Professional Review & Comment

on

Draft Environmental Impact Statement for

Constitution Pipeline Project (February 2014),

FERC Docket No. CP13-499-000

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Earthjustice

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EXECUTIVE SUMMARY

Due to previous experience reviewing gas pipeline projects in the Mid-Atlantic, Meliora Environmental Design, LLC (Meliora Design) was asked to provide professional review and comment on the Draft Environmental Impact Statement for Constitution Pipeline Project (February 2014). In general, the comments address issues directly related to surface soils, steep slopes, stream and wetland crossings, and to a lesser extent, karst and shallow bedrock, as they relate to and impact surface water quality and quantity.

While the Draft Environmental Impact Statement and supporting documentation contain information related to soils, steep slopes, stream and wetland crossings, and other sensitive natural features whose disturbance may adversely affect water quality, our primary findings are that:

1. This information is often limited or insufficient. For example, limited information and no site-specific testing is required for soils conditions outside of agricultural or residential areas. As a result, the information on existing soils conditions, and the measures necessary to evaluate potential impacts, prevent those adverse impacts, or successfully achieve soil restoration, is lacking from the Draft Environmental Impact Statement ("Draft EIS"). Without such information the Draft EIS is incomplete and inadequate.

2. Most importantly, there is no consideration or process to identify and evaluate specific locations that include one or more of these or other sensitive natural features. For example, an area of highly erodible soils on steep slopes adjacent to a high quality stream is likely to experience greater impacts due to site disturbance, and to have a much higher likelihood of subsequent conditions after disturbance (i.e., erosion, lack of vegetation establishment, etc.) that could adversely impact water quality. However, there is no process to identify areas of multiple sensitive features, or to consider the potential impacts that could be caused when multiple sensitive features are disrupted at a single location. As a result, the likelihood of potential adverse water quality impacts cannot be accurately assessed. Without a process to identify areas of multiple sensitive features and evaluate potential impacts, the Draft EIS is incomplete and inadequate.

3. There is no consideration of the cumulative impacts and effects within a given watershed or sub-watershed, and whether these impacts are few and limited, or extensive and likely to impact water quality. There also is no consideration as to the nature of the waterbody and whether these impacts may be large and significant. A small headwater tributary, with a limited drainage area and baseflow, may experience greater impacts than a larger waterbody. Multiple stream crossings are likely to have a higher impact on water quality than a single stream crossing. However, the documents due not provide a process for identifying these conditions. As a result, the cumulative impacts on water quality cannot be assessed, and the Draft EIS is incomplete and inadequate.

Given the availability of information in a geographic information system database (GIS) format, there is no basis for failing to undertake this comprehensive analysis related to both multiple sensitive site conditions and cumulative impacts. This analysis is a standard practice in the use of GIS data to develop sensitivity indexes and should be a component of the Draft EIS. The documents must include both comprehensive data, and an analysis of the data to identify and evaluate potential adverse water quality impacts due to the presence of multiple sensitive environmental conditions and/or cumulative impacts. A GIS-based approach of data analysis could be used to identify sensitive features that have not been deemed relevant enough to protect individually, but are significant when aggregated.

4. The construction of the pipeline will involve large amounts of land disturbance that will adversely impact the surface soils' ability to regrow vegetation or naturally infiltrate rainfall. Once rainfall is not infiltrated and vegetation cover is decreased or inhibited, runoff volume and rate will increase. With these increases, accelerated erosion and sediment transport can occur more frequently and in larger amounts, causing irreparable damage to local wetlands, streams, and other waterbodies. Many land use types, existing land uses, soil types, or topography are more sensitive to land disturbance and should be thoroughly evaluated for unnecessary and excessive impacts during construction. Appropriate construction practices to avoid or reduce disturbance, or restoration measures to mitigate impacts to sensitive land uses, cannot be implemented unless these areas are identified and

evaluated. The Draft EIS lacks adequate information on soils conditions, but also lacks consideration of the impacts of soil disturbance, and recommendations to prevent or mitigate these impacts, including recommendations to limit disturbance in sensitive areas. As a result, the Draft EIS is inadequate.

5. The fact that stream crossings only consider borings as a crossing option when a modest-sized stream is located next to a roadway implies that avoidance of roadway disturbance has a higher priority than avoidance of stream channel disturbance. Similarly, the lack of soil testing requirements in public lands implies that these lands are less important than residential or agricultural lands.

As a result of these deficiencies, it is our opinion that significant adverse impacts are likely to occur to water quality within many of the streams and wetlands impacted by this project. Without complete data and comprehensive evaluation of the data, the areas of significant impact cannot be adequately identified, and measures to prevent or mitigate adverse impacts cannot be implemented.

Specific deficiencies within the Draft EIS are documented below.

Documents reviewed include:

a. FERC's Draft Environmental Impact Statement for the Constitution Pipeline and Wright Interconnect Projects, February 2014 (Executive Summary; Sections 1–5; Appendices A–R)
2. Constitution's Resource Report 1: General Project Description, November 2013 (Environmental Report, Vol. I)
3. Constitution's Resource Report 2: Water Use and Quality, November 2013 (Environmental Report, Vol. I)
4. Constitution's Resource Report 7: Soils, November 2013 (Environmental Report, Vol. I)
5. Constitution's Soil Erosion & Sediment Control Narrative & Environmental Construction Plan, Construction Activities in Pennsylvania, November 2013 (Environmental Report, Vol. II, Appx. I)
6. Constitution's Environmental Construction Plan, Construction Activities in New York, November 2013 (Environmental Report, Vol. II, Appx. J)
7. Constitution's Wetland Delineation Report, November 2013 (Environmental Report, Vol. II, Appx. L)
8. Constitution's Site Specific Major Waterbody Crossing Plan, November 2013 (Environmental Report, Vol. II, Appx. M)
9. Constitution's Trenchless Feasibility Study, November 2013 (Environmental Report, Vol. II, Appx. N)

DISCUSSION

1. Outstanding Information Regarding Project Impacts

Constitution desires construction to begin 2nd and 3rd quarter of 2014. FERC has requested more documentation on various components of the project that should be publicly reviewed prior to approval. A revised draft EIS that incorporates the outstanding documentation should be published for public comment before any Project approvals are granted. Additional information requested by FERC include:

a. Formal slope stability analysis at MP 30.3.
b. Geotechnical feasibility study for all trenchless crossing locations.
c. Identification of all water wells within 150 ft. of the proposed pipeline.
d. Description of impacts of workspace on waterbodies affected by construction on a waterbody specific basis to describe impacts, impact avoidance, impact minimization, and impact mitigation.
e. Site-specific plans for impacts to wetlands by permanent access roads.
f. Upland Forest Mitigation Plan.
g. Site-specific blasting plans for in-water blasting.
h. Timing restrictions for water withdrawals.

Finalized documentation should be provided by Constitution to FERC prior to Draft EIS finalization. Many instances of FERC only having partial studies or evaluations were noted in the documents. FERC should be waiting to do their evaluation until all information is provided.

2. Surface Impacts to Soils

FERC concludes that surface impacts to soils are only temporary and relies on best management practices of other regulatory agencies to provide additional guidelines to help prevent irreversible damage to surface soils during construction. However, these guidelines are limited in nature and do not prevent soil compaction. The guidelines do not require restoration practices that sufficiently mitigate soil compaction due to construction impacts. With the exception of agricultural and residential lands, FERC does not require testing to identify soils highly susceptible to damage from construction.

Previous field investigations performed by Meliora Design on behalf of Delaware Riverkeeper Network in temporary right-of-way (ROW) locations along the Tennessee Gas Pipeline's 300 Line Upgrade Project in Milford, Pennsylvania, showed increased soil compaction as reflected in increased soil bulk density measurements when the temporary ROW locations were compared to undisturbed natural areas adjacent to the pipeline ROW. Severe compaction was noted within the former temporary ROW. Based on literature values, measured bulk densities were high enough to inhibit plant growth and infiltration. By limiting plant growth and infiltration, runoff volume and rate will be increased. The conditions were considered stabilized and restored even though they had less than 70% vegetative cover (potentially inhibited by measured compaction). Absent more stringent requirements, construction activities for the Constitution Pipeline Project likely will

result in severely compact soils that are incapable for supporting plant growth or for allowing natural infiltration of rainfall.

a. Compaction from temporary work space will be difficult to restore by regrading to pre-existing contours, retilling at the surface, and reseeding the area. Heavy equipment used in the construction of the pipeline will inherently compact work areas to depths deeper than conventional surface tilling will reach. Lasting impacts identified by FERC include increased runoff to streams and wetlands due to a reduction in infiltration capacity and difficulty in reestablishing vegetation. Infiltration capacity becomes limited when soils lose their porosity and soil structure, resulting in increased runoff volumes to streams. Excessive runoff changes stream geomorphology due to an increase in both volume and velocity. Streambanks and riparian areas are impacted by changes to the stream channel due to the increases in peak flow volume and rate. Streams with more flow also have higher energy. More energy means more in-stream erosion and sediment transport. Compaction creates conditions where bulk densities of soils are so high that the soils inhibit the germination of plants and plant root growth. The establishment of vegetative cover within the pipeline ROW will be more difficult once surface soils are compacted. If vegetation regrowth is limited within both the temporary and permanent ROW, the likelihood of accelerated erosion will be increased. Avoidance of compaction can be achieved by limiting ROW widths to prevent compaction before it takes place. To determine if compaction is

present, soil testing needs to be conducted. By limiting the testing of bulk densities outside of agricultural and residential areas, there is no mechanism for identifying soils that have been compacted along the majority of the project length. Procedures that limit compaction deep into the soils such as limiting rutting depths, limiting ROW widths, using timber mats in wet areas with a likelihood of compaction, and restoring soil structure following impacts, should be required more widely than only in agricultural and residential areas.

b. Because compaction along the pipeline is a potential impact, FERC calls for penetrometer testing of soils within agricultural and residential areas to make sure soils are decompacted following construction. When testing indicates compaction in these areas, Constitution will be asked to implement decompaction procedures according to the *Soil Protection and Subsoil Decompaction Plan.* This plan is not implemented in other land uses and therefore no compaction will be mitigated following construction in wetlands, interior forests, or other sensitive areas. Natural land uses such as interior forests and wetlands rely on vegetative cover to prevent the movement of soils during rain events by intercepting rainfall, stabilizing soils with their roots, and protecting surface soils with leaf litter and detritus. They also require soil with bulk densities low enough to allow for germination and root penetration, infiltration of rainfall, and the movement of nutrients from the surface down into the root zone. The Draft EIS does not

explain why agricultural and residential should receive greater protections than natural lands. All land uses will experience more sediment laden runoff from their surfaces, limited regrowth of plants and vegetation, and exposed soil surfaces after compaction. The same considerations to prevent or restore compacted soils should be implemented for both actively used lands as passively used lands. Accelerated erosion is probably the largest concern resulting from soil compaction. When runoff cannot infiltrate, isn't slowed at the surface by vegetation, and has a direct connection to exposed soils, sediments are more likely to be transported to downhill streams and wetlands.

c. FERC recommends avoidance of rutting below 4" in agricultural areas to avoid compaction. These recommendations should be implemented throughout the project area.

d. The Draft EIS only identifies soils in agricultural and residential areas that contain specific fine textures and high water tables as being highly susceptible to compaction. Without identifying similar areas in interior forests, wetlands, or close to streams, no determination of potential impacts can be made due to a lack of information being provided. Extensive areas being crossed by the pipeline may fall into the category of susceptible to compaction.

e. The ECPs call for wetlands to be decompacted as necessary if mats are not utilized. No quantification is given and no testing is called for to determine allowable compaction limits or thresholds to decompact wetlands. Wet soils are especially susceptible to impacts from construction activity.

f. The Draft EIS discounts the impacts to resources located outside of the permanent ROW, asserting that "most impacts on soil will be temporary and short-term." This conclusion is not supported by the information contained in the Draft EIS. Once a soil's structure is disturbed with heavy equipment, compaction, and removal of surface vegetation, it is very difficult to regain structure that allows for infiltration of surface water or the regrowth of healthy vegetation following construction. The only way to avoid permanent compaction of soils is to prevent the compaction from taking place in the first place (by limiting ROW widths) and to employ soil disturbance techniques that preserve soil structure.

g. FERC notes that pipeline activities such as "clearing, grading, trenching, and backfilling, could adversely affect soil resources by causing accelerated erosion, compaction, and introduction of rock or fill material to the surface." FERC relies upon environmental construction plans that focus on temporary erosion and sedimentation controls to address soil impacts. While temporary erosion and sedimentation measures may help to limit the transport of eroded soils, they cannot fully eliminate the acceleration of

erosion or soil compaction caused by construction. Once sediment reaches a stream or wetland, changes to the habitat of plants, fish, and insects can take place. Typically, healthy streams have gravel bottoms and cobble bars free of mud and sediment. This allows for spawning areas for fish and habitat for insects and plants. Sediment from accelerated erosion smothers fish eggs and covers spawning areas with fine sediments, thus inhibiting fish reproduction. Increased turbidity in streams and wetlands prevents light penetration into the water column and increases water temperatures. Decreased light penetration can retard plant growth in streams, wetlands, and lakes. Sediment in the water column also physically impacts fish by interfering with their ability to remove oxygen from the water. Downstream lakes and reservoirs can also begin to fill in due to sediment accumulation.

3. Impacts to Steep Slopes

Steep slopes are found consistently throughout the length of the pipeline. When combined with erodible soils, the ability for construction crews to manage runoff and sediment discharge from the construction site becomes more difficult. Many of these areas are directly adjacent to wetland or stream crossings where additional disturbance will take place. More study needs to be done to identify areas of cumulative impact due to slope, soils, proposed disturbance, and proximity to water resources such as wetlands or high value streams. Steep slopes alone do not necessarily cause accelerated erosion. The exposure of soils to direct rainfall from vegetation clearing, the disturbance of the soil structure from excavation, and the

reduction of infiltration following compaction all increase runoff volumes. Increased runoff volumes and rates increase sediment transport into streams and wetlands. When higher runoff volumes travel down steep slopes, erosive flow conditions increase, thus causing accelerated erosion. Temporary erosion controls can help to slow down runoff and limit downstream sedimentation. But once temporary erosion control is removed, it is up to the stabilizing vegetation and any permanent erosion control to reduce runoff velocities. Because construction practices can compact soils and inhibit vegetation regrowth, areas of steep slopes can become a large source of sediment-laden runoff to nearby streams and wetlands.

a. Numerous areas were identified as potential landslide areas. The likelihood for these soils to become unstable during or after construction is high. Multiple features also contain seepage or drainage features which can provide for greater accelerated erosion potential or exacerbate the likelihood of a landslide. Pipeline activity such as trenching along slopes and equipment on unstable surfaces will potentially increase the risk of landslides. Slope failure in combination to poorly managed stormwater runoff can increase the likelihood of sedimentation of nearby streams and wetlands. The Draft EIS recommends measures to minimize landslide potential including compaction of fill, installation of trench breakers, and minimization of stockpiling on slopes. However, Constitution has not indicated that it intends to adopt any site-specific mitigation measures.

These and other mitigation measures identified by FERC should be required as conditions of FERC's approval of the Project.

b. Clearing vegetation from steep slopes will increase the likelihood of sediment-laden runoff reaching downslope water resources. Vegetation cover on slopes is the only feature that provides stability to slopes and intercepts rainfall. With it removed or maintained as herbaceous within ROWs, the ability for the existing soils to resist accelerated erosion becomes diminished. Accelerated erosion will lead to sediment impacts in nearby streams and wetlands. Two steep slope areas were directly related to stream crossing and were noted as having potential channel migration.

c. Constitution has proposed to utilize 110-foot ROWs in areas of steep slopes (as opposed to 100-foot ROW in other forested areas and 75-foor ROW in wetlands). The difference between the 110-foot ROW and the 100-foot ROW represents 12.2 acres of interior forest. This additional area of disturbance will cause greater water quality impacts resulting mainly from erosion and sedimentation. As discussed above, increase compaction and reduced vegetative cover increase runoff volume and rate creating conditions that accelerate erosion, especially on steep slopes. Within sensitive areas such as steep slopes, construction practices that reduce (rather than widen) proposed ROW widths should be identified and implemented.

4. Karst Features

Constitution's one-page karst Mitigation Plan identifies karst features as prevalent between mileposts 118.3 and 124.2. Potential avoidance of these areas should be considered. Exposing subsurface karst features to disturbed surface conditions could allow sediment and eroded material to enter subsurface water sources. The mitigation plan calls for monitoring of accelerated erosion, certain unidentified stormwater measures, and silt fence near caves and sink holes. Maintaining waterbody features and limiting the removal of riparian vegetation is suggested but not required or quantified. The mitigation plan identifies notification and investigative procedures if karst features are exposed during construction. However, once the Project is approved and construction has commenced, route changes to avoid larger karst features may not be possible. A revised draft EIS should include a greater investigation of currently identified karst terrain and identification of any caves, sinkholes, or other karst features that have the potential to allow surface contaminants and sediment to enter groundwater sources.

5. Stream Crossings

The crossing methods need to be evaluated and documented for each stream crossing. While a dry open cut is more protective than a wet open cut, environmental impacts to the stream or wetland to be crossed and their downstream waterbodies can still occur under many circumstances. Sediment transport downstream can occur in a dry crossing either as construction is taking place or following the completion of the cut across the stream or wetland.

Destabilization of streambank and streambed due to excavation can increase the likelihood of sediment transport within the stream. The construction activities disturbing the streambed bottom can increase the likelihood of scour, which can eventually damage the gas pipe. The only way to avoid impacts to the streambed, sideslopes, and downstream ecology is to not disturb the surface of the stream with a trench cut for the pipeline. Alternative trenchless technologies allow for a crossing that does not disturb the surface of the streambed or its side slopes. This eliminates changes to the interface between the stream substrate and its flow of water. During construction, there is also the potential for unexpectedly large flows to enter bypass structures such as flumes or pumps. Unless these measures are sized for the largest possible flows, the potential exists for streamflows to enter the trench cut and move sediment downstream.

a. An individual feasibility study was not performed at each crossing. Many intermediate streams fit into width categories appropriate for conventional bore but were only proposed to be crossed by open cut crossing. If a conventional boring is feasible from a geotechnical standpoint, it should be considered as the preferred stream crossing method.

b. Crossing multiple adjacent streams at once with a trenchless technology could prevent a cumulative impact. While these streams or adjacent wetlands may not be feasible on an individual basis, the adjacent nature of features that could be avoided by use of trenchless technology could make

the extra effort worthwhile if in-stream disturbance was avoided. An evaluation of this type has not been performed, but should be considered.

c. Only where road crossing were adjacent to streams or wetlands or where the crossing was too large were trenchless technologies proposed. This implies that road disturbance (and the cost of road disturbance and/or restoration) is of higher priority than stream disturbance. More weight should be given to avoidance of high value streams or wetlands that can be crossed by borings and trenchless techniques without surface excavation. While Constitution proposes to avoid impacts by attempting all crossings as dry crossing, disturbance will take place at the surface and sediment transport downstream will become more likely. High value streams and wetlands will be more sensitive to minor sediment impacts and should be considered for trenchless crossing.

d. As proposed, the pipeline would cross Exceptional Value wetlands in Pennsylvania between mileposts 22.5 and 22.7. An alternative crossing method should be evaluated to limit the impact on these wetlands. Wetlands adjacent to streams should also be identified so that a cumulative impact can be avoided if possible.

6. Temporary Workspaces

Temporary workspaces make up a large portion of the disturbance of the pipeline construction. Effort should be made to reduce the need for temporary workspace and minimize the width of disturbance where possible. 75.5 acres of a total of 91.8 acres of wetland impacts are caused by construction activities in temporary workspaces. The need for these disturbances should be evaluated on a site-specific basis. Construction impacts to wetlands can occur when the soils and vegetation are disturbed by heavy machinery used to excavate trenches and move sections of pipe into place. Surface and subsurface flow patterns can become altered by construction disturbances that alter soils and vegetation by altering how water moves from below ground to above or vice versa. The movement of water within a wetland is critical to the type of habitat that is present and any alteration of topography by changing soil elevations or grade can alter water elevations negatively. Clearing of wetland vegetation can limit a wetland's ability to mitigate flood flows and control localized erosion. Wetland vegetation can play an important role in trapping and accumulating sediment. Vegetation and flow patterns are the primary ways wetlands trap sediment from surface waters. This benefit to local ecology can be disturbed by altering a wetland's vegetative or hydraulic patterns. Compaction and rutting of wetland soils can alter hydrologic patterns as well as inhibit plant germination.

7. **Shallow Bedrock**

   The length of pipeline proposed in shallow bedrock is quite large (45.5 miles). Although Constitution says they have not needed to blast in similar locations, the fact that it is not certain prior to the draft EIS is troubling. If blasting is required, subsequent environmental analyses should be required, including development of a supporting plan to mitigate blasting impacts. The requirements for subsequent analyses and planning should be documented in the Draft Environmental Impact Statement.

RECOMMENDATIONS

The following data collection, data analysis, and construction mitigation measures are recommended for consideration in the Draft Environmental Impact Statement:

- **Baseline Monitoring of Soil Conditions:** baseline monitoring should be required for all soils, not just agricultural and residential soils.
- **Comprehensive impact analysis of sensitive features and areas:** Indexes mapping should be conducted for areas with multiple sensitive features (i.e., highly erodible soils, steep slopes, proximity to wetlands and streams, etc.). By assigning a numerical value for the presence of sensitive features (e.g. one point for each sensitive feature present at a given location), highly susceptible areas can readily be identified, and appropriate alternatives considered and recommendations developed.
- **Cumulative Impact Analyses:** In conjunction with a comprehensive analysis, a cumulative impact analysis should be conducted to identify the number of stream

crossings per tributary, sub-watershed, and larger stream segments. The number of stream crossings per upstream drainage area should be developed as a me

- **Narrower ROW**.

CONCLUSION

Based on all the documents reviewed, FERC has identified many of the impacts likely to occur during construction of the pipeline and the continued maintenance of the permanent ROW by Constitution. These impacts can be mitigated with existing technologies but the proposed construction practices and technologies are not the most advanced nor the most effective in preventing accelerated erosion and sediment transport from uplands into nearby streams and wetlands. When considering the number of stream and wetland crossings by both access roads, construction areas, and the pipeline itself, more care should be taken at each of these impacts to minimize permanent disturbance on a site by site basis. A more thorough evaluation of the cumulative impacts of the varying topography, soil characteristics, stream locations, and sensitive resources needs to be completed so that FERC and other agencies can fully evaluate the entirety of the impacts this pipeline construction will have on soil and water quality in both Pennsylvania and New York.