Winter Manure Spreading Surface Water Risk Assessment

The winter manure spreading risk assessment is recognized in the current Wisconsin NRCS 590 Nutrient Management Plan Practice Standard (V.A.2.b.(2)) as "locally identified areas delineated in a conservation plan as contributing nutrients to a direct conduit to groundwater or surface water as a result of runoff".

The winter manure spreading risk assessment is implemented in addition to following prohibitions from the Nutrient Management Practice Standard:

- No application of nutrient to frozen soil within 300 feet of a stream/1000 feet of a lake or pond.
- No application of nutrients where runoff can reach a direct conduit to groundwater.
- No application of manure on frozen soils where slopes are greater than 9%, 12% with contouring, contour strips, or buffers.

The winter manure spreading risk assessment is a conservation planning analysis of the interconnection of each individual field-to-surface waters by concentrated flow channels and the flow path of runoff within the associated drainage area of each identified concentrated flow channels. Areas of fields that are internally drained or upland areas of watersheds that produce runoff as sheet flow will be ranked as having the lowest risk to impact surface water.

Fields determined to have a low risk for runoff of manure from frozen soil will discharge some manure to surface waters under conditions which generate heavy runoff. Application of manure to fields with a documented low risk using this method will reduce the likelihood of an "acute" impact to water quality due to manure runoff. **Internally drained areas of fields may have a higher risk for discharge to groundwater or subsurface drainage tile,** and these risks must also be evaluated by the conservation planner.

<u>Winter Manure Spreading Surface Water Risk Assessment Process</u>

1) Document the presence of concentrated flow channels within areas where manure will be mechanically applied to frozen soil. Utilize contour lines on a topographic map, stereo photographs, soil maps, GIS digital elevation model data or in-field observation of drainage patterns to identify the presence of concentrated flow channels.

   Concentrated flow channels include intermittent streams, drainage ditches, and drainage ends identified on the soil survey and contiguous up-gradient deflections of contour lines on a topographic map. Concentrated flow channels can also be identified in the field as ephemeral gullies where the down gradient flow of water has eroded linear channels in the field. The erosion pattern is often obliterated by tillage or by residue from recent crop harvest, but the pattern will return after a few runoff events.

2) Determine the watershed boundaries for each concentrated flow channel by evaluating the path of overland flow as runoff to the identified concentrated flow channel (hydrology

methods used to calculate contributing watershed for the design of a grassed waterway can be used for this analysis). This delineated watershed is the "**associated drainage area**" for the concentrated flow channel.

Within each associated drainage area, delineate the areas that deliver runoff directly to the concentrated flow channel as non-sheet flow (dendritic flow pattern radiating out from the concentrated flow channel). On a topographic map, these areas will appear as a compact series of contour lines directly adjacent to the concentrated flow channel.

All areas within 50 feet on each side of a concentrated flow channel shall be considered to deliver runoff directly to the channel. All areas where water floods or ponds that are directly connected to a concentrated flow channel shall be assumed to provide direct runoff.

Areas of continuous slopes greater than 300 feet in length that adjoin concentrated flow channels should also be identified as contributing non-sheet flow because, under frozen soil conditions, runoff and associated contaminants from these areas will reach the channel.

Identifiable areas of internal drainage should be **delineated out** of the associated drainage area where possible.

3) To determine the relative risk for runoff from manure applied to frozen and snow-covered soil, a field-by-field analysis will be conducted. A measurement of the surface area of each field delineated as **contributing runoff to the concentrated flow channel as non-sheet flow** shall be recorded. A low-risk field for winter surface application of manure is defined as having less than 1/3 (33%) of its surface area identified as contributing runoff directly to the concentrated flow channel via non-sheet flow. **NOTE: the 33% measurement is a planner's estimation, not a precise acreage measurement.** Larger fields may be subdivided in order to meet this criterion as a strategy for development of a winter spreading plan.

   All associated drainage area delineations and concentrated flow channel locations must be verified in the field by a certified conservation planner.

4) If between 33% and 40% of a field is identified as contributing runoff directly to a concentrated flow channel as non-sheet flow, additional management practices shall be implemented if manure will be applied to frozen and snow-covered soil. Additional manure management practices may include reduced manure application rates (3500 gallons/ac. liquid manure), partial incorporation of liquid manure into crop residue layer, or manure applications only to areas of the field that are outside of risk area defined above.

5) If greater than 40% of a field is identified as contributing runoff directly to a concentrated flow channel as non-sheet flow, manure should not be applied to these areas during frozen and snow covered soil conditions.