At the Montgomery County Board of Supervisors Meeting with EQT and NextEra held at Blacksburg High School on November 5, 2014 the companies proposing the pipeline discussed some of the details of construction. At one point a question was asked by a member of the Board of Supervisors (BOS) which asked about the dangers to pets and children during construction of the proposed pipeline in a residential area such as Preston Forest. One of the representatives from EQT/NextEra stated that the pipe would be laid and backfilled so no trench would be left open. Well, that is not precisely what is likely to happen. According to the Federal Energy Regulatory Commission (FERC), Williams, and Spectra there are very distinct stages of constructing a natural gas pipeline which would seemingly refute the response given to the question asked by the BOS.

**PIPELINE INSTALLATION SEQUENCE**

According to FERC¹, “After a company has received authorization from FERC as well as all necessary permits, and has an easement on a property, construction would proceed as follows:

1. The civil survey (and any uncompleted environmental surveys) would be completed and the construction right-of-way would be marked/staked for the clearing crew.
2. The clearing crew would remove any trees or brush within the right-of-way that would interfere with construction.
3. Temporary erosion control devices would be installed as required.
4. Next, the right-of-way would be graded.
5. Topsoil would be separated from subsoil in agricultural/residential areas (or in other areas requested during the easement negotiations).
6. Heavy equipment, such as backhoes or trenching machines, would then dig the trench. In areas where bedrock is near the surface, blasting may be required.
7. The pipe would be delivered to the right-of-way in segments (called joints).
8. The pipe would be bent to fit the trench and welded together. All welds would be tested prior to placing the pipe in the trench.
9. The trench would be back filled and if topsoil was removed it would be returned.
10. Construction debris would be removed.
11. The right-of-way would be regraded, seeded, and temporary and permanent erosion control devices would be installed.
12. After the right-of-way has revegetated the temporary erosion control devices would be removed.
13. Prior to gas flowing, the pipeline would be pressure tested (normally with water) to ensure it does not leak.”

You can see in the diagram provided by FERC of the process of constructing a natural gas pipeline (on the next page) that the trench, once dug, will be left open during padding of the trench bottom, stringing of the sections of pipe, bending and welding of the pipe, x-ray and weld repair, coating applied, Inspection and repair of the coating, and lowering of the pipeline into the trench. That does not happen in one day’s time. That process will take weeks.

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The representative of EQT/Next/Era did say that yellow “caution tape” would be placed around the construction site. Only if young kids and pets could read and understand what that meant.
CLEARING AND GRADING

Once the surveying is complete, the pipeline construction is ready to begin. The first step will be to clear and grade the construction right-of-way\(^2\). This will involve plowing down trees, clear cutting the area, or timbering the trees for the landowner. The method used will depend on the negotiations with each landowner. Each of the approaches will involve heavy equipment (bulldozers, excavators, shredders, dump trucks, etc.), falling trees and limbs, chainsaws, shredders, and trucks. With either clear cutting or timbering for the landowner, there will need to be disposal of limbs and stumps. Often the limbs and small trees are shredded, but in some areas all debris (stumps, small trees, and stumps) are piled and burned. If burning is not permitted, then stumps and other debris may need to be taken to the County Landfill.

Grading with something like a 36,400 lbs Caterpillar D6M LGP Crawler Tractor
TRENCHING

Trenching is done next prior to any other pipeline work. Where needed, blasting and rock hammers are used. In areas with rock, the trench will have sand or sandbags at the bottom to protect the pipe. Of course, this requires the trench to be dug deeper. In agricular areas the trench may be deeper, four feet or more, while the typical trench provides for three feet of surface dirt over the pipe.

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3 Construction of the Bell Road Pipeline Project by Piedmont Natural Gas.
Project Ditching -- Bell Road Pipeline Project

Ditching in rock free area – Vanderbilt Area (Ditching for a much smaller pipeline).
PIPE STRINGING

Once the trenches are dug, the next stage of pipeline construction will be to bring and string the large sections of pipe (each section approximately 40' in length). “Individual joints of pipe are strung along the right of way adjacent to the excavated ditch and arranged so they are accessible to construction personnel. A mechanical pipe-bending machine bends individual joints of pipe to the desired angle at locations where there are significant changes in the natural ground contours or where the pipeline route changes direction”4

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Appalachian Gateway Pipeline

[Image of pipeline]

4 Williams [http://co.williams.com/williams/operations/gas-pipeline/pipeline-construction/]
WELDING AND COATING PIPE

“After the stringing and bending are complete, the pipe sections are aligned, welded together, and placed on temporary supports along the edge of the trench. All welds are then visually and radio graphically inspected. Line pipe, normally mill-coated or yard-coated prior to stringing, requires a coating at the welded joints. Prior to the final inspection, the entire pipeline coating is electronically inspected to locate and repair any coating faults or voids.” ⁵ Where the yellow boxes are over the 42” pipeline below is where the welding is being done – in this case, by mechanical processes.

Pipeline Welding – in Nebraska

Northeast Energy Direct (NED) pipeline. Notice how the longer section of the pipe is open endangering pets and children.

⁵ Williams, http://co.williams.com/williams/operations/gas-pipeline/pipeline-construction/
Pipe ready for laying

The trenching is done before stringing the pipe, welding it, and readying it for laying in the trench. The trench may lay open for quite some time.
LOWERING PIPE IN AND BACKFILLING

Once the sections of pipe are welded and tested, the next stage will be to lower the 42” pipe into the trench. “The pipe assembly is lowered into the trench by side-boom tractors. The trench is backfilled using a backfilling or bladed equipment; no foreign materials are permitted in the trench.”

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6 Williams, http://co.williams.com/williams/operations/gas-pipeline/pipeline-construction/
Laying the Pipeline with large 120,119 lbs. CAT PL87 Pipelayer
These Pipelayers are quite large and quite heavy, but are of the type most likely used in laying a pipe the size of the proposed Mountain Valley Pipeline in mountainous and over karst terrain. Perhaps EQT/NextEra will provide additional information.

Pipeline ready for backfilling
Pipeline Padding, Backfilling -- Bell Road Pipeline Project
This is a 12” pipe, so it is much smaller and requiring much less equipment than the backfilling of a 42” pipeline

TESTING

“After backfilling, the pipeline is hydrostatically tested following federal regulations. Test water is obtained and disposed of in accordance with applicable federal, state and local regulations.”7

FINAL STAGE: RESTORATION

The final stage is restoration. “Restored areas are restored as close as possible to their original ‘contours’.”8 “Original contours” does not mean to their original vegetated state.

General Restrictions9:

- Buildings or other structures, including, but without limitation, overhanging balconies, patios, decks, swimming pools, wells, walls, septic systems, propane tanks, transformer pads, or the storage of materials which creates an obstruction or prevents the inspection of the right-of-way by air or foot, shall not be erected within the right-of-way.

- The Crossing Party shall not develop or build retaining walls, drive piling or sheeting, or install an engineered structure that develops or controls overburden loads that will impact the pipeline (see Section 3.9).

- Deep foundations which include piers, caissons, drilled shafts, bored piles, and cast-in-situ piles located within 500 feet of the pipeline shall be installed/drilled using an auger.

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7 Williams, http://co.williams.com/williams/operations/gas-pipeline/pipeline-construction/
8 Williams, http://co.williams.com/williams/operations/gas-pipeline/pipeline-construction/
- Occupied structures shall not be located within 50 feet of the pipeline unless a minimum cover of 48 inches is provided above the top of the pipeline.

- Any deviation for aboveground and underground structures will be reviewed on a case-by-case basis.

- Trees or large shrubs and bushes are not permitted within the right-of-way. Trees planted outside of the right-of-way should be placed so branches and limbs will not overhang the pipeline right-of-way as the tree matures. Buckeye may trim/remove overhanging branches and limbs that encroach into the right-of-way.

- Flowerbeds, vegetable gardens, lawns, and low shrubbery not exceeding 30 inches are permitted within the right-of-way. Buckeye is not responsible for replacing any plantings located within the right-of-way.

- Privacy fences or fences that prevent access to the right-of-way are not permitted.

- All other fence installations within the right-of-way will be reviewed for approval on a case-by-case basis. Upon written approval, fences shall be constructed with a 14-foot gate or removable sections across the right-of-way.

- Fence posts shall not be installed within 5 feet of the pipeline and must be equidistant if crossing the pipeline.

- No fence shall cross the right-of-way at less than a 60-degree angle.

- Fences that run parallel to the pipeline shall be installed outside the right-of-way.

- Masonry, brick, or stone walls are not permitted on the right-of-way.

**Other Restrictions**

**Temporary equipment crossings**

- To protect pipelines from external loading, Williams will perform an engineering evaluation to determine the effects of any proposed equipment use. Mats, timber bridges or other protective materials deemed necessary by Williams will be placed over Williams’ facilities for the duration of any loading. Protective materials will be purchased, placed and removed at no cost to Williams. The right of way must be restored to its original condition.

**Roads, streets and driveways**

- A preliminary engineering review will be performed for all roads, streets, driveways, etc., proposed on Williams’ right of way. A pipeline inspection prior to construction may be necessary. Driveways, highways, roads and streets crossing Williams’ pipeline facilities must cross at an angle as close to 90 degrees as possible. All crossings must be over straight pipe and at locations free of any crossovers. Parallel occupancy of the right of way is not permitted.

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And there it is, all cleaned up and ready for 2 – 2 ½ billion cubic feet of methane gas pushed through the pipe over karst typography at 1,400 psi daily. That is 23,000+ cubic feet of gas per second.

Representatives from EQT/NextEra said they could not comment on the revenues they would receive – that was propriety information. Well, at the current price of $4 per 1,000 cubic feet of natural gas, EQT/NextEra will have revenues from Transco of between $8 and $10 million PER DAY. It may be “proprietary, but the math is very simple!

Perhaps revenue sharing should be granted.

Note: Many of the references provided are from Williams, the largest natural gas pipeline in company in the United States. We may not natural gas pipelines bearing fracked gas but Williams is transparent in providing information about these infrastructure projects. EQT/NextEra, on the other hand, provided essentially no information at their meeting with the Montgomery County Board of Supervisors and residents and they do not provide any detailed information about this process on their website.

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