

HY-BON VRT Training

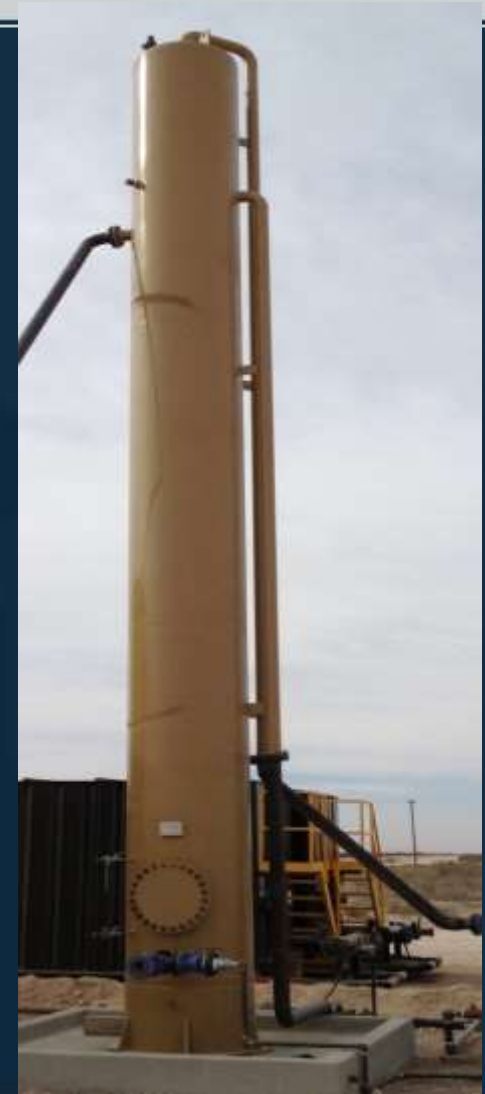
Overview and Operation

Vapor Recovery Tower



What is a VRT?

- A *vapor recovery tower* is a tall pressure vessel which is installed between the production separator(s) and the liquid storage tanks
- A Vapor Recovery Tower technically meets the standards of being a pressure vessel and thus is considered by the EPA to be process equipment. It is not considered to be a storage tank and is not subject to the Quad O Regulations.
- Pressure vessels designed to operate in excess of 204.9 kilopascals and without emissions to the atmosphere are exempt.
 - Although VRT's are normally rated for pressures between 50 and 175 psig, they typically gravity feed to the liquid storage tanks at very low pressure (~1 psig)
 - In most installations, the flash gas from the liquids in the VRT flow to a vapor recovery unit for compression



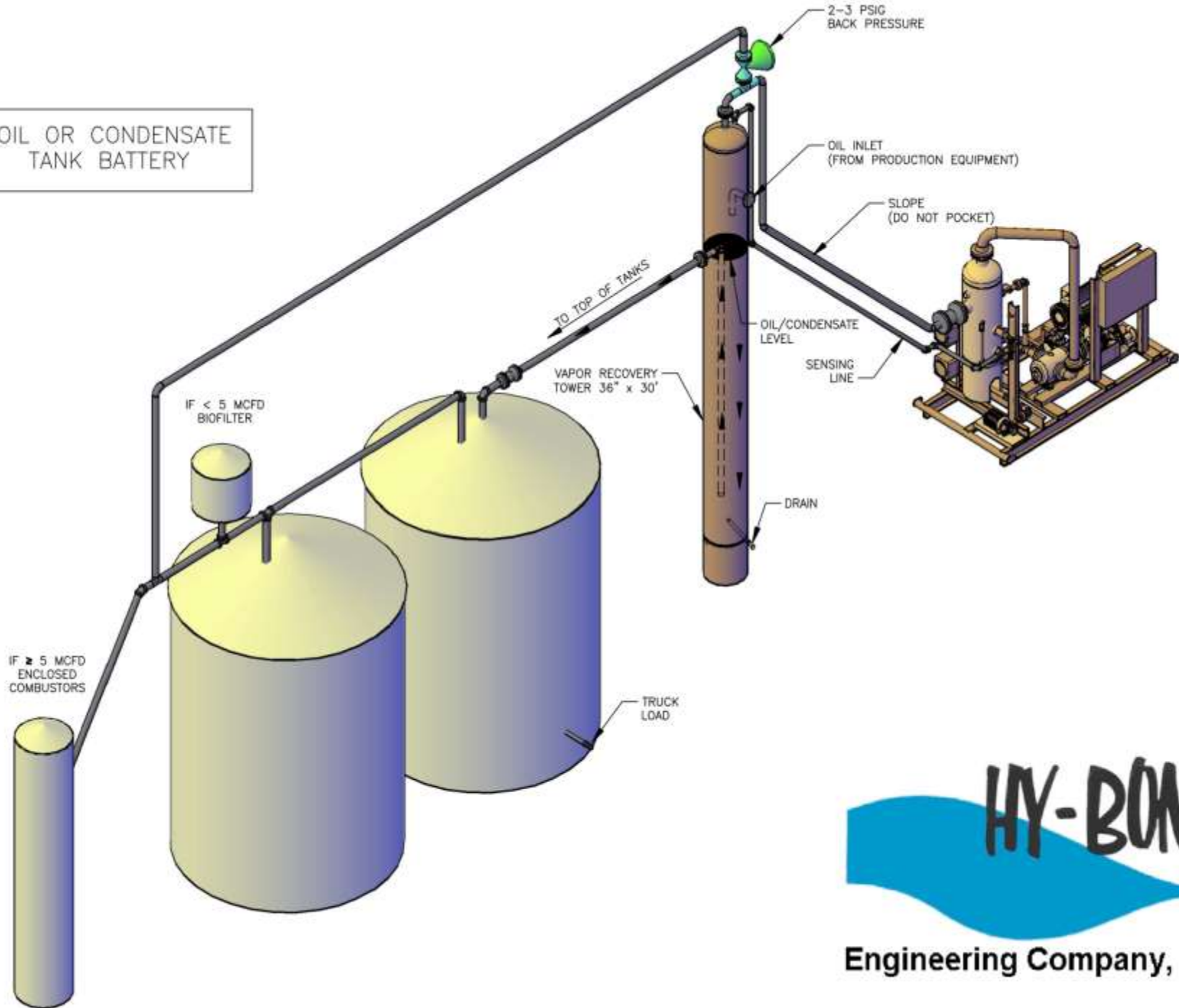
How does a VRT work?

- Liquids enter the VRT through the oil inlet and exit the VRT through the oil outlet
- The liquid level in the VRT normally remains 1-2 feet below the oil outlet nozzle due to the slight positive pressure in the VRT and the oil is pushed up through the down comer.
- The oil outlet down comer keeps vapors from being pushed to the liquid storage tanks
- The area above the normal liquid level is used as a vapor space and a VRU is used to maintain a pressure of ~1 psig
- Liquid should have a retention time of approximately 25-30 minutes

Benefits of Vapor Recovery Towers

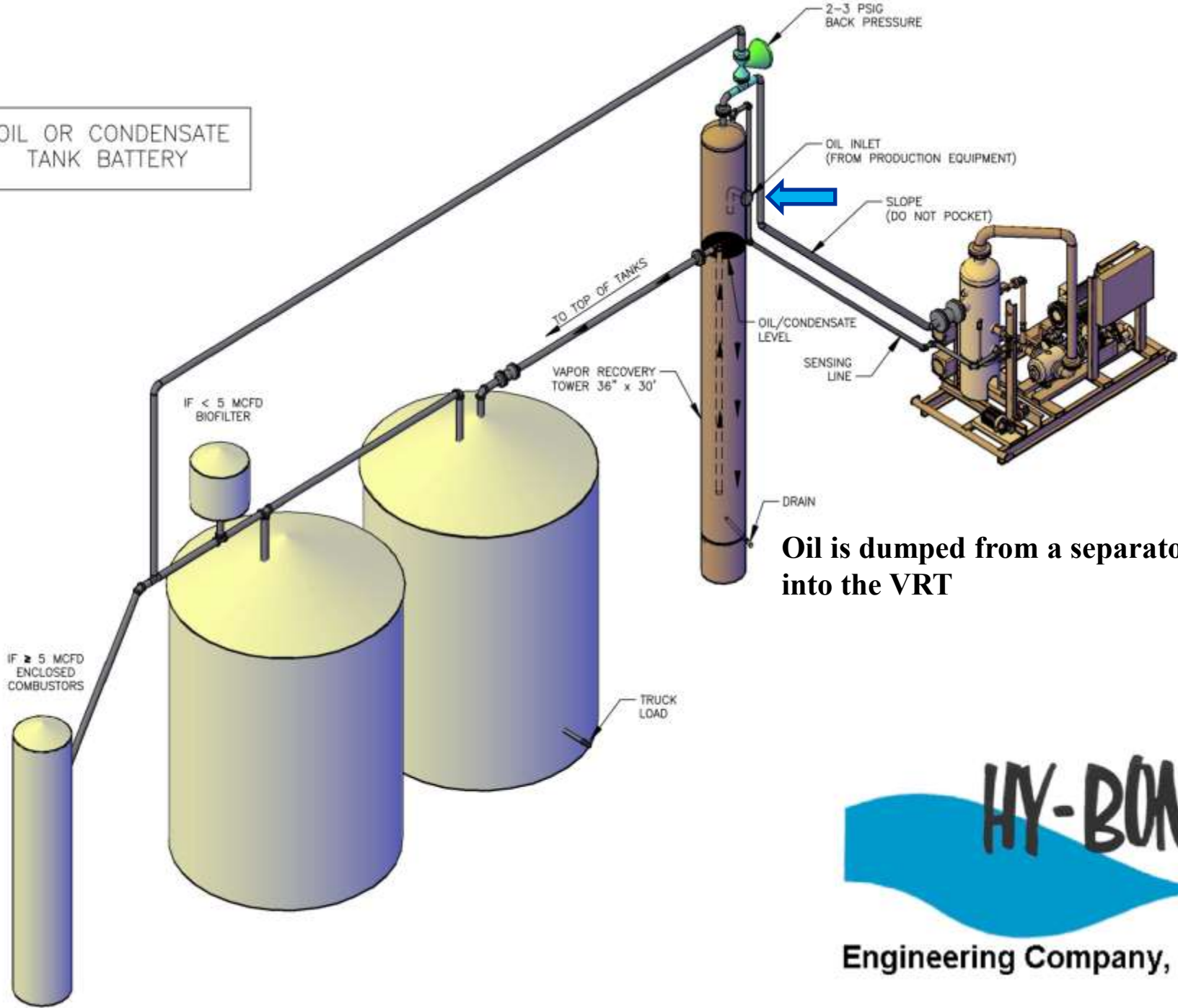
- Vapor Recovery Towers isolate liquid storage tanks from the pressures associated with the oil vapors
- Vapor Recovery Towers can help keep some facilities from falling under the requirements of the New Source Performance Standard (“Quad O”)
- Vapor Recovery Towers help keep air (and therefore, oxygen) out of gas pipelines by sequestering the vapors in the Tower and eliminating the vapor containment potential common to atmospheric tanks
- The VRT serves as the last designated pressure vessel to collect vapors off of the oil and send them to the VRU / flare / combustor without the propensity to leak that storage tanks typically have.

OIL OR CONDENSATE
TANK BATTERY



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OIL OR CONDENSATE
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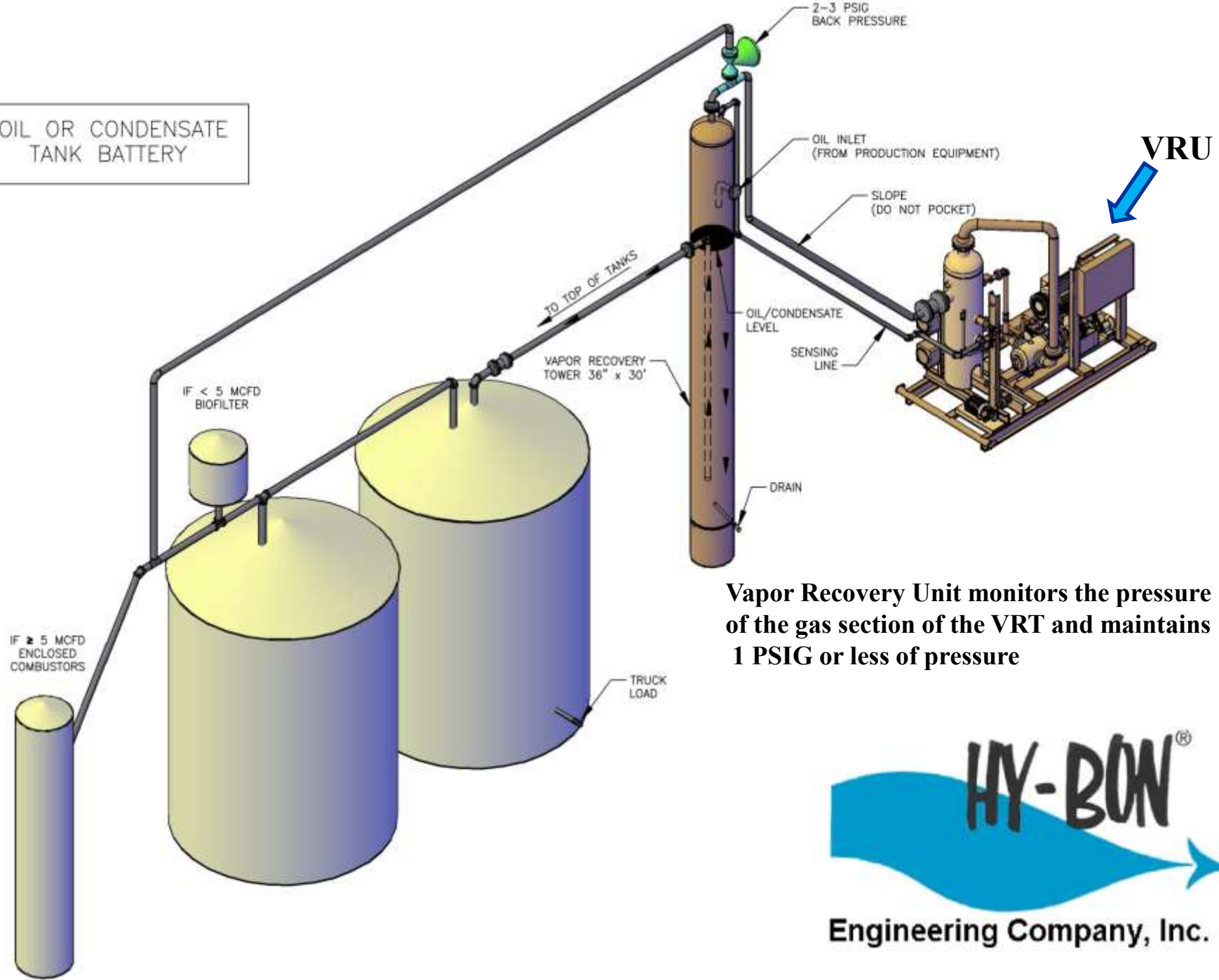


Oil is dumped from a separator into the VRT



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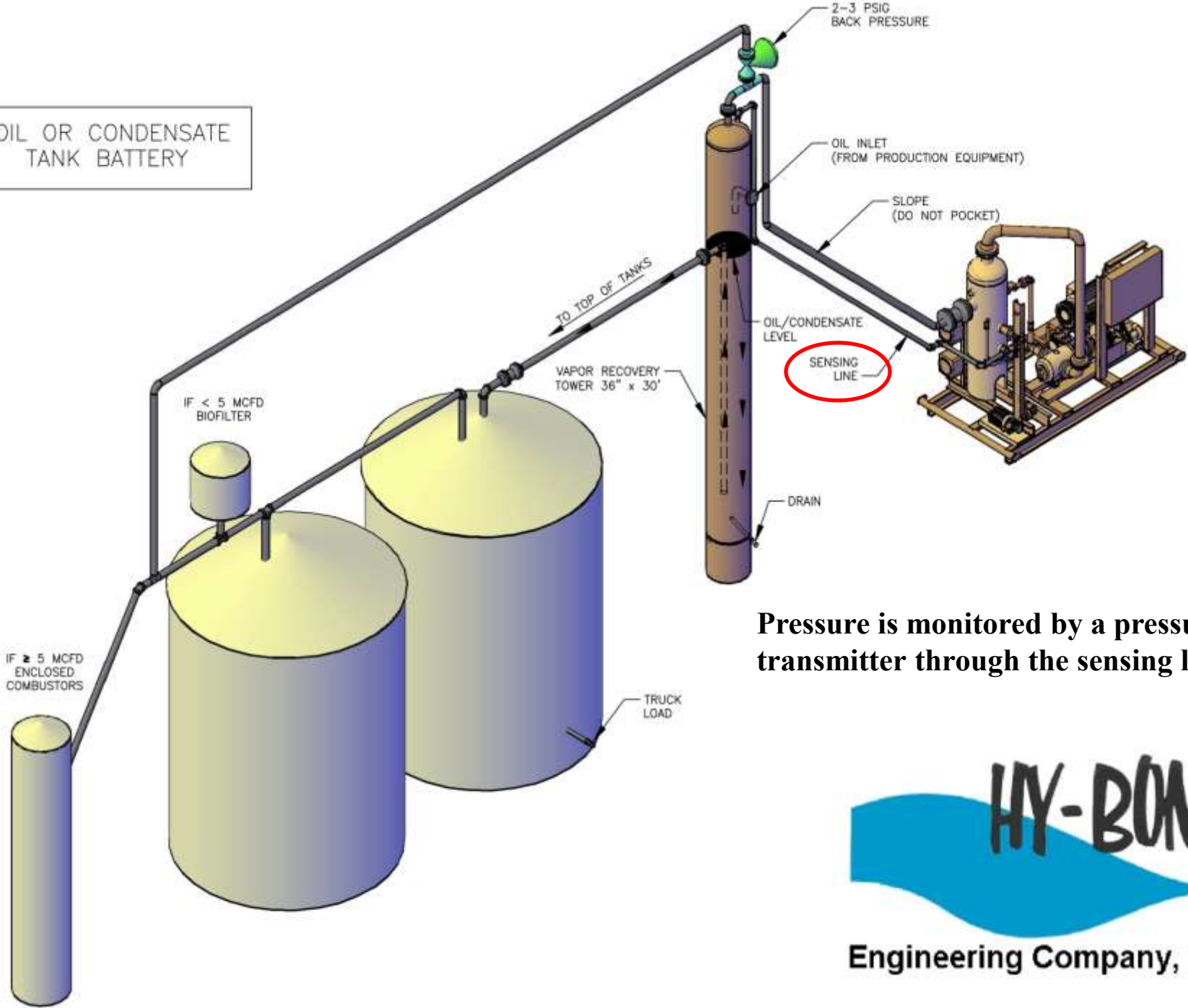
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Vapor Recovery Unit monitors the pressure of the gas section of the VRT and maintains 1 PSIG or less of pressure



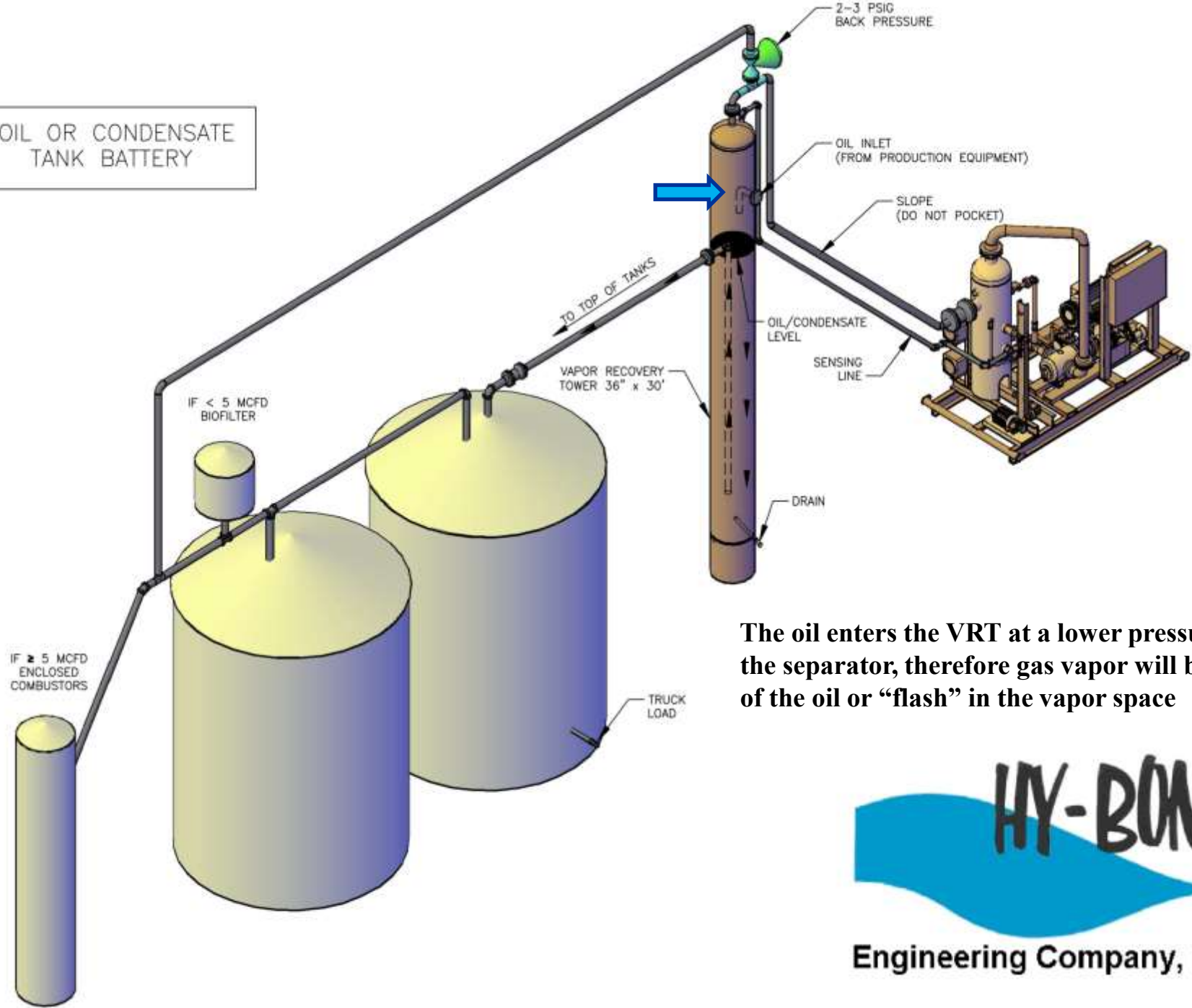
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Pressure is monitored by a pressure transmitter through the sensing line



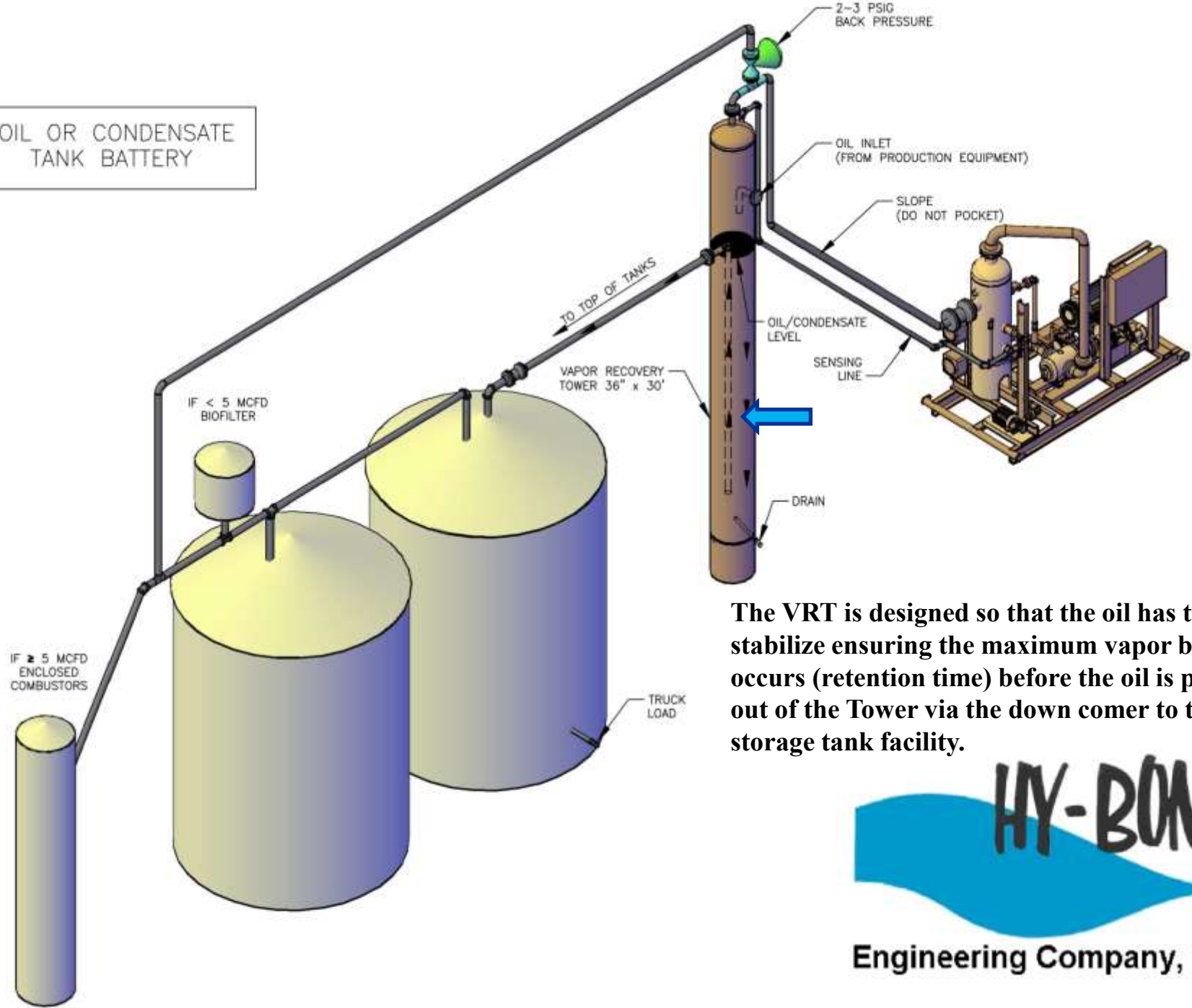
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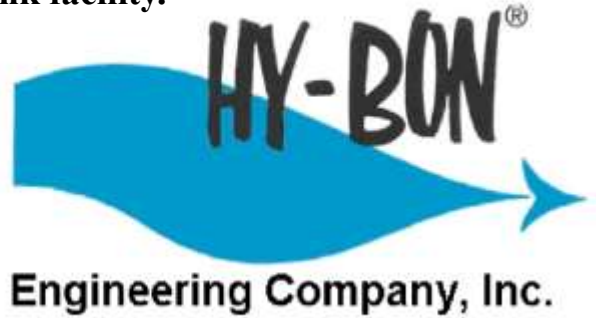
The oil enters the VRT at a lower pressure than the separator, therefore gas vapor will break out of the oil or “flash” in the vapor space



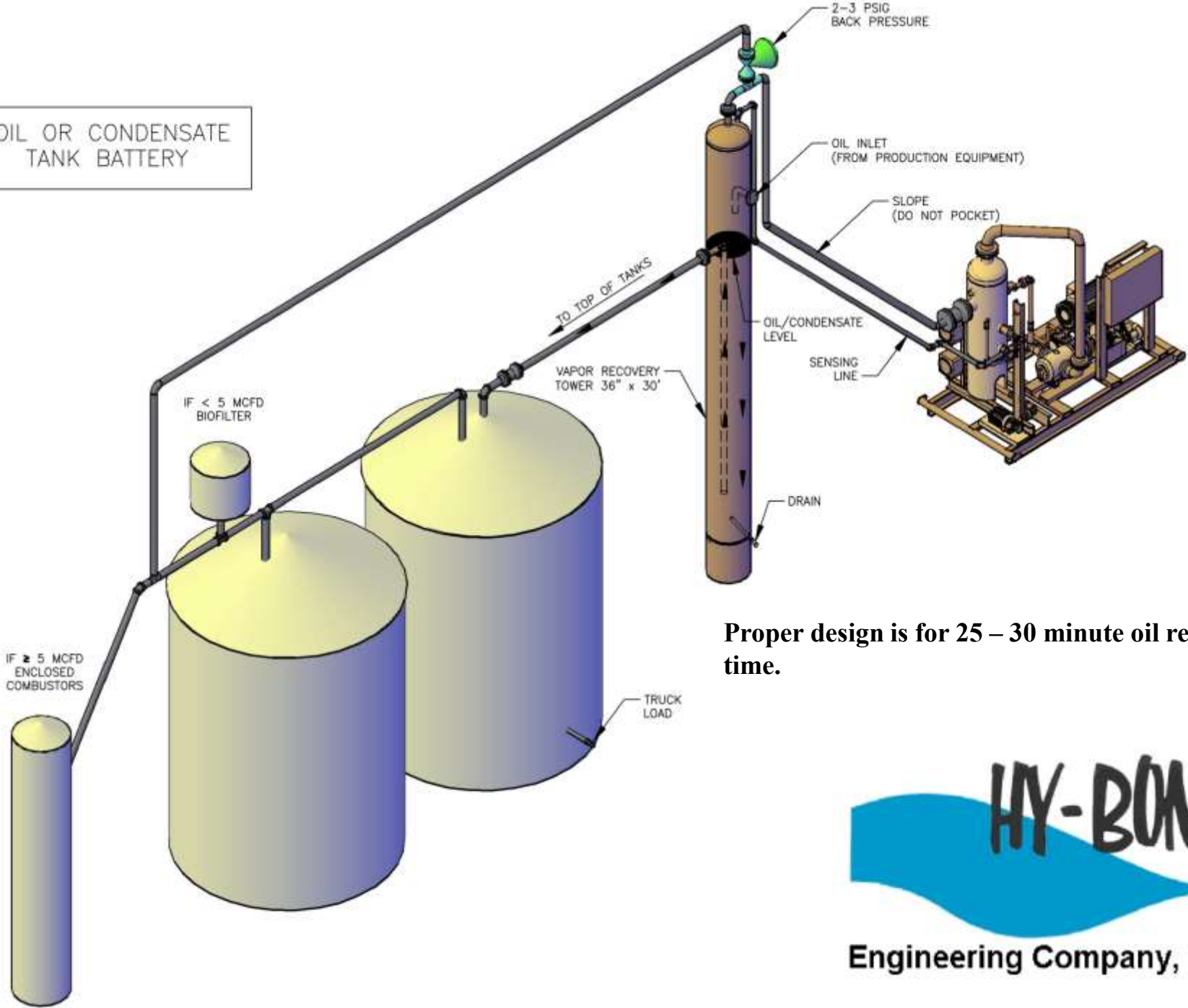
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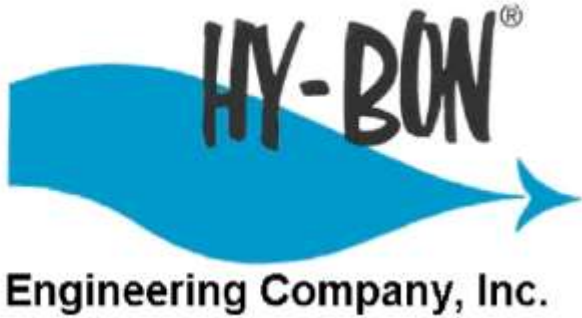
The VRT is designed so that the oil has time to stabilize ensuring the maximum vapor breakout occurs (retention time) before the oil is pushed out of the Tower via the down comer to the storage tank facility.



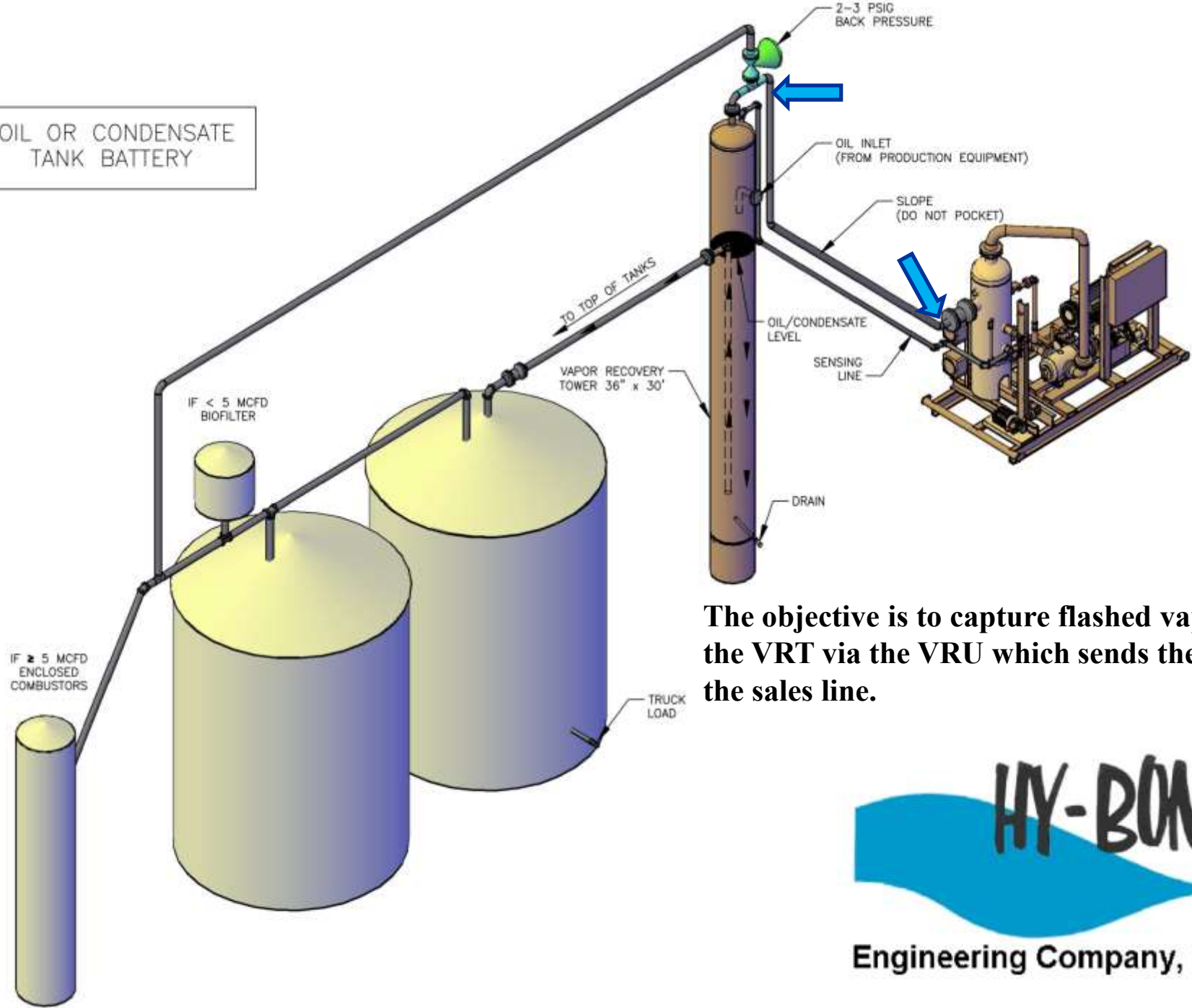
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Proper design is for 25 – 30 minute oil retention time.



OIL OR CONDENSATE
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The objective is to capture flashed vapors in the VRT via the VRU which sends the gas to the sales line.



HY-BON prides itself in providing high quality equipment to address the issues of storage tank emissions. The methods used to control the potential vapors coming off the tanks are the specific niche of HY-BON and the employed Vapor Recovery Tower (VRT) fits that description.

For a detailed description of the HY-BON Product line please review our Website at:

www.HY-BON.com