

## **HORIZONTAL DIRECTIONAL DRILLING CONTINGENCY PLAN**

*If a release of bentonite is detected, call Jennifer Cannon immediately at 540-233-0008.*

### **1.0 INTRODUCTION**

Columbia Gas Transmission, LLC (Columbia) is proposing to extend an existing 26 inch natural gas pipeline (Line MB) for approximately 21.1 miles from the existing Owings Mills Metering and Regulation Station (M&R Station) in Baltimore County, Maryland, to the existing Rutledge Compressor Station in Harford County, Maryland. Columbia is proposing to utilize the horizontal directional drilling (HDD) technique for select crossings along this Project. The purpose of this document is to provide guidance in order to eliminate or minimize adverse effects from directional drilling fluid seepage or drill failure.

### **2.0 FRAC-OUT DETECTION**

The most obvious signs of a frac-out are surface seepage or loss of circulation/pressure of the drilling fluid. One of the functions of the drilling fluid is to seal the hole to maintain the downhole pressure. The loss of the returning fluid is a sign that pressure is not being contained in the drill hole and surface seepage is occurring outside the hole. If there is a reduction in the quantity of drilling fluid returning to the drilling site (loss of circulation), this could be a warning sign. However, some loss of drilling fluid is also normal in the drilling process. There can be instances during the drilling process when a small layer of loose sand, a small gravel layer or a small rock fracture is encountered. These occurrences will require minimal, additional drilling fluids to fill in the voids. Consequently, a small drilling fluid loss in and of itself is not an indication of a potential frac-out condition. It is the loss of drilling fluid in combination with other factors, which may indicate a potential frac-out condition. For example, if there is a loss of drilling fluid and the return of cuttings do not show a large quantity of gravel that could indicate a loss of containment pressure within the hole.

Columbia must only use firms who specialize in HDD to perform the proposed stream and wetland crossings. Columbia is responsible for the supervision of the drilling contractor and retains the right to shut down operations. Columbia's Environmental Inspector (EI) is responsible for on-site visual monitoring of the construction area during construction operations. The EI shall walk the construction area at least every four hours during drilling operations where access is permissible to visually monitor for inadvertent releases. If a loss of circulation is detected, the EI shall be notified immediately and the EI shall perform visual inspections of the construction area until the pressure of the drilling fluid has stabilized and the EI has confirmed that surface seepage has not resulted.

## 2.1 General Corrective Action

Once a frac-out is detected, the drilling crew shall take immediate corrective action. The only pressure causing the frac-out to occur is the pressure from the drilling fluid pumps. Therefore, the most immediate direct corrective action is:

- To stop the drilling fluid pumps or decrease the pressure (by stopping the pumps or decreasing the pressure, the pressure in the hole will quickly bleed off. With no/reduced pressure in the hole, the frac-out will stop or decrease significantly).
- As soon as a frac-out is detected, the circulation of mud will only be stopped/reduced temporarily until the response process has been initiated. Once the response/ containment process (Sections 2.1.1, 2.1.2 and 2.2) has been initiated and is under control, the drilling activities will immediately resume.

There is greater potential for a frac-out at the entry and exit locations. In the contingency planning for the pipeline crossing, frac-outs at the entry and exit locations have been considered and the following preventive actions have been developed:

- The entry and exit locations on all directionally drilled crossings shall have dry (upland) land segments where a frac-out can be easily detected, contained, and remediated.
- To isolate and contain a potential frac-out at each of the drill sites, there must be a berm around the downslope side of the drilling rig set-up area. Hay bales or silt fence must be part of the berm on the resource side of the drilling area (see appropriate county Erosion and Sedimentation Control Plans).

**2.1.1** In the event of a frac-out in an Upland Area, the following corrective actions will be taken immediately:

- The source/pumps will be stopped temporarily or the pressure will be decreased.
- The frac-out will be contained immediately by installing hay bales or silt fence and/or constructing dikes or pits.
- The drilling mud will be removed from the ground surface to the greatest extent possible and removed from the site using manual equipment such as shovels and wheel barrows or earth-moving equipment such as backhoes or small bulldozers, portable pumps and/or vacuum trucks.
- If necessary, the affected area will be watered down to further dissipate drilling muds that remain after mechanical efforts have been exhausted.

- The affected areas will be restored within 30 days as closely as possible to their previous condition.
- Documentation must be made and maintained by the contractor and provided to Columbia.
- The Contractor must follow any special instructions from Columbia's Environmental Inspectors (EIs).

**2.1.2** In the event of a frac-out into wetlands and/or waterbodies, the containment and corrective actions described below must be taken immediately and the Contractor must make the appropriate contacts in accordance with Section 2.2 below.

- The source/pumps will be stopped temporarily or the pressure will be decreased.
- The frac-out will be contained immediately by installing hay bales or silt fence and/or constructing dikes or pits (do not construct earthen dikes or berms within wetland or stream areas).
- The drilling mud will be removed from the ground surface and from the site to the greatest extent possible by manual means such as by use of shovels, wheelbarrows and/or vacuum hoses. Earth moving equipment such as backhoes or small bulldozers will be used only if manual means prove to be impractical and only after appropriate measures have been taken to minimize impacts to the resource. These measures will be authorized by Columbia's EI.
- The affected areas will be restored as closely as possible to their previous condition.
- Documentation must be made and maintained by the contractor and provided to Columbia's EI.
- The Contractor must follow any special instructions from Columbia's EI.

Typically, drilling activities will not be suspended unless the frac-out creates a threat to public health and safety or unless suspended by Columbia's Chief Inspector or EI.

## **2.2 Response and Reporting Personnel**

If a release of bentonite is detected, the drilling contractor will immediately notify Columbia's EI and Chief Inspector. The EI has been given "stop work authority" by Columbia and his/her instructions must be followed. The EI and Chief Inspector will

immediately notify Jennifer Cannon (540-233-0008), the Natural Resource Permitting Project Manager. Jennifer Cannon will be responsible for notifying the Maryland Department of the Environment and U.S. Army Corps of Engineers in compliance with the Section 401 Non-Tidal Wetlands and Waterways and Section 404 authorizations.

### **2.3 Response Equipment**

The drilling contractor will be responsible for having all response materials and equipment required for containment/remediation during a frac-out. Such materials must be stored within the drilling sites.

The materials should include at a minimum: lumber for temporary shoring, equipment mats, sand, portable pumps, hand tools, and hay bales and silt fence. The drilling contractor will also have heavy equipment such as backhoes available, which can be utilized to control and clean up large frac-outs.

### **2.4 Follow-Up**

After the frac-out has been contained, the drilling contractor and Columbia will make every effort to determine why it occurred. Once Columbia has determined the cause of the frac-out, measures will be developed to control the factors causing it and to minimize the chance of recurrence. Developing the corrective measure will be the joint effort of Columbia and the drilling contractor.

In some cases, the corrective measure may involve a determination that the existing hole encountered a void, which could be bypassed with a slight change in profile. In other cases, it may be determined that the existing hole encountered a zone of unsatisfactory soil material and the hole may have to be abandoned. Any such activity must be documented by the contractor and Columbia.

### **3.0 DRILL FAILURE**

Besides frac-out concerns, there is also a potential for failure of the drilling apparatus. If the drilling apparatus becomes inextricably lodged, and cannot be withdrawn without exiting the construction work limits (unless the appropriate approvals are first obtained by the Columbia's Natural Resource Permitting Department), or damaging the resource(s) the directional drill was performed to protect, the apparatus and hole will be abandoned. If the hole is abandoned, it will be filled with cuttings and drilling fluid. Once the abandoned hole is filled, a second attempt will be made to complete the drill. The second attempt must be performed within the confines of the approved construction work limits as shown on the Environmental Construction Drawings. The second attempt will generally be offset slightly from the original entry-hole location.