

Summary

This section contains the formulas, rules, and principles, and the rate schedules and calculation procedures for determining the assessed value of oil and gas well resource production equipment, and buildings located at an oil or gas well site.

Description

Resource production equipment includes the fixtures, machinery and other appliances by which petroleum oil or gas is produced to the surface, stored, transported from a well site or a battery or gas handling site, or is compressed.

Resource production equipment does not include the fixtures, machinery and other appliances by which petroleum oil or gas is stored at a battery site, or is compressed where the gas is, for the most part, a by-product of petroleum oil production.

Oil or Gas Well Site

The area of land on or under which is located the resource production equipment used to raise or pump the oil or gas to the surface, the resource production equipment used to inject air, water, steam or gas to enhance the production of a well, or the resource production equipment at a water source well, that was operated for 30 or more days in the 12 month period ending July 1 of the preceding year to which the assessment roll relates.

The resource production equipment located at an oil well site includes the pumping equipment, wellhead assembly, tubing and rods, flow lines, manifolds and well accessories.

The resource production equipment located at a gas well site includes the wellhead assembly, tubing, chemical equipment, water handling equipment, metering equipment, flow line and manifold.

The resource production equipment used to inject air, water, steam or gas to enhance the production of a well, and the resource production equipment at a water source well, includes the pumping equipment, wellhead assembly, tubing and rods, metering equipment, control valves, flow lines, manifolds, cable and well accessories.

New Well Site

An oil or gas well site that was drilled in the 12 month period ending July 1 of the preceding year to which the assessment roll relates.

Swabber Well Site

An oil or gas well site where on July 1 of the preceding year to which the assessment roll relates, the resource production equipment used in the preceding year has been removed from the site, with the exception of the wellhead, and has not been replaced with any other on-site resource production equipment.

Shut-In Well Site

The area of land on or under which is located the resource production equipment used to raise or pump the oil or gas to the surface, the resource production equipment used to inject air, water, steam or gas to enhance the production of a well, or the resource production equipment at a water source well, that was operated for less than 30 days in the 12 month period ending September 1 of the preceding year to which the assessment roll relates.

Observation Well Site

The area of land on or under which is located the resource production equipment used to monitor an oil or gas well to enhance the production of the well.

Gas Storage Well Site

The area of land on or under which is located the resource production equipment used to inject gas into a gas cavern or sub surface formation and to pump gas from a gas cavern or subsurface formation.

Flow Line

A flow line is resource production equipment consisting of a line of pipe used to transport oil or gas within a well site to a battery or gas handling site.

Replacement Cost New

The replacement cost new of oil and gas well resource production equipment and buildings located at an oil or gas well site, or a new well site shall be determined by the standard unit method.

For the purposes of identifying the presence and classification of oil and gas well resource production equipment so as to determine its replacement cost new using the standard unit method, the assessor shall use and rely upon information reported by the Saskatchewan Ministry of the Economy and/or its Minister (or any successor of either) in the administration of *The Oil and Gas Conservation Act* and corresponding regulation (or any successor legislation), to the extent such information is available.

The replacement cost new of oil and gas well resource production equipment located at a swabber well site or shut-in well site or observation well site shall be limited to the wellhead assembly which shall be determined in accordance with the wellhead assembly specifications in Chapter 4 - Resource Production Equipment, Section 4.1.3 - Oil and Gas Well Resource Production Equipment, Well Classification.

The replacement cost new of oil and gas well resource production equipment located at an observation well site or gas storage well site, and the replacement cost new of flow lines shall be determined by the unit-in-place method.

The trended original cost method for determining replacement cost new shall be used where the replacement cost new of specific oil or gas well resource production equipment cannot be determined by the standard unit method or the unit-in-place method.

The trended original cost shall include all direct and indirect costs. Direct costs include materials, labour, supervision, equipment rentals, and utilities. Indirect costs include architectural and engineering fees, building permits, title and legal fees, insurance, interest and fees on construction loans, taxes incurred during construction, advertising and sales expenses, and overhead and profit. Trended original costs shall be determined FOB the well site as of January 1, 2019.

Standard Unit Method

The replacement cost new shall be determined as follows:

1. Determine the classification of the well.
2. Determine the resource production equipment needed to operate a substitute well. The substitute well must perform the same function as the well being valued.
3. Calculate the replacement cost new of the resource production equipment located at the well by summing the replacement cost of the substitute resource production equipment.

Unit-In-Place Method

The replacement cost new shall be determined as follows:

1. Determine the type of resource production equipment using the rating guide.
2. Determine the features requiring a unit-in-place lump sum or percentage adjustment.
3. Calculate the replacement cost new of the resource production equipment by adjustment of the base rate by the unit-in-place adjustments.

Trended Original Cost Method

The replacement cost new shall be determined as follows:

1. Determine the original construction cost of all the resource production equipment at the facility.
2. Determine the direct and indirect costs requiring an adjustment.
3. Determine the direct and indirect cost factor for oil and gas resource production equipment required to adjust construction costs to January 1, 2019.
4. Calculate the construction cost of all the resource production equipment at the facility by adjusting the original construction cost for any direct or indirect costs requiring adjustment and multiplying the adjusted original construction cost by the comparative cost index.
5. Determine replacement cost of resource production equipment that can be separately identified and rated by the unit-in-place method.
6. Calculate the replacement cost of the resource production equipment that can not be separately identified by subtracting the replacement cost of separately identified components from the construction cost of all the resource production equipment at the facility.

Physical Deterioration

The amount of physical deterioration for oil and gas well resource production equipment, buildings and structures shall be determined using the lifetime depreciation method. No allowance shall be made for functional and economic obsolescence, except as may be accounted for in the downtime allowance or the production adjustment factor.

Lifetime Depreciation Method

The amount of physical deterioration shall be 40 percent. When calculating replacement cost new less depreciation no additional allowance shall be made for physical deterioration except as may be accounted for in the production adjustment factor.

Downtime Allowance

The downtime allowance for oil and gas well resource production equipment shall be determined by the schedule of rates method.

The downtime allowance shall account for the loss in value due to under-utilization of the resource production equipment. This includes any loss in value due to differences in replacement cost and differences in the amount of depreciation, that have not been taken into account using the procedures in this Manual.

Schedule of Rates Method

The downtime allowance shall be 10 percent. When calculating replacement cost new less depreciation and downtime, no additional allowance shall be made for downtime except as may be accounted for in the production adjustment factor.

Production Adjustment Factor

The production adjustment factor for oil and gas well resource production equipment, buildings and structures located at an oil or gas well site, and flow lines shall be determined by the schedule of rates method.

The production adjustment factor shall account for the loss in value due to under-utilization of the resource production equipment, buildings and structures. This includes any loss in value due to differences in replacement cost and differences in the amount of depreciation, that have not been taken into account using the procedures in this Manual.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: General Rules

A production adjustment factor shall not be applied to the oil and gas well resource production equipment, buildings and structures located at a new well site, swabber well site, shut-in well site, observation well site, or gas storage well site.

Schedule of Rates Method

The production adjustment factor shall be 0.75 for qualified resource production equipment, buildings, structures and flow lines.

Qualifying Production Level

The production adjustment factor shall be applied to resource production equipment, buildings, structures and flow lines located at an oil or gas well site. The factor shall be a three year average of production from a 36 month period ending July 1 of the preceding year to which the assessment roll relates.

The average production of the well shall be determined as follows:

1. Determine the volume of oil or gas produced by the well during the 12 month period of July 1 to June 30 for each of the three years.
2. Determine the number of days the well was operated during the 12 month period of July 1 to June 30 for each of the three years.
3. Calculate the production of the well for each year by dividing the volume of oil or gas produced by the well for the year by the number of days the well was operated during the year.
4. Calculate the average production of the well by summing the production of the well for the three years and dividing by three.

Oil Wells

| Well Area (Abbreviation) | Crude Type | Qualifying Production Level | |
|---------------------------------|------------|-----------------------------|---------------------|
| | | barrels/day | M ³ /day |
| Weyburn (WE) | Light | 1.39 | 0.221 |
| | Medium | 1.47 | 0.234 |
| Swift Current (SC) | Light | 1.15 | 0.183 |
| | Medium | 1.53 | 0.243 |
| | Heavy | 4.25 | 0.676 |
| Kindersley (KD) | Light | 1.15 | 0.183 |
| | Heavy | 4.25 | 0.676 |
| North Battleford - South (NB-S) | Heavy | 4.99 | 0.794 |
| North Battleford - North (NB-N) | Heavy | 4.99 | 0.794 |

Gas Wells

| Well Area (Abbreviation) | Qualifying Production Level | |
|---------------------------------|-----------------------------|---------------------|
| | cu.ft./day | M ³ /day |
| Weyburn (WE) | 49,865 | 1,412.02 |
| Swift Current (SC) | 35,725 | 1,011.61 |
| Kindersley (KD) | 40,474 | 1,146.10 |
| North Battleford - South (NB-S) | 49,865 | 1,412.02 |
| North Battleford - North (NB-N) | 49,865 | 1,412.02 |

Calculation Procedure

Resource Production Equipment at an Oil or Gas Well Site

| Description | Document No. | Page No. |
|---|--------------|----------|
| Standard Unit Resource Production Equipment [a), b), c)] | | |
| a) Determine Well Characteristics | | |
| a ₁ . Well Area | 4.1.3 | 1 |
| a ₂ . Well Type | 4.1.3 | 1 |
| a ₃ . Crude Type | 4.1.3 | 2 |
| a ₄ . Horizontal Completion | 4.1.3 | 2 |
| a ₅ . Depth | 4.1.3 | 2 |
| a ₆ . Rated Volume | 4.1.3 | 2 |
| a ₇ . Facility Type | 4.1.3 | 2 |
| a ₈ . Days Operated | 4.1.3 | 2 |
| b) Determine Substitute Well Features | 4.1.3 | 3-18 |
| c) Base Rate = (c ₁ + c ₂ + c ₃ ... + c ₉) | | |
| c ₁ . Pumping Equipment Rate | 4.1.5 | 1-5 |
| c ₂ . Well head Assembly Rate | 4.1.4 | 1 |
| c ₃ . Tubing and Rods Rate | 4.1.7 | 1 |
| c ₄ . Chemical Equipment Rate | 4.1.17 | 1 |
| c ₅ . Water Handling Equipment Rate | | |
| c ₅ = (c _{5.1} + c _{5.2}) | | |
| c _{5.1} Separator Rate | 4.1.8 | 1-5 |
| c _{5.2} Scraper Traps Rate | 4.1.26 | 1 |
| c ₆ . Metering Equipment Rate | 4.1.14 | 1-4 |
| c ₇ . Control Valves Rate | 4.1.15 | 1-3 |
| c ₈ . Manifold Rate | 4.1.25 | 1 |
| c ₉ . Flow Line Rectifier Rate | 4.1.19 | 1 |
| d) Unit-in-Place Resource Production Equipment | 4.1.1 | 2 |
| e) Trended Original Cost Resource Production Equipment | 4.1.1 | 3 |
| f) Replacement Cost New = (c + d + e) | | |
| g) RCN less Physical Deterioration and Downtime | | |
| Allowance = f x (1 - (g ₁ + g ₂)) | | |
| g ₁ . Physical Deterioration | 4.1.1 | 3 |
| g ₂ . Downtime Allowance | 4.1.1 | 3 |
| h) Production Adjustment Factor | 4.1.1 | 3-5 |
| i) Assessed Value = (g x h) | | |

The calculation procedure for oil and gas well buildings on an oil or gas well site is found on Document 3.1.3, Page 1.

Description

The comparative cost factors are used to determine the replacement cost of oil and gas well resource production equipment valued by the trended original cost method.

Application

The trended original cost method shall be used when the individual components of resource production equipment cannot be determined or estimated.

The trended original cost method shall not be used to determine the replacement cost of resource production and equipment located at an oil or gas well site, or to determine the replacement cost of resource production equipment that can be separately identified and rated.

Comparative Cost Factor

The comparative cost factor shall be used to calculate the replacement cost new of resource production equipment as of January 1, 2019.

Factors

| Year | Comparative Cost Factor |
|----------------|-------------------------|
| 1940 and older | |
| 1941 | |
| 1942 | |
| 1943 | |
| 1944 | |
| 1945 | |
| 1946 | |
| 1947 | |
| 1948 | |
| 1949 | |
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| 1967 | |
| 1968 | |
| 1969 | |
| 1970 | |
| 1971 | |

Portions of this section are not available for viewing due to licensing with Marshall and Swift. Therefore the factors etc. have been intentionally left blank.

This information is available for purchase by contacting:

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Email: info.request@sama.sk.ca

Web Site: <http://www.sama.sk.ca>

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Well Classification

| Year | Comparative Cost Factor |
|----------------|--------------------------------|
| 1972 | |
| 1973 | |
| 1974 | |
| 1975 | |
| 1976 | |
| 1977 | |
| 1978 | |
| 1979 | |
| 1980 | |
| 1981 | |
| 1982 | |
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| 2009 | |
| 2010 | |
| 2011 | |
| 2012 | |
| 2013 | |
| 2014 | |
| 2015 | |
| 2016 | |
| 2017 | |
| 2018 and newer | |

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Well Characteristics

This section describes the formulas, rules and procedures for determining the classification of resource production equipment located at an oil or gas well site. Oil and gas well resource production equipment shall be classified in accordance with the following well characteristics:

| | |
|-----------------------|---------------|
| Well Area | Depth |
| Well Type | Rated Volume |
| Crude Type | Facility Type |
| Horizontal Completion | Days Operated |

Well Area

The well areas shall be:

| Well Area (Abbreviation) | Description |
|---------------------------------|--|
| Weyburn (WE) | All municipalities east of the third meridian, from R.M. 1 to R.M. 371 inclusive, except R.M. 282. |
| Swift Current (SC) | All municipalities west of the third meridian, from R.M. 43 to R.M. 261 inclusive. |
| Kindersley (KD) | All municipalities west of the third meridian, from R.M. 282 to R.M. 382 inclusive, including R.M. 282 and R.M. 372. |
| North Battleford - South (NB-S) | All municipalities from R.M. 394 to R.M. 555 inclusive. |
| North Battleford - North (NB-N) | All municipalities from R.M. 561 to R.M. 622 inclusive and the Northern Administrative District. |

Well Type

The well types shall be:

| | |
|-----------------|----------------------------|
| Oil | Gas Injection |
| Oil (New) | Continuous Steam Injection |
| Gas | Cyclic Steam Injection |
| Gas (New) | Water Source |
| Air Injection | Water Source (New) |
| Water Injection | |

Oil (New) and Gas (New) wells are those wells located on a new well site that was drilled in the 12 month period ending July 1 of the year immediately preceding the year to which the assessment roll relates.

Crude Type

The crude types shall be:

- Light
- Medium
- Heavy

Horizontal Completion:

The horizontal completion types shall be:

- Vertical
- Horizontal

Depth

The depth of an oil or gas well shall be determined by measuring the distance from the kelly bushing to the average depth of the perforations in the well casing, or in the case of a horizontal well, the distance from the kelly bushing to the kick off depth.

Rated Volume

The volume for an oil well shall be determined based on the combined volume of oil and water produced.

The volume for a water source well shall be determined based on the volume of water produced.

The period July 1 to June 30 of the year immediately preceding the year to which the assessment roll relates, shall be used to determine the volume and days operated.

The rated volume shall be determined by application of the following formula:

$$RV = \text{volume} \div \text{days operated}$$

- where: RV = rated volume
 volume = number of barrels of oil and/or water produced by the well
 days operated = number of days the well was operated

Facility Type

The facility types shall be:

| Type | Description |
|------------|---|
| Tanks | Used to store oil on site until it is transferred to a battery. |
| Flow Lines | Used to transfer oil directly to a battery or gas directly to a gas plant, satellite or compressor station. |

Days Operated

The number of days that the well was operated during the period July 1 to June 30 of the year immediately preceding the year to which the assessment roll relates.

Shut-In Well Site Reporting Period

The shut-in well site status shall be determined from the 12 month period ending September 1 of the year immediately preceding the year to which the assessment roll relates.

Pumping Units

All oil well pumping units shall be conventional or hydrabeam.

Water Handling Equipment

| Type | Description | Rate (\$) |
|------|---|-----------|
| 1 | <ul style="list-style-type: none"> 20% of Metering Cabinet 10% - 125 - 260psi 12"x5' vertical two phase Separator 60% - 2" receiving and launching trap without bypass 70% - Test Leads | 11,490 |
| 2 | <ul style="list-style-type: none"> 125 - 260psi 24"x10' vertical two phase separator 3" receiving and launching trap with bypass | 58,290 |

Metering Equipment

| Type | Description | Rate (\$) |
|------|--|-----------|
| 1 | <ul style="list-style-type: none"> One 300psi gas, dry flow recorder chart 100" with 2 pens 50% of one 3" 300psi senior quick change 50% of one 3" 300psi simplex | 13,160 |

Water Handling Buildings

| Type | Description | Rate (\$) |
|------|---|-----------|
| 1 | <ul style="list-style-type: none"> 10% - 8' height, 64 sq.ft. metal shed with lining and insulation, floor and heat 20% of 50% 40 barrel open top plastic pop tank 20% of 50% 120 barrel open top plastic pop tank | 1,860 |
| 2 | <ul style="list-style-type: none"> 8' height, 64 sq.ft. metal shed with lining and insulation, floor and heat 300 barrel lap welded steel stock tank with open top | 47,590 |

Chemical Equipment

| Type | Description | Rate (\$) |
|------|---|-----------|
| 1 | <ul style="list-style-type: none"> Alcohol drip (9 imp. gal. tank) | 1,690 |

Substitute Well Features: Weyburn Well Area - Light Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 160 pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | Depth (ft.) | | | |
|--|-------------|---------------|---------------|--------|
| | <3000 | 3000 to <4800 | 4800 to <5700 | ≥ 5700 |
| < 3 | 40 | 114 | 114 | 228 |
| 3 to < 10 | 57 | 114 | 114 | 228 |
| 10 to < 75 | 57 | 160 | 160 | 320 |
| 75 to < 120 | 80 | 160 | 228 | 320 |
| 120 to < 200 | PC-120 | 228 | 320 | 456 |
| ≥ 200 | PC-120 | 320 | 456 | 640 |
| Rated volume = oil per day + (water per day ÷ 2) | | | | |

2. Horizontal Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 120 | 160 |
| 120 to < 200 | 228 |
| 200 to < 300 | 456 |
| 300 to < 450 | 456 |
| 450 to < 600 | 640 |
| ≥ 600 | 912 |
| Rated volume = oil per day + (water per day ÷ 2) | |

3. Prime Mover ... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 3/4" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Well Accessories

Cathodic protection rectifier.

Building

n/a

Substitute Well Features: Weyburn Well Area- Medium Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical wells
 - New wells ... 160 Pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | Depth (ft.) | | | |
|--|-------------|----------------|----------------|--------|
| | < 3000 | 3000 to < 4800 | 4800 to < 5700 | ≥ 5700 |
| < 3 | 40 | 114 | 114 | 228 |
| 3 to < 10 | 57 | 114 | 114 | 228 |
| 10 to < 75 | 57 | 160 | 160 | 320 |
| 75 to < 120 | 80 | 160 | 228 | 320 |
| 120 to < 200 | PC-120 | 228 | 320 | 456 |
| ≥ 200 | PC-120 | 320 | 456 | 640 |
| Rated volume = oil per day + (water per day ÷ 2) | | | | |

2. Horizontal Wells
 - New wells... 640 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 120 | 160 |
| 120 to < 200 | 228 |
| 200 to < 300 | 456 |
| 300 to < 450 | 456 |
| 450 to < 600 | 640 |
| ≥ 600 | 912 |
| Rated volume = oil per day + (water per day ÷ 2) | |

3. Prime Mover ... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 3/4" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Well Accessories

Cathodic protection rectifier.

Building

n/a

Substitute Well Features: Swift Current Well Area - Light Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications.

Pumping Equipment

1. Vertical wells
 - New wells ... 40 pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | Depth (ft.) | | |
|---|-------------|----------------|--------|
| | < 2000 | 2000 to < 4500 | ≥ 4500 |
| < 1.7 | 25 | 40 | 40 |
| ≥ 1.7 | 25 | 40 | 40 |
| Rated volume = oil per day + (water per day ÷ 0.67) | | | |

2. Horizontal Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 120 | 160 |
| 120 to < 200 | 228 |
| 200 to < 300 | 456 |
| 300 to < 450 | 456 |
| 450 to < 600 | 640 |
| ≥ 600 | 912 |
| Rated volume = oil per day + (water per day ÷ 2) | |

3. Prime Mover... electric.

Wellhead Assembly

Vertical... threaded 2000 lbs.
 Horizontal... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 5/8" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

n/a

Substitute Well Features: Swift Current Well Area - Medium Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 114 pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | Depth (ft.) | | |
|--|-------------|----------------|--------|
| | < 2000 | 2000 to < 4500 | ≥ 4500 |
| < 7 | 40 | 114 | 114 |
| 7 to < 190 | 57 | 114 | 114 |
| ≥ 190 | 228 | 228 | 228 |
| Rated volume = oil per day + (water per day ÷ 1.5) | | | |

2. Horizontal Wells
 - New wells ... 640 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 120 | 160 |
| 120 to < 200 | 228 |
| 200 to < 300 | 456 |
| 300 to < 450 | 456 |
| 450 to < 600 | 640 |
| ≥ 600 | 912 |
| Rated volume = oil per day + (water per day ÷ 2) | |

3. Mover ... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 5/8" rod
 Horizontal ... 2 7/8" tubing plain steel; 3/4" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

n/a

Substitute Well Features: Swift Current Well Area - Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical wells
 - New wells ... 160 pumping unit
 - All other vertical well pumping units ... 160 pumping unit
 - Related Volume = oil per day

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 180 | PC-54 |
| 180 to < 500 | PC-64 |
| ≥ 500 | PC-80 |
| Rated volume = oil per day + (water per day ÷ 7) | |

3. Prime Mover

| Facility Type | Prime Mover |
|---------------|----------------|
| Tank | Gas Motor |
| Flow Line | Electric Motor |

Wellhead Assembly

Vertical ... flanged 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½” tubing plain steel; 1” rod
 Horizontal ... 3 ½” tubing plain steel; 1” rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

| Facility Type | Building | Rate (\$/unit) |
|---------------|----------------------|----------------|
| Tank | 64 sq.ft. pump shack | 6,600 |
| Flow Line | n/a | |

Substitute Well Features: Kindersley Well Area - Light Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 40 pumping unit
 - All other vertical pumping well units:

| Rated Volume (barrels/day) | Depth (ft.) | | |
|---|-------------|----------------|--------|
| | < 2000 | 2000 to < 4500 | ≥ 4500 |
| < 1.7 | 25 | 40 | 40 |
| ≥ 1.7 | 25 | 40 | 80 |
| Rated volume = oil per day + (water per day ÷ 0.67) | | | |

2. Horizontal Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 120 | 160 |
| 120 to < 200 | 228 |
| 200 to < 300 | 456 |
| 300 to < 450 | 456 |
| 450 to < 600 | 640 |
| ≥ 600 | 912 |
| Rated volume = oil per day + (water per day ÷ 2) | |

3. Prime Mover... electric motor.

Wellhead Assembly

Vertical ... threaded 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2¾" tubing plain steel; ⅝" rod
 Horizontal ... 2⅞" tubing plain steel; ¾" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

n/a

Substitute Well Features: Kindersley Well Area- Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... 160 pumping unit
 - All other vertical well pumping units ... 160 pumping unit
 - Rated Volume = oil per day

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 180 | PC-54 |
| 180 to < 500 | PC-64 |
| ≥ 500 | PC-80 |
| Rated volume = oil per day + (water per day ÷ 7) | |

3. Prime Mover

| Facility Type | Prime Mover |
|---------------|----------------|
| Tank | Gas motor |
| Flow Line | Electric motor |

Wellhead Assembly

Vertical ... flanged 2000 lbs.

Horizontal ... flanged 2000 lbs.

Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 2 7/8" tubing plain steel; 7/8" rod

Horizontal ... 3 1/2" tubing plain steel; 1" rod

Length ... depth of well for first tubing string

... depth of well minus 200 ft. for each additional tubing string

Building

| Facility Type | Building | Rate (\$/unit) |
|---------------|----------------------|----------------|
| Tank | 64 sq.ft. pump shack | 6,600 |
| Flow Line | n/a | |

Substitute Well Features: North Battleford (South) Well Area - Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... PC-15 pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 30 | PC-10 |
| 30 to < 80 | PC-15 |
| 80 to < 120 | PC-28 |
| 120 to < 180 | PC-54 |
| ≥ 180 | PC-64 |
| Rated volume = oil per day + (water per day ÷ 3) | |

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 180 | PC-54 |
| 180 to < 500 | PC-64 |
| ≥ 500 | PC-80 |
| Rated volume = oil per day + (water per day ÷ 7) | |

3. Prime Mover

| Facility Type | Prime Mover |
|---------------|----------------|
| Tank | Gas motor |
| Flow Line | Electric motor |

Wellhead Assembly

Vertical ... flanged 2000 lbs.
 Horizontal ... flanged 2000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½” tubing plain steel; 1” rod
 Horizontal ... 3 ½” tubing plain steel; 1” rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

| Facility Type | Building | Rate (\$/unit) |
|---------------|----------------------|----------------|
| Tank | 64 sq.ft. pump shack | 6,600 |
| Flow Line | n/a | |

Substitute Well Features: North Battleford (North) Well Area - Heavy Crude Oil Wells

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical Wells
 - New wells ... PC-15 pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | Depth (ft.) | | |
|--|-------------|----------------|-------|
| | <1000 | 1000 to < 2000 | ≥2000 |
| < 9.0 | 40 | 80 | PC-15 |
| ≥ 9.0 | 57 | PC-15 | PC-15 |
| Rated volume = oil per day + (water per day ÷ 3) | | | |

2. Horizontal Wells
 - New wells ... PC-54 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 180 | PC-54 |
| 180 to < 500 | PC-64 |
| ≥ 500 | PC-80 |
| Rated volume = oil per day + (water per day ÷ 7) | |

3. Prime Mover

| Facility Type | Prime Mover |
|---------------|----------------|
| Tank | Gas motor |
| Flow Line | Electric motor |

Wellhead Assembly

Vertical ... flanged 2000 lbs.

Horizontal ... flanged 2000 lbs.

Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½" tubing plain steel; 1" rod

Horizontal ... 3 ½" tubing plain steel; 1" rod

Length ... depth of well for first tubing string

... depth of well minus 200 ft. for each additional tubing string

Building

| Facility Type | Building | Rate (\$/unit) |
|---------------|----------------------|----------------|
| Tank | 64 sq.ft. pump shack | 6,600 |
| Flow Line | n/a | |

Substitute Well Features: Swift Current Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

| Description | Specifications | |
|---|--|--------|
| Tubing | <ul style="list-style-type: none"> 1" diameter, plastic Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string | |
| Wellhead assembly | <ul style="list-style-type: none"> Threaded, 1000 pound pressure. Dual wellhead for multi-zone completions. | |
| Chemical Equipment | 60% of Type 1 | |
| Water handling buildings | 100% of Type 1 | |
| Water handling equipment | 100% of Type 1 | |
| Metering equipment | 10% of Type 1 | |
| Rated Volume = gas per day | | |
| Total Rate (\$) (Excludes tubing, flow line and manifold) | Threaded, 1000 pound pressure | 30,170 |
| | Dual wellhead | 32,070 |

Substitute Well Features: Kindersley Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

| Description | Description | |
|---|--|---------|
| Tubing | <ul style="list-style-type: none"> 2 3/8" diameter, plain steel Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string | |
| Wellhead assembly | <ul style="list-style-type: none"> Threaded, 2000 pound pressure Dual wellhead for multi-zone completions | |
| Chemical equipment | None | |
| Water handling buildings and equipment | 65% of Type 2 | |
| Metering equipment | 80% of Type 1 | |
| Rated volume = gas per day | | |
| Total Rate (\$) (Excludes tubing, flow line and manifold) | Threaded, 2000 pound pressure | 100,180 |
| | Dual wellhead | 102,580 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Well Classification

Substitute Well Features: North Battleford (South) Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

| Description | Specifications | |
|---|--|--------|
| Tubing | <ul style="list-style-type: none"> • 2$\frac{3}{8}$" diameter, plain steel • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string | |
| Wellhead assembly | <ul style="list-style-type: none"> • Threaded, 2000 pound pressure • Dual wellhead for multi-zone completions | |
| Chemical equipment | Alcohol drip | |
| Water handling buildings and equipment | 55% of Type 2 | |
| Metering equipment | 80% of Type 1 | |
| Rated volume = gas per day | | |
| Total Rate (\$) (Excludes tubing, flow line and manifold) | Threaded, 2000 pound pressure | 91,280 |
| | Dual wellhead | 93,680 |

Substitute Well Features: North Battleford (North) Well Area - Gas Wells

The resource production equipment required to operate a substitute gas well that performs the same function as the gas well being valued shall be determined in accordance with the following specifications:

| Description | Specifications | |
|---|--|--------|
| Tubing | <ul style="list-style-type: none"> • 2$\frac{3}{8}$" diameter, plain steel • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string | |
| Wellhead assembly | <ul style="list-style-type: none"> • Flanged, 2000 pound pressure • Dual wellhead for multi-zone completions | |
| Chemical equipment | Alcohol drip | |
| Water handling buildings and equipment | 48% of Type 2 | |
| Metering equipment | 80% of Type 1 | |
| Rated volume = gas per day | | |
| Total Rate (\$) (Excludes tubing, flow line and manifold) | Flanged, 2000 pound pressure | 85,780 |
| | Dual wellhead | 93,530 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Well Classification

Substitute Well Features: Air, Water and Gas Injection Wells

The resource production equipment required to operate a substitute air, water or gas injection well that performs the same function as the injection well being valued shall be determined in accordance with the following specifications:

| Description | Specifications | |
|---|---|--------|
| Tubing | <ul style="list-style-type: none"> • 2⁷/₈" tubing, plain steel • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string | |
| Wellhead assembly | Threaded, 2000 pound pressure | |
| Metering equipment | 1 - 2" floco meter | |
| Control valves | 1 - 3" choke 1 - pressure control switch | |
| Well accessories | All wells east of the third meridian: Cathodic protection rectifier | |
| Building | 20 sq.ft. fibreglass wellhead shelter | |
| Total Rate (\$) (Excludes tubing, flow lines and manifolds) | All wells east of the third meridian | 58,010 |
| | All wells west of the third meridian | 43,480 |

Substitute Well Features: Continuous Steam Injection Wells

The resource production equipment required to operate a substitute continuous steam injection well that performs the same function as the injection well being valued shall be determined in accordance with the following specifications:

| Description | Specifications | |
|---|---|--|
| Tubing | <ul style="list-style-type: none"> • 3¹/₂" tubing, lined • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string | |
| Wellhead assembly | Flanged, 3000 pound pressure | |
| Metering equipment | 1 - 3" turbine meter and totalizer | |
| Control valves | 1 - 3" choke | |
| Total Rate (\$) (Excludes tubing, flow lines and manifolds) | 67,440 | |

Substitute Well Features: Cyclic Steam Injection Wells

The resource production equipment required to operate a substitute cyclic steam injection well that performs the same function as the injection well being valued shall be determined in accordance with the following specifications:

| Description | Specifications |
|--|--|
| Tubing and rods | <ul style="list-style-type: none"> • 3½" tubing, lined; 1" rods • Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string |
| Pumping equipment | 67% of a conventional 160 pumping unit with electric motor |
| Wellhead assembly | Flanged, 3000 pound pressure |
| Metering equipment | 3 - 3" turbine meters and totalizers |
| Control valves | 1 - 3" choke |
| Total Rate (\$) (Excludes tubing, rod, flow lines and manifolds) | 197,530 |

Substitute Well Features: Water Source Wells

The resource production equipment required to operate a substitute water source well that performs the same function as the water source well being valued shall be determined in accordance with the following specifications:

Tubeing and Rods

1. New Wells
 - 2 7/8" tubing, plain steel; 7/8" rod
 - Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string
2. Rated volume <150,000 imp. gal./day
 - 2 7/8" tubing, plain steel; 7/8" rod
 - Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string
3. Rated volume >150,000 imp. gal./day
 - 2 7/8" tubing plain steel
 - Length: depth of well for first tubing string, depth of well minus 200 ft. for each additional tubing string for depth of well

| Description | Specifications | | |
|---|---|--|---------|
| | New Wells and Wells Rated Volume <150,000 imp. gal./day | Rated Volume ≥150,000 imp. gal./day | |
| Pumping equipment | <ul style="list-style-type: none"> • PC-15 pumping unit • 50% of 1 - variable frequency drive | <ul style="list-style-type: none"> • Submersible pumping unit 400 series 100 stage • Submersible pump motor 456 series 80 hp • Switchboard 100 hp • Transformer 75 kva • Size 4 submersible pump cable x well depth x 1.05 • 50% of 1 - variable frequency drive | |
| Wellhead assembly | Threaded, 2000 pound pressure | Threaded, 2000 pound pressure | |
| Metering equipment | None | None | |
| Control Valves | <ul style="list-style-type: none"> • 1 - 3" choke • 1 - pressure control switch | <ul style="list-style-type: none"> • 1 - 3" choke • 1 - pressure control switch | |
| Well Accessories: Cathodic Protection | All wells east of the third meridian | All wells east of the third meridian | |
| Building | None | 20 sq.ft. fibreglass wellhead shelter with heat | |
| Total Rate (\$) (Excludes tubing, rod, cable, flow lines and manifolds) | All wells east of the third meridian | 146,210 | 222,650 |
| | All wells west of the third meridian | 131,680 | 208,120 |

Substitute Well Features: Heavy Crude Steam Assisted Gravity Drainage (SAGD) Oil Wells (entire Province)

The resource production equipment required to operate a substitute oil well that performs the same function as the oil well being valued shall be determined in accordance with the following specifications:

Pumping Equipment

1. Vertical SAGD Wells
 - New wells ... PC-15 pumping unit
 - All other vertical well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 30 | PC-10 |
| 30 to < 80 | PC-15 |
| 80 to < 120 | PC-28 |
| 120 to < 180 | PC-54 |
| ≥ 180 | PC-64 |
| Rated volume = oil per day + (water per day ÷ 3) | |

2. Horizontal SAGD Wells
 - New wells ... 456 pumping unit
 - All other horizontal well pumping units:

| Rated Volume (barrels/day) | All Depths (ft.) |
|--|------------------|
| < 180 | PC-54 |
| 180 to < 500 | PC-64 |
| 500 to < 600 | 320 |
| 600 to < 800 | 456 |
| ≥ 800 | 640 |
| Rated volume = oil per day + (water per day ÷ 7) | |

3. Prime Mover

| Facility Type | Prime Mover |
|---------------|----------------|
| Tank | Gas motor |
| Flow Line | Electric motor |

Wellhead Assembly

Vertical ... flanged 3000 lbs.
 Horizontal ... flanged 3000 lbs.
 Dual wellhead for multizone completion.

Tubing and Rods

Vertical ... 3 ½" tubing plain steel; 1" rod
 Horizontal ... 4½" tubing plain steel; 1" rod
 Length ... depth of well for first tubing string
 ... depth of well minus 200 ft. for each additional tubing string

Building

| Facility Type | Building | Rate (\$) |
|---------------|----------------------|-----------|
| Tank | 64 sq.ft. pump shack | 6,600 |
| Flow Line | n/a | |

Description

A typical well head assembly is made up of a casing head, tubing head and Christmas tree. The well head may be screwed onto the casing or it may be an assembly that is bolted together. These are called the threaded or flanged well heads respectively.

Rates

The rates for well head assembly are dollars per unit.

| Type | Size | | | |
|--------------------------------------|-------------------------------|-----------------------------|-----------------------------|------------------------------|
| | Series 400 W.P. ≤ 1000 psi | Series 600 W.P. 2000 psi | Series 900 W.P. 3000 psi | Series 1500 W.P. 5000 psi |
| Pumping Oil | | | | |
| Single Flanged | 15,700 | 18,190 | 18,920 | 30,880 |
| Single Threaded | 13,820 | 15,800 | 16,400 | 26,330 |
| Dual Flanged | 27,650 | 32,080 | 33,970 | 34,360 |
| Dual Threaded | 15,640 | 24,690 | 29,440 | 29,290 |
| Flowing Oil & Gas | | | | |
| Single Flanged | 18,120 | 22,740 | 29,630 | 29,670 |
| Single Threaded | 14,490 | 20,830 | 26,810 | 27,050 |
| Dual Flanged | 25,130 | 30,490 | 35,930 | 35,950 |
| Dual Threaded | 16,390 | 23,230 | 26,090 | 26,150 |
| Injection - Air, Gas or Water | | | | |
| Flanged | 18,190 | 22,740 | 30,160 | 30,170 |
| Threaded | 14,370 | 20,830 | 27,220 | 27,050 |
| Dual Threaded | 16,390 | 23,230 | 26,090 | 26,150 |
| Injection - Steam | | | | |
| Flanged | 39,690 | 39,700 | 39,700 | 39,700 |
| Steam Injection & Pumping | | | | |
| Flanged | 56,700 | 56,790 | 56,740 | 56,620 |
| Tubingless (Casing Head) | | | | |
| Flanged | 14,360 | 15,850 | 15,700 | 16,000 |
| Threaded | 9,570 | 10,170 | 10,590 | 10,840 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Well Head Assembly

Conventional and Hydrabeam

This is the typical horsehead or grasshopper counterbalance unit. The rods are raised by carrier bar at the horsehead end of the waling beam. On the downstroke, the weight of the rod assembly is counterbalanced by large weights. The picot point of the assembly is in the middle of the walking beam.

Rates

The rates for conventional and hydrabeam pumping units are in dollars per unit.

| Gear Box Torque Rating (x 1000) (lb.) | Without Prime Mover (2) | Electric Prime Mover (1) | | Gas Prime Mover (1) | |
|---------------------------------------|-------------------------|--------------------------|------------|---------------------|------------|
| | | Rate | Range (hp) | Rate | Range (hp) |
| 25 | 38,210 | 55,830 | 5 | 91,920 | 9 - 12 |
| 40 | 42,350 | 59,280 | 6 | 94,730 | 9 - 12 |
| 57 | 51,170 | 70,150 | 5 - 10 | 108,760 | 9 - 12 |
| 80 | 54,710 | 74,930 | 5 - 10 | 119,860 | 9 - 19 |
| 114 | 91,780 | 113,550 | 7.5 - 15 | 163,020 | 13 - 19 |
| 160 | 99,590 | 124,410 | 15 - 25 | 179,410 | 20 - 29 |
| 228 | 118,000 | 145,860 | 20 - 40 | 214,750 | 20 - 39 |
| 320 | 139,170 | 174,120 | 30 - 60 | 261,680 | 30 - 59 |
| 456 | 175,730 | 213,980 | 40 - 75 | 315,440 | 40 - 99 |
| 640 | 205,230 | 244,770 | 50 - 75 | 382,060 | 60 - 99 |
| 912 | 239,270 | 282,880 | 60 - 100 | 452,960 | 60 - 149 |
| 1280 | 393,250 | 435,810 | 70 - 125 | 608,160 | 100 - 199 |

Rates include:

- prime mover where noted
- belt
- rod rotator
- concrete base
- bottom hole pump
- frame extension and side rails
- polish rod
- beam chemical injector at 50%
- counter weights
- pressure switch
- stuffing box
- installation

NOTE: 1) Costs include:

- per electrified site - \$10,160
- per gas operated site - propane vessel and/or scrubber with self-feed gas at \$12,440

2) Cost without Prime Mover:

- electrical and propane vessel costs are not included and must be added if these rates are used.
- apply these rates to non-typical installations

3) Strap jacks and slant jacks:

- increase conventional pumping unit cost by 20%

Unitorque and Air- Balanced Beam

The entire walking beam for unitorque and air-balanced beam pumping units moves up and down with the pivot point at the end of the beam. Unitorque pumping units have a counterweight system similar to conventional pumping units. The air-balanced beam pumping units have no counterweights. The downstroke is cushioned by a very large air-supplied “shock absorber”. There will be a small compressor mounted on the pumping unit to feed the unit.

Rates

The rates for unitorque and air-balanced beam pumping units are dollars per unit.

| Gear Box Torque Rating (x 1000) (lb.) | Without Prime Mover (2) | Electric Prime Mover (1) | | Gas Prime Mover (1) | |
|--|-------------------------|--------------------------|------------|---------------------|------------|
| | | Rate | Range (hp) | Rate | Range (hp) |
| 114 | 99,450 | 122,170 | 7.5 - 15 | 163,880 | 13 - 19 |
| 160 | 121,450 | 146,950 | 15 - 25 | 202,450 | 20 - 29 |
| 228 | 139,630 | 170,510 | 20 - 40 | 237,420 | 20 - 39 |
| 320 | 167,780 | 203,460 | 30 - 60 | 291,750 | 30 - 59 |
| 456 | 197,160 | 236,180 | 40 - 75 | 338,450 | 40 - 99 |
| 640 | 219,290 | 259,470 | 50 - 75 | 397,640 | 60 - 99 |
| 912 | 269,400 | 314,490 | 60 - 100 | 485,560 | 60 - 149 |
| Rates include: <ul style="list-style-type: none"> - prime mover where noted - belt - rod rotator - concrete base - bottom hole pump - frame extension and side rails - polish rod - beam chemical injector at 50% - counter weights - pressure switch - stuffing box - installation | | | | | |
| NOTE: 1) Costs include: <ul style="list-style-type: none"> - per electrified site - \$10,130 - per gas operated site - propane vessel and/or scrubber with self-feed gas at \$12,410 2) Cost without Prime Mover: <ul style="list-style-type: none"> - electrical and propane vessel costs are not included and must be added if these rates are used - apply these rates to non-typical installations | | | | | |

Submersible Pumping Equipment

Submersible pumps have the major working system suspended at the bottom of the well bore inside the tubing. This system is identified on the surface by heavy electric cable emerging from the top of the wellhead.

Motor Rates

The motor rates for submersible pumping equipment are in dollars per unit.

| Rating (hp) | Rate | | |
|-------------|------------|------------|------------|
| | 375 4½" | 456 5½" | 540 6⅝" |
| 7.5 | 39,970 | 36,700 | |
| 10 | 47,060 | 39,290 | |
| 15 | 52,930 | 43,840 | |
| 19.5 | 56,780 | 48,350 | |
| 22.5 | 60,010 | 51,580 | |
| 25 | 67,700 | 53,560 | |
| 30 | | 58,020 | 45,860 |
| 40 | | 66,950 | 49,590 |
| 50 | | 76,110 | 56,040 |
| 60 | | 79,840 | 63,720 |
| 70 | | 88,260 | 68,930 |
| 80 | | 96,690 | 74,750 |
| 90 | | 105,120 | 79,960 |
| 100 | | 113,560 | 84,420 |
| 110 | | 122,490 | 90,250 |
| 120 | | 130,910 | 95,950 |
| 130 | | | 101,780 |
| 150 | | | 112,190 |
| 160 | | | 118,020 |
| 180 | | | 128,930 |
| 200 | | | 140,460 |
| 225 | | | 152,730 |

NOTE: 1) Series number refers to outside diameter size of motor or pump, eg. series 456 is 4.56 inches O.D.
 2) Motors and pumps can be stacked, eg. in 4½" casing, to achieve 100 hp, 4 - 25 hp motors are stacked.
 3) Generally, the pump is the value of the motor. This can be used as a guide if proper size information is not available.

Pump Rates

The pump rates for submersible pumping equipment are in dollars per unit.

| Stages | Length (ft.) | Rate | | | |
|-----------|--------------|------------------------|------------------------|-------------------------|---------------------|
| | | 338 400-1500 4½" | 400 280-4000 5½" | 540 2000-7000 6⅝" | 540 10000 6⅝" |
| ≤ 20 | 2.1 | 13,450 | 13,310 | 13,230 | 13,170 |
| 21 - 40 | 3.5 | 16,790 | 13,560 | 17,260 | 23,980 |
| 41 - 60 | 4.9 | 20,230 | 15,930 | 20,070 | 28,070 |
| 61 - 80 | 6.3 | 23,630 | 18,640 | 22,760 | 32,180 |
| 81 - 100 | 7.8 | 27,020 | 21,170 | 25,590 | 36,170 |
| 101 - 120 | 9.1 | 30,280 | 23,690 | 28,300 | 41,810 |
| 121 - 140 | 10.5 | 33,670 | 26,270 | 31,080 | 44,360 |
| 141 - 160 | 11.9 | 37,070 | 28,710 | 33,760 | 48,310 |
| 161 - 180 | 13.3 | 40,470 | 31,280 | 36,590 | 52,330 |
| 181 - 200 | 14.7 | 43,870 | 33,890 | 39,280 | 56,400 |
| 201 - 220 | 16.1 | | 36,400 | 42,070 | 60,580 |
| 221 - 240 | 17.5 | | 38,990 | 44,870 | 64,630 |
| 241 - 260 | 18.9 | | | 50,280 | 68,700 |
| 261 - 280 | 20.4 | | | 53,200 | 72,840 |
| > 280 | 21.8 | | | 56,240 | 76,950 |

Switchboards

The switchboard rates for submersible pumping equipment are in dollars per unit.

| Rating (hp) | Rate |
|-------------|--------|
| 25 | 14,420 |
| 50 | 16,200 |
| 100 | 18,710 |
| 200 | 28,480 |
| 1000 | 47,340 |
| 1500 | 48,620 |
| 2000 | 49,930 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Pumping Units

Transformers

The transformer rates for submersible pumping equipment are in dollars per unit.

| Size (kVA) | Rate |
|------------|--------|
| 50 | 11,780 |
| 75 | 12,440 |
| 100 | 16,360 |
| 125 | 17,670 |
| 150 | 21,600 |
| 200 | 30,760 |
| 250 | 33,370 |

Cable

The cable rates for submersible pumping equipment are in dollars per linear foot.

| Size | Power (hp) | Rate |
|------|------------|-------|
| 1 | > 200 | 32.34 |
| 2 | 150 - 200 | 28.27 |
| 4 | < 150 | 21.14 |

Progressive Cavity (PC)

Pump Rates

The pump rates for progressive cavity pumping equipment are in dollars per unit.

| Size M ³ /100 rpm | Rate |
|---|---------|
| 10 | 71,120 |
| 12 | 72,850 |
| 15 | 75,170 |
| 28 | 78,900 |
| 54 | 85,190 |
| 64 | 92,470 |
| 80 | 95,540 |
| 95 | 97,530 |
| 120 | 115,950 |
| Rates Include: <ul style="list-style-type: none"> - drive system (gas or electric prime mover, hydraulic or electric skid) - bottom hole pump (rotor, stator) - installation | |

Variable Frequency Drive

The rate for a variable frequency drive shall be \$52,990 per unit.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Pumping Units

Description

Prime movers include electric and gas motors used to provide power to pumping units.

Triple-Rated Motors

The triple-rated motor prime mover rates are in dollars per unit.

| Size | | Controller Size | Rate |
|--|--------------------|--|--------|
| (hp) | (kw) | | |
| 10 / 7.5 / 5 | 7.5 / 5.6 / 3.7 | 1 | 8,410 |
| 15 / 10 / 7.5 | 11.2 / 7.5 / 5.6 | 2 | 11,130 |
| 20 / 15 / 10 | 14.9 / 11.2 / 7.5 | 2 | 12,480 |
| 25 / 20 / 15 | 18.6 / 14.9 / 11.2 | 2 | 14,360 |
| 30 / 22 / 15 | 22.4 / 18.6 / 11.2 | 3 | 16,000 |
| 40 / 30 / 20 | 29.8 / 22.4 / 14.9 | 3 | 19,800 |
| 50 / 40 / 30 | 37.3 / 29.8 / 22.4 | 3 | 22,700 |
| 60 / 50 / 40 | 44.8 / 37.3 / 29.8 | 4 | 26,390 |
| 75 / 60 / 50 | 56 / 44.8 / 37.3 | 4 | 28,780 |
| 100 / 75 / 60 | 74.6 / 56 / 44.8 | 4 | 32,900 |
| 125 / 100 / 75 | 93.3 / 74.6 / 56 | 4 | 34,740 |
| Rates include: | | | |
| <ul style="list-style-type: none"> - 3 phase - 1200 RPM - fan-cooled motor - 60 Hz - class F insulation | | <ul style="list-style-type: none"> - controller - 460 volt - totally enclosed - installation | |

Single-Rated Motors

The single-rated motor prime mover rates are in dollars per unit.

| Size (hp) | Rate |
|-----------|--------|
| 1 - 2 | 6,120 |
| 3 - 5 | 6,360 |
| 7.5 - 10 | 7,160 |
| 15 - 20 | 9,570 |
| 25 - 30 | 12,500 |
| 40 | 14,860 |
| 50 | 15,760 |
| 60 | 18,830 |
| 75 | 20,990 |
| 100 | 28,620 |
| 125 | 32,780 |
| 150 | 36,900 |
| 200 | 50,080 |
| 250 | 59,930 |

Rates include:

- 3 phase
- 1200 RPM
- fan-cooled motor
- 60 Hz
- class F insulation
- controller
- 460 volt
- totally enclosed
- installation

Gas Engines

The gas engine prime mover rates are in dollars per unit.

| Group # | Size (hp) | Rate |
|---------|-----------|---------|
| 1 | 9 - 12 | 38,960 |
| 2 | 13 - 19 | 48,850 |
| 3 | 20 - 29 | 65,660 |
| 4 | 30 - 39 | 82,240 |
| 5 | 40 - 59 | 107,380 |
| 6 | 60 - 99 | 123,810 |
| 7 | 100 - 149 | 196,500 |
| 8 | 150 - 199 | 202,000 |

NOTE: Deduct \$3,710 if no electric start in groups #1 to #4.

Rates include:

- twin-disk clutch
- condensing radiator with fan
- pressure lubrication
- combination gas-gasoline carburetor
- adjustable sub-base
- miscellaneous pipe fittings
- power take off
- heavy flywheel
- regulator
- air cleaner
- engine starter
- installation

Description

The bottom hole pump is suspended from the surface by a series of 20 foot steel or fibreglass rods that are threaded together. The most common size for the tubing is 2 $\frac{7}{8}$ inches (plain) in diameter and for the rod it is $\frac{7}{8}$ inches in diameter.

Rates

The rates for tubing and rods are dollars per lineal foot.

Tubing

| Size (in.) | Steel | | Plastic |
|---------------------|-------|-------|---------|
| | Plain | Lined | |
| $\leq 1\frac{1}{2}$ | 5.87 | | 2.08 |
| 2 | 6.52 | | |
| 2 $\frac{3}{8}$ | 7.07 | 7.89 | |
| 2 $\frac{7}{8}$ | 8.07 | 14.28 | |
| 3 $\frac{1}{2}$ | 11.26 | 15.50 | |
| 4 | 15.08 | 19.40 | |
| 4 $\frac{1}{2}$ | 20.31 | 24.91 | |

Rods

| Size (in.) | Rate |
|---------------|------|
| $\frac{5}{8}$ | 2.83 |
| $\frac{3}{4}$ | 3.53 |
| $\frac{7}{8}$ | 4.45 |
| 1 | 5.35 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Tubing and Rods

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Separators and Treaters

Description

A separator is a vertical, spherical or horizontal vessel through which the emulsion is passed to split liquids and gases. Centrifugal action created by baffles inside the unit causes the split to occur.

Vertical Two-Phase Separators

A treater is a vessel that heats the emulsion to finalize the field separation cycle.

The rates for separators are in dollars per unit.

| Diameter (in.) | Height (ft.) | | | |
|---------------------------------------|--------------|--------------------------|---------|---------|
| | 5 | 7.5 | 10 | 15 |
| 125-260 psi Working Pressure | | | | |
| ≤ 16 | 23,370 | 24,610 | 25,820 | 28,120 |
| 24 | 39,930 | 41,930 | 44,210 | 47,890 |
| 30 | 53,830 | 54,870 | 57,600 | 62,830 |
| 36 | 56,460 | 67,860 | 71,240 | 77,580 |
| 42 | 76,830 | 80,750 | 84,840 | 92,480 |
| 48 | 89,160 | 93,770 | 98,460 | 107,320 |
| 54 | 101,500 | 106,680 | 112,060 | 122,250 |
| 60 | 113,930 | 119,690 | 125,720 | 137,080 |
| 500-1000 psi Working Pressure | | | | |
| ≤ 16 | 27,500 | 28,940 | 30,370 | 33,190 |
| 24 | 45,850 | 49,840 | 52,300 | 57,010 |
| 30 | 64,390 | 65,590 | 68,980 | 75,000 |
| 36 | 77,410 | 81,250 | 85,300 | 92,990 |
| 42 | 92,390 | 96,990 | 101,740 | 110,970 |
| 48 | 107,730 | 112,900 | 127,440 | 132,200 |
| 54 | 122,330 | 128,370 | 146,930 | 151,190 |
| 60 | 136,990 | 143,980 | 157,110 | 164,940 |
| 1200-1440 psi Working Pressure | | | | |
| ≤ 16 | 29,660 | 31,220 | 32,790 | 35,730 |
| 24 | 49,210 | 54,440 | 57,230 | 62,450 |
| 30 | 68,430 | 71,310 | 75,540 | 82,470 |
| 36 | 83,060 | 87,300 | 91,720 | 102,360 |
| 42 | 101,660 | 106,850 | 112,180 | 122,380 |
| 48 | 118,310 | 124,300 | 130,520 | 142,340 |
| 54 | 134,880 | 141,760 | 148,810 | 162,410 |
| 60 | 151,480 | 159,240 | 167,260 | 182,380 |
| Rates include: | | | | |
| - 1 oil dump valve | | - 1 gauge glass assembly | | |
| - 1 liquid level controller | | - 1 safety relief valve | | |
| - 1 pilot gas supply regulator | | - 1 pressure gauge | | |

Vertical Three-Phase Separators

The rates for vertical three-phase separators are in dollars per unit.

| Diameter (in.) | Height (ft.) | | | |
|---|--------------|---------|---------|---------|
| | 5 | 7.5 | 10 | 15 |
| 125-260 psi Working Pressure | | | | |
| ≤ 16 | 39,350 | 44,560 | 49,740 | 52,850 |
| 20 | 43,280 | 50,200 | 56,940 | 60,070 |
| 24 | 54,000 | 57,110 | 58,360 | 70,510 |
| 30 | 56,300 | 65,050 | 66,710 | 78,200 |
| 36 | 57,470 | 66,850 | 68,120 | 80,870 |
| 42 | 81,070 | 89,380 | 91,260 | 94,230 |
| 500-1000 psi Working Pressure | | | | |
| ≤ 16 | 47,700 | 48,910 | 50,390 | 57,360 |
| 20 | 54,120 | 55,570 | 57,200 | 68,310 |
| 24 | 55,780 | 59,680 | 65,560 | 76,430 |
| 30 | 63,450 | 65,560 | 82,390 | 114,080 |
| 36 | 65,610 | 75,940 | 94,600 | 120,130 |
| 42 | 87,700 | 107,050 | 133,420 | 165,640 |
| 1200-1440 psi Working Pressure | | | | |
| ≤ 16 | 48,760 | 50,850 | 53,080 | 59,940 |
| 20 | 60,890 | 64,410 | 68,090 | 75,150 |
| 24 | 64,980 | 67,100 | 69,450 | 84,800 |
| 30 | 69,060 | 72,610 | 87,790 | 118,070 |
| 36 | 81,190 | 90,920 | 100,770 | 131,860 |
| 42 | 111,830 | 125,240 | 138,950 | 185,870 |
| Rates include: <ul style="list-style-type: none"> - 2 oil and water dump valves - 1 oil level controller - 1 pilot gas supply regulator - 1 gauge glass assembly - 1 safety relief valve - 1 pressure gauge - 1 water level controller | | | | |

Horizontal Two-Phase Separators

The rates for horizontal two-phase separators are in dollars per unit.

| Diameter (in.) | Length (ft.) | | |
|---------------------------------------|--------------|--------------------------|---------|
| | 8 | 10 | 15 |
| 125-260 lb. Working Pressure | | | |
| ≤ 16 | 37,060 | 37,980 | 39,850 |
| 20 | 40,030 | 40,990 | 43,100 |
| 24 | 45,600 | 46,650 | 49,180 |
| 30 | 45,730 | 49,540 | 52,210 |
| 36 | 55,370 | 56,720 | 59,720 |
| 42 | 60,380 | 61,820 | 65,200 |
| 48 | 65,770 | 67,330 | 70,870 |
| 54 | 71,040 | 72,830 | 76,920 |
| 60 | 76,420 | 78,350 | 82,720 |
| 500-1000 lb. Working Pressure | | | |
| ≤ 16 | 38,220 | 39,230 | 41,510 |
| 20 | 40,340 | 43,510 | 45,820 |
| 24 | 48,360 | 49,540 | 52,210 |
| 30 | 51,870 | 53,190 | 55,990 |
| 36 | 61,390 | 62,740 | 66,130 |
| 42 | 67,150 | 68,660 | 72,390 |
| 48 | 73,660 | 75,460 | 79,570 |
| 54 | 80,300 | 82,240 | 86,730 |
| 60 | 86,940 | 89,030 | 93,820 |
| 1200-1440 lb. Working Pressure | | | |
| ≤ 16 | 45,900 | 46,910 | 48,830 |
| 20 | 57,380 | 58,500 | 60,830 |
| 24 | 58,010 | 59,180 | 61,780 |
| 30 | 67,530 | 68,860 | 71,750 |
| 36 | 87,070 | 88,810 | 92,560 |
| 42 | 94,610 | 96,530 | 100,630 |
| 48 | 105,870 | 108,020 | 112,660 |
| 54 | 117,140 | 119,520 | 124,520 |
| 60 | 128,420 | 131,040 | 136,570 |
| Rates include: | | | |
| - 1 oil dump valve | | - 1 gauge glass assembly | |
| - 1 liquid level controller | | - 1 safety relief valve | |
| - 1 pilot gas supply regulator | | - 1 pressure gauge | |

Horizontal Three-Phase Separators

The rates for horizontal three-phase separators are in dollars per unit.

| Diameter (in.) | Length (ft.) | | |
|---|--------------|---------|---------|
| | 8 | 10 | 15 |
| 125-260 lb. Working Pressure | | | |
| ≤ 16 | 39,670 | 43,670 | 53,330 |
| 20 | 45,890 | 50,470 | 61,700 |
| 24 | 53,740 | 59,160 | 72,260 |
| 30 | 59,270 | 63,100 | 77,120 |
| 36 | 64,890 | 71,400 | 87,270 |
| 42 | 78,510 | 86,570 | 105,900 |
| 48 | 84,210 | 92,750 | 113,420 |
| 54 | 92,500 | 101,710 | 124,390 |
| 60 | 101,070 | 110,790 | 135,490 |
| 500-1000 lb. Working Pressure | | | |
| ≤ 16 | 40,310 | 44,500 | 54,250 |
| 20 | 50,570 | 55,580 | 68,000 |
| 24 | 55,770 | 61,320 | 75,010 |
| 30 | 61,730 | 67,810 | 82,930 |
| 36 | 71,460 | 78,570 | 96,140 |
| 42 | 91,870 | 104,640 | 127,890 |
| 48 | 100,260 | 110,180 | 134,990 |
| 54 | 111,790 | 122,650 | 150,040 |
| 60 | 122,850 | 135,170 | 165,220 |
| 1200-1440 lb. Working Pressure | | | |
| ≤ 16 | 62,180 | 68,420 | 72,610 |
| 20 | 65,330 | 71,810 | 87,780 |
| 24 | 65,520 | 72,140 | 88,290 |
| 30 | 76,430 | 84,090 | 102,700 |
| 36 | 97,010 | 106,740 | 125,420 |
| 42 | 110,150 | 121,240 | 153,990 |
| 48 | 121,560 | 133,730 | 163,560 |
| 54 | 134,760 | 148,220 | 181,300 |
| 60 | 147,940 | 162,810 | 198,980 |
| Rates include: <ul style="list-style-type: none"> - 2 oil and water dump valves - 1 oil level controller - 1 pilot gas supply regulator - 1 water level controller - 1 gauge glass assembly - 1 safety relief valve - 1 pressure gauge | | | |

Spherical Separators

The rates for spherical separators are in dollars per unit.

| Working Pressure (lb.) | Diameter (in.) | Rate |
|------------------------|----------------|--------|
| 125 | 36 | 33,070 |
| | 42 | 36,940 |
| 260 | 36 | 37,120 |
| | 42 | 41,360 |
| | 48 | 49,000 |

Rollo Metering Separators

The rates for rollo metering separators are in dollars per unit.

| Rollo Metering - Vertical: 125 lb. working pressure | | |
|---|--------------------------------|-----------------------------|
| Size (in. x ft.) | Rate Without Automatic Sampler | Rate With Automatic Sampler |
| 24 x 6 | 26,140 | 28,390 |
| 30 x 6 | 30,420 | 33,130 |
| 36 x 6 | 34,860 | 38,040 |
| 48 x 6 | 40,600 | 44,580 |
| Rates include: - separator - meter - recorder - installation Pounds (force) per sq.in. x 6.894757 = kpa rating | | |

Treater Accessories

The rates for treater accessories are in dollars per unit.

Ignition System

| Type | Rate |
|-----------|--------|
| Automatic | 20,520 |
| Manual | 3,440 |

Desand System

| Length (ft.) | Rate | |
|--------------|-----------|--------|
| | Automatic | Manual |
| ≤ 25 | 89,810 | 12,830 |
| 26 - 35 | 116,540 | 42,380 |
| 36 - 45 | 143,280 | 71,390 |
| ≥ 46 | 170,070 | |

Burner

The rate for a burner shall be \$62,130 per unit.

Atmospheric Treater - Coalescer Wash Tank

The rates for atmospheric treaters – coalescer wash tanks are in dollars per unit.

| Size (barrels) | Rate |
|----------------|---------|
| ≤ 400 | 120,930 |
| 750 | 161,220 |
| 900 | 174,680 |
| 1,000 | 181,400 |
| 1,500 | 235,100 |
| 2,000 | 248,560 |
| 2,500 | 288,920 |
| 3,000 | 315,840 |
| 3,500 | 335,900 |
| 4,000 | 349,350 |
| ≥ 5,000 | 369,660 |

Rates include:

- burn and heating equipment including 2 firetubes
- lining
- gas regulators and scrubbers
- fittings
- cone bottoms
- stacks
- flame arrestors
- all piping
- valves and meters
- baffles and all necessary materials
- installation

Horizontal Mechanical Coalescer Treater

The rates for horizontal mechanical coalescer treaters are in dollars per unit.

| Diameter (in.) | Length (ft.) | | | |
|--|--------------|---------|---------|---------|
| | 4 | 6 | 8 | 10 |
| 15-50 lb. Working Pressure | | | | |
| 15.5 | 220,400 | 243,040 | 257,620 | 293,310 |
| 20 | 241,810 | 262,430 | 292,440 | 347,060 |
| 22 | 259,780 | 273,450 | 335,670 | 376,760 |
| 25 | 282,380 | 292,380 | 365,950 | 450,060 |
| 30 | 302,690 | 332,690 | 409,430 | 537,890 |
| 75 lb. Working Pressure | | | | |
| 20 | | 312,620 | 355,420 | 509,590 |
| 22 | | 328,250 | 364,680 | 518,600 |
| 25 | | 347,940 | 375,480 | 532,230 |
| 30 | | 368,820 | 421,250 | 552,110 |
| 44 | | 390,950 | 482,210 | 607,200 |
| 45 | | 414,410 | 515,120 | 624,680 |
| 50 | | 439,270 | 546,410 | 643,460 |
| Rates include: <ul style="list-style-type: none"> - single firetube - fuel gas system c/w burning equipment - ladder and crownsnest - thermometer - water and oil outlet valve - relief valve - flame arrestor and stack anodes - insulation - water siphon - pressure gauge and gauge glass - gas back pressure valve - water meter - installation - scrubber | | | | |

Vertical Treater

The rates for vertical treaters are in dollars per unit.

| Diameter (in.) | Length (ft.) | | | | |
|--|--------------|---------|---------|---------|---------|
| | 3 | 4 | 6 | 8 | 10 |
| 50 lb. Working Pressure | | | | | |
| 20 | 127,720 | 149,220 | 159,970 | 200,670 | 233,430 |
| 24 | 129,460 | 152,630 | 165,600 | 211,420 | 246,480 |
| 28 | 130,660 | 156,130 | 171,230 | 220,630 | 257,750 |
| 30 | 131,720 | 158,430 | 173,530 | 225,540 | 264,650 |
| 75 lb. Working Pressure | | | | | |
| 20 | 127,130 | 152,030 | 169,060 | 218,190 | 255,440 |
| 24 | 149,220 | 158,950 | 178,140 | 230,610 | 270,280 |
| 28 | 155,090 | 165,090 | 184,800 | 241,240 | 283,200 |
| 30 | 158,420 | 168,420 | 188,890 | 246,990 | 290,000 |
| Rates include: <ul style="list-style-type: none"> - single firetube - fuel gas system c/w burning equipment - ladder and crownsnest - thermometer - water and oil outlet valve - relief valve - flame arrestor and stack anodes - insulation - water siphon - pressure gauge and gauge glass - gas back pressure valve - water meter - installation - scrubber | | | | | |

Horizontal Electrostatic Coalescer Treater

The rates for horizontal electrostatic coalescer treaters are in dollars per unit.

| Diameter (in.) | Length (ft.) | | |
|--|--------------|---------|---------|
| | 6 | 8 | 10 |
| 50 lb. Working Pressure | | | |
| 20 | 355,140 | 458,380 | 562,140 |
| 25 | 406,620 | 532,980 | 622,020 |
| 30 | 458,380 | 570,280 | 682,200 |
| 40 | 562,140 | 687,960 | 802,070 |
| 50 | 665,890 | 799,860 | 921,230 |
| 75 lb. Working Pressure | | | |
| 20 | 363,820 | 469,940 | 648,030 |
| 25 | 417,660 | 547,690 | 675,870 |
| 30 | 469,940 | 585,260 | 700,310 |
| 40 | 577,230 | 672,390 | 767,540 |
| 50 | 683,490 | 747,850 | 812,200 |
| Rates include: <ul style="list-style-type: none"> - single firetube, flame arrestor & stack - gas out scrubber dome - high temperature shutdown - 1 oil and 1 gas outlet valve - instrument air manifold c/w regulators - water meter - pressure gauge and thermometer - gauge glasses - pre-piping to skid edge c/w valves - ladder and transformer platformer - fuel gas manifold c/w burning equipment - low level shutdown - oil and water level controller - 2 water outlet valves - relief valve - scrubber - transformer circuit breaker - skid - anodes - insulation - installation | | | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Separators and Treaters

Description

Dehydrators remove liquid from the gas to prevent corrosion or plugging of the flow.

Glycol Absorber Tower (600# ANSI Rating)

The rates for glycol absorber towers are in dollars per unit.

| Size Diameter (in.) x Length (ft.) | Rate | | |
|---------------------------------------|---------------|--|--|
| | Standard Unit | Including 2-Phase Inlet Scrubber | Including 3-Phase Inlet Scrubber |
| 1400 #DWP | | | |
| 12 x 12 | 28,960 | 43,500 | 51,200 |
| 12 x 14 | 30,100 | 44,210 | 52,260 |
| 12 x 16 | 31,220 | 45,910 | 53,730 |
| 12 x 18 | 32,210 | 47,000 | 54,760 |
| 12 x 20 | 33,350 | 48,080 | 55,790 |
| 12 x 30 | 38,300 | 52,580 | 61,790 |
| 1420 #DWP | | | |
| 16 x 12 | 35,100 | 51,580 | 61,770 |
| 16 x 14 | 36,840 | 53,020 | 63,180 |
| 16 x 16 | 38,270 | 54,380 | 64,940 |
| 16 x 18 | 40,010 | 55,790 | 66,300 |
| 16 x 20 | 41,370 | 57,480 | 68,100 |
| 16 x 30 | 47,940 | 65,650 | 76,470 |
| 1400 #DWP | | | |
| 20 x 12 | 44,930 | 64,210 | 75,090 |
| 20 x 14 | 47,000 | 66,300 | 77,170 |
| 20 x 16 | 49,130 | 68,430 | 79,290 |
| 20 x 18 | 51,200 | 70,480 | 81,760 |
| 20 x 20 | 53,730 | 72,690 | 83,880 |
| 20 x 30 | 63,890 | 82,690 | 94,440 |
| 1380 #DWP | | | |
| 24 x 12 | 55,790 | 83,880 | 96,980 |
| 24 x 14 | 60,690 | 88,410 | 101,370 |
| 24 x 16 | 65,250 | 93,030 | 106,310 |
| 24 x 18 | 69,840 | 97,510 | 110,520 |
| 24 x 20 | 74,370 | 102,410 | 115,450 |
| 24 x 30 | 96,410 | 124,260 | 137,340 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Dehydrators

| Size Diameter (in.) x Length (ft.) | Rate | | |
|---|---------------|--|--|
| | Standard Unit | Including 2-Phase Inlet Scrubber | Including 3-Phase Inlet Scrubber |
| 1400 #DWP | | | |
| 30 x 12 | 93,930 | 138,910 | 155,700 |
| 30 x 14 | 100,490 | 145,430 | 162,240 |
| 30 x 16 | 107,140 | 152,040 | 169,180 |
| 30 x 18 | 114,040 | 158,950 | 175,780 |
| 30 x 20 | 119,880 | 165,660 | 182,010 |
| 30 x 30 | 151,270 | 197,410 | 213,590 |
| 36 x 12 | 122,060 | 176,890 | 194,800 |
| 36 x 14 | 130,140 | 185,350 | 203,190 |
| 36 x 16 | 138,100 | 193,330 | 211,210 |
| 36 x 18 | 140,850 | 201,750 | 219,290 |
| 36 x 20 | 154,960 | 209,790 | 227,470 |
| 36 x 30 | 193,800 | 248,940 | 266,430 |
| 42 x 20 | 189,980 | 246,110 | 262,700 |
| 42 x 30 | 228,860 | 283,950 | 301,510 |
| <p>Rates include:</p> <ul style="list-style-type: none"> - knitted 304 stainless wire mesh mist extractor - glycol gas heat exchanger in upper section - liquid level controller with supply gas regulator - diaphragm operated liquid discharge valve with shut-off ball valve - fuel gas shut-off valve - reflex gauge column assembly with safety cocks - thermometer with thermowell - pressure gauge with isolating valve - ASME safety relief valve 1" threaded - skid and building - gas outlet line to skid edge | | | |
| <p>Integral scrubber includes:</p> <ul style="list-style-type: none"> - liquid level controller with supply gas regulator (2 or 3 phase) - diaphragm operated liquid discharge valve with shut-off ball valve (2 or 3 phase) - gauge column assembly with safety cocks (reflex) - cold weather coil - phase drain valve (Apollo) | | | |
| <p>NOTE: DWP refers to design working pressure</p> | | | |

Standard Glycol Reconcentrator Units

The rates for standard glycol reconcentrator units are in dollars per unit.

| Heat Output (BTU/hr.) | Reboiler Size Diameter(in.) x Length (ft.) | Surge Tank Size Diameter(in.) x Length (ft.) | Rate |
|--|--|--|---------|
| 100,000 | 18 x 3.5 | 18 x 3 | 70,530 |
| 155,000 | 18 x 5.5 | 18 x 3.5 | 78,670 |
| 235,000 | 18 x 5.5 | 18 x 3.5 | 92,320 |
| 375,000 | 24 x 6.5 | 24 x 6 | 131,140 |
| 545,000 | 30 x 6.5 | 30 x 6 | 166,550 |
| 750,000 | 30 x 15 | 30 x 12.5 | 189,420 |
| 1,000,000 | 50 x 15 | 30 x 15 | 226,150 |
| 1,250,000 | 50 x 17.5 | 30 x 15 | 278,940 |
| Rates include: <ul style="list-style-type: none"> - glycol pump - flame arrestor - glycol filter - gas firing accessories - thermostats - still column - equipment mounted on structural steel skid - installation Rates do not include: <ul style="list-style-type: none"> - ladders - gas or electric pumps - stand-by pumps - gas sparging or stripping accessories for high concentration glycol | | | |

Accessories (Lump Sum)

| Description | Rate |
|---------------------------------------|--------|
| Skid | |
| 8' x 16' | 9,660 |
| 9' x 22' | 14,750 |
| Ladder | 6,210 |
| Gas sparging or stripping accessories | 6,410 |

CaCl Rollo Units

| Tower Size Diameter (in.) x Length (ft.) | Rate |
|---|---------|
| 22 x 15 | 70,080 |
| 24 x 15 | 76,670 |
| 26 x 15 | 79,200 |
| 22 x 17 | 75,780 |
| 24 x 17 | 80,160 |
| 26 x 17 | 84,550 |
| 24 x 24 | 89,250 |
| 30 x 24 | 105,850 |
| Rates include: <ul style="list-style-type: none"> - pipes - valves - fittings - installation Rates do not include meters and chemical injectors | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Dehydrators

Description

A gas boot is a vapour recovery system that draws gases that are being released in storage tanks.

Rates

The rates for gas boots are in dollars per unit.

| Size Diameter (in.) x Length (ft.) | Rate |
|---|-------------|
| 16 x 5 | 8,680 |
| 16 x 10 | 12,170 |
| 16 x 20 | 19,080 |
| 16 x 40 | 35,810 |
| 16 x 50 | 37,630 |
| 24 x 10 | 27,400 |
| 24 x 20 | 30,010 |
| 24 x 40 | 35,750 |
| 24 x 50 | 39,350 |
| 30 x 20 | 53,490 |
| 30 x 40 | 72,900 |
| 30 x 50 | 82,590 |
| 36 x 35 | 72,550 |
| 36 x 50 | 91,580 |
| NOTE: For 30 in. or 36 in. diameter no ladder or platform included with rates - add \$12,870 if present | |
| Rates include: | |
| - miscellaneous pipe | |
| - valves | |
| - fittings | |
| - installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Gas Boots

Description

A flare stack is used to burn off excess gas.

Rates

The rates for flare stacks are in dollars per stack.

| Height (ft.) | Rate (Diameter) (in.) | | |
|--------------|-----------------------|--------|--------|
| | 4 | 6 | 8 |
| 30 - 60 | 19,740 | 24,080 | 30,200 |
| 70 - 100 | 21,320 | 26,150 | 33,160 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Flare Stacks

Description

The gas passes through this vessel to remove liquids. It functions as a small scale separator.

Fuel Gas Scrubber

The rate for fuel gas scrubbers is in dollars per unit.

| | Rate |
|--|-------------|
| All sizes | 5,130 |
| Rates include: <ul style="list-style-type: none">- shut-off valve- pressure gauge- relief valve- installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Gas Scrubbers

Description

Heaters and heat exchangers are used to prevent line and equipment from freezing.

Heaters

The rates for direct and indirect heaters are in dollars per unit.

| Output Range (BTU) | Rate | |
|--|----------|---------|
| | Indirect | Direct |
| 50,000 - 170,000 | 47,410 | 41,390 |
| 171,000 - 375,000 | 48,430 | 42,790 |
| 376,000 - 625,000 | 51,980 | 44,930 |
| 626,000 - 875,000 | 58,950 | 48,430 |
| 876,000 - 1,250,000 | 69,480 | 58,970 |
| 1,251,000 - 1,750,000 | 82,350 | 71,830 |
| 1,751,000 - 2,500,000 | 96,390 | 75,340 |
| 2,501,000 - 3,500,000 | 117,410 | 110,410 |
| 3,501,000 - 4,500,000 | 145,440 | 114,330 |
| Rates include: <ul style="list-style-type: none"> - fire tube - thief hatch - skid - temperature control and high temperature shut down - flame arrestor and stack - expansion pot c/w instruments - soil (not included with direct) - fuel gas manifold c/w burning - installation | | |

Tubular and Rectangular Plate Heat Exchangers

The rates for tubular and rectangular plate heat exchangers are in dollars per cubic foot.

| Face Area (sq.ft.) | Rate (\$/cu.ft.) |
|--|------------------|
| ≤ 2 | 2,454 |
| 3 | 2,357 |
| 4 | 2,290 |
| 6 | 2,119 |
| 8 | 1,949 |
| 10 | 1,791 |
| 12 | 1,675 |
| 14 | 1,456 |
| Rates include: | |
| <ul style="list-style-type: none"> - standard unit stainless steel plates - installation | |
| Sample Calculation: | |
| Face Area = 3 ft. x 4 ft. | |
| Length = 8 ft. | |
| Volume = 3 ft. x 4 ft. x 8 ft. | |
| = 96 cu.ft. | |
| Rate = \$1,675 /cu.ft. | |
| Value = Volume x Rate | |
| = 96 cu.ft. x \$1,675/cu.ft. | |
| = \$160,800 | |

Description

Meters are used to calibrate the pressure and volume of gas flowing through a flow line or at a gas well.

Dry Flow Meters

The rates for dry flow meters are in dollars per unit.

| Type | Rate |
|--|-------|
| Gas, Dry Flow Recorder Chart 100" (\leq 1000 psi) | |
| 1 or 2 pen | 6,450 |
| 3 pen | 8,160 |

Orifice Fittings and Meter Runs

The rates for orifice fittings and meter runs are in dollars per unit.

| Size (in.) | Rate |
|--|--------|
| Senior Quick Change (100 - 600 psi) | |
| 2 | 8,720 |
| 3 | 10,170 |
| 4 | 12,140 |
| 6 | 15,400 |
| 8 | 18,680 |
| 10 | 21,960 |
| Simplex (150 - 600 psi) | |
| 2 | 2,570 |
| 3 | 3,240 |
| 4 | 3,880 |
| 6 | 5,950 |
| 8 | 7,480 |
| 10 | 9,170 |
| Rates include: | |
| <ul style="list-style-type: none"> - orifice fittings - regulator - pipes - valves and fitting for meter run - installation | |

Net Oil Computer and Micro Motion Meter

| Inlet Size (in.) | Rate |
|--|--------|
| 2 | 45,370 |
| 3 | 48,770 |
| 4 | 52,420 |
| Rates include: - capacitance probe - indicator - installation | |

Positive Displacement Meter

The rates for positive displacement meters are in dollars per unit.

| Line Size (in.) | Rate |
|-------------------------|--------|
| Floco Meter | |
| ≤ 2 | 6,030 |
| 3 to 4 | 8,890 |
| Sampler | 3,400 |
| Sales Meter | |
| ≤ 2 | 14,170 |
| 3 to 6 | 46,580 |
| ≥ 8 | 79,000 |
| Ticket printer | 3,510 |
| Temperature Compensator | 3,920 |
| Brine Meters | |
| ≤ 2 Low (pressure) | 3,040 |
| 2 High (pressure) | 4,450 |
| 3 Low (pressure) | 4,980 |
| 3 High (pressure) | 5,390 |
| Digital Meter | |
| 1 | 7,260 |
| 2 w/cubic meter readout | 9,880 |

Turbine Meters and Totalizer

The rates for turbine meters and totalizers are in dollars per unit.

| Size (in.) | Rate |
|----------------|------------------------|
| ≤ 2 | 13,500 |
| 3 | 14,850 |
| Rates include: | |
| - meter | - fittings |
| - pipes | - miscellaneous valves |
| - totalizer | - installation |

Vortex Liquid Gas or Steam Meters

The rates for vortex liquid gas or steam meters are in dollars per unit.

| Size (in.) | Rate |
|----------------|--------------------------------|
| 2 | 6,090 |
| 6 | 10,440 |
| 8 | 16,590 |
| Rates include: | |
| - meter | - analog amplifier or enhancer |
| - meter run | - miscellaneous valves |
| - fittings | - installation |

Transmitters

The rates for transmitters are in dollars per unit.

| Type | Rate |
|------------------------------|--------|
| Pressure or flow transmitter | 10,440 |
| Temperature transmitter | 6,260 |

Additives

| Type | Rate per Readout |
|-----------------|------------------|
| Computer Assist | 1,260 |

Weighmatic

The rate for weighmatic is in dollars per unit.

| Description | Rate |
|--|-------------|
| Weighmatic - crude oil production rate test system Complete unit | 136,170 |
| Rates include: <ul style="list-style-type: none"> - separator - valves and fittings - computer related equipment - installation Rates do not include gas metering equipment. | |

Cabinet Type Meter Housing

The rate for a meter cabinet is in dollars per unit.

| Type | Rate |
|---|-------------|
| Meter Cabinet | 20,330 |
| Includes: <ul style="list-style-type: none"> - 1-2 pen dry flow recorder - 2 door shed - small separator and associated equipment - lines, valves, meters, gauges, etc - installation - freight | |

Description

A valve is a device used to control the rate of flow in a line, to open or shut off a line completely, or to serve as an automatic or semi-automatic safety device.

Valves

The rates for valves are in dollars per unit.

Gate Valves

| Size (in.) | Rate | |
|------------|-----------------------------|--|
| | 1500 Working Pressure (lb.) | |
| 2 | 9,790 | |
| 3 | 13,150 | |
| 4 | 16,030 | |

Ball Valves

| Size (in.) | Rate | |
|------------|------------------------|--------|
| | Working Pressure (lb.) | |
| | < 2000 | ≥ 2000 |
| 2 | 5,160 | 6,400 |
| 3 | 6,810 | 8,300 |
| 4 | 8,790 | 12,810 |
| 6 | 12,430 | 17,400 |
| 8 | 22,580 | 32,420 |

Water Check Valves

| Size (in.) | Rate | | |
|------------|------------------------|-------|--------|
| | Working Pressure (lb.) | | |
| | 150 | 300 | 600 |
| < 4 | 1,660 | 2,050 | 2,400 |
| 6 - 8 | 2,960 | 4,060 | 6,080 |
| 10 | 5,530 | 7,090 | 10,600 |
| 12 | 7,490 | 8,800 | 13,120 |

Check Valves

| Size | Rate |
|------|--------|
| < 4 | 2,660 |
| 6 | 8,980 |
| 8 | 15,210 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Valves and Controls

Desurgers

| Size (in.) | Rate |
|------------|--------|
| ≤ 2 | 8,610 |
| 3 | 11,680 |
| 4 | 14,380 |

Pneumatic and Electric

| Size (in.) | Rate | |
|--|--------|--------|
| | 2-Way | 3-Way |
| Pneumatic | | |
| ≤ 2 | 6,720 | 10,080 |
| 3 | 9,200 | 14,460 |
| 4 | 12,010 | 17,250 |
| 6 | 19,440 | |
| Electric | | |
| ≤ 2 | 9,720 | 10,390 |
| 3 | 12,180 | 13,070 |
| Rates include: - valve - actuator - installation | | |
| NOTE: High-low pressure shutdown, rate at \$2,060. Intermitter (time cycle control), rate at \$2,770. | | |

Surface Safety Valves

| Type | Typical Model | Rate |
|--|---------------------|--------|
| Self actuating | Willis B-15 & B-20 | 11,880 |
| | Willis C-15 | 11,880 |
| Hydr/Elect. actuating | Willis HYG 20 3000# | 17,880 |
| | Willis HYG 30 3000# | 17,880 |
| | Willis HYG 40 3000# | 17,880 |
| Pneumatic actuating | Willis PG 20 3000# | 26,970 |
| | Willis PG 30 3000# | 26,970 |
| | Willis PG 40 3000# | 26,970 |
| Rates include: - valve - actuator and fittings - installation | | |

Pressure Control Switch

| Type | Rate |
|----------------|-------|
| Presco, Murphy | 1,320 |

Choke

The rates for chokes are in dollars per unit.

| Type | Size (in.) | Rate |
|-------------------------------|------------|--------|
| Low pressure and low volume | ≤ 2 | 1,520 |
| High pressure and high volume | 3 - 6 | 12,890 |

Lease Automatic Custody Transfer Unit

The rates for lease automatic custody transfer units are in dollars per unit.

| Size (in.) | Rate | |
|------------|----------------|----------|
| | 150 & 300 ANSI | 600 ANSI |
| 2 | 117,040 | 128,050 |
| 3 | 140,260 | 153,500 |
| 4 | 174,720 | 203,500 |
| 6 | 232,760 | 280,340 |
| 8 | 289,220 | 369,630 |

Rates include:

- meter
- sampler
- valves
- strainer
- pressure indicator
- pipe fittings
- BS&W monitor
- skid
- installation

Rates do not include booster and shipping pumps.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Valves and Controls

Description

A pump is used to increase the pressure on a fluid in order to move the fluid through a pipe.

Rates

The rates for pumps are in dollars per unit.

Centrifugal Pump

| Inlet Size (in.) | Rate |
|------------------|-------|
| 1 | 4,680 |
| 2 | 5,500 |
| 3 | 6,200 |
| 4 | 6,610 |
| 5 | 7,740 |
| 6 | 9,190 |

Gear Pump

| Inlet Size (in.) | Rate |
|------------------|--------|
| 2 | 4,820 |
| 3 | 6,020 |
| 4 | 10,430 |
| 6 | 11,530 |

Progressive Cavity

| Inlet Size (in.) | Rate |
|------------------|--------|
| 1 | 4,740 |
| 2 | 6,810 |
| 3 | 8,760 |
| 4 | 13,310 |
| 6 | 15,560 |
| 8 | 20,580 |

NOTE:

- 1) Add for prime movers
- 2) The rates above are for 1 stage pumps.
To determine the 2 and 3 stage pump rates, 12% of the 1 stage pump rate is added to each subsequent stage.

Rate include:

- pump
- base
- valves and fittings
- installation

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Pumps

Reciprocating (Plunger) Pumps

| Input (hp) | Rate | | | |
|---|---------|--------|---------|------------|
| | Simplex | Duplex | Triplex | Quintuplex |
| 3 | 30,050 | 39,180 | | |
| 5 | 33,200 | 39,940 | | |
| 10 | 42,210 | 44,030 | | |
| < 21 | | | 47,490 | 56,640 |
| 21 - 40 | | | 60,030 | 71,640 |
| 41 - 70 | | | 86,730 | 140,290 |
| 71 - 100 | | | 126,920 | 152,770 |
| 101 - 150 | | | 156,020 | 230,720 |
| 151 - 250 | | | 216,180 | 238,150 |
| > 250 | | | 386,980 | 389,460 |
| Rates include: - pump - base - prime mover - installation | | | | |

Transformer and Injection Pumps

| Size (hp) | Rate |
|--|---------|
| 10 | 95,240 |
| 20 | 100,610 |
| 30 | 106,090 |
| 50 | 116,760 |
| 100 | 143,650 |
| 250 | 224,690 |
| 500 | 359,310 |
| 750 | 494,000 |
| 1000 | 628,880 |
| Rates include: - motor - thrust chamber - intake section - pump - shutdown switches - skid - installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Chemical Injectors

Description

Chemical injectors are used to add chemicals to prevent freezing, plugging or corrosion or to assist in whatever process is being carried out in the treatment or other cycle.

Rates

The rates for chemical injectors are in dollars per unit.

| Description | Size (hp) | Rate |
|---|------------------|-------------|
| Electric motor driven (add for tanks > 60 imp. gal.) | ≤ 2 | 8,210 |
| | 3 and 5 | 20,820 |
| Multiple head proportioning pump | | 8,520 |
| Air/gas driven | | 4,790 |
| Alcohol drip (9 imp. gal. tank) | | 1,690 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Chemical Injectors

Description

Compressors are used to supply air pressure to operate valves, fire flood wells and to transport gas in a flow line.

Utility Air Compressors

The rates for utility air compressors are in dollars per unit.

| Size | | Rate |
|---|------|--------|
| (hp) | (KW) | |
| ½ - 1 | 0.37 | 8,660 |
| 1½ - 3 | 2.20 | 15,220 |
| 5 | 3.70 | 18,390 |
| Rates include: - air receiver - motor - installation | | |

Instrument Air Compressors

The rates for instrument air compressors are in dollars per unit.

| Size | | Rate |
|---|--------------|--------|
| (hp) | (KW) | |
| ≤ 10 | 0.37 | 36,950 |
| 11 - 15 | 7.46 - 11.19 | 50,880 |
| 16 - 20 | | 69,070 |
| > 20 | | 74,950 |
| Rates include: - air receiver - explosion-proof motor - dryer and after cooler - installation | | |

Injection Air Compressors

The rates for injection air compressors are in dollars per unit.

| Size (hp) | Rate |
|----------------------------|-----------------|
| 400 | 1,204,120 |
| 550 | 1,542,610 |
| 1000 | 2,457,490 |
| 2000 | 2,785,420 |
| 3000 | 3,309,980 |
| 4000 | 3,904,300 |
| Rates include: | |
| - air intake, coolers | - valves |
| - fittings and equipment | - concrete base |
| - engine or electric motor | - installation |
| - miscellaneous pipes | |
| - metering and controls | |

Natural Gas Compressors

The rates for natural gas compressors are in dollars per horsepower unit.

| Description | Rate |
|---|-------------|
| Turbine engine/centrifugal (gas plant) | 8,570 |
| Reciprocating engine (gas plants) | 6,060 |
| Reciprocating or electric (field gathering) | 4,020 |
| Rates include: | |
| - building | |
| - gauge board | |
| - filters | |
| - electrical equipment | |
| - atmospheric-type jacket water cooler | |
| - free air and exhaust duct | |
| - scrubber | |
| - supports | |
| - electrical substation | |
| - skid or concrete base | |
| - suction or discharge bottles | |
| - compressor | |
| - conductors and conduit | |
| - central panel | |
| - pumps | |
| - intake or exhaust silencer | |
| - main switchboard | |
| - installation | |

Description

Cathodic protection uses a rectifier with a network of wires and anodes installed to create an electric field around flow lines and casing in corrosion prevention.

Rates

The rates for cathodic protection rectifiers are in dollars per unit.

| Size (amperage) | Rate |
|---|--------|
| Single well (12 - 16) | 14,530 |
| Field system (17 - 25) | 21,790 |
| Rates include: | |
| <ul style="list-style-type: none"> - rectifier - conduit and fittings - 2" x 60" steel anodes - cadwelds and handicap - cables - splice kits and connectors - installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Cathodic Protection Rectifiers

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Control Panels

Description

Control panels are switches and other devices used to start, stop, measure, monitor or signal the operation of equipment.

Rates

The rates for control panels are in dollars per unit.

| Power Rating | | Rate |
|--|-------------|-------------|
| (hp) | (KW) | |
| ≤ 50 | < 38 | 32,930 |
| 51 - 450 | 38 - 336 | 73,360 |
| 451 - 850 | 337 - 634 | 127,890 |
| 851 - 1500 | 635 - 1119 | 219,010 |
| 1501 - 2500 | 1120 - 1865 | 293,090 |
| 2501 - 4000 | 1866 - 2984 | 365,570 |
| Rates include: - relays - control circuit gauges - installation | | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Control Panels

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Steam Generators

Description

Steam generators are used to inject steam to the producing formation for enhanced oil recovery systems.

Rates

The rates for steam generators are in dollars per unit.

| Description | Rate |
|---|------------------|
| 10,000,000 BTU/hr. unit | |
| Generator | 1,147,470 |
| Water softener and filter | 90,930 |
| Trailer | 127,250 |
| Building (on trailer) | 86,260 |
| Total for Unit | 1,451,910 |
| 18,500,000 BTU/hr. unit | |
| Generator | 1,158,020 |
| Water softener and filter | 91,020 |
| 2 Trailers (soft and gen) | 199,610 |
| 2 Buildings (on trailer) | 148,710 |
| Total for unit | 1,597,360 |
| 22,000,000 BTU/hr. unit | |
| Generator | 1,178,810 |
| Water softener and filter | 102,010 |
| 2 Trailers (soft and gen) | 236,330 |
| 2 Buildings (on trailer) | 156,420 |
| Total for unit | 1,673,570 |
| 25,000,000 BTU/hr. unit | |
| Generator | 1,346,770 |
| Water softener and filter | 109,440 |
| 1 Trailers | 200,170 |
| 1 Buildings | 91,300 |
| Total for unit | 1,747,680 |
| 50,000,000 BTU/hr. unit schedule 80 to 160 | |
| 1,750 to 2,400 psi | |
| Base, installation, tie-in | 2,497,110 |
| Generator | 2,549,760 |
| Water softeners and filters | 212,480 |
| Materials and accessories | 405,260 |
| Total for Unit | 5,664,610 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Steam Generators

| Description | Rate |
|--|------------------|
| ≥ 100,000,000 BTU/hr. unit schedule 80 to 160 | |
| 1,750 to 2,400 psi | |
| Base, installation, tie-in | 2,743,420 |
| Generator | 3,444,260 |
| Water softeners and filters | 292,520 |
| Materials and accessories | 405,760 |
| Total for Unit | 6,885,960 |
| Rates include: <ul style="list-style-type: none"> - softeners - filters - accessories - installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Filters

Description

Filters are used for cleaning water.

Sand Filter

The rates for sand filters are in dollars per tank unit.

| Tank Size (in.) | Imp. Gal. per Minute | Pipe Size (in.) | Rate |
|-----------------|----------------------|-----------------|---------|
| 20 x 54 | 30 | 1½ | 18,200 |
| 24 x 54 | 40 | 1½ | 21,120 |
| 30 x 60 | 60 | 2 | 28,790 |
| 36 x 60 | 90 | 2½ | 37,810 |
| 42 x 60 | 120 | 3 | 58,620 |
| 48 x 60 | 150 | 3 | 71,110 |
| 60 x 60 | 250 | 4 | 104,260 |
| 72 x 60 | 420 | 6 | 158,860 |
| 84 x 60 | 580 | 6 | 211,260 |

Carbon Filter

The rates for carbon filters are in dollars per tank unit.

| Tank Size (in.) | Imp. Gal. per Minute | Pipe Size (in.) | Rate |
|-----------------------|----------------------|-----------------------|--------|
| 20 x 54 | 10 | 1½ | 16,770 |
| 24 x 54 | 15 | 1½ | 19,810 |
| 30 x 60 | 25 | 2 | 24,310 |
| 36 x 60 | 35 | 2 | 32,540 |
| 42 x 60 | 50 | 2½ | 47,040 |
| 48 x 60 | 65 | 2½ | 55,810 |
| 60 x 60 | 100 | 3 | 76,250 |
| Rates include: | | | |
| - concrete base | | - miscellaneous pipes | |
| - valves and fittings | | - installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Filters

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Industrial Water Softeners

Description

Water softeners are used to soften the water for steam generators.

Rates

The rates for industrial water softeners are in dollars per tank unit.

Single Unit

| Softener Tank Width (in.) x Height (in.) | Brine Tank Width (in.) x Height (in.) | Imp. Gal. per Minute | Pipe Size (in.) | Rate | |
|---|--|-------------------------|--------------------|-----------------|-----------------|
| | | | | Single Units | Duplex Units |
| 20 x 54 | 24 x 80 | 55 | 2 | 25,590 | 51,430 |
| 24 x 54 | 30 x 48 | 75 | 2½ | 30,080 | 60,440 |
| 30 x 60 | 38 x 48 | 125 | 3 | 40,970 | 82,280 |
| 36 x 60 | 42 x 48 | 175 | 4 | 54,350 | 109,210 |
| 48 x 60 | 48 x 60 | 150 | 3 | 62,880 | 126,190 |
| 54 x 60 | 54 x 60 | 275 | 4 | 73,950 | 148,460 |
| 60 x 60 | 60 x 60 | 400 | 4 | 83,790 | 168,310 |
| 72 x 60 | 72 x 60 | 560 | 6 | 128,420 | 257,880 |
| 84 x 60 | 84 x 60 | 760 | 6 | 170,930 | 343,380 |

Rates include:

- time clock control
- specific gravity meter
- injectors
- valves and fittings
- liquid level control
- hardness monitor
- concrete base
- water meters
- chemical
- miscellaneous pipes
- installation

Rates do not include pumps and motors.

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Industrial Water Softeners

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Flow Lines and Service Lines

Description

A flow line is a line of pipe used to transport or conduct oil or gas within a well site to a battery or gas handling site, satellite, gas plant, compressor station, or other facility at which the oil or gas is prepared for pipeline transport.

A service line is a line of pipe used to transport water from a water source well or to transport fuel gas to an oil well site prime mover or to transport water, steam, air, oxygen, acid or carbon dioxide to enhance the recovery of oil from an oil well.

Oil, Gas, Water and Air Lines

The rates for oil, gas, water and air lines are in dollars per lineal foot.

| Line Size (in.) | Rate | | |
|---|-------------|-----------|----------------|
| | Plastic (L) | Steel (N) | Fibreglass (F) |
| 1 | 8.56 | 20.16 | |
| 2 | 10.05 | 22.18 | 20.22 |
| 3 | 13.79 | 26.70 | 26.28 |
| 4 | 18.13 | 30.69 | 35.26 |
| 6 | 30.79 | 41.87 | 62.31 |
| 8 | 43.73 | 56.67 | 97.51 |
| 10 | 59.03 | 76.36 | 118.80 |
| 12 | 75.56 | 92.59 | 145.38 |
| 14 | 89.92 | 100.44 | 171.96 |
| Rates include: - construction contract - land right-of-way - pipe - exterior coating - damages and pre-staking - engineering - radiographic inspection - legal survey | | | |

Internal Coated Pipes

The rates for internal coated pipes are in dollars per lineal foot.

| Pipe Size (in.) | Rate (C) |
|-----------------|----------|
| 2 | 53.09 |
| 3 | 65.73 |
| 4 | 80.05 |
| 6 | 118.34 |
| 8 | 156.57 |

Steel Pipe with Polyethylene Liner

The rates for steel pipe with polyethylene liner are in dollars per lineal foot.

| Pipe Size (in.) | Rate |
|------------------------|-------------|
| 2 | 47.53 |
| 3 | 53.44 |
| 4 | 60.60 |
| 6 | 82.99 |
| 8 | 103.29 |
| 10 | 128.97 |
| 12 | 163.18 |
| 14 | 193.93 |

Steam Service Lines

The rates for steam service lines are in dollars per lineal foot.

| Pipe Size (in.) | Rate |
|------------------------|-------------|
| 1 | 69.25 |
| 2 | 78.70 |
| 3 | 80.93 |
| 4 | 84.61 |
| 6 | 109.72 |
| 8 | 132.30 |

Description

Manifolds are systems of headers and branch piping that can be used to gather or distribute fluids. Typically manifolds include valves for controlling the on/off flow of fluids.

Rates

The rates for manifolds are in dollars per manifold.

Production

| Size (in.) | Rate | |
|------------|--------|-----------|
| | Manual | Automatic |
| 1 | 3,160 | 11,000 |
| 2 | 7,850 | 14,680 |
| 3 | 11,320 | 21,760 |
| 4 | 15,500 | 27,330 |
| 6 | 22,400 | 34,610 |
| 8 | 32,030 | 45,690 |
| 10 | 46,450 | 57,570 |
| 12 | 67,170 | 84,630 |
| 14 | 97,060 | 122,290 |

Injection

| Size (in.) | Rate | | |
|--|--------|-----------|--------|
| | Water | Air & Gas | Steam |
| 2 | 9,130 | 9,910 | 11,780 |
| 3 | 12,740 | 13,680 | 16,410 |
| 4 | 16,610 | 17,700 | 21,200 |
| Rates include: - pipe - fittings - valves - installation | | | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Manifolds

Description

Scraper traps are used to insert scrapers to clean out the flow lines and service lines.

Rates

The rates for scraper traps are in dollars per trap or injection unit.

Receiving and Launching Traps

| Line Size (in.) | Rate | |
|-----------------|-------------|----------------|
| | With Bypass | Without Bypass |
| 2 | 11,650 | 5,210 |
| 3 | 14,080 | 6,380 |
| 4 | 16,360 | 7,400 |
| 6 | 24,230 | |
| 8 | 31,250 | |
| 10 | 44,850 | |
| 12 | 56,820 | |

Automatic Pig Injection

| Line Size (in.) | Rate |
|---|--------|
| 2 | 16,080 |
| 3 | 26,030 |
| 4 | 42,660 |
| Rates include: | |
| <ul style="list-style-type: none"> - valves - miscellaneous pipe and fittings - installation | |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Scraper Traps

Description

In heavy oil areas, oil is often trucked to the battery where it is measured by weight and dumped into a receiving pit.

Rates

Balance scales are the typical platform-type scale that allow the complete vehicle to be weighed. Load cell scales weigh one set of axles at a time. The rates for scales are in dollars per unit.

| Type | Rate |
|-----------------|---------|
| Balance scale | 215,060 |
| Load cell scale | 163,200 |

Section: Oil & Gas Well Resource Production Equipment

Resource Production Equipment

Subject: Truck Scales

Summary

This section describes the formulas, rules and principles for determining the assessed value of mine resource production equipment.

Definitions

Mine resource production equipment is the fixtures, machinery, tools, railroad spur tracks, and other appliances used to extract and produce the ore but does not include equipment used to process or refine the ore.

Shaft linings, safety equipment, shop tools for maintenance service, spare parts, and surplus equipment are not resource production equipment by which a mine is operated.

Formulas, Rules and Principles

The assessed value of mine resource production equipment shall be determined by the replacement cost method established in this section. The replacement cost new shall be determined using the unit-in-place method or the trended original cost method.

The replacement cost of continuous belt conveyors over 1,000 feet in length, and solution mining resource production equipment shall be determined by the unit-in-place method. The unit-in-place base rates account for all direct and indirect costs. No additional adjustments shall be made to the base rates.

The unit-in-place base rates for solution mining resource production equipment shall be determined in accordance with the rates schedules in Chapter 4 – Resource Production Equipment, Section 4.1 – Oil and Gas Well Resource Production Equipment.

The trended original cost shall include all direct and indirect costs. Direct costs include materials, labour, supervision, equipment rentals, and utilities. Indirect costs include architectural and engineering fees, building permits, title and legal fees, insurance, interest and fees on construction loans, taxes incurred during construction, advertising and sales expense, and overhead and profit. Trended original costs shall be determined FOB the mine site as of January 1, 2019.

Depreciation shall be determined by calculating the amount of physical deterioration using the lifetime depreciation method. Functional and economic obsolescence shall not be accounted for in the calculation of depreciation. No additional allowance shall be made for depreciation except as may be accounted for in the downtime allowance factor.

The downtime allowance and the downtime allowance factor for mine resource production equipment shall be determined by the schedule of rates method. The downtime allowance and the downtime allowance factor shall account for all the loss in value due to under-utilization of the resource production equipment. This includes any loss in value due to differences in replacement cost and difference in the amount of depreciation, that have not been taken into account using the procedures in this Manual.

Replacement Cost New

The following mine resource production equipment shall be valued:

- Head frame and head house including mechanical and electrical equipment;
- Service and production hoists c/w cages, skips, pulleys, cables, guide ropes and rails, skip load and dump facilities;
- Water control – pipes, pumps, motors;
- Compressed – air service – piping, compressors, motors, controls;
- Personnel and service vehicles;
- Mobile and overhead cranes, forklifts;
- Ventilation systems, fans, ducts;
- Heating and cooling facilities;
- Warning system;
- Production equipment – miners, drag lines, loaders, loading shovels, front-end loaders, ore trucks, ore haulers, scoop trams, conveyor systems and numerous ancillary and auxiliary equipment;
- Drills and blasting equipment;
- Feeders and crushers;
- Roof and floor maintenance equipment, rock bolters, graders, scraper haulers;
- Crawler and wheel tractors c/w dozers and/or buckets;
- Electrical wiring and equipment required to operate plant and equipment; and
- Any other equipment used in the mining operation that is not listed as an exclusion.

The following mine resource production equipment shall not be valued:

- Shaft linings – concrete, steel, wood, etc. (tubing and cribbing);
- Safety equipment – fire, personal, etc.;
- Sharp tools for maintenance and service;
- Spare parts; and
- Surplus equipment.

Unit-In-Place Method

The replacement cost of new conveyors and solution mining resource production equipment shall be determined as follows:

1. Determine the type of resource production equipment using the rating guide.
2. Determine the features requiring unit-in-place adjustment.
3. Calculate the replacement cost of the resource production equipment by adjusting the base rate by the unit-in-place adjustments.

Trended Original Cost Method

The replacement cost new shall be determined as follows:

1. Determine the original construction cost of all the resource production equipment at the facility.
2. Determine the direct and indirect costs requiring an adjustment.
3. Determine the comparative cost index for mine resource production equipment required to adjust construction costs to January 1, 2019.
4. Calculate the construction cost of all the resource production equipment at the facility by adjusting the original construction cost for any direct or indirect costs requiring adjustment and multiplying the adjusted original construction cost by the comparative cost index.
5. Determine replacement cost of conveyors and solution mining resource production equipment that is valued by the unit-in-place method.
6. Calculate the replacement cost new of the resource production equipment by subtracting the replacement cost new of conveyors and solution mining resource production equipment from the construction cost of all the resource production equipment in the facility.

Physical Deterioration

Lifetime Depreciation Method

The amount of physical deterioration shall be 40 percent. When calculating replacement cost less depreciation no additional allowance shall be made for depreciation.

Downtime Allowance

Schedule of Rates Method

The downtime allowance for all mine resource production equipment shall be 10 percent.

Downtime Allowance Factor

Schedule of Rates Method

The downtime allowance factor shall be determined for mine resources production equipment that is not used for 30 days or more in the 12 month period preceding January 1st of the year to which the assessment roll relates.

Periods of time less than 7 consecutive days during which mine resource production equipment is not used shall not be included in the calculation of the number of down days.

The downtime adjustment factor shall be determined by application of the following formula:

$$DAF = 1 - \frac{DD - 30}{365}$$

where: DAF = downtime adjustment factor
DD = number of down days

Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: General Rules

Calculation Procedure

| Description | Document No. | Page No. |
|---|--------------|----------|
| a) Conveyor Base Rate | 4.2.3 | 1 |
| b) Unit-in-Place Resource Production Equipment | 4.2.1 | 2 |
| c) Trended Original Cost Resource Production Equipment | 4.2.1 | 3 |
| d) Replacement Cost New = (a + b + c) | | |
| e) RCN less Physical Deterioration and Downtime Allowance = $d \times (1 - (e_1 + e_2))$ | | |
| e ₁ . Physical Deterioration | 4.2.1 | 3 |
| e ₂ . Downtime Allowance | 4.2.1 | 3 |
| f) Downtime Allowance Factor | 4.2.1 | 3 |
| g) Assessed Value (e x f) | | |

Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Comparative Cost Factor

Description

The comparative cost factors are used to determine the replacement cost new of mine resource production equipment valued by the trended original cost method.

Application

The trended original cost method shall be used when the individual components of resource production equipment cannot be determined or estimated. The trended original cost method shall not be used to determine the replacement cost of conveyors or solution mining resource production equipment.

Comparative Cost Factor

The comparative cost factor shall be used to calculate the replacement cost new of resource production equipment as of January 1, 2019.

Factors

| Year | Comparative Cost Factor |
|----------------|-------------------------|
| 1940 and older | |
| 1941 | |
| 1942 | |
| 1943 | |
| 1944 | |
| 1945 | |
| 1946 | |
| 1947 | |
| 1948 | |
| 1949 | |
| 1950 | |
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| 1966 | |
| 1967 | |
| 1968 | |
| 1969 | |
| 1970 | |
| 1971 | |
| 1972 | |
| 1973 | |
| 1974 | |

Portions of this section are not available for viewing due to licensing with Marshall and Swift. Therefore the factors etc. have been intentionally left blank.

This information is available for purchase by contacting:

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Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Comparative Cost Factor

| Year | Comparative Cost Factor |
|----------------|--------------------------------|
| 1975 | |
| 1976 | |
| 1977 | |
| 1978 | |
| 1979 | |
| 1980 | |
| 1981 | |
| 1982 | |
| 1983 | |
| 1984 | |
| 1985 | |
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| 2008 | |
| 2009 | |
| 2010 | |
| 2011 | |
| 2012 | |
| 2013 | |
| 2014 | |
| 2015 | |
| 2016 | |
| 2017 | |
| 2018 and newer | |

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Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Conveyors

Description

Conveyors are used to transport ore within a mine facility.

Application

The rate schedule shall be applied to continuous belt conveyors over 1,000 feet in length. Continuous belt conveyors less than 1,000 feet in length and all special design, tripper automatic loading and unloading, extensible, mobile bridge and bridge conveyors shall be valued by the trended original cost method.

Continuous Belt Conveyor

The rates for conveyors are in dollars per lineal foot.

| Belt Width (in.) | Rate |
|--|-------------|
| 24 | 257 |
| 30 | 302 |
| 36 | 353 |
| 42 | 380 |
| 48 | 474 |
| 54 | 533 |
| 60 | 570 |
| 72 | 678 |
| Rates include: - belting - drives - structure - hardware | |

Section: Mine Resource Production Equipment

Resource Production Equipment

Subject: Conveyors
