OVERLAND PASS PIPELINE PROJECT

HORIZONTAL DIRECTIONAL DRILLING INADVERTENT RELEASE CONTROL PLAN

DRAFT

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1.0 PURPOSE AND NEED

Most of the waterbody crossings on the Overland Pass Pipeline Project will be conducted using the open-cut crossing method. In the event that an open cut is not feasible or expressly permitted by regulatory agencies, the horizontal directional drill (HDD) method will be used to install the pipeline. Ideally, the HDD method involves no disturbance to the bed or bank of the waterbody being crossed. However, if a natural fracture or unconsolidated area in the ground is encountered, an unexpected release of drilling mud to the environment could occur. This Horizontal Directional Drilling Inadvertent Release Control Plan outlines the measures that would be taken to mitigate the inadvertent release of drilling mud.

2.0 DRILLING BASICS

The HDD method is a technically advanced process involving specialized equipment and skilled operators. The primary environmental risk associated with this crossing method come from the potential for inadvertent release of drilling fluid. The selection and supervision of the drilling contractor will be the responsibility of Overland Pass Pipeline Company LLC (Overland Pass).

A drilling fluid release is indicated when pressure in the drill hole is not maintained and a loss of circulation of drilling fluids occurs. Minimal, consistent loss of drilling fluid typically occurs during the drilling process when layers of loose sand, gravel, or fractured rock are encountered and drilling fluid fills voids in the material. The loss of returning drilling fluid and a reduction in drilling pressure indicates that seepage is occurring outside of the hole.

3.0 DRILLING FLUID AND DRILLING FLUID SYSTEM

The directional drilling process uses drilling fluid consisting primarily of water and bentonite, a naturally occurring clay. Drilling fluid removes the cuttings from the borehole, stabilizes the walls of the borehole and acts as a coolant and lubricant to the drill bit during the drilling process. The drilling fluid mixture consists of 1 to 5 percent bentonite clay and from 0 to 40 percent inert solids from the borehole cuttings with the remainder being water.

The drilling fluid is prepared in the mixing tank using both new and clean recycled drilling fluid. The fluid is pumped at rates of 100 to 500 gallons per minute (gpm) through the center of the drill pipe to the drilling tools. Return flow is through the annulus created between the wall of the drilled hole and the drill pipe. During pilot hole drilling the cuttings are returned to a small excavation at the entry point called the entry pit. From the entry pit, the returned fluid is pumped to the fluid processing equipment. Typically, shaker screens, desanders, desilters and centrifuges process and remove increasingly finer cuttings from the drilling fluid. The cleaned fluid is recycled to the mixing tank for reuse in the borehole. The cuttings removed by the cleaning process are disposed of at a site approved to accept this type of material.

4.0 DRILLING FLUID RELEASE

4.1 Prevention

Horizontal directional drilling is a pipeline installation method typically used to avoid disturbance of sensitive surface features, including waterbodies and wetlands. HDD does, however, present a remote potential for surface disturbance through inadvertent drilling fluid releases. Drilling fluid releases are typically caused by blockage of the return flow path around the drill pipe where pressurization of the drilling fluid rises above the containment capability of the overburden soil material. Pressurized drilling fluids follow the path of least resistance, which may result in the drilling fluid flowing to the ground

surface should the annulus around the drill pipe become plugged. Releases may follow fractures in bedrock or other voids in the strata that allow the fluid to surface.

4.1.1 Suitable Material and Adequate Overburden

Prevention of drilling fluid seepage is a major consideration in determining the profile of the HDD crossing. The primary factors in selecting the pipeline crossing profile include the type of soil and rock in the geological material and the depth of cover material. Cohesive soils, such as clays, dense sands and competent rock are considered ideal materials for horizontal drilling. The depth of adequate overburden is also considered. A minimum depth of cover of 25 feet in competent soils is required to provide a margin of safety against drilling fluid seepage.

The areas that present the highest potential for drilling fluid seepage are the drill entry and exit points where the overburden depth is minimal. Along both the entry and exit points, above ground containment pits can be constructed with berms to collect and provide temporary storage for the inadvertently released drilling fluid or seepage until it can be pumped back into the drilling system.

4.1.2 Pipeline Geometry

The geometry of the pipeline profile can slightly affect the potential for drilling fluid seepage. In a profile which forces the pipe to make compound or excessively tight radius turns, key-seating of the drill pipe may develop, blocking the return flow to surface, allowing downhole pressures to build up, thereby increasing the potential for drilling fluid seepage. The profiles for Overland Pass' pipeline crossings minimize this potential, with very smooth and gradual vertical curves placed deep in the crossing profile, therefore affording maximum cover. Therefore, the potential for pressure buildup caused by pipeline geometry has been minimized.

4.1.3 Responsibility of Drilling Contractor

The drilling contractor is responsible for execution of the HDD, including actions for detecting and controlling drilling fluid seepage. Overland Pass will closely supervise the progress and actions of the drilling contractor.

4.2 Detection and Monitoring Procedures

To determine if an advertent release has occurred, HDD activities will be constantly monitored on this project, either by the Contractor, Construction Inspector, Environmental Inspector, or any combination of the three. Monitoring procedures will include:

- Inspection along the drill path.
- Continuous examination of drilling mud pressure gauges and return flows to the surface pits.
- Monitoring of drill status information regarding drilling conditions and alignments of the drilling profile during the course of drilling activities.
- If a release occurs in a wetland, containment of the drilling fluids, and continued inspection to determine any potential for movement of released drilling mud within the wetland, and collection of drilling mud returns at the location for future analysis, as required.

- If a release occurs in a wetland or waterbody, monitoring of the release will be documented by the Environmental Inspector. Overland Pass will keep photographs of release events on record.

5.0 NOTIFICATION PROCEDURES

If monitoring indicates a release is occurring or has occurred, the Contractor shall immediately begin containment while the Construction Inspector or Environmental Inspector will immediately notify Overland Pass' construction management personnel.

Overland Pass will notify the appropriate agencies immediately upon discovery of an inadvertent wetland release, detailing the location and nature of the release, corrective actions being taken, and whether the release poses any threat to public health and safety.

6.0 CORRECTIVE ACTION

The greatest potential for drilling fluid seepage is during drill entry and exit where the overburden is reduced for entry and exit of drilling tools at the low approach angle. In the contingency planning for the pipeline crossings, drilling fluid seepage containment will be incorporated into the drill plan. The entry or exit locations will generally be located in upland areas on a dry land segment where drilling fluid seepage can be readily detected and contained. To isolate and contain potential drilling fluid seepage, an above ground containment pit will be constructed between the entrance and exit points and the feature boundary. Straw bales or silt fencing may also be used to further reinforce the berm. The Contractor will have available equipment and materials, including hand tools, backhoes or small bulldozers, silt fencing, lumber for temporary shoring, portable pumps, sand bags, straw bales, onsite to contain and control drilling fluid seepage on land.

Overland Pass will address an inadvertent release immediately upon discovery. The following measures will be implemented to minimize or prevent further release, contain the release, and clean up the affected area:

<u>Upland Release:</u>

- The Contractor will determine and implement any modifications to the drilling technique or composition of drilling fluid (e.g., thickening of mud by increasing bentonite content, temporary lowering of the downhole pressures) to minimize or prevent further releases of drilling mud.
- Overland Pass will oversee the placement of containment structures at the affected area to prevent migration of the release.
- If the amount of the release is large enough to allow collection, the drilling mud will be collected and returned to either the drilling operations or a disposal site by hose or tanker.
- If the amount of the release is not large enough to allow collection, the released drilling fluid will be swept, shoveled, or mixed with sand and temporarily left in place to dry. Steps will be taken to prevent drilling fluid or silt-laden water from flowing into a wetland or waterbody.
- If public health and safety are threatened by an inadvertent release, drilling operations will be shut down until the threat is eliminated.

Waterbody Release:

- If a release occurs within a waterbody, Overland Pass will contact the appropriate agency as soon as possible to inform them if there is a threat to public health and safety, and explain whether or not the release can be corrected without incurring additional environmental impact. If necessary, drilling operations will be reduced or suspended to assess the extent of the release and to implement corrective actions.
- If the release is a single-point release, accessible with a hose and truck, the Contractor will attempt to 'cap' the release, if possible, by placing a section of pipe over the release to contain the fluid within the pipe section. With a larger release, the Contractor may attempt to place a water-filled bladder around the release in order to isolate it from the waterbody prior to removal. After the release is contained, the fluid will be pumped into trucks and reused or disposed of at an appropriate facility.
- If public health and safety are threatened, drilling fluid circulation pumps will be turned off. This measure will be taken as a last resort because of the potential for drill hole collapse resulting from loss of down-hole pressure.
- If monitoring indicates that the intake water quality at downstream user locations is impacted to the extent that it is no longer suitable for treatment, alternative water sources (i.e., trucked or bottled water) will be provided to impacted users.
- Overland Pass will assist agencies with any sampling they may require.

Wetland/Riparian Area Release:

- The Contractor will determine and implement any modifications to the drilling technique or composition of drilling fluid (e.g., thickening of mud by increasing bentonite content, temporary lowering of the downhole pressures) to minimize or prevent further releases of drilling mud.
- If a release occurs within the wetland, reasonable measures, within the limitation of directional drilling technology and Contractor's capability, will be taken to re-establish drilling mud circulation.
- Overland Pass will evaluate the release to determine if containment structures are warranted and can effectively contain the release. When making this determination, Overland Pass will also consider if placement of containment structures will cause additional adverse environmental impact.
- Upon completion of the drilling operations, Overland Pass will consult with applicable regulatory agencies to determine any final clean-up requirements for the inadvertent release.
- If public health and safety are threatened by the inadvertent release, drilling operations will be shut down until the threat is eliminated.
- Overland Pass will assist regulatory agencies with any sampling they may require.

7.0 ABANDONMENT

If corrective actions do not prevent the threat to public health and safety, or if the pipeline installation is unsuccessful, Overland Pass may opt to re-drill the hole along a different alignment after receiving

appropriate regulatory approvals. In this case, the following procedures will be implemented to abandon the previous drill hole.

- To seal the abandoned drill hole, thickened drilling mud and cuttings will be pumped into the hole as the drill assembly is extracted.
- Within approximately 10 vertical feet of the surface, Overland Pass will remove drilling mud and cuttings, then fill the drill end points and any mud pits with soil, and grade the location to the original contour.

8.0 FOLLOW-UP

After the drilling fluid seepage has been contained, the drilling contractor and Overland Pass will make every effort to determine the cause of the seepage. After the cause has been determined, measures will be implemented to control the factors causing the seepage and to minimize the chance of recurrence. Developing the corrective measure will be a joint effort of Overland Pass and the drilling contractor and will be site and problem specific.

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 the 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. If the hole is abandoned, it will be filled with cuttings and drilling fluid, as described in section 7.0.

9.0 RESPONSE EQUIPMENT

Containment equipment and materials, including lumber for temporary shoring, sandbags, portable pumps, floating containment booms, hand tools, silt fence, and straw bales, will be stored within the drilling sites. The drilling contractor will also have heavy equipment such as backhoes and bulldozers that can be used to control and clean up drilling fluid seepage.