

Fragmenting the Landscape, One Gas Well at a Time

Sue Smith-Heavenrich

In the Spring '09 issue, Sue Smith-Heavenrich wrote about contamination of New York's water resources from the "fracking" process used to liberate natural gas trapped in underground shale formations. NOFA-NY supports passage of recently introduced legislation to regulate fracking (see page 16). In this installment, Smith-Heavenrich explores potential impacts of drilling and gas pipeline installation on agricultural land and forests.

"Natural gas leasing is now the number one rural land-use issue," says Brett Chedzoy. Chedzoy speaks not only as a regional extension forester with Cornell Cooperative Extension of Schuyler County, but also as a farmer with personal experience—operations on his livestock farm have been disrupted twice for gas pipeline construction projects.

John Lacey, who served as an agricultural land resource specialist for New York State Department of Agriculture and Markets for over thirty years, agrees. Lacey believes that every farmer—even those who do not lease their land for gas drilling—needs to understand the potential impacts drilling and pipeline construction can have on agricultural lands. Both Chedzoy and Lacey have been speaking to groups of landowners and farmers since last sum-

mer, urging them to protect their fields and forests.

Gas Under the Cornfields

Up until the 1970s, gas drillers and pipeline companies didn't show much concern for the land they used. Too often they left fields with depressions where a pipeline trench subsided, dead zones polluted by residual salt from a brine spill, or pipelines buried so close to the surface that farmers couldn't plow or cultivate.

Over the years some things have changed for the better: Pipelines are buried deeper, and some drilling companies remove all drilling muds and wastes from the site rather than covering them and burying the pits. Even the most careful operation can experience a spill that could contaminate water and soil, but there are other environmental

issues that can impact agriculture, including soil compaction and fragmentation of fields and forests.

Once energy companies have developed wells capable of commercial production, they'll need to build gathering pipelines to convey the gas to market. These pipelines will cross a number of parcels; even landowners not involved in a drilling unit may be affected by pipeline construction on a neighboring property, or if eminent domain is exercised to take land needed for pipelines.

Many of the problems that Lacey has documented resulted from a lack of understanding of soil drainage qualities and regional climate. Pipeline consultants from the South and West are accustomed to dealing with arid climates and soils only. They don't understand, for example, that the Soil and Water Conservation Department map designation of "moderately drained" refers to the root zone for crops, not the full depth of the soil required for pipeline excavation.

Before allowing a well to be drilled or a pipeline to be constructed, "you need to have a good understanding of your soils and the way they drain," Lacey tells farmers. While the valleys are made up of gravelly soils that tend to drain well, the hills are covered with a topsoil layer that is, in some places, as thin as 8 inches.

Whatever its depth, "make sure your topsoil is scraped to the side and piled in a berm," Lacey says. Only when the construction is completed and the area decompacted should the topsoil be replaced.

Many soils in New York state have an impermeable fragipan, a silty-clay subsoil layer with low fertility. Pour water onto soil and it percolates downward until it hits the fragipan—then it begins to flow horizontally. This is significant because water flowing horizontally along a fragipan layer will pool in a pipeline trench. Left unaddressed, this will create chronic drainage problems for a field or right-of-way (ROW) through forest.

Agricultural Mitigation for Pipeline Right-of-Ways (ROWs)

1. Strip the topsoil and store it in a berm.
2. Allow an ROW wide enough to allow for the segregated storage of the topsoil, the trench spoil, and truck traffic. This may mean a temporary ROW up to 60 feet wide for a small gathering pipeline, and up to 110 feet wide for a major transmission pipeline, during the construction phase.
3. On sloped land make sure there are durable sandbag "trench breakers" placed sufficiently along the trench to control water from following the excavated "path of least resistance" and preventing "blowouts" down the hill.
4. Make sure the exposed subsoil is ripped and decompacted before the protected topsoil is used to cover it. Also, the crew should pick up and remove all the larger stones and rock material lifted up during the ripping prior to replacing the topsoil layer.
5. After replacing topsoil the crew should go over the disturbed area again with a deep subsoiler. When finished, it should be easy to penetrate the soil at least 18 inches below the surface.

Best mitigation practices for agricultural landscapes are discussed in the publication, *Pipeline Right-of-Way Construction Projects: Agricultural Mitigation through the Stages of Project Planning, Construction/Restoration and Follow-Up Monitoring*, available online at www.agmkt.state.ny.us/ap/agservices/WEBAP-ConstrGuides.pdf.



A pipeline right-of-way in Van Etten, New York, offers an opening for invasive species and a temptation to all-terrain vehicles. *Photo by Sue Smith-Heavenrich*

New York state receives 3 inches of precipitation a month on average, making it hard to find an extended period of time for construction when the soils aren't excessively moist. Even in winter the soils are subject to periodic thaws. "That makes them too wet and vulnerable for the type of traffic that drilling and pipeline work require," Lacey states.

Because of these potential problems, farmers must continually monitor and inspect the excavation and installation work during drilling and pipeline construction, Lacey emphasizes. This means everything from checking the numbers imprinted on the drainage pipe to making sure that the workers don't use topsoil to pad the pipeline and fill in the trench.

"When the restoration is done by the book, farmers should see an even growth of their crop the following year," Lacey says. But landowners need to continue monitoring and inspecting the restored construction site for at least two years because settling soil can create depressions, and wet spots may show up long after installation is finished.

Right-of-Ways Through the Trees

Without proper lease protections, forest owners face potential losses in terms of timber, wildlife habitat, and other property uses. If a gas company wants to use your

land for a drilling pad or as an ROW for a pipeline, they ought to pay fair value for all timber removed from your land, Chedzoy says. Even young successional forests have value. An 8-inch tree may have current value only as firewood, but if left for another 50 years it would have significant value as a saw log.

"Make sure you specify that the trees be cut by a logging crew and piled in an accessible location," Chedzoy says. Too often energy companies use bulldozers to clear land, leaving trees mixed with stones and debris. This makes them unacceptable to a mill or to someone using a chainsaw.

As with fields, forest owners will want to protect topsoil, restore drainages, and control erosion. Once construction is completed, the soil needs to be decompacted. Then the topsoil should be replaced and—especially if the area will be maintained by brush-hogging—the rocks and stones must be picked out.

Usually the companies reseed the area with a conservation mix, Chedzoy says. Forest owners may also want to consider shooting chopped straw or hay to mulch the area, and putting in water bars or other erosion control measures.

According to Chedzoy, ROWs are the number-one entry point for invasive species. Removing trees in an ROW creates an "edge"—an opening preferred by such

invasive species as European buckthorn, multiflora rose, privet, several Asian species of honeysuckle, burning bush, Japanese barberry, autumn olive, swallowwort, Oriental bittersweet, and garlic mustard.

The problem with invasive species is that they interfere with native plants and degrade the wildlife habitat. "A common example is buckthorn," Chedzoy says. "It displaces other berry-producing shrubs such as viburnums, amelanchier (service berry), raspberries, and blackberries. Unfortunately, buckthorn fruit has a cathartic effect on wildlife that causes them to vomit the fruit without deriving much nutritional value." While this helps the buckthorn disperse its seed, it offers little benefit for the wildlife.

Invasive plants also affect the quality of the forest. The more-competitive invasive plants may shade or crowd out the existing seedlings and saplings, changing the character of the woods. Or, like garlic mustard, they may produce chemicals that inhibit seed germination.

A pipeline ROW may create other problems for forest owners. Landowners needing access to their forests for timber harvest will want to make sure there are permanent crossings for skidders and other heavy equipment. Otherwise forest owners wanting to sell a few trees may find themselves required to provide a "timber bridge," a temporary support placed over the pipeline to protect it from the weight of skidders and other vehicles.

Trespass liability has become an issue as well. Many forest owners have complained that pipeline ROWs become conduits for ATV and snowmobile traffic.

Fragmenting the Agricultural Landscape

Like forests, agricultural land can be fragmented due to gas well development. NY Ag and Markets Farmland Protection Program Manager David Behm, concerned about preserving agricultural land for future generations, wonders whether conservation easements will be strong enough to protect farmland in the face of a natural gas rush.

A conservation easement is a legal document that is written in the form of a deed. It permanently restricts the future development of a piece of property for the pur-

Leasing Pointers for Forest Owners

- The loss of current and future timber should be appraised exclusively by your Forester.
- Cleared timber should be harvested by conventional logging methods and left neatly piled in designated areas if to be later sold or utilized. Otherwise, the timber should be chipped or removed from the site.
- If you are currently enrolled in the NYS 480-A Forest Tax Law, conversion penalties should be paid by lease holder. If you are contemplating enrollment in 480-A, will you still qualify if additional forest land is cleared?
- Outline penalties and provisions for noncompliance, such as failure to revegetate temporary worksites, damage to unmarked trees, delays in completion, erosion damage, and spills.
- Require a performance bond with your Forester as the final authority on compliance.
- Require the lease holder to construct at least one permanent crossing in a designated location if you expect to someday cross the pipeline with heavy equipment.
- Consider what can be done to minimize the impact on wildlife habitat.
- List measures to reduce the establishment of invasive plant species, such as planting screens along cleared edges.

For a more extensive list, see *Gas Rights and Right-of-Way Leasing Pointers for Forest Owners* (pdf), available online at <http://gasleasing.cce.cornell.edu>.



Pipeline construction leaves an ugly path through a cornfield. *Photo by John Lacey*

pose of preserving or maintaining the scenic, open, historic, agricultural, or natural condition, character, or significance of that property.

A farmer with an active gas lease encumbering his property may still participate in the conservation easement program, provided the gas company will release their

surface rights, Behm notes. Failing that, the farmer has four other options. One is for the gas company to specify potential well sites and then to exclude those from the conservation easement.

One well on a farm doesn't seem like a huge impact. What concerns Behm is the cumulative effect of gas development in a

given area over time. He believes that access roads to well sites will fragment the agricultural land. Wherever a road divides a field, agricultural land is at risk. He is particularly concerned about access roads that cut off a couple acres from a larger field. Those smaller pieces are at risk for development, Behm says.

Organic Community Applauds U.S. Effort to Safeguard New York's Drinking Water

NOFA-NY supports our congressional delegation's recent bipartisan efforts to make sure that the Marcellus Shale natural gas development boom does not contaminate the state's water supplies. In June, two bills were introduced in the House and Senate that would ensure that natural gas mining companies comply with the provisions of the federal Safe Drinking Water Act. Four New York State Representatives are among the ten cosponsors of H.R. 2766, known as the FRAC Act (Fracking Responsibility and Awareness of Chemicals Act). The related Senate bill, S. 1215, is cosponsored by Senator Chuck Schumer.

Four years ago, an exemption to the requirements of the federal Safe Drinking Water Act was enacted to spur the development of a new natural gas extraction technique, hydraulic fracturing. The bills introduced seek to eliminate that regulatory exemption and bring hydrofracing natural gas mining technology back under the regulation of the Safe Drinking Water Act.

Under the current exemption to the Safe Drinking Water Act, hydrofracing fluid is allowed to contain a mixture of chemicals that is kept secret from federal reg-

ulators, first responders, and the public at large. This hydrofracing fluid is injected deep into the ground at high pressure to release the gas that is held in the shale layer. Some hydrofracing fluid use, storage, and disposal methods allow for some of the hydrofracing "mystery chemical soup" to leave the site, where it may become a threat to the safety of well water, surface water supplies used in irrigation, or public water supplies.

New York's organic growers and eaters are pleased to see our elected representatives asserting our rights to clean water. No new technology is so important that the quality of the water we use to grow our food (and for drinking and washing) should be compromised for the benefit of a particular industry.

Organic farmers are encouraged that our representatives are going to bat for all New York farmers. Our state's organic farmers take great care to produce wholesome food under the exacting standards of the USDA's National Organic Program. No industry should be allowed to contaminate our public water resources through unregulated release of potentially toxic chemicals

into the environment. Such contamination will affect all farmers—both conventional and organic. At its 2009 Annual Meeting, New York Farm Bureau voted to support policy that all the chemicals used in hydrofracing be disclosed to the public.

Consumers should also have the freedom to exclude synthetic chemical substances from their diets. Unregulated hydrofracing risks the drinking water supplies of 30 million people in the Southern Tier, New York City, and Philadelphia; all these citizens are dependent on the watersheds that will be impacted by hydrofracing of the Marcellus Shale. No industry should be allowed to insist that we consume synthetic chemical byproducts in our drinking water, or, indirectly, through our food.

The organic community supports the efforts of Congressmen Arcuri, Hinchey, Massa, and McHugh, and Senator Schumer, to protect our natural resources and our health. H.R. 2766/S. 1215 is much-needed legislation that will bring natural gas exploration back under the purview of the federal regulators who ensure the purity and safety of our water.



Reprinted from the quarterly newsletter of the Northeast Organic Farming Association of New York, Inc., (NOFA-NY), an organization dedicated to the creation of a sustainable regional food system which is ecologically sound and economically viable. NOFA-NY can be contacted at: 607-652-NOFA or on the web at www.nofany.org. For permission to reproduce more copies contact NOFA-NY. Please include this message in any reprints.