# Vapor Recovery Tower

## 1.1 Quote Information

| Customer Information | | | |
|---|---|---|---|
| Name | | Company | |
| Business Title | | | |
| Email | | Phone Number: | |
| **Equipment Information** | | | |
| Quantity: | | Ship to Location (City, State, Zip) | |
| Proposal Due Date | | Freight Terms | ☐ EXW ☐ FCA ☐ FOB ☐ CIF ☐ Other _____ |
| Potential Order Date: | | Preferred Ship Date: | |

| Rank (1-4) Importance of the Following: | | | | | | | |
|---|---|---|---|---|---|---|---|
| Price: | | Spec Compliance: | | Delivery: | | Quality/Reliability: | |

| Additional Comments |
|---|
| |

## 1.2 Process Conditions

| Process Data | Parameter | VRT |
|---|---|---|
| Inlet Pressure (PSIG) | | Atmos. |
| Inlet Temp (°F) | | 70 - 120 |
| Design Pressure (PSIG) | | 75-125 |
| Gas Inlet Flowrate (MMSCFD) | | < 0.5 |
| Oil Inlet Flowrate (BBL/Day) | | 1000-6000 |
| Oil Inlet SG / API | | 0.7 |
| Fluid Elevation in Tank or NPSHA (Ft) | | 20-30 |
| Retention Time (min) | | 20-25 |
| Inlet Fluid Composition | | |
| Shop Capable Size | <60"OD, <40'S/S, <125# | **Required** / **Requested** |

## 1.3 Design Scope

| | |
|---|---|
| S/S Length | ☐ 30ft ☐ 35ft ☐ 40ft ☐ Other |
| Rating | MAWP:<br>☐ 75 psig ☐ 100 psig ☐ 125 psig ☐ Other |
| Style | ☐ Bare Vessel<br>☐ Vessel with Accessories |
| Externals | Outlet Piping |
| Paint | ☐ Cimarron Standard SP-3/DTM 1 Coat, Color: Desert Tan<br>☐ Cimarron Standard SP-6/2 Coat, Color: Desert Tan<br>☐ Custom |
| | |

| **Vessel Adders** | **Accessories (Ship Loose of Bare Vessel option)** | |
|---|---|---|
| ☐ Internal Coating | **Item:** | **OEM/Type Preference:** |
| | ☐ Concrete Blocks | |
| Corrosion Allowance:<br>☐ 1/32" ☐ 1/16" ☐ 1/8" ☐ 1/4" | ☐ PSV | |
| NACE Adders:<br>☐ Hardness Testing<br>☐ Materials<br><br>☐ Manway<br>☐ All Flanged Connections<br>☐ Pressure/Temperature Re-ratings | Gauges (Level, PI, TI)<br>☐ Sight<br>☐ Transmitters | |

| **Additional Requests** |
|---|
| |

## 1.4 Application Guidance

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
- 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

How does a VRT work? Benefits of Vapor Recovery

- 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.

## 1.5 Sizing Information

| Parameter | Data | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Tower OD (inches) | 24 | 24 | 36 | 36 | 48 | 48 | 60 | 60 | 60 |
| Tower S/S Height (ft) | 30 | 40 | 30 | 40 | 30 | 40 | 30 | 40 | 40 |
| Liquid Outlet from Bottom Head Seam (ft) | 27 | 37 | 25.5 | 35.5 | 24 | 34 | 22.5 | 32.5 | 32.5 |
| Liquid Outlet Downcomer from Bottom Head seam (ft) | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Volume Barrels | 14 | 19.6 | 29.6 | 42.2 | 49.2 | 71.6 | 71.7 | 107 | 107 |
| **BBL Fluid per day Max @ 20 Minutes** | **1007** | **1410** | **2130** | **3037** | **3545** | **5157** | **5162** | **7680** | **7680** |
| **BBL Fluid per day Max @ 25 Minutes** | **806** | **1128** | **1704** | **2429** | **2836** | **4125** | **4129** | **6144** | **6144** |
| **BBL Fluid per day Max @ 30 Minutes** | **671** | **940** | **1420** | **2024** | **2364** | **3438** | **3441** | **5120** | **5120** |