H HORIZONTAL DIRECTIONAL DRILL CONTINGENCY PLAN

1.0 INTRODUCTION

Horizontal directional drills (HDDs) are commonly used in pipeline construction for crossing large waterbodies, transportation corridors, and other sensitive features. This special pipeline construction method allows for the pipeline to be placed via a drill without impacting the ground surface between the entry and exit locations. This HDD Contingency Plan provides procedures to manage contingencies that may occur during HDDs associated with the installation of the Sea Port Oil Terminal (SPOT) Project's onshore pipelines. Section 1.4.4.12, "Special Pipeline Construction Methods," Volume IIb, provides a detailed description of the HDD installation process and the locations of all HDDs planned for the SPOT Project.

2.0 ALTERNATIVE CONSTRUCTION TO HDD

HDDs have been in use since the 1970s. The technology has become commonplace and is a proven method that is readily available for installing crude oil pipelines. Issues that occur with HDDs are primarily related to geotechnical issues, where significant non-uniformity exists in the underlying formations (notably containing scattered rock, sands, and gravel) or cavities where the drilling fluid pressures on the drill string head cannot be maintained or could be lost. In these cases, the pilot hole or reaming hole may collapse and not accommodate pulling through the welded pipe section.

If, for any reason, it becomes necessary to suspend HDD operations and/or abandon a partially completed drill hole, the drill string will be withdrawn and the hole will be pumped with flowable backfill material and pugged at the surface. If it is determined necessary to abandon the original HDD location, the proposed alignment may be modified to accommodate a new HDD. The typical procedure to replace an HDD is to move its location approximately 50 feet (15.2 meters) to either side of the original location.

In the event that an HDD is found to be technically unfeasible, an alternative construction method to suit the site-specific conditions may be selected, including open cut construction of bore methods (see Section 1.4.4, "Pipeline Construction," Volume IIb). Such alternative methods would only be used after notifying applicable regulatory agencies and obtaining any necessary approvals. As the proposed SPOT Project would occur in Harris County and Brazoria County, Texas, the geology is generally conducive to the use of HDDs and, therefore, the chance would be low for an HDD to be non-viable and an alternative method to be chosen.

3.0 HDD MONITORING PROCEDURES

During an HDD, there is the potential risk of an inadvertent release of drilling muds to the ground surface. The HDD contractor supervisor will be onsite at all times during an HDD and will continuously monitor all operations during drilling activities for any indication of loss of pressure or loss of drilling muds/fluids. Drilling mud that would be used for HDDs will consist of fresh water with a high-yield

bentonite to achieve the necessary viscosity for the drilling mud. Bentonite is the commercial name for a nontoxic mixture of naturally-occurring clays and rock particles and is not considered a hazardous material by the U.S. Environmental Protection Agency or the Texas Commission on Environmental Quality. Drilling parameters will be established to maximize circulation of drilling muds and minimize the risk of inadvertent releases. Monitoring of the HDD will include:

- Visual inspection along the drill path, including monitoring the wetlands and waterbodies for evidence of a release;
- Continuous monitoring of drilling mud, drilling mud pressures, and return flows by the HDD contractor; and
- Periodic recording of HDD status regarding site conditions, pressures, returns, and progress during the course of HDD activities.

Once the HDD is complete, the HDD contractor would inspect the site after equipment removal for any signs of an inadvertent release.

4.0 DRILLING FLUIDS CONTROL AND CONTAINMENT

4.1 STORAGE OF FLUIDS AND LUBRICANTS

Any use of fluids and lubricants that could harm the environment if released would be handled in accordance with the applicable federal, state, and local regulations as well as the HDD contractor's Spill Response Plan. The HDD contractor would be required to provide the Spill Response Plan for review and approval by the SPOT Terminal Services LLC (the Applicant) or their representative.

4.2 CONTAINMENT AND CLEANUP OF DRILLING FLUIDS

HDD procedures demand that highly accurate monitoring and control systems are used to track the progress and exact location of the drilling head at all times. Drilling mud is used during the advancement of the drill string to erode the formation and aid in stabilizing the pilot hole. The specific weight of the drilling mud is adjusted throughout the installation method to ensure hydrological stability. If a release of drilling mud should occur, the following measures will be implemented. Only experienced personnel trained in the HDD will be assigned the task of conducting and monitoring the HDD.

4.2.1 Measures to Contain a Release of Drilling Fluid in a Wetland or Waterbody

1. If the inadvertent release of drilling mud occurs within a wetland or sensitive area, appropriate regulatory agencies will be contacted in accordance with application regulations and permit conditions. Drilling mud pressure will be reduced and operations will be temporarily suspended to assess the extent of the release and to implement other possible corrective actions.
2. If public health and safety is threatened, drilling mud circulation pumps will be turned off until the threat is eliminated. This measure will be taken as a last resort because of the potential for drill-hole collapse resulting from loss of down-hole pressure.

3. A sample of the drilling mud will be collected and held for future analysis in the event that an analysis is requested by regulatory agencies.

4. Inspection will be initiated to determine the potential movement of released drilling mud within the wetland, waterbody, or other sensitive feature.

5. The HDD contractor will determine and implement modifications to the HDD technique or composition of drilling mud (i.e., thickening of drilling mud by increasing bentonite content), as appropriate, to minimize or prevent further releases of drilling mud.

6. Reasonable measures, within the limitation of HDD technology and the HDD contractor's capability, will be taken to re-establish drilling mud circulation.

7. The HDD contractor will evaluate the release to determine if containment structures are warranted and can effectively contain the release. When making this determination, the HDD contractor will also consider if placement of containment structures will cause additional adverse environmental impacts.

8. Upon completion of HDD operations, the Applicant will consult with the applicable regulatory agencies to determine if there is a need for any final cleanup requirements for the inadvertent release.

4.2.2 Measures to Contain a Release of Drilling Fluid on Land

1. If a land release is detected, the HDD contractor will take corrective action to contain the release and to prevent offsite migration.

2. If public health and safety are threatened by an inadvertent release, HDD operations will be shut down until the threat is effectively addressed or eliminated.

3. The HDD contractor will determine and implement modifications to the HDD technique or composition of drilling mud (i.e., thickening of drilling mud by increasing bentonite content), as appropriate, to minimize or prevent further releases of drilling mud.

4. If the amount of drilling mud from an on-land release does not allow for practical collection, the drilling mud will be diluted with freshwater and allowed to dry. If warranted, a containment structure will be installed to prevent silt-laden water from flowing into a wetland or waterbody.

5. If the amount of release is enough to allow collection, the drilling mud released will be collected and returned to either the HDD operation or disposed offsite.

5.0 NOTIFICATION PROCEDURES

If a release occurs, the HDD contractor must immediately notify the Applicant's Chief Inspector. The Applicant's Chief Inspector will then notify the appropriate regulatory agencies of the inadvertent release. The Applicant's Chief Inspector will maintain an agency contact list for the SPOT Project.