

Internal Corrosion in Tanks and Vessels 37th Annual Meeting

EnhanceCo
Internal Corrosion Specialists

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WHEAT STATE

CORROSION ASSOCIATION

EST. 2022

What Causes Internal Corrosion?

Acid Gasses

Corrosive
Components

Corrosive
Byproducts

Solids

Microbiology

WATER

What Can We Do about Internal Corrosion (in Tanks and Vessels)

Design

Remove Corrosive Constituents Prior to entering tanks and vessels in the process

Coatings

Inhibition

Cathodic Protection

What Accelerates Internal Corrosion

Heat

Lack of Flow/
Too Much
Flow

Deposition of
Debris

Pressure

Product
Quality

Upstream Vessels and Tanks

Field Tanks

HP
Separators

LP
Separators

Heat
Exchanges

Drain or
Sump Lines

Midstream Vessels

Slug
Catchers

Filter
Separators

Line Heaters

Compressors

Fin Fan
Coolers

Gas Storage

Liquid Tanks

Drain or
Sump Lines

Were to Look?

Large Pressure Changes (meters, dump valves, changes in pipe diameter)

Large Temperature Changes (Fin Fans, Headers, Exhaust Pipes)

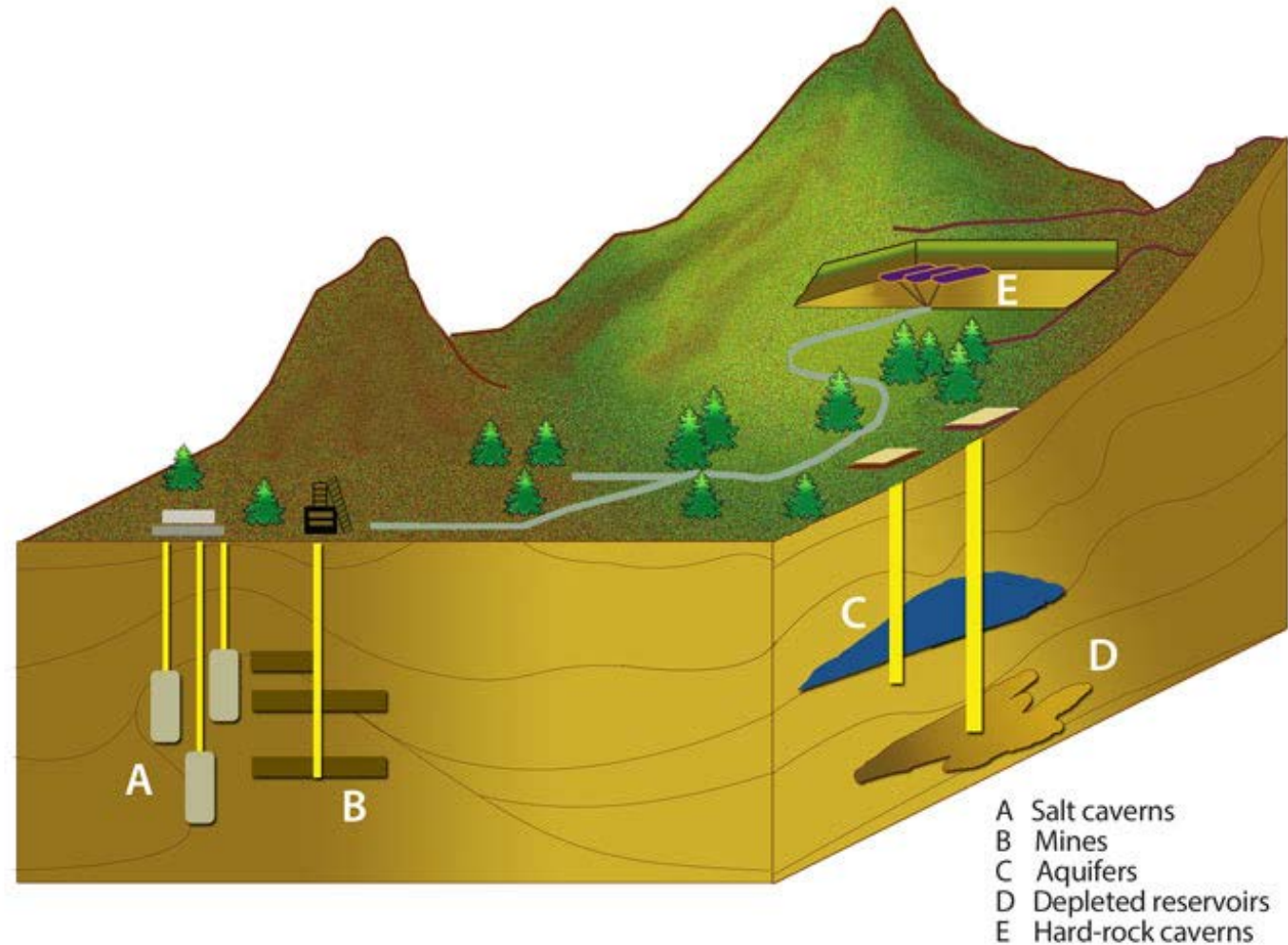
Places where acid gasses can (or are forced to) break out or concentrate (reflux towers and throttle valves on amine units)

Solids Deposition (bottom of slug catcher, liquid dump on slug catcher, condensate tank, water tank, fuel scrubber etc.)

Figure 1. Types of underground natural gas storage facilities

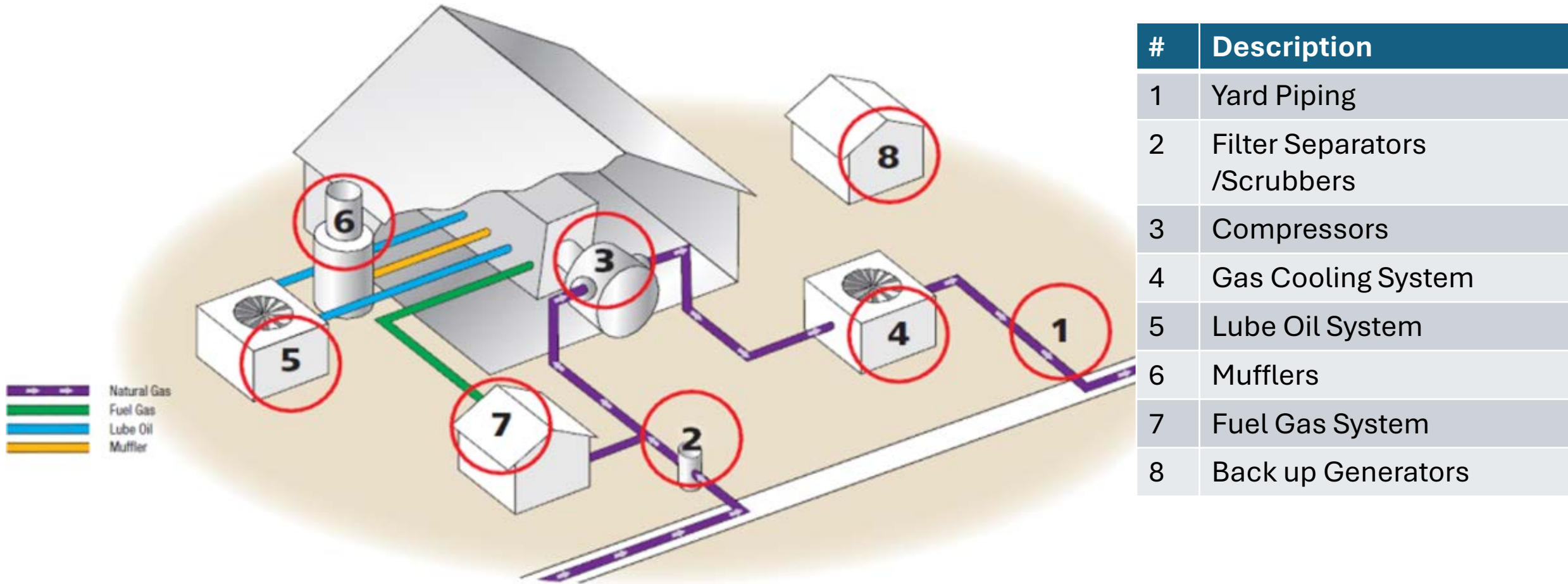
Gas Storage

- Aquifer
- Depleted Reservoir
- Hard Rock
- Salt Domes



Source: PB-KBB, inc., enhanced by EIA.

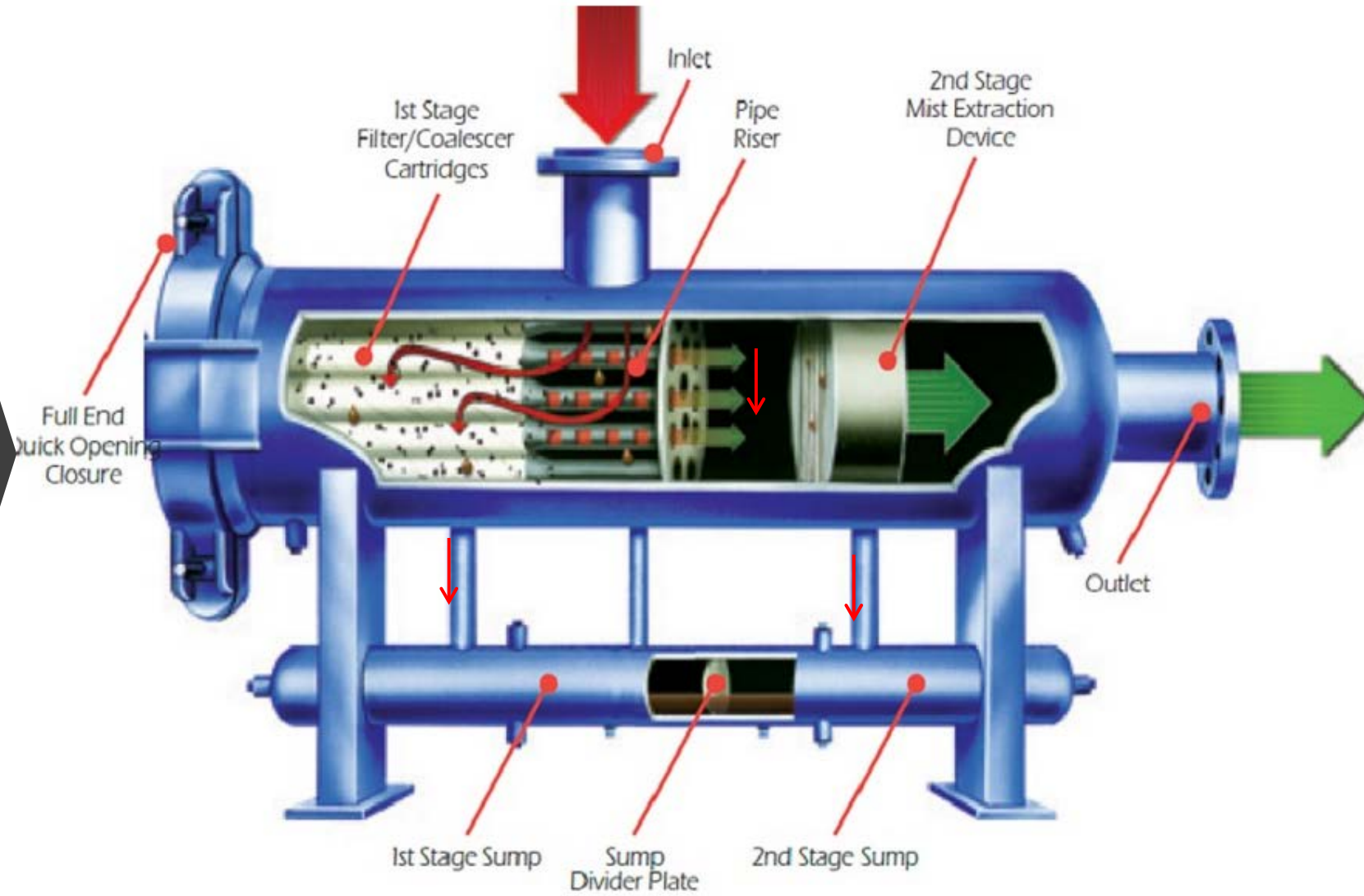
Compression station yard. *Courtesy of Spectra Energy/PennStateExtension*



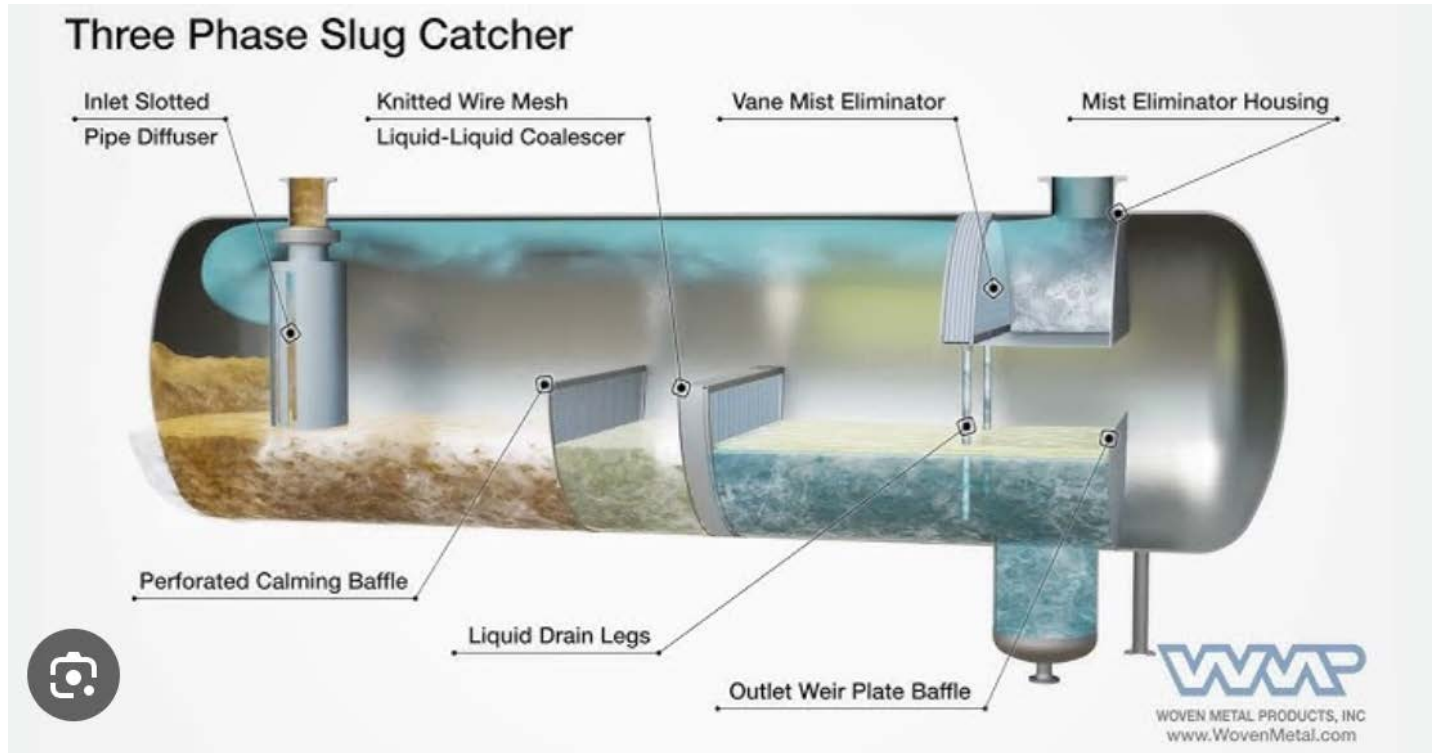
Compressor Station Overview



Filter Separator



Three Phase Slug Catcher



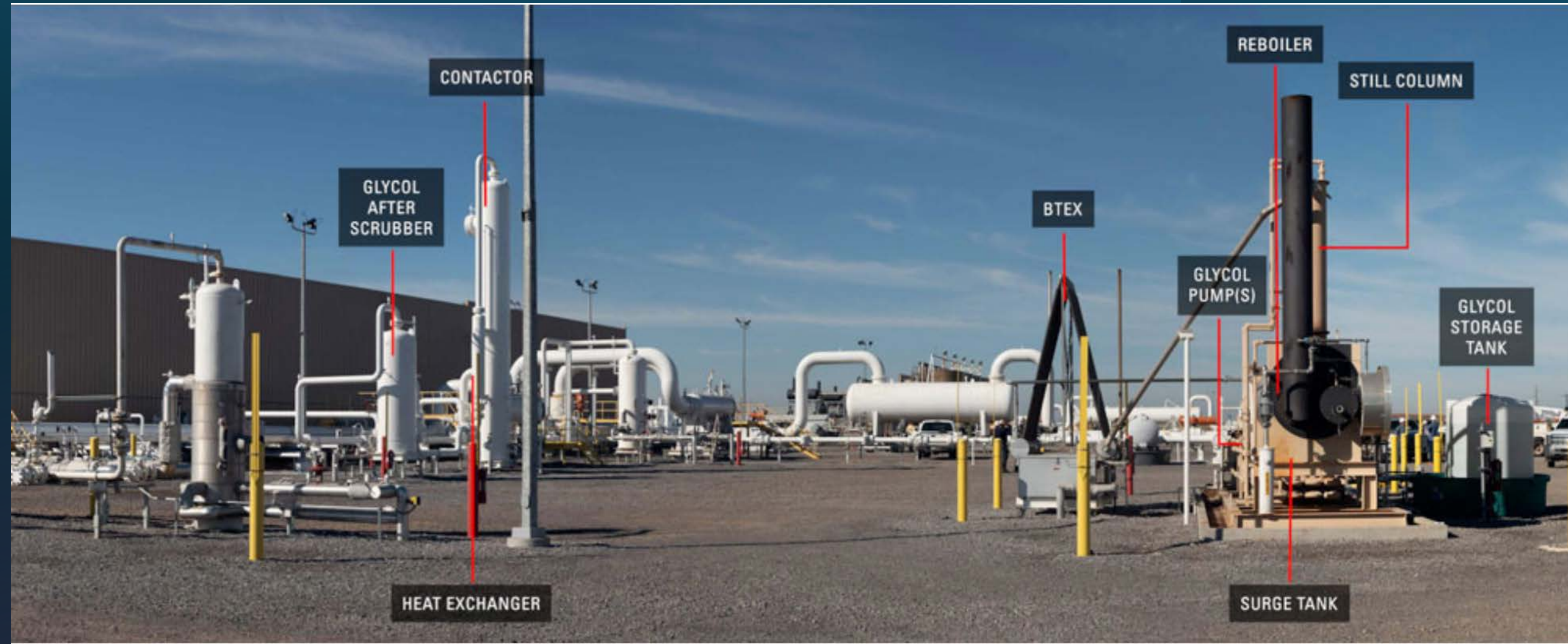
DEHYDRATION PROCESS

NATURAL GAS ONLY PASSES THROUGH THE INLET SCRUBBER AND CONTACTOR

CONTACTOR

INLET SCRUBBER

FILTER SEPARATOR





Where Do I Find More Information?

- API –Primarily focused on petroleum and natural gas
 - 510 – Pressure Vessel Inspection Code
 - RP 572 –Inspection of pressure vessels
 - API 570- Inspection, repair, alteration and re-rating of in-service piping systems
 - API-579 Fitness for service assessment of structural integrity of piping and vessels
- ASME –Multiple industries, typically deals with design and inspection of new vessels and piping in Oil and Gas
- AMPP –Primarily corrosion and risk assessment



THANK YOU FOR
YOUR LISTENING

DO YOU HAVE
ANY QUESTIONS?

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