



Dakota Access Pipeline Project - DAPL

Facilities Design

(Extraction from Design Basis Memorandum)

FACILITIES DESIGN

Mainline Block Valves Sites

All Mainline Block Valve assemblies (MLVs) for the DAPL Crude Oil Supply system, the DAPL Mainline, and the ETCOP Mainline will be designed and located by Wood Group in accordance with DOT 195, Subpart C, Paragraph 195.116 and Subpart D – *Construction*, Paragraphs 195.258 and 195.260.

All Mainline Block Valves will be installed above ground and provided with electric actuators.

All MLVs will be ball valves and will be manufactured in accordance with API 6D "*Specification for Pipeline Valves*". Mainline valves will be provided with a full-bore internal diameter to facilitate pigging.

MLVs will be positioned along the pipeline near major highway, railroad, and river crossings. MLVs will also be placed near the beginning of High Consequence Areas (HCAs) as identified by the Pipeline and Hazardous Materials Safety Administration (PHMSA) and in select locations recommended by the Spill Model Study (which is discussed further in Section 7.2).

All MLVs will be integrated with a SCADA system which will provide emergency shutdown capabilities of pump stations and designated mainline valves.

As third party connections are made at manual side tap valves the valves will be remotely actuated at that time

Launcher and Receiver Sites

All Launcher and Receiver installations will be designed by Wood Group in accordance with DOT 195, Sub-Part F – Operation and Maintenance, Paragraph 195.426. Barred tees will also be provided along all mainline branch connections. In the Vernon area, the 30" parallel manifold will be piggable with a barred tee as it intersects the DAPL mainline. For all Launcher/Receivers, the over-sized barrel lengths will be made long enough to accommodate the longest "smart" ILI tools manufactured by Enduro. In addition, the barrels will be long enough to handle TD Williamson's "*Spiral-All*" ILI tool – which is specifically designed to evaluate the longitudinal weld seam in spiral-welded line pipe.

The final consideration for Receiver design is that the nominal diameter pipe section will be made long-enough to handle the full length of the aforementioned ILI tools. This is to ensure that ILI tools will pass far enough into the over-size barrel so that the tail end of the ILI tool will be positioned safely downstream of the main trap block valve – allowing it to be fully-closed for barrel isolation and tool removal purposes.

Launcher/Receiver combinations will be included at all pump stations within the Supply Network and the DAPL 30" mainline, with the exception of the pump stations located at Stanley (Launcher only), Epping, ND and Johnson's Corner, ND -- which are close enough to other pump stations to utilize the Launcher/Receiver at those stations.

In addition, 9 stand-alone Launcher/Receiver sites will be installed at various points along the DAPL 30" mainline to facilitate maintenance pigging operations and periodic ILI surveys.

A terminus Receiver for the DAPL system and a Launcher for the ETCOP system will be located at Patoka, IL.

Civil Design

All civil infrastructures are constructed using the applicable DAPL, ETC, or Process Industry Practice (PIP) Standards and Specifications, and the Project "Civil-Structural Design Criteria" (Document No. DAPL-WGM-GN000-CS-DES-0001).

In the absence of site-specific geotechnical studies, all structural supports are designed to rest on helical foundation systems following a "performance-driven specification" based on loads and reactions shown on the construction drawings.

Grading of all sites are designed with a minimum surface slope of 1% to provide a positive drainage flow away from structures and into surrounding areas. Overland flow is used to the maximum extent possible to minimize or avoid the need for catch basins or storm water collection systems.

Unless specifically noted on the drawings, compacted gravel surfaces are provided around process and non-process areas, parking, roadways, light-duty maintenance tracks, and at driveway entrances.

Electrical and Instrumentation Design

API RP 500 will be used to determine electrical area classifications around the launchers, receivers, mainline valves, and metering equipment.

The pump stations and metering facilities will be fully-automated to enable remote operation from the SCADA Command Center. With that in mind, it is anticipated that no personnel will be required on site for the operation of each proposed facility. However, DAPL's Operations personnel will be strategically located to allow for timely response to operations and/or maintenance activities as required.