). Unfortunately, the performance history for percolation / infiltration testing in Idaho has been very poor. This last fact prompted the change in Rules and clarification in guidance we currently have.

It was pointed out that all horizontal movement to surface water occurs in the aquifer after the effluent has traveled vertically through the vadose zone. So, vertical infiltration distance should not impact horizontal separation distance to surface water unless an impermeable layer is encountered. Horizontal saturated hydraulic conductivity is typically greater than vertical saturated hydraulic conductivity due to the physical deposition processes that generated the soil layers. This may cause effluent to disperse horizontally during its vertical travel to the aquifer. These facts indicate that saturated hydraulic conductivity (k_{sat}), aquifer dispersivity, gradient and thickness should be variables used for saturated flow in the aquifer.

Soil mineralogy and iron (Fe), aluminum (Al) and Calcium (Ca) cation concentrations should be determined to evaluate adsorption and precipitation potential. One member did not agree with including Ca in the list of cations due to Ca cation's sensitivity to pH changes. Changing pH allows the Ca cations to solubilized and release sequestered phosphorus. Another member thought that at this time Ca should continue to be considered because wastewater processing may be able to limit the pH fluctuations below the drainfield. Additionally, we may find that Fe and Al bearing soils are devoid of Ca. Another member voiced their desire to retain the current 300 foot / 200 foot / 100 foot separation distances, but allow simple reductions if site attributes supported reduced setbacks. It was pointed out that this activity must be done with care so that adjacent systems are not granted different setbacks causing strife between neighbors and conflict with the regulatory agencies. In summary, vadose zone variables should include vadose zone thickness, unsaturated flow attribute, soil mineralogy and particle size distribution.

Other factors addressing new onsite system technologies should be employed as they become known. A technology's ability to consistently meet a set discharge limit will determine the amount of constituent of concern discharged to the drainfield and ultimately the environment. These limits will establish the load discharge to the soils, and the soil's ability to sequester (adsorb, precipitate) the constituent of concern will help define the setback distance.

It was pointed out that in a previous meeting some variables were mentioned for use in a matrix. This matrix was a proposed method for the Health Districts to use to determine setback distances. It was recommended that we include these previously identified variables. For completeness, the mentioned variables are included below:

1. Soil type
2. Mass of soil
3. Surface water type
4. Depth to groundwater
5. Linear loading rate of soil
6. % Gravel in soil
7. Distribution methods
8. Existing surface water concerns (TMDLs)
9. Larger flows (LSAS) cap for setback reductions.

Finally, the following variables should be added: soil bulk density and plasticity index. Receiving surface water beneficial use should also be included. A surface water's beneficial use may categorize the allowable setback distances.

Next Meeting Schedule:

The next meeting is tentatively scheduled for Thursday, 11 February 2010, from 10:00 am MST (9:00 am PST) to 12:00 pm MST (11:00 am PST).

Meeting Topic:

Review Milestones.
Discuss available phosphorus data.
Available phosphorus removal technologies.
Discuss modeling and potential trial modeling runs.

Meeting adjourned at 12:07 pm.