

Impact	Summary	Causes	Link
<b>Adverse Effects on Farming and Farmland Preservation</b>	Well pad development on active farmland, potential soil and water contamination, and significant freshwater use for hydraulic fracturing can all have negative impacts on farming practices and long-term farmland preservation.	Development; Pollution; Contamination; Water use	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoFaFP.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoFaFP.html</a>
<b>Adverse Effects on Local Economic Development</b>	Sudden development, particularly surrounding non-renewable resource extraction, can lead to rapid economic and population growth followed by equally rapid stagnation and decline. The aesthetics of rapid industrial-based growth can hinder tourism and long-term economic development.	Boomtown creation, Reduced tourism	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoLED.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoLED.html</a>
<b>Adverse Effects on Local Housing Market from Increased Scarcity and Cost</b>	With rapidly developing new industry, communities can experience a large influx of new workers. This new population needs housing and other services that may not be available. This increased demand can drive up prices across the community, making affordable housing impossible for both workers and other community members.	Rapid and large influx of out-of-state workers	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoLHMfISaC.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoLHMfISaC.html</a>
<b>Adverse Effects on Property Values</b>	Concerns about environmental damage, whether real or perceived, along with potential mortgage and insurance restrictions around fracking sites, can drive down local housing prices.	Environmental damage; Mortgage and insurance restrictions	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoPV.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoPV.html</a>
<b>Adverse Effects on Road Conditions and Safety</b>	With hydraulic fracturing comes substantial truck traffic related to well pad operations. Increased truck traffic leads to deteriorating roads and increased costs of repair and maintenance.	Truck traffic	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoRCaS.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/AEoRCaS.html</a>
<b>Air Pollution</b>	Several aspects of the hydraulic fracturing operation can lead to air pollution, including truck traffic, flared methane	Well pad pumps and drilling machinery; Flaring; Drilling	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-">http://50.87.248.60/~trevorw4/collaborative/fracking-</a>

	gas, gas leaks, and evaporation from wastewater ponds.	dust; Gas escape from well; Dust from increased road traffic; Sand Dust (mining); Machine/Truck Emissions	<a href="http://database/resources/AP.html">database/resources/AP.html</a>
<b>Degenerating Civic Discourse, Erosion of Community Character, and Increased Crime</b>	Hydraulic fracturing has emerged as a very contentious issue on the local scale. The tenor of the debate can degenerate otherwise respectful community discourse. This is often made worse because the negative impacts of fracturing are often felt evenly across a community while the benefits accrue more unevenly, with those who have leased land standing to benefit the most. Likewise, some commentators have argued that the influx of new residents and workers can dramatically change the character of the town and that transient workers, in particular, can lead to increases in crime.	Heterogeneous allocation of adverse impacts, and lucrative fracking leases	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/DCDEoCCaIC.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/DCDEoCCaIC.html</a>
<b>Deterrence of or Constraint on Future Growth</b>	Well pad construction, pipelines, and other hydraulic fracturing related infrastructure may create permanent barriers or increased costs to future plot development.	Pipelines and well sites within local government limits may slow or increase the cost of future development	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/DooCoFG.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/DooCoFG.html</a>  (no data)
<b>Difficulty with Local Government Workforce Retention (and resulting rising salaries)</b>	Increasing employment opportunities is an obviously positive result of a growing hydraulic fracturing industry in a community. However, the new opportunities can raise demand for employees, thereby raising salaries. This may make it difficult for local governments to retain and pay employees.	Increased oil and gas employment opportunities	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/DwLGWR(rrs.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/DwLGWR(rrs.html</a>
<b>Earthquakes and Ground Vibration</b>	Some experience suggests that injection of fluids and wastewater in proximity to fault lines can increase seismic activity.	Fluid injections near or on fault-lines. Significant uncertainty around causation.	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/EaGV.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/EaGV.html</a>
<b>Environmental Impacts from Increased Sand</b>	Sand is a major component of fracturing fluid. It is used to prop open the newly fractured shale. The high demand for	Need for proppant	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-">http://50.87.248.60/~trevorw4/collaborative/fracking-</a>

<b>Mining and Processing</b>	sand can increase mining and processing operations in some areas. These operations have their own set of local impacts.		<a href="http://50.87.248.60/~trevorw4/collaborative/resources/ElfISMaP.html">database/resources/ElfISMaP.html</a>
<b>Farmland Preservation</b>	In certain communities, particularly those with high property costs, the income from farming may not be competitive with other uses of land. However, where farmers are able to increase their income as a result of natural gas leases and royalties, the economics of maintaining an active farm can become more attractive. By this calculus, hydraulic fracturing can potentially help maintain the character of a community by preserving farmland.	Private revenue from leases and royalties	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/FP.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/FP.html</a>
<b>Groundwater Pollution</b>	There are several mechanisms by which fracking wastewater can pollute groundwater. The most common occurs when water from wastewater ponds runs off and enters the groundwater. It is also possible for fracturing fluid to leak from wells due to defects in the cement casing around the drill. Some people also claim that wastewater can enter the groundwater by moving up through the ground from disposal wells, but that is unproven and controversial.	Wastewater pond runoff. Drill leaks.	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/GP.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/GP.html</a>
<b>Health Concerns for Workers</b>	The process of hydraulic fracturing poses a number of risks for workers, including exposure to chemicals, accidents at the well site, or inhalation of particulate matter such as silica dust.	Chemical spills, explosions, other accidents at the well; Silica dust exposure	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/HCFW.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/HCFW.html</a>
<b>Improved Roads</b>	Increased heavy truck traffic associated with hydraulic fracturing causes road damage. However, many operators agree to maintain and repair roads at their own expense. This can provide local governments with improved roads, possibly to higher standards than before fracking, without cost to taxpayers.	Operator maintenance, road use agreements	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IR.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IR.html</a>

<p><b>Increased Burden on and Cost of Provision of Local Government Services</b></p>	<p>Rapidly growing populations create greater demand for government services and infrastructure such as city personnel, courthouses, emergency services, and municipal offices.</p>	<p>Rapid population growth, resulting in need for greater staff and infrastructure (ex. courthouses, offices, city personnel)</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IBoaCoPoLGS.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IBoaCoPoLGS.html</a>  (no data)</p>
<p><b>Increased Burden on and Costs for Local Health and Emergency Services</b></p>	<p>The increased local population that can come with hydraulic fracturing along with the increase in industrial activities that could cause emergencies can escalate the burden on local health services and emergency services, driving up costs across the board.</p>	<p>Increase in number of people needing services, increase in activities which could cause emergencies</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IBoaCfLHaES.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IBoaCfLHaES.html</a></p>
<p><b>Increased Local Charitable Contributions</b></p>	<p>As new members of a community, hydraulic fracturing companies will often make an effort to integrate themselves through, among other things, local charitable</p>	<p>Donations from operators</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/ILCC.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/ILCC.html</a></p>
<p><b>Increased Local Employment</b></p>	<p>The economic activity created by hydraulic fracturing extends from the industry itself to housing to leisure. Hydraulic fracturing has the potential to create jobs and dramatically increase local employment opportunities and wages.</p>	<p>Boom created by increase in economic activity and population</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/ILE.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/ILE.html</a></p>
<p><b>Increased Property Values</b></p>	<p>The broad-based economic activity created by hydraulic fracturing as well as the fracking-specific increases to undeveloped sub-surface rights can increase property values across an entire jurisdiction.</p>	<p>Value of undeveloped subsurface resources; Economic boom</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IPV.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IPV.html</a></p>
<p><b>Increased Revenue from Fee-for-Service Payments</b></p>	<p>Local governments often carry-out fee-for-service operations such as town or county clerk fees related to land records and fees for water use. Governments can therefore benefit through increased payments of this nature.</p>	<p>Payments for services rendered (ex. county clerk fees for providing land records, water sales)</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IRfFP.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IRfFP.html</a></p>
<p><b>Increased Revenue from</b></p>	<p>States collect a number of fees and taxes associated with hydraulic fracturing operations (for example, severance</p>	<p>State intergovernmental transfers (severance taxes or</p>	<p><a href="http://50.87.248.60/~trevorw4/collaborative/fracking-">http://50.87.248.60/~trevorw4/collaborative/fracking-</a></p>

<b>Intergovernmental Transfers</b>	taxes and impact fees). In many cases states have an arrangement with the host towns in which the state transfers a percentage of this income in proportion to the fracking activity within the town.	impact fees)	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/IRfIT.html">database/resources/IRfIT.html</a>
<b>Increased Tax Revenue</b>	With new industry comes population growth, increasing property values, and increasing visitors. This will increase local tax revenue particularly through property taxes, local sales tax, and hotel/lodging taxes.	Population growth; Property tax; Sales tax; Hotel/Lodging tax	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/ITR.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/ITR.html</a>
<b>Loss of Local Habitat and Species</b>	A number of factors can have a negative impact on local habitats and species including proliferation of well pad sites, pipelines, truck traffic, noise, light, and both air and water pollution.	Infrastructure; Transport; Pollution	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/LoLHaS.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/LoLHaS.html</a>
<b>Loss of Recreational Space</b>	The proliferation of well pad sites, pipelines, and other infrastructure has the potential to reduce recreational spaces such as parks, sports fields, and nature reserves.	Footprint of multiple well pads sizable	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/LoRS.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/LoRS.html</a>
<b>Noise Pollution</b>	Truck traffic, compressors, workers, and other drilling operations create noise that can be disruptive to the surrounding community.	Operation	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/NP.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/NP.html</a>
<b>Revenue from Leasing and Royalties</b>	Private land owners who lease their property for hydraulic fracturing stand to make money through payments for development rights and other royalties. Where operations take place on public land, the same is true for the government that holds the land.	Payments for development rights (to private owners or for county-owned land)	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/RfLaR.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/RfLaR.html</a>
<b>Soil Compaction</b>	Heavy truck and equipment traffic over soil, particularly wet soil, can push air from soil, making it denser, less able to hold water, nutrients, and air, and therefore have an effect on plant growth.	Equipment and truck transport	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SC.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SC.html</a>  (no data)
<b>Soil Erosion and</b>	Development of industrial sites and associated	Development; Infrastructure;	<a href="http://50.87.248.60/~trevorw4/coll">http://50.87.248.60/~trevorw4/coll</a>

<b>Increased Sedimentation</b>	infrastructure including pipes and roads, leads to increased soil disruption. For example, increased impervious cover can lead to heightened levels of stormwater runoff, which can cause erosion and sedimentation in water bodies.	-Increased impervious cover; - Soil Compaction	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SEaIS.html">aborative/fracking-database/resources/SEaIS.html</a>
<b>Strain on Water Infrastructure and Public Utilities</b>	After fracturing, a portion of the fluid used to fracture the shale will flow back to the surface. Likewise, naturally occurring water from within the shale is produced and flows to the surface. Both of these contaminated wastewaters need either treatment, disposal, or both. These wastewaters are often treated by municipal wastewater treatment plants and both their volume and chemical content can strain the plant's capacity. Likewise, increased municipal wastewater from a rapidly increasing population can strain the wastewater treatment infrastructure, solid waste management, and energy provisioning.	Increased loads of wastewater from flowback (about 70% of water used in fracking comes back up the well). Often treated by the muni WWTP; Increased loads due to more people/more technologies on line with energy, garbage, waste disposal etc needs	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SoWlaPU.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SoWlaPU.html</a>
<b>Surface Water Pollution</b>	Leaks and spills from storage containers and storage ponds can impact surface waters such as streams and ponds. However, some communities also fear that workers will illegally dump fill material into local water bodies. Finally, if the process pollutes groundwater, that polluted groundwater could migrate to surface water bodies and cause surface water pollution.	Storage container leaks, Storage pond liner leaks; Spills, "Casing leaks; Proppants and fracking chemicals released into the subsurface which can migrate to groundwater resources; Accidents; Spills; Dumping"	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SWP.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/SWP.html</a>
<b>Visual Blight</b>	Drilling rigs, truck traffic, construction sites, well pad industrial sites, lighting, and other components of the hydraulic fracturing process can degrade both the landscape scenery and an individual viewshed.	Development; Operation	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/VB.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/VB.html</a>
<b>Wastewater Generation</b>	After fracturing, a portion of the fluid used to fracture the shale will flow back to the surface. Likewise, naturally occurring water from within the shale is produced and flows to the surface. Both of these contaminated wastewaters	Flowback and produced waster from wells contains high levels of known and unknown contaminants	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/WG.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/WG.html</a>

	need either treatment, disposal, or both.		
<b>Water Depletion</b>	During the hydraulic fracturing process, significant amounts of fresh water are injected into the wells in order to fracture the shale and release gas and oil.	High levels of freshwaters required during the fracking process	<a href="http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/WD.html">http://50.87.248.60/~trevorw4/collaborative/fracking-database/resources/WD.html</a>

## About the Land Use Collaborative

<http://50.87.248.60/~trevorw4/collaborative/fracking-database/>

The Land Use Collaborative provides research, training, technical assistance, support, and strategic planning services to communities. Working with trained students, the Collaborative quickly, affordably, and effectively develops techniques to remedy nearly all types of land use problems that afflict urban, suburban, and rural communities. The Collaborative works in partnership with local land use leaders, other change agents, and state and federal agencies.

## About This Resource

Governing the local impacts of hydraulic fracturing is a daunting task that demands information sharing and collaboration between local leaders. The purpose of this resource is to facilitate that information sharing by cataloguing the most common local impacts of hydraulic fracturing. This resource does not have all the answers, but it can serve as an initial point of collaboration and information sharing to help local governments make informed decisions about governing the local impacts of hydraulic fracturing.

## Credits

This interactive resource was designed and implemented by Soumya Kambhampati. The material in this resource was collected and organized by Christopher Halfnight, Rebecca Gallagher, Allison Sloto, Avana Andrade, and Eleanor Killiam under the supervision of Josh Galperin, Jessica Bacher, and John Nolon.