

## **SMC SAMPLE DIRECTIONAL DRILLING CONTINGENCY PLAN (Revised 5/20/09)**

The Lake County Stormwater Management Commission (SMC) recommends that, at a minimum, this contingency plan be used to minimize environmental impacts due to uncontrolled releases of drilling mud (assumed to be bentonite plus additives). The proposed plan must be approved prior to issuance of a Watershed Development Permit. The entire contingency plan shall be placed on the erosion control sheet in the drawing set where the contractor will see it up front and include all provisions into the bid.

### **Introduction**

The use of directional drilling can be the method of choice for installing utilities. Ideally, this technique has an entry pit and an exit pit with no disturbance in between them. This is often used for drilling under roads, wetlands, creeks, etc. where open cuts are not practical or would result in excessive environmental impacts.

Unfortunately, every directional drilling project has the potential for the uncontrolled release (“frac out”) of drilling mud into the environment. Releases have occurred in upland locations and in wetland locations and from drilling depth of five feet to over twenty feet. The releases have adversely impacted upland and wetland ecosystems, affected environmental aesthetics and have frequently resulted in backlash from property owners and the public in general. Furthermore, cleaning up the drilling mud is much more time consuming and expensive than preventing, or at least immediately containing and remediating, the release.

Drilling mud typically consists of a mixture of water, bentonite clay and an emulsifier such as guar gum. The primary problem is the bentonite. Bentonite is a very effective waterproofing agent and is used for sealing wells, creating impermeable slurry walls, etc. Bentonite in wetlands has a similar sealing action and can destroy a wetlands ability to interact with the ground water. Furthermore, bentonite can smother benthic communities (things that live in the bottom sediments) and create water that is so turbid that little light reaches submerged plant life. It can be nearly impossible to get the bentonite out of the wetland without significantly impacting the wetland in the process. Therefore, a contingency plan is needed to immediately and effectively respond to drilling mud releases into the environment.

### **Treatment Alternatives**

There are three primary ways to keep drilling mud out of the environment:

1. Minimize drilling pressures to keep the mud from fracturing out of the soil and **if a frac out is identified, stop drilling immediately;**
2. Contain any frac outs; and
3. Use anionic polymers to remove suspended bentonite from water.

### *Containment*

The most practical method for containment of drilling mud in upland areas is construction of a barrier placed around a frac out area to keep the mud contained to a small area. The barrier can be made of lightweight materials, such as aluminum or plastic, and should have handles so it can be easily taken to the frac out area. The barrier may be sandbags, silt fence or other measure as long as it is effective and can be installed immediately.

Containment in wetlands and flowing streams is much more difficult because, once suspended in the water, the bentonite is so fine it will pass through most containment structures like silt fence or turbidity barriers. The most practical approach in open water is to **immediately** stop drilling and isolate the area using a turbidity barrier or containment box, as appropriate. The contained water must then be removed using a vacuum truck or treated with appropriate anionic polymers and removed by vacuum or manual methods.

### *Polymers*

Polymers are branched organic molecules that grab onto small suspended particles resulting in one large particle that is heavy enough to settle out of the water. There are essentially two kinds of polymers, cationic and anionic. **Cationic polymers can be toxic to freshwater aquatic life (they stick onto gills) and should not be used.** There are a wide variety of types and forms of anionic polymers available but they do not all work equally well in removing suspended clay from water. A knowledgeable polymer vendor must evaluate the site-specific conditions and recommend appropriate polymers to use and how to use them. This evaluation and recommendation should take place during the design phase of the project so appropriate polymers can be available on-site during all phases of the work. **Polymers are only required to be available onsite if drilling will be under or near streams or other wetlands.**

### **Contingency Plan Contents**

The SMC shall require, at a minimum, a Contingency Plan with the following components:

#### *General Information Requirements*

1. Name, address and phone number of onsite drilling company representative;
2. Material Safety Data Sheets (MSDS) for drilling mud constituents;
3. Name, address and phone number of anionic polymer vendor;
4. Catalog cut sheets for each recommended polymer, directions for use and any limitations;

5. A brief narrative discussing the directional drilling operation, identification of likely problem locations and proposed methods of ensuring that frac outs do not occur or are properly contained.

*Minimum Operational Requirements*

1. At least one vacuum truck must be onsite during all drilling operations and at least one additional vacuum truck shall be readily available or on stand-by at a nearby location, as appropriate
2. At least one full time person to walk the drilling route and identify frac outs and coordinate remediation. This may best be accomplished by a Designated Erosion Control Inspector (DECI).
3. Verification of adequate polymer stored onsite to treat at least one release into wetlands or streams with the understanding that additional polymer will be procured if the first is used
4. Frac outs in upland areas that do not affect wetlands or other sensitive areas are to be summarized in a weekly report to the SMC detailing the amount of drilling mud released, the method of containment, remediation method used and any additional relevant information
5. SMC must be contacted immediately if a frac out affects wetland areas. Appropriate telephone numbers should be a part of the contingency plan. Each frac out must be summarized in daily reports to the SMC detailing the amount of drilling mud released, the method of containment, remediation method used and any additional relevant information
6. SMC will require a line item in the engineer's estimate for the performance guarantee for cleanup of frac outs. This portion of the performance guarantee will be used to clean up or stabilize impacted areas if the contractor fails to take immediate corrective action.

SMC or the local community may have additional requirements to the above list depending on the location, length and depth of the proposed directional drilling.