AEM Tier 2 Worksheet
Farmstead Water Supply Evaluation

Glossary

Casing: Steel or plastic pipe installed while drilling a well, to prevent collapse of the well bore hole and the entrance of contaminants, and to allow placement of a pump or pumping equipment.

Drilled wells: Wells constructed by a combination of jetting or driving. These wells are normally 4 to 8 inches in diameter.

Driven-Point (sand point) Wells: Wells constructed by driving assembled lengths of pipe into the ground with percussion equipment or by hand. These wells are usually smaller in diameter (2 in. or less), less than 50 feet deep, and can be installed in areas of relatively loose soils, such as sand.

Dug wells: Large-diameter wells often constructed by hand.

Grout: Slurry of cement or clay used to seal the space between the outside of the well casing and the bore hole, or to seal an abandoned well.

Hydro-Geological: Geology as it related to the occurrence, distribution and use of groundwater.

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Background

Preventing well water and spring development contamination should be a priority concern for every farm. Health impacts to people and animals can be serious and treatment methods can be costly. Once the groundwater that supplies a well or spring is contaminated, it can be very difficult to clean up. The only options may be to treat the water or obtain water from another source. If farm related contamination affects a neighbors' well, the farm may be responsible for clean-up costs.

The condition of a well or spring and its proximity to potential sources of contamination determine the risk posed to the quality of the water. For example, a cracked well casing allows pathogens, nitrates, oil and pesticides to enter the well more easily. Pesticide spills near a well while mixing or loading can result in contamination of nearby wells, including those of neighbors depending on proximity and hydro-geological conditions. Feedlots, barnyards and septic systems are potential sources of pathogens and nitrates. Manure and fertilizer applications and waste storage areas can also be sources of nitrates. Both pathogens and nitrates pose serious health hazards if they get into drinking water supplies.

NYS Department of Health has regulations pertaining to locations of new wells in relation to agricultural pollutant sources. The USDA Natural Resource Conservation Service standards also contain recommended setback distances for manure application or storage in relation to existing wells. Farmers should be aware of these distances before siting a new well or applying nutrients near wells.

AEM Principle:

Agricultural operations should be carried out so as to prevent potential agricultural pollutants from impacting drinking water sources.

Glossary Continued…

Minimum Separation Distances: The minimum distance between an existing water supply system and a potential pollution source. See recommendations below. Requirements for new wells can be found at: http://www.health.ny.gov/regulations/nycrr/title_10/part_5/appendix_5b.htm#table1

Nitrates: A chemical derived from nitrogen-containing substances such as animal wastes, fertilizers and septic system leachate. Nitrates are soluble in water, and if they get into drinking water supplies at elevated rates, they pose serious health risks to fetuses and young children.

Pathogen: Any microorganism that causes disease, such as a bacterium, viruses or protozoan.

Pitless Adapter: A sanitary, watertight connection to the well casing using either a prefabricated unit or by welding. The adapter allows water from the well to be diverted horizontally below the frost line into underground water lines.

Recharge Area: The natural process of infiltration and percolation of rainwater from land areas or streams through permeable soils into water-holding rocks or unconsolidated materials (such as sands and gravels) that provide underground storage.

Sanitary Well (Cap) Seal: Watertight connection (usually rubber gasket) used to seal the well where pump lines and electric cables pass out the top of the well casing.

Recommended Minimum Separation Distances to Protect Water Wells from Farm Related Contamination*

Contamination Source	Distance (Feet) from existing well
Manure spreading (new wells should be installed 200 feet from manure spread fields)	100
Engineered and properly maintained waste storages	100
Manure pile areas	200
Vegetated Treatment Areas*	100
Barnyard, silo, barn gutters and animal pens*	100
Fertilizer and/or pesticide mixing and/or clean up areas	100
Petroleum Storage	100 down gradient
Mortality Management Site*	200

*Taken from NRCS Standards and Cornell Guidelines

AEM Tier 2 Worksheet: **Farmstead Water Supply Evaluation**		**Potential Concern**		
Factors Needing Assessment:	Lower 1	2	3	Higher 4
What is the type of water supply?	Public or community water supply	Drilled well		Driven-point (sand point), dug well or spring development or surface water (i.e. ponds, streams) should not be used for human drinking water unless treated.
How many water supplies exist at the farmstead? **Complete chart on page 7**				
Is the water supply adequate for intended use? **Has your water supply ever gone dry?**				
Do you know what your average daily water usage is? **Do you keep records?**				
What is the position of the water supply in relation to potential pollution sources?	Upslope from all potential pollution sources. All surface water is diverted from water supply **AND** Water supply not subject to flooding.	At grade with potential pollution sources. No surface water runoff reaches water supply **AND/OR** Water supply rarely floods.	Down slope from potential pollution sources. Some polluted runoff may reach water supply **OR** Water supply floods occasionally.	Settling or depression near well casing, allowing potentially polluted runoff to reach water supply. **OR** Supply is subject to frequent flooding.
What is the separation distance* between the water supply and potential farmstead contamination sources? ***See table in background section.**	Meets or exceeds all state and local minimum required separation distances **AND** There is a separate water supply for livestock and household use.	Meets or exceeds all minimum separation distances. **AND** Connections, such as livestock watering facilities, contain backflow prevention.	Meets minimum separation distances.	Does not meet minimum separation distances for one or more potential pollution sources.

AEM Tier 2 Worksheet: **Farmstead Water Supply Evaluation**		**Potential Concern**		
Factors Needing Assessment:	Lower 1	2	3	Higher 4
What is the soil texture in the recharge area impacting the well or spring?	Fine-textured soils (clay, silty clay, sandy clay).	Medium-textured soils (silt, silt loam, loam).	Moderately course-textured soils (fine sandy loam, sandy loam)	Coarse-textured soils (sandy, loamy sands, gravel). **OR** Soils shallow to fractured bedrock.
Is the area subject to a high water table?				
Does the farmer have a copy of the well driller's log and report?				
What is the condition of the casing and well cap (seal)?	Casing clean steel, plastic or wrought iron at least 6 in. diameter. No holes or cracks. Cap tightly secured. Screened vent that faces the ground. Pitless adapter or sanitary well seal for pump lines or electric cables.	Casing at least 4 in. in diameter and no defects visible. Well has vent without screen. There is a pitless adapter or sanitary well seal.	Casing consists of 4 in. fiberglass and has no holes or cracks visible. Cap loose. No pitless adapter or sanitary well seal.	Holes and/or cracks in casing are visible. Cap loose or missing. Can hear water running.
What is the casing depth?				
What is the casing height above the land surface?	More than 18 in. above grade. **AND** Outside any flood-prone area.	Above grade **AND** At least 2 ft. above highest known water level in flood-prone areas.		Below grade or in pit or basement.

AEM Tier 2 Worksheet: **Farmstead Water Supply Evaluation**		**Potential Concern**		
Factors Needing Assessment:	Lower 1	2	3	Higher 4
What is the condition of the surface material around the well casing?	Casing surrounded at the ground surface by a 4 in. thick concrete slab extending at least 2 ft. in all directions and sloping away from casing.	No settling of the surface material around well casing and ground sloped away from well casing. No space between well casing and surrounding surface material.	Can see settling of surface material around well casing.	Can see settling of surface material around well casing and visible space between well casing and surrounding surface material.
Has the well been grouted? **If so, what is the condition?**				
How often is the water tested?	Water tested at least twice each year (spring and fall) for presence of bacteria and nitrates.	Water tested every year for presence of bacteria and nitrates.	Water tested every 3 years for bacteria and nitrates.	No recent water tests done for bacteria and nitrates.
Have wells tested positive for any contaminants? **If so, please list type, date and treatment:**				
How often is the plumbing system inspected?				
Are there unused or abandoned wells on the farm?	No abandoned wells.	Unused wells capped and protected. Abandoned wells have been filled and plugged according to NYSDEC Standards.		Unused wells not capped or plugged.
For dug or driven point wells: **Is the catchment area fenced or inaccessible to livestock?** **Is surface water diverted from the area?** **If a dug well, is it covered?** **If not, how often is it visually inspected?**				

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Factors Needing Assessment:	Lower 1	2	3	Higher 4
For a spring: **Is the catchment area fenced or inaccessible to livestock?** **Is the spring covered?** **If not, how often is it visually inspected?** **Are overflow pipes and vent openings screened?**				
Have any wells in the neighborhood or adjacent area tested positive for contamination?				
Comments:				
Benefits to other resources can also be possible while working toward improved water quality. Taking stock of how existing and future management affect soil, water, air, plants, animals, energy, greenhouse gases, people, and economics can result in more effective plans and additional benefits to farms and communities both now and into the future. **Additional Comments:**				

Farmstead Water Supply Inventory

Water Supply No.	Location	Type	Intended Use	Comments/Condition