



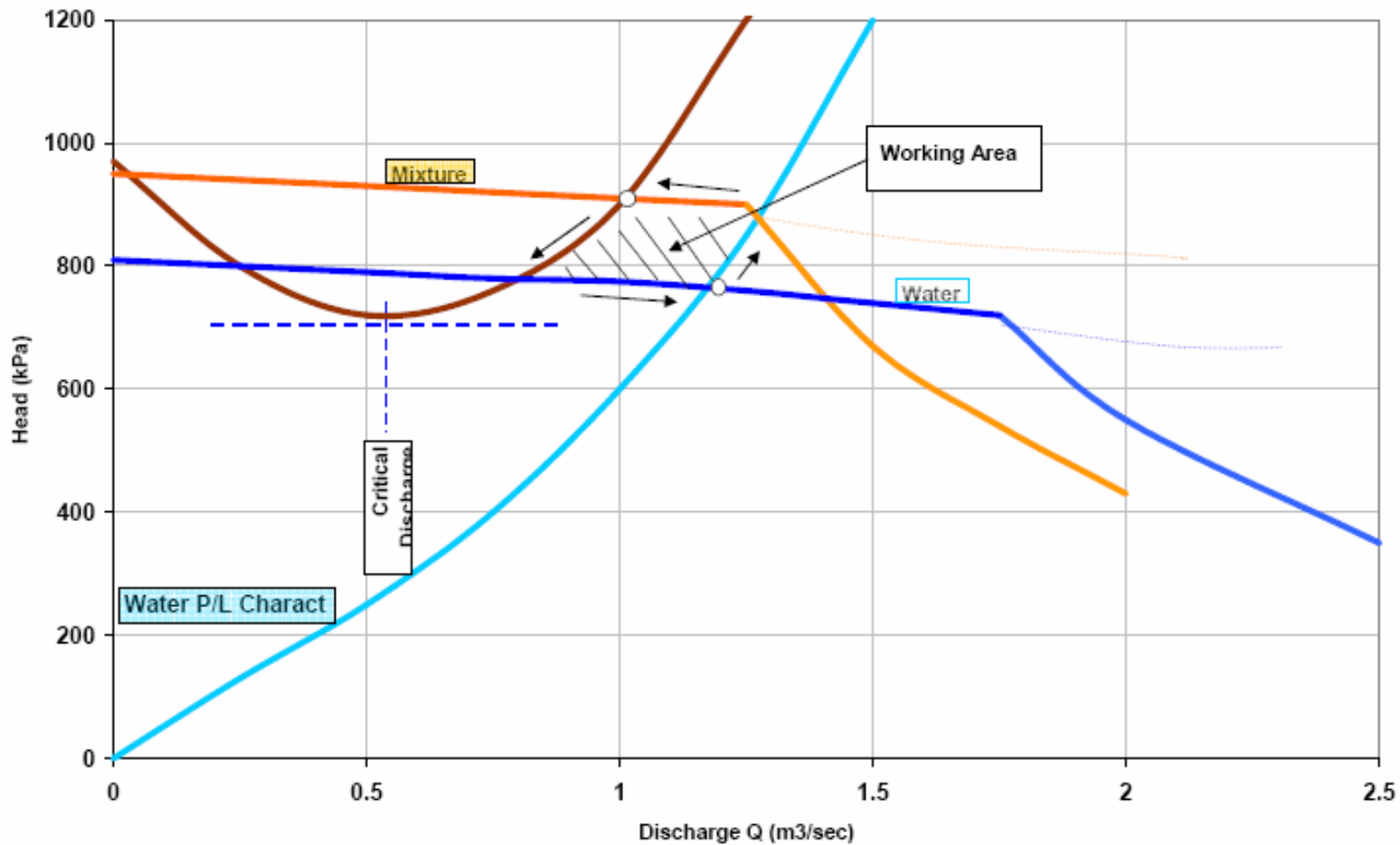
# Hydraulic Dredging: horizontal transport

## Part 3: Exercise on Hydraulic Dredging Process

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# A Typical Pump, Diesel-Drive and Pipeline Characteristic Diagram: H / Q Diagram

Dredge Pump, Drive & Pipe Characteristics for Water and Mixture Soil-Water



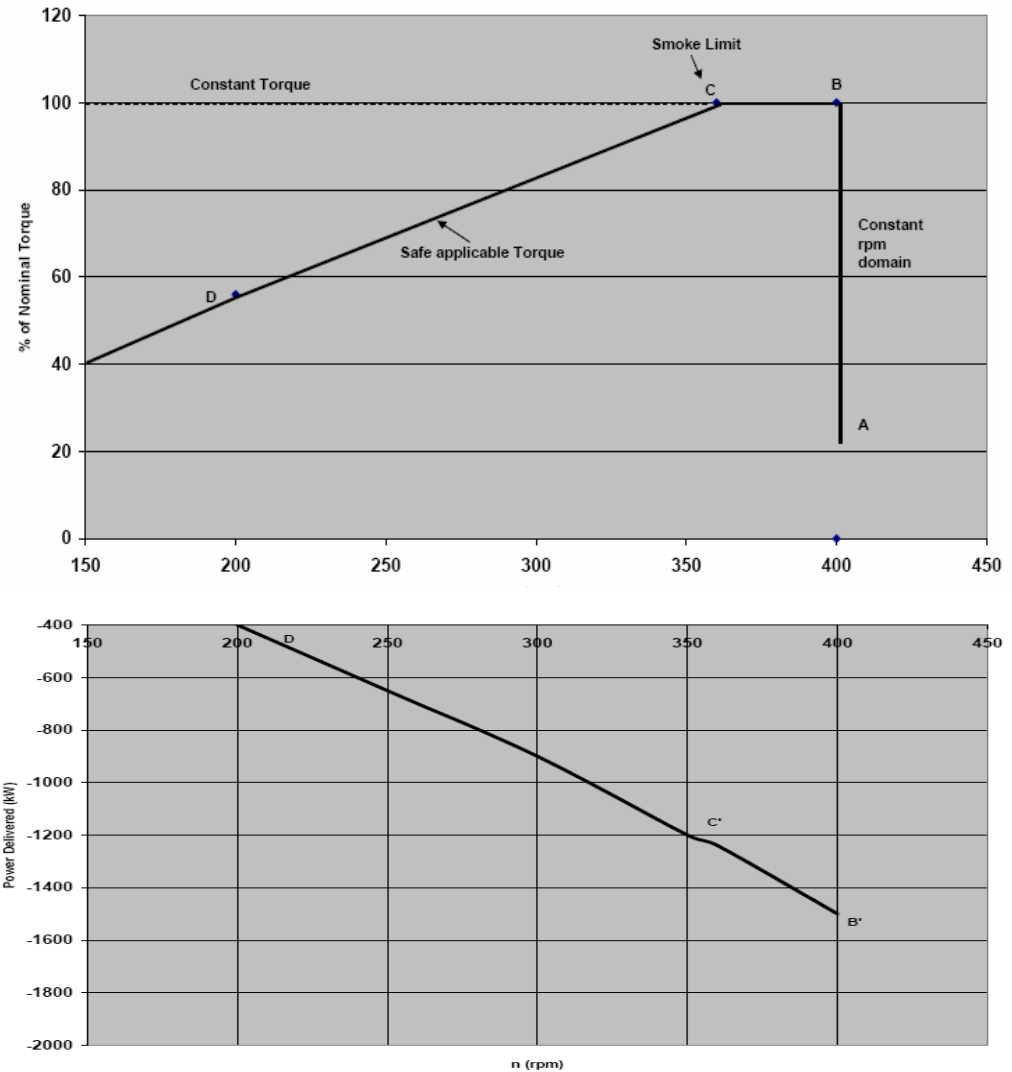
# Given: the Power, Torque vs n (rpm) characteristic of a Diesel-Drive system

The manufacturer of the Diesel engine specifies the maximum torque to be applied for n under the Smoke Limit (by reduction of fuel injection) so that the engine temperature does not rise too high.

In “A” will the engine run at full n with limited fuel-injection. In “B” Full-Torque (Full power) is reached with maximum n and maximum fuel-injection.

In “C” the Smoke Limit is reached. Between “C” and “D”, the fuel-injection is regulated so that a safe Torque can still be applied.

Power - Rpm characteristic of a Diesel Engine



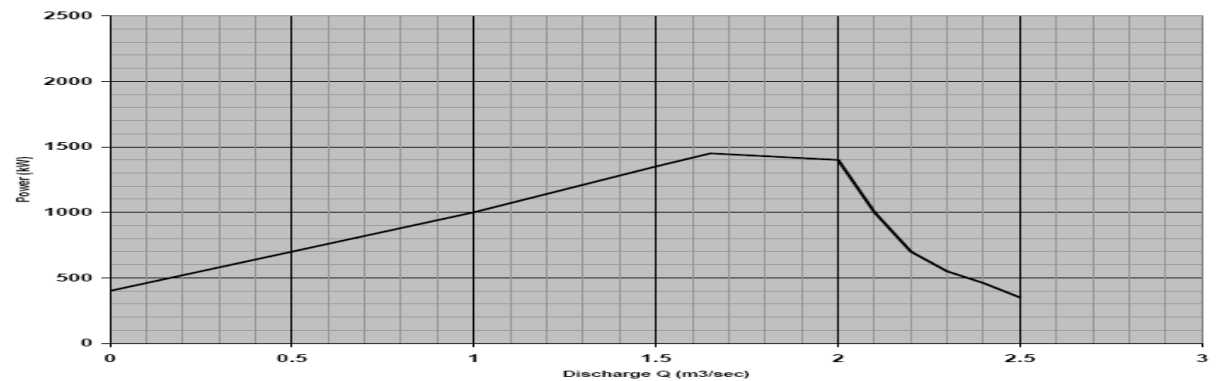
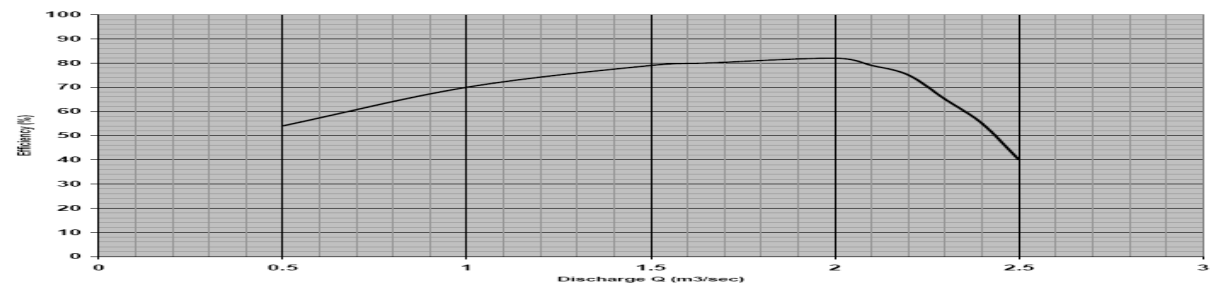
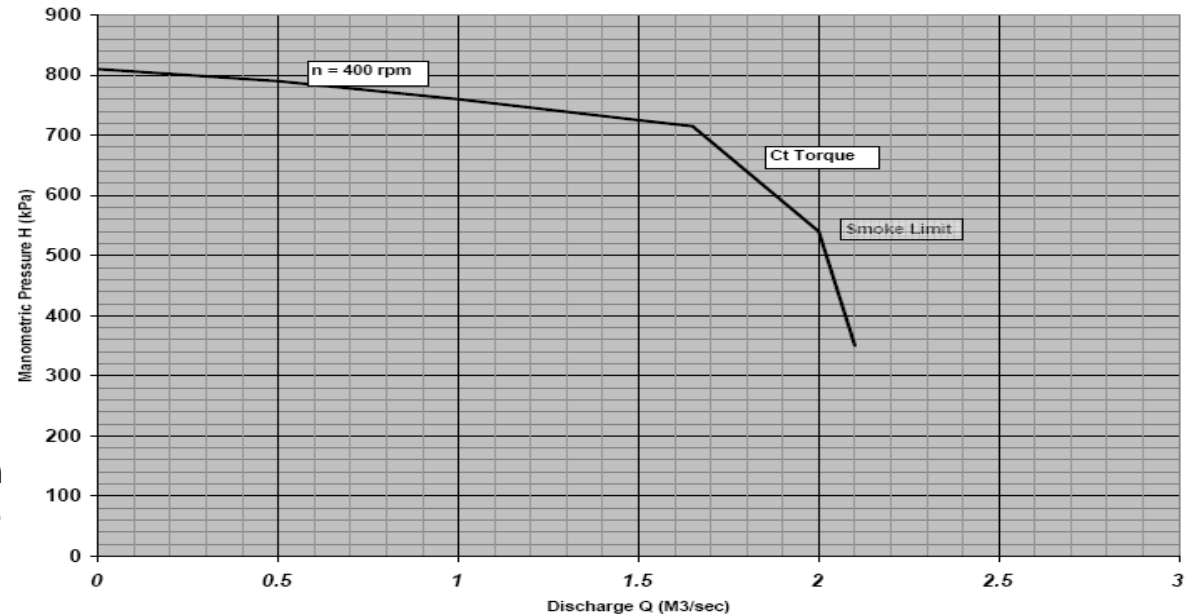
## Given: The Pump & Drive Characteristic for n = 400 rpm

The pump & drive system will have to work on 3 different pipelines with the following characteristics (above the critical discharge):

Pipeline 1:  $H = 300 \times Q^2$  (kPa)

Pipeline 2:  $H = 200 \times Q^2$  (kPa)

Pipeline 3:  $H = 100 \times Q^2$  (kPa)



## Questions:

**Determine for each of the 3 pipelines with the Pump & Drive system:**

- **the corresponding Working Points ?**
- **the corresponding n-values ?**
- **indicate the solution-deduction on the graph !**



