



## CASE STUDY

# DSI PBL® Bypass System requested to be used for a Split Flow Application, successfully delivered LCM material.

### Application/Objective

The DSI PBL circulating sub was requested by a major operator in Qatar to be utilized in a Split Flow Application in the 12 1/4" hole side track operation. The application was originally defined that the PBL would be remain closed during the drilling operation and would be activated at section TD in order to improve hole cleaning through the ports of the circulating sub and cooling the components of the BHA on the trip out of the well; this would help save time while pulling out of hole. BHA design and hydraulic information were provided to DSI engineering by the client in order to run the DSI hydraulics program and confirm feasibility of the required flow option.

The calculations were approved and an 8-1/4" PBL sub was configured with 2 x 16/32" nozzles in the ports and 1 x 40/32" nozzle in the Dart to give a split of 57.5% downward flow (690 gpm) and a 42.5% sideways flow (510 gpm) total flow of 1200 gpm. Maximum flow rate while drilling was 1000 gpm. PBL Split Flow would provide 20 % additional flow for hole cleaning.

### Results & Benefits

Unexpected losses were encountered during the early stages of drilling the section which led to a change in the plan, the PBL was required to be activated four times during this operation & LCM of 350 microns with 100 ppb and a coarser recipe LCM of 2600 microns with 200 ppb were pumped through the tool.

#### Activation Depths/ Inclinations:

**Activation 1** – 6,800 feet @ 25 deg    **Activation 2** – 6,980 feet @ 26 deg

**Activation 3** – 7,150 feet @ 30 deg    **Activation 4** – 8,840 feet @ 66 deg

### Conclusion

The unexpected losses resulted in the tool not required to be utilized in the Split Flow mode for hole cleaning/BHA cooling on this section following TD. However, the versatility of the PBL tool that can be used either as a split flow tool and also to displace LCM material proved that in this instance, the PBL tool is a valuable insurance component in the BHA which enabled the circulation of LCM during the drilling process while preventing the risk of plugging the sensitive BHA components.

The tool has been run by the client during this drilling program in both split flow and standard mode in different hole sizes and is planned to be included in many other future operations.

