

# Seismic Data Collection

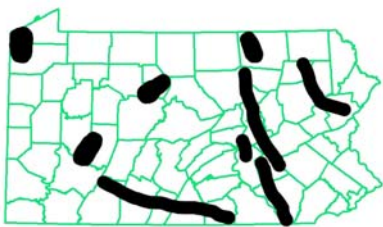
## Frequently Asked Questions

### Introduction

As part of the requirements of Act 129 of 2008, the Pennsylvania Department of Conservation and Natural Resources is evaluating the geology in the state to determine if carbon dioxide can be stored underground, as one way to address our emissions that contribute to global warming. Part of that process will include the collection of seismic data during the second half of 2009.

For more information about carbon capture and storage, log on to:

[www.dcnr.state.pa.us/info/carbon/index.aspx](http://www.dcnr.state.pa.us/info/carbon/index.aspx)



Areas of Pennsylvania where seismic data will be captured or purchased

### What are seismic data?

Seismic data is generated by using vibrations to capture a two-dimensional picture of the rock layers beneath the surface. The interpretation of seismic data allows the scientist to make an estimated picture of the rocks beneath the surface without drilling or digging trenches. The collection of vibrations which, when coupled with time elements, represent the rate of transmission of energy through a material. Scientists have measured many different materials and have a portfolio of data which allow them to interpret the type of material, the structure of the material, and the depth below the surface of the material, all based upon the nature of the vibrations. The data are used in many ways, from determining how thick the soil may be in an area, to locating cracks in the rocks.

### Who is gathering the data?

The project to acquire seismic data is under the direction of the Department of Conservation and Natural Resources' Bureau of Topographic and Geologic Survey. The actual field seismic data collection work will be conducted by ARM Geophysics, headquartered in Hershey, Pa.

### When will data collection begin?

The data collection activities will begin in July 2009, and will probably run through September. The exact date will not be known until a week before the collection begins. The areas probably will be done in sequence rather than simultaneously. In addition, factors beyond the control of DCNR and the contractor may delay the start of the collection.

### How will the state use this data?

The data will be used to interpret the geology deep beneath the surface. Frequently we know what is happening within a few hundred feet down. This project will allow scientists to develop a

picture of the subsurface rocks to depths of 10,000 feet, and in some cases even deeper. In addition to being of academic interest, there are practical reasons to collect these data. For example, the commonwealth is searching for a deep geologic zone where we might safely place carbon dioxide to help reduce Pennsylvania's contribution to global warming. These data will aid in that search.

### Where is it being collected?

The data will be acquired in several parts of the commonwealth. As shown on the map to the left, data acquisition will occur in most of the eastern and central parts of the state, with some occurring in the western part. Portions of western Pennsylvania already have been examined using seismic data collection methods, and much of that data will be purchased.

### How is it collected?

Where new data are to be collected, a few large "thumper" trucks, traveling slowly along the public roadways, will provide the source of the energy input into the surface. Geophones -- small sensitive devices designed to record the seismic energy as it is reflected back to the surface by the underlying geologic features -- will be temporarily placed along the side of the road. All the geophones will be connected by a long cable lying on the surface along the edge of the road.

The energy put into the ground by "thumper" trucks will be minimal. Older seismic efforts used dynamite. Not today. New technology allows the same, and many times better, information to be gleaned using a weight dropped behind a truck, or a vibration from a weight placed upon the ground surface. The energy input from the weight drop is similar to a bag of cement being dropped from the back of a pick up truck. In the case of the vibration inducing device, the feeling is similar to standing next to a parked, but running, diesel train engine.

## Will trucks and people have to cross my land?

Generally, work will not need access to private land. The trucks will remain on the right-of-way. For the geophones, the vast majority of the work also will be conducted along the public thoroughfare, within the right-of-way. If it should be necessary to collect data on private property, the owner will be contacted in advance, and will be asked for permission. Should permission be requested, and the property owner chooses to deny the request, the contractor will find an alternative location to collect the data.

## How will I know when seismic data are being collected in my area?

DCNR will contact local governmental and community leaders, and encourage local media to share the information with their viewers and readers. In addition, all the seismic crews will be accompanied by a geologist from the Bureau of Topographic and Geologic Survey. These individuals will be happy to discuss the activities, and to describe the nature of the work. Because the data will be in a raw form, the geologists will not be able to give a detailed description of what is being found.

## Does it cause earthquakes or damage to property?

Seismic data collection does not cause earthquakes. Unless you are standing quite close, within a few feet of the equipment, you will not notice the vibrations from either the weight drop or the vibrating weight.

The risk of any damage comes from placing the weight on top of a shallowly buried pipe or cable. Part of the work prior to the start of the data collection is to identify the buried utilities in the data collection area. The location of these utilities within the public rights-of-way is generally well known, so the risk of damage is quite low. In the unlikely event any damage occurs from the work, the contractor is fully insured and will correct the problem quickly.

If the contractor requests to place a geophone in your yard, and is permitted to do so, the small box will be set on the ground. The cable from the box will run across the yard to the road. That work will be done by an individual, and will be done by hand. Flower beds, walls, driveways, etc., will not be disturbed.

## Will roadways need to be closed?

There are no plans to close roads, although short delays may occur as equipment is moved. Where new data are to be collected, a few large trucks, traveling slowly along the public roadways, will provide the source of the energy input into the surface. The operation will be conducted to insure the safety of the public and the seismic crews moving the cables and geophones. Each part of the operation will have flaggers to control the flow of traffic.

## Is it noisy?

The noise level will be consistent with a large truck driving slowly down the road. If the truck that drops a weight is being used, there will be a thump heard. Any noise that occurs will be short-term; the trucks and geophone are constantly being moved. For example, the contractor will be collecting data over a distance of 2 to 3 miles each day, depending on conditions. This means the trucks and their associated noise would be in front of someone's home for no more than a day, most likely for no more than a few hours. The cables and geophones will be in place, depending on the data and the area, for a few days to a week, but there is no noise associated with them.

## Will the public have access to the results of the work?

All the data are public, once they have been processed. DCNR will post the information on its website, probably within two months after it is collected. The raw data, should someone have the need for it, may be obtained from DCNR after the processed data are on the website. The current plan is to make all the data available on DCNR's website at <http://www.dcnr.state.pa.us/topogeo/>. These data will be free, and questions about the final data can be directed to a geologist who will answer all questions.



Top and middle photos: Seismic trucks  
Bottom: seismic lines and geophones

### More Information

For more information on seismic data collection contact:

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[www.dcnr.state.pa.us/topogeo](http://www.dcnr.state.pa.us/topogeo)



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