

**APPENDIX III**

**2002**

**ALBERTA  
MACHINERY & EQUIPMENT  
ASSESSMENT MANUAL**



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# TABLE OF CONTENTS

## SECTION 1 MACHINERY & EQUIPMENT ASSESSMENT MANUAL

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<b>1.000</b>	<b>SCHEDULE A –BASE COST .....</b>	<b>1</b>
	<b>1.001 MACHINERY AND EQUIPMENT NOT DESCRIBED IN SCHEDULE A.....</b>	<b>1</b>
	1.001.100 Table 1–Cost Factors.....	1
	<b>1.005 MACHINERY AND EQUIPMENT DESCRIBED IN SCHEDULE A.....</b>	<b>2</b>
	<b>1.010 TANKS.....</b>	<b>2</b>
	1.010.100 Steel Bolted, Welded, or Pop Tanks–Above Ground.....	2
	1.010.200 Stairways–Walkways–Stiles .....	3
	1.010.300 Steel Welded Underground Tanks.....	3
	1.010.400 Tanks–Insulation and Coatings.....	4
	1.010.420 Steel Tanks–Fibreglass Insulation (50 mm) .....	4
	1.010.430 Steel Tanks–Fibreglass Insulation (76 mm) .....	5
	1.010.500 Steel Tanks–Urethane Insulation (25 mm) .....	5
	1.010.510 Steel Tanks–Urethane Insulation (38 mm) .....	6
	1.010.520 Steel Tanks–Urethane Insulation (50 mm) .....	6
	1.010.600 Fibreglass Tanks–Vertical.....	7
	1.010.620 Fibreglass Tanks–Underground.....	7
	1.010.640 Fibreglass Tanks–Insulation .....	7
	1.010.700 Steel Pop Tanks–Rectangular .....	7
	1.010.720 LPG Steel Tanks .....	8
	1.010.800 Steel Chemical Storage Tanks .....	8
	1.010.820 Plastic Chemical Storage Tanks .....	8
	<b>1.020 HEATERS, GAUGES, AND SWITCHES .....</b>	<b>9</b>
	1.020.100 Tank Heaters.....	9
	1.020.200 Indirect Fired Line Heaters.....	9
	1.020.300 Tank Gauges.....	9
	1.020.400 Level Switches .....	10
	<b>1.030 TREATERS.....</b>	<b>10</b>
	1.030.100 Vertical .....	10
	1.030.200 Mechanical–Horizontal.....	11
	1.030.300 Electro Static/Dual Polarity–Horizontal .....	11
	<b>1.040 SEPARATORS .....</b>	<b>12</b>
	1.040.100 Vertical 2-Phase.....	12
	1.040.200 Vertical 3-Phase.....	13
	1.040.300 Horizontal 2-Phase .....	13
	1.040.400 Horizontal 3-Phase .....	14
	1.040.500 Vertical Centrifugal/Recycling.....	14
	1.040.600 Environmental Low Stage Separator Tank Units.....	15
	1.040.700 Pre-Fabricated Environmental Battery Units .....	15
	<b>1.050 FUEL GAS SCRUBBERS .....</b>	<b>16</b>
	<b>1.060 FREE WATER KNOCKOUTS .....</b>	<b>17</b>

<b>1.070 GAS BOOTS</b> .....	<b>17</b>
<b>1.080 FLARE SYSTEMS</b> .....	<b>17</b>
1.080.100 Vent Stacks 100 mm (4 in.) Stack.....	17
1.080.120 Vent Stacks 150 mm (6 in.) Stack.....	18
1.080.140 Vent Stacks 203 mm (8 in.) Stack.....	18
1.080.200 Flare Stacks Pilot & Shottube 100 mm (4 in.) Stack.....	18
1.080.220 Flare Stacks Pilot & Shottube 150 mm (6 in.) Stack.....	18
1.080.240 Flare Stacks Pilot & Shottube 200 mm (8 in.) Stack.....	18
1.080.300 Flare Stacks–Manual or Automatic or Solar Igniter 100 mm (4 in.) Stack.....	19
1.080.320 Flare Stacks–Manual or Automatic or Solar Igniter 150 mm (6 in.) Stack.....	19
1.080.340 Flare Stacks–Manual or Automatic or Solar Igniter 200 mm (8 in.) Stack.....	19
1.080.500 Incinerators .....	19
<b>1.090 COMPRESSORS</b> .....	<b>20</b>
1.090.100 Vapour Recovery –Blower .....	20
1.090.200 Vapour Recovery–Single Stage.....	20
1.090.300 Vapour Recovery–Two Stage.....	20
1.090.400 Gas Compressors–Two Stage Electric Drive – Packaged .....	21
1.090.500 Gas Compressors–Two Stage Gas Drive–Packaged.....	21
<b>1.100 PUMPS</b> .....	<b>22</b>
1.100.100 Vertical Turbine Pumps.....	22
1.100.200 Centrifugal Pumps–End Suction .....	22
1.100.300 Centrifugal Pumps–Vertical Inline.....	23
1.100.400 Rotary Gear Pumps .....	23
1.100.500 Progressive Cavity Pumps.....	24
1.100.600 Piston / Plunger Pumps .....	24
1.100.700 Waterflood Pumps .....	25
<b>1.110 AIR COMPRESSORS</b> .....	<b>25</b>
1.110.100 Utility Air Compressors .....	25
1.110.200 Instrument Air Compressors–Reciprocating .....	25
1.110.300 Instrument Air Compressors–Rotary Screw .....	26
<b>1.120 CHEMICAL INJECTORS</b> .....	<b>26</b>
1.120.100 Electric Drive.....	26
1.120.200 Air/Gas Drivers.....	26
1.120.300 Oscillamatic.....	27
<b>1.130 CONTROL VALVES</b> .....	<b>27</b>
1.130.100 Emergency Shutdown Valves (ESD).....	27
1.130.200 2-Way Pneumatic Valves.....	27
1.130.300 Intermitter–Time Cycle Controller .....	28
<b>1.140 CHOKES</b> .....	<b>28</b>
1.140.100 Wellhead/Manifolds–Willis Manual .....	28
1.140.200 Wellhead/Manifolds–Master Flo Manual.....	28
1.140.300 Wellhead/Manifolds–Willis Pneumatic .....	28
1.140.400 Wellhead/Manifolds–Master Flo Pneumatic .....	29
<b>1.150 ORIFICE FITTING AND METER RUNS</b> .....	<b>29</b>

1.150.100	Senior .....	29
1.150.200	Simplex .....	29
<b>1.160</b>	<b>METERING AND ANALYSIS .....</b>	<b>30</b>
1.160.100	Mechanical Liquid Meters .....	30
1.160.200	Mechanical Gas Meters .....	30
1.160.300	Liquid Turbine Meters .....	30
1.160.400	Totalizers and Analyzers.....	31
1.160.500	Capacitance Probes.....	31
1.160.600	Chart Recorders.....	31
1.160.700	Transmitters .....	31
<b>1.170</b>	<b>PRODUCTION MANIFOLDS.....</b>	<b>32</b>
1.170.100	Manual–Per Well.....	32
1.170.200	Rotary Selector Valve .....	32
<b>1.180</b>	<b>PIGGING EQUIPMENT .....</b>	<b>33</b>
1.180.100	Pig Launcher/Receiver Traps .....	33
1.180.200	Pig Entry Tees.....	33
1.180.300	Pig Ball Valves–Manual Injectors.....	33
<b>1.190</b>	<b>ELECTRICAL SERVICES .....</b>	<b>34</b>
1.190.100	General Service Entrance on the Site .....	34
1.190.400	Thermo–Electric Generators.....	34
1.190.500	Remote System Radio Towers .....	34
1.190.600	Fire and Gas Detection Systems .....	34
<b>1.230</b>	<b>DEHYDRATORS .....</b>	<b>35</b>
1.230.100	Calcium Chloride Dryers .....	35
1.230.200	Glycol Dehydrator Package - 2 Phase.....	35
1.230.300	Glycol Dehydrator Package Options.....	36
<b>1.240</b>	<b>FILTERS .....</b>	<b>37</b>
1.240.100	Peco Liquid Filters .....	37
1.240.200	Peco Gas Filter Separations.....	37
1.240.300	Peco Dry Gas Filters.....	37
<b>1.250</b>	<b>LACT UNITS.....</b>	<b>38</b>
1.250.100	60 mm and 89 mm Piping Units.....	38
1.250.200	114 mm Piping Units.....	38
<b>2.000</b>	<b>SCHEDULE B–ASSESSMENT YEAR MODIFIERS .....</b>	<b>39</b>
<b>3.000</b>	<b>SCHEDULE C–DEPRECIATION.....</b>	<b>40</b>
3.001	TABLE 1–ANTICIPATED AGE LIFE .....	41
3.002	TABLE 2–DEPRECIATION FACTORS - ANTICIPATED AGE LIFE .....	42
<b>4.000</b>	<b>SCHEDULE D–ADDITIONAL DEPRECIATION.....</b>	<b>44</b>



## 1.000 SCHEDULE A –BASE COST

### 1.001 MACHINERY AND EQUIPMENT NOT DESCRIBED IN SCHEDULE A

The factors in Table 1 and the formula below shall be used to determine the base cost for machinery and equipment that is not described in Schedule A.

Formula: Base Cost = ac X cf

Where ac = the cost of machinery and equipment determined in accordance with Appendix V of the *Minister's Guidelines*.

cf = the cost factor to convert the cost of the machinery and equipment (ac) from the year it was constructed in, to its cost in 1994.

1.001.100 TABLE 1–COST FACTORS

Year of Construction	Cost Factor	Year of Construction	Cost Factor	Year of Construction	Cost Factor
1913	18.86	1943	9.77	1973	3.31
1914	19.51	1944	9.71	1974	2.93
1915	19.88	1945	9.63	1975	2.43
1916	18.35	1946	8.93	1976	2.14
1917	15.57	1947	8.30	1977	1.96
1918	13.56	1948	7.94	1978	1.78
1919	11.97	1949	7.95	1979	1.57
1920	9.80	1950	7.73	1980	1.40
1921	10.87	1951	6.94	1981	1.24
1922	11.78	1952	6.50	1982	1.16
1923	11.48	1953	6.12	1983	1.28
1924	11.61	1954	6.05	1984	1.34
1925	11.79	1955	6.00	1985	1.30
1926	11.89	1956	5.76	1986	1.30
1927	11.90	1957	5.56	1987	1.26
1928	11.62	1958	5.45	1988	1.24
1929	11.18	1959	5.39	1989	1.18
1930	11.57	1960	5.34	1990	1.13
1931	12.46	1961	5.30	1991	1.07
1932	13.43	1962	5.29	1992	1.05
1933	14.08	1963	5.26	1993	1.03
1934	13.87	1964	5.05	1994	1.00
1935	13.73	1965	4.86	1995	0.98
1936	13.34	1966	4.68	1996	0.97
1937	12.49	1967	4.29	1997	0.94
1938	12.72	1968	4.48	1998	0.91
1939	12.60	1969	4.39	1999	0.88
1940	11.96	1970	3.97	2000	0.88
1941	10.91	1971	3.82	2001	0.85
1942	9.99	1972	3.53	2002	0.84

**1.005****MACHINERY AND EQUIPMENT DESCRIBED IN SCHEDULE A**

The rates in Schedule A reflect typical costs for field installations of component types. These rates apply to each component type regardless of the exact configuration of the system.

The rates for property described in Schedule A must be used to determine the base cost for that property and no changes or adjustments to the rates are permissible.

The base cost for machinery & equipment described in Schedule A is determined as follows:

- 1) Select the component category (e.g. Tanks, Steel Bolted),
- 2) Select the specific component (e.g. Size, Type),
- 3) Apply the base rate for the specific component.

**1.010****TANKS****1.010.100****STEEL BOLTED, WELDED, OR POP TANKS—ABOVE GROUND**

Size (m <sup>3</sup> )	(bbl)	Diameter (m)	Height (m)	Base Rate (\$)
8	50	2.36	1.83	<b>7 850</b>
14	90	2.41	3.05	<b>8 700</b>
16	100	2.90	2.44	<b>9 000</b>
33	210	3.05	4.57	<b>12 550</b>
48	300	3.66	4.57	<b>14 650</b>
64	400	3.66	6.10	<b>15 200</b>
79	500 (Low)	6.55	2.44	<b>18 050</b>
79	500 (High)	4.72	4.88	<b>17 100</b>
119	750	4.72	7.32	<b>19 900</b>
159	1 000 (Low)	9.07	2.44	<b>24 400</b>
159	1 000 (High)	6.55	4.88	<b>24 400</b>
238	1 500	6.55	7.32	<b>29 100</b>
318	2 000	9.07	4.88	<b>34 950</b>
397	2 500	9.07	6.10	<b>80 300</b>
477	3 000	9.07	7.32	<b>94 000</b>
636	4 000	10.52	7.32	<b>120 400</b>
795	5 000	11.79	7.32	<b>146 700</b>
1 590	10 000	16.76	7.32	<b>259 450</b>
3 179	20 000	20.42	9.75	<b>345 800</b>

**Rates include:** flat bottom, cone deck  
 flush-type cleanout door  
 thief hatch and vacuum relief  
 standard nozzles, manways and cleanouts  
 flanges, valves and piping  
 foundation bands and painting  
 installation

**Note:** 1 barrel (Oil, 42 US Gallons) = 0.158 987 m<sup>3</sup>



**1.010.200 STAIRWAYS–WALKWAYS–STILES**

<b>Stairway</b>	<b>Base Rate (\$ per m)</b>
4.3 m of rise or less	<b>395</b>
Over 4.3 m of rise	<b>370</b>

<b>Walkways or platforms</b>	<b>Base Rate (\$ per m)</b>
1.2 m wide metal	<b>280</b>

<b>Stiles</b>	<b>Base Rate (\$)</b>
Per stile over berm	<b>1 050</b>

**Rates include:** paint and installation

**1.010.300 STEEL WELDED UNDERGROUND TANKS**

<b>Volume (l)</b>	<b>(gal.)</b>	<b>(bbl)</b>	<b>Base Rate (\$)</b>
2 505	550	16	<b>7 550</b>
5 005	1 100	31	<b>7 900</b>
9 810	2 156	62	<b>13 400</b>
15 015	3 300	94	<b>13 950</b>
25 025	5 500	157	<b>23 150</b>
35 035	7 700	220	<b>24 800</b>
50 050	11 000	315	<b>37 650</b>

**Rates include:** excavation and backfill  
hold downs and concrete  
piping, flanges and valves  
installation

**1.010.400 TANKS—INSULATION AND COATINGS**

Insulation (mm)	Coating Type	Base Rate (\$ per m <sup>2</sup> )
	Epoxy internal coating	45.50
50.0	Fibreglass, c/w metal cladding	76.50
76.0	Fibreglass, c/w metal cladding	89.50
51.0	Urethane for fibreglass tanks c/w	32.50
6.35	Diathon coating	
25.0	Urethane Insulation, c/w sealer	45.00
38.0	Urethane Insulation, c/w sealer	48.00
50.0	Urethane Insulation, c/w sealer	51.50
63.0	Urethane Insulation, c/w sealer	56.00
76.0	Urethane Insulation, c/w sealer	60.00

**Rates include:** surface preparation  
installation

**Note:** Use the following formula to find the area of tank to be covered:

Horizontal Tank:

$$\text{Area} = (2 \times 3.14 \times r^2) + (2 \times 3.14 \times r \times l)$$

Vertical Tank:

$$\text{Area} = (1 \times 3.14 \times r^2) + (2 \times 3.14 \times r \times h)$$

Vertical Tank:

Area = 1 end only and cylinder

Where: r = radius

l = length

h = height

**1.010.420 STEEL TANKS—FIBREGLASS INSULATION (50 MM)**

Size (bbl)	Diameter X Height (m x m)	Base Rate (\$ per 50 mm)
50	2.36 x 1.83	1 350
90	2.41 x 3.05	2 100
100	2.90 x 2.44	2 200
210	3.05 x 4.57	3 900
300	3.66 x 4.57	4 800
400	3.66 x 6.10	6 150
500(Low)	6.55 x 2.44	6 400
500(High)	4.72 x 4.88	6 850
750	4.72 x 7.32	9 650
1 000 (Low)	9.07 x 2.44	10 250
1 000 (High)	6.55 x 4.88	10 250
1 500	6.55 x 7.32	14 100
2 000	9.07 x 4.88	15 550
2 500	9.07 x 6.10	18 250
3 000	9.07 x 7.32	20 900
4 000	10.52 x 7.32	25 150
5 000	11.79 x 7.32	29 100
10 000	16.76 x 7.32	46 350
20 000	20.42 x 9.75	72 850

**1.010.430 STEEL TANKS—FIBREGLASS INSULATION (76 MM)**

<b>Size (bbl)</b>	<b>Diameter X Height (m x m)</b>	<b>Base Rate (\$ per 76 mm)</b>
50	2.36 x 1.83	1 600
90	2.41 x 3.05	2 450
100	2.90 x 2.44	2 600
210	3.05 x 4.57	4 550
300	3.66 x 4.57	5 650
400	3.66 x 6.10	7 200
500(Low)	6.55 x 2.44	7 500
500(High)	4.72 x 4.88	8 050
750	4.72 x 7.32	11 300
1 000 (Low)	9.07 x 2.44	12 000
1 000 (High)	6.55 x 4.88	12 000
1 500	6.55 x 7.32	16 500
2 000	9.07 x 4.88	18 200
2 500	9.07 x 6.10	21 350
3 000	9.07 x 7.32	24 450
4 000	10.52 x 7.32	29 400
5 000	11.79 x 7.32	34 000
10 000	16.76 x 7.32	54 200
20 000	20.42 x 9.75	85 250

**Note:** Use the following formula to calculate the area covered by the tank:

$$\text{Area} = (1 \times 3.14 \times r^2) + (2 \times 3.14 \times r \times h)$$

Where: r = radius  
h = height

**1.010.500 STEEL TANKS—URETHANE INSULATION (25 MM)**

<b>Size (bbl)</b>	<b>Diameter X Height (m x m)</b>	<b>Base Rate (\$ per 25 mm)</b>
50	2.36 x 1.83	800
90	2.41 x 3.05	1 250
100	2.90 x 2.44	1 300
210	3.05 x 4.57	2 300
300	3.66 x 4.57	2 850
400	3.66 x 6.10	3 650
500(Low)	6.55 x 2.44	3 750
500(High)	4.72 x 4.88	4 050
750	4.72 x 7.32	5 650
1 000 (Low)	9.07 x 2.44	6 050
1 000 (High)	6.55 x 4.88	6 050
1 500	6.55 x 7.32	8 300
2 000	9.07 x 4.88	9 150
2 500	9.07 x 6.10	10 700
3 000	9.07 x 7.32	12 300
4 000	10.52 x 7.32	14 800
5 000	11.79 x 7.32	17 100
10 000	16.76 x 7.32	27 250
20 000	20.42 x 9.75	42 850

**1.010.510 STEEL TANKS—URETHANE INSULATION (38 MM)**

<b>Size (bbl)</b>	<b>Diameter X Height (m x m)</b>	<b>Base Rate (\$ per 38 mm)</b>
50	2.36 x 1.83	850
90	2.41 x 3.05	1 350
100	2.90 x 2.44	1 400
210	3.05 x 4.57	2 450
300	3.66 x 4.57	3 050
400	3.66 x 6.10	3 850
500(Low)	6.55 x 2.44	4 050
500(High)	4.72 x 4.88	4 300
750	4.72 x 7.32	6 050
1 000 (Low)	9.07 x 2.44	6 450
1 000 (High)	6.55 x 4.88	6 450
1 500	6.55 x 7.32	8 850
2 000	9.07 x 4.88	9 750
2 500	9.07 x 6.10	11 450
3 000	9.07 x 7.32	13 100
4 000	10.52 x 7.32	15 800
5 000	11.79 x 7.32	18 250
10 000	16.76 x 7.32	29 100
20 000	20.42 x 9.75	45 700

**1.010.520 STEEL TANKS—URETHANE INSULATION (50 MM)**

<b>Size (bbl)</b>	<b>Diameter X Height (m x m)</b>	<b>Base Rate (\$ per 50 mm)</b>
50	2.36 x 1.83	900
90	2.41 x 3.05	1 400
100	2.90 x 2.44	1 500
210	3.05 x 4.57	2 650
300	3.66 x 4.57	3 250
400	3.66 x 6.10	4 150
500(Low)	6.55 x 2.44	4 300
500(High)	4.72 x 4.88	4 650
750	4.72 x 7.32	6 500
1 000 (Low)	9.07 x 2.44	6 900
1 000 (High)	6.55 x 4.88	6 900
1 500	6.55 x 7.32	9 500
2 000	9.07 x 4.88	10 500
2 500	9.07 x 6.10	12 250
3 000	9.07 x 7.32	14 050
4 000	10.52 x 7.32	16 950
5 000	11.79 x 7.32	19 600
10 000	16.76 x 7.32	31 200
20 000	20.42 x 9.75	49 050

**Note:** Use the following formula to calculate the area covered by the tank:

$$\text{Area} = (1 \times 3.14 \times r^2) \div (2 \times 3.14 \times r \times h)$$

Where: r = radius  
h = height

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**1.010.600 FIBREGLASS TANKS—VERTICAL**

Size (m <sup>3</sup> )	(bbl)	Base Rate (\$)
14.0	90	20 150
33.0	210	25 500
48.0	300	29 750
64.0	400	34 100
80.0	500	38 350
119.0	750	51 550

**1.010.620 FIBREGLASS TANKS—UNDERGROUND**

Size (m <sup>3</sup> )	(bbl)	Base Rate (\$)
2.3	14	9 400
4.6	29	10 200
7.9	50	13 050
16.0	100	16 500
32.0	200	26 550

**Rates include:** standard manway, nozzles and valves  
reinforcement installation

**1.010.640 FIBREGLASS TANKS—INSULATION**

Size (m <sup>3</sup> )	(bbl)	Base Rate (\$)
14.0	90	900
16.0	100	950
33.0	210	1 650
48.0	300	2 050
64.0	400	2 600
80.0	500	2 750
119.0	750	4 100

**Rates include:** 51.0 mm urethane with  
6.35 mm Diathon coating  
preparation and installation

**1.010.700 STEEL POP TANKS—RECTANGULAR**

Size (m <sup>3</sup> )	(bbl)	Base Rate (\$)
8.0	50	8 900
16.0	100	10 200
33.0	210	16 350
64.0	400	19 450

**Rates include:** painting and steel skids

**1.010.720 LPG STEEL TANKS**

Size (m <sup>3</sup> )	(US gal.)	Base Rate (\$)
1.9	500	3 750
3.8	1 000	6 200
5.7	1 500	18 850
8.0	2 000	22 650
19.0	5 000	49 550
34.0	9 100	55 900
45.0	12 000	63 200
68.0	18 000	76 600
114.0	30 000	96 750

**Rates include:** manway, piping and flanges  
valves and instrumentation  
foundation and installation

**Note:** one US gallon equals 3.8 litres.

Steel ladder and Platform	Base Rate (\$)
Add each	3 300

**1.010.800 STEEL CHEMICAL STORAGE TANKS**

Size (L)	(Imp. gal.)	Base Rate (\$)
1 365	300	1 550
2 275	500	1 700
4 550	1 000	2 650

**Rates include:** painting and installation

**1.010.820 PLASTIC CHEMICAL STORAGE TANKS**

Size (L)	(Imp. gal.)	Base Rate (\$)
410	90	1 650
819	180	1 800
910	200	1 850
1 000	220	1 900
1 365	300	2 050
2 275	500	2 300
3 412	750	2 950
4 550	1 000	3 150
6 825	1 500	4 150

**Rates include:** piping, valves, stand, and straps  
Installation

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**1.020 HEATERS, GAUGES, AND SWITCHES****1.020.100 TANK HEATERS**

Rating (kW)	(Btu)	Base Rate (\$)
73 kW & smaller	250 000	<b>3 300</b>
147 kW	500 000	<b>3 750</b>

**Rates include:** flame arrestor  
stack  
burning equipment  
installation

**Note:** 3412.14 Btu/h = 1 kW

**1.020.200 INDIRECT FIRED LINE HEATERS**

Rating (kW)	(Btu/h)	Diameter (mm)	Length (m)	Base Rate (\$)
73	250 000	610	2.3	<b>20 600</b>
147	500 000	660	3.5	<b>23 500</b>
220	750 000	762	4.1	<b>26 150</b>
293	1 000 000	914	4.4	<b>30 850</b>
440	1 500 000	1 118	5.6	<b>36 900</b>
586	2 000 000	1 219	6.6	<b>52 450</b>
879	3 000 000	1 524	7.5	<b>66 350</b>
1 172	4 000 000	1 829	8.4	<b>87 300</b>
1 465	5 000 000	2 134	8.7	<b>127 450</b>
1 758	6 000 000	2 337	8.7	<b>169 200</b>

**Rates include:** fire tube, burners and pilot  
flame arrestor, stack and fuel gas manifold  
fuel gas scrubber, ball valve, PSV and pressure gauge  
values, regulator, temperature controller  
high temperature switch, thermometer and expansion drum  
thief hatch, gauge glass and insulation  
skids and installation

**Note:** 3412.14 Btu/h = 1 kW  
Direct Heaters are considered obsolete

**1.020.300 TANK GAUGES**

Type	Base Rate (\$)
Varec 2500 automatic	<b>3 150</b>

**Rates include:** aluminium gauge head  
guide piping, elbows,  
brackets and anchor bar  
installation

**1.020.400 LEVEL SWITCHES**

Type	Base Rate (\$)
Roof Mount	1 600
Static Pressure Sensing	1 400

**Rates include:** electrical tubing, valves and flanges installation

**1.030 TREATERS**

**1.030.100 VERTICAL**

Diameter (m) (ft)		Height (m) (ft)		Pressure (kPa) (psi)		Base Rate (\$)
1.22	4	6.1	20.0	345	50	51 000
1.22	4	8.4	27.5	345	50	56 350
1.83	6	6.1	20.0	345	50	56 950
1.83	6	8.4	27.5	345	50	63 250
2.44	8	6.1	20.0	345	50	74 050
2.44	8	8.4	27.5	345	50	83 100
3.05	10	6.1	20.0	345	50	86 700
3.05	10	8.4	27.5	345	50	98 000
1.22	4	6.1	20.0	517	75	56 300
1.22	4	8.4	27.5	517	75	62 350
1.83	6	6.1	20.0	517	75	63 100
1.83	6	8.4	27.5	517	75	70 200
2.44	8	6.1	20.0	517	75	82 400
2.44	8	8.4	27.5	517	75	92 550
3.05	10	6.1	20.0	517	75	96 800
3.05	10	8.4	27.5	517	75	109 500

**Rates include:** fire tube, flame arrestor, stack, anodes, fuel gas system c/w scrubber, thermostats, regulators and valves, ladder, crownsnest water siphon, thermometer, pressure gauge, gauge glass, water outlet valve, oil outlet valve, oil ,gas and water meters, gas back pressure valve, relief valve, insulation, skid, and installation

**Note:** 6.894757 pound force per square inch = 1 kPa



## 1.030.200

## MECHANICAL–HORIZONTAL

Diameter (m) (ft)		Height (m) (ft)		Pressure (kPa) (psi)		Base Rate (\$)
1.83	6	6.1	20	345	50	113 950
2.44	8	6.1	20	345	50	126 950
2.44	8	7.6	25	345	50	140 900
2.44	8	9.1	30	345	50	188 650
3.05	10	9.1	30	345	50	202 050
3.05	10	12.2	40	345	50	218 650
3.05	10	15.2	50	345	50	233 550
3.05	10	21.3	70	345	50	303 100
1.83	6	6.1	20	517	75	126 050
2.44	8	6.1	20	517	75	139 050
2.44	8	7.6	25	517	75	146 950
2.44	8	9.1	30	517	75	200 750
3.05	10	9.1	30	517	75	214 150
3.05	10	12.2	40	517	75	230 750
3.05	10	15.2	50	517	75	257 750
3.05	10	21.3	70	517	75	327 300

## 1.030.300

## ELECTRO STATIC/DUAL POLARITY–HORIZONTAL

Diameter (m) (ft)		Height (m) (ft)		Pressure (kPa) (psi)		Base Rate (\$)
1.83	6	6.1	20	345	50	134 250
2.44	8	6.1	20	345	50	147 300
2.44	8	7.6	25	345	50	161 250
2.44	8	9.1	30	345	50	208 950
3.05	10	9.1	30	345	50	228 450
3.05	10	12.2	40	345	50	245 050
3.05	10	15.2	50	345	50	263 200
3.05	10	21.3	70	345	50	332 750
1.83	6	6.1	20	517	75	146 350
2.44	8	6.1	20	517	75	159 400
2.44	8	7.6	25	517	75	167 300
2.44	8	9.1	30	517	75	221 050
3.05	10	9.1	30	517	75	240 550
3.05	10	12.2	40	517	75	257 150
3.05	10	15.2	50	517	75	287 400
3.05	10	21.3	70	517	75	356 950

**Rates include:** fire tube, flame arrestor, stack, anodes,  
fuel gas system c/w scrubber, thermostats,  
regulators and valves  
ladder, crownsnest water siphon,  
thermometer, pressure gauge, gauge glass,  
water outlet valve, oil outlet valve,  
oil ,gas and water meters,  
gas back pressure valve, relief valve,  
insulation, skid, and installation

**Note:** 6.894757 pound force per square inch = 1 kPa.

## 1.040

## SEPARATORS

## 1.040.100

## VERTICAL 2-PHASE

<b>862–1896 kPa (125 psi - 275 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
300	12	1.5	5.0	<b>27 500</b>
400	16	1.5	5.0	<b>28 150</b>
500	20	1.5	5.0	<b>28 750</b>
600	24	1.5	5.0	<b>34 200</b>
750	30	1.5	5.0	<b>36 250</b>
900	36	1.5	5.0	<b>38 300</b>
400	16	2.3	7.5	<b>28 950</b>
500	20	2.3	7.5	<b>29 600</b>
600	24	2.3	7.5	<b>35 200</b>
750	30	2.3	7.5	<b>37 350</b>
900	36	2.3	7.5	<b>39 550</b>

<b>5102 kPa (740 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
400	16	1.5	5.0	<b>28 750</b>
500	20	1.5	5.0	<b>29 950</b>
600	24	1.5	5.0	<b>35 400</b>
750	30	1.5	5.0	<b>37 600</b>

<b>10204 kPa (1480 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
400	16	1.5	5.0	<b>29 200</b>
500	20	1.5	5.0	<b>30 800</b>
600	24	1.5	5.0	<b>37 100</b>
750	30	1.5	5.0	<b>39 550</b>
400	16	2.3	7.5	<b>29 950</b>
500	20	2.3	7.5	<b>31 750</b>
600	24	2.3	7.5	<b>37 850</b>
750	30	2.3	7.5	<b>40 400</b>
900	36	2.3	7.5	<b>42 900</b>

**1.040.200 VERTICAL 3-PHASE**

<b>862–1896 kPa (125 psi – 275 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
400	16	2.3	7.5	<b>32 700</b>
500	20	2.3	7.5	<b>33 300</b>
600	24	2.3	7.5	<b>39 750</b>
750	30	2.3	7.5	<b>41 900</b>
900	36	2.3	7.5	<b>44 100</b>
1 200	48	2.3	7.5	<b>49 700</b>
500	20	3.0	10.0	<b>34 400</b>
600	24	3.0	10.0	<b>41 050</b>
900	36	3.0	10.0	<b>45 650</b>
1 200	48	3.0	10.0	<b>51 400</b>
1 500	60	3.0	10.0	<b>56 600</b>

<b>10204 kPa (1480 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
400	16	2.3	7.5	<b>33 650</b>
500	20	2.3	7.5	<b>35 500</b>
600	24	2.3	7.5	<b>42 400</b>
900	36	2.3	7.5	<b>47 450</b>
1 200	48	2.3	7.5	<b>75 000</b>
400	16	3.0	10.0	<b>35 750</b>
600	24	3.0	10.0	<b>45 050</b>
900	36	3.0	10.0	<b>50 750</b>
1 200	48	3.0	10.0	<b>80 950</b>

**1.040.300 HORIZONTAL 2-PHASE**

<b>862–1896 kPa (125 psi - 275 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
600	24	3.0	10.0	<b>25 650</b>
750	30	3.0	10.0	<b>27 800</b>
900	36	3.0	10.0	<b>29 900</b>

<b>10204 kPa (1480 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	<b>(\$)</b>
500	20	3.0	10.0	<b>25 700</b>
600	24	3.0	10.0	<b>29 300</b>
750	30	3.0	10.0	<b>32 000</b>
900	36	3.0	10.0	<b>34 700</b>

**1.040.400 HORIZONTAL 3-PHASE**

<b>862–1896 kPa (125 psi - 275 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	
600	24	3.0	10.0	<b>32 600</b>
750	30	3.0	10.0	<b>34 750</b>
900	36	3.0	10.0	<b>36 850</b>

<b>10204 kPa (1480 psi)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	
600	24	3.0	10.0	<b>36 250</b>
750	30	3.0	10.0	<b>39 000</b>
900	36	3.0	10.0	<b>41 700</b>

**Rates include:** liquid dump valves, block valves and fittings  
 level controllers and high level switch  
 gas valve pipe and fittings  
 PSV, pressure gauge and gauge glass  
 water boot (on 3 Phase horizontal)  
 senior orifice fitting and meter run  
 flow recorder  
 skids and saddles  
 thermometer and installation

**1.040.500 VERTICAL CENTRIFUGAL/RECYCLING**

<b>10204 kPa (1480 psi<sup>2</sup>)</b>				
<b>Diameter</b>		<b>Height</b>		<b>Base Rate</b>
<b>(mm)</b>	<b>(in.)</b>	<b>(m)</b>	<b>(ft)</b>	
150	6	1.5	5.0	<b>30 850</b>
200	8	1.5	5.0	<b>36 700</b>
300	12	1.5	5.0	<b>41 900</b>
400	16	2.6	8.5	<b>51 850</b>
600	24	3.7	12.0	<b>90 300</b>
800	32	4.6	15.0	<b>114 350</b>

**Rates include:** gas back pressure valve and controller  
 flow recorder and valve manifold  
 senior orifice fitting and meter run  
 pressure relief valve  
 water level controller and gauge  
 water dump valve and flow meter  
 temperature and pressure gauges  
 gas regulators, filter and scrubber  
 ball valves piping and flanges  
 installation

**Note:** Use the following table to cross reference ANSI ratings to working pressure:

**WORKING PRESSURE**  
**Service Temperature**  
**-28.9 to 37.8C (-20 to 100F)**

ANSI	kPa	psi
150	1 896	275
300	5 102	740
600	10 204	1 480
900	14 893	2 160
1 500	24 821	3 600
2 500	41 369	6 000

**Note:** Pound (force) per square inch x 6.894 757 = kPa.

**1.040.600 ENVIRONMENTAL LOW STAGE SEPARATOR TANK UNITS**

Size (bbl)	Base Rate (\$)
50	<b>46 750</b>
100	<b>71 550</b>

**Rates include:** sand frac flow back vessel  
 piping and frac tees  
 75 or 100 mm meter run  
 dry flow meter  
 sand diffuser  
 ladder, hatches and pad  
 installation

**1.040.700 PRE-FABRICATED ENVIRONMENTAL BATTERY UNITS**

Low pressure Unit (48kPa)	Lines & Meter Runs (mm)	Base Rate (\$)
Standard Unit unheated	50	<b>42 600</b>
Standard Unit unheated	75	<b>44 250</b>
Heated Unit	50	<b>47 550</b>
Heated Unit	75	<b>49 200</b>
Treating Unit	50	<b>60 750</b>
Treating Unit	75	<b>62 400</b>
Companion Storage Tank	<b>add each</b>	<b>25 400</b>

**Standard Unit**

**Rates include:** 500 barrel used railway oil tank car horizontal separator  
 high level and high pressure shut off valves  
 dry flow recorders and fluid level indicators  
 flow lines, meter, flare lines  
 100mm x12.2m flare stack, ignition and arrestor  
 steel skids and saddles  
 weir plank pad and installation

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**Heated Unit**

**Rates include:** 250mm fire tube, burner and pilot light  
500 barrel used railway oil tank car horizontal separator  
high level and high pressure shut off valves  
dry flow recorders and fluid level indicators  
flow lines, meter, flare lines  
100mm x12.2m flare stack, ignition and arrestor  
steel skids and saddles  
weir plank pad and installation

**Treating Unit**

**Rates include:** degasers and down comers  
spreader pan and baffle plates  
individual fluid level gauges for oil, gas and water  
500 barrel used railway oil tank car horizontal separator  
high level and high pressure shut off valves  
dry flow recorders and fluid level indicators  
flow lines, meter, flare lines  
100mm x12.2m flare stack, ignition and arrestor  
steel skids and saddles  
weir plank pad and installation

**Companion Storage Tank**

**Rates include:** extension of site work, weir, pad and installation  
steel skids and saddles  
connecting piping to main unit  
meters, valves and indicators

<b>High Pressure Unit (345 kPa)</b>	<b>Lines &amp; Meter Runs (mm)</b>	<b>Base Rate (\$)</b>
Standard Unit, Unheated	75	<b>110 050</b>

**Rates include:** 500 barrel welded tank, horizontal separator  
high level and high pressure shut off valves  
dry flow recorders and fluid level indicators  
flow lines, meter, flare lines  
100 mm x12.2 m flare stack, ignition and arrestor  
steel skids and saddles  
weir plank pad and installation

**1.050****FUEL GAS SCRUBBERS**

	<b>Base Rate (\$)</b>
All Sizes	<b>2 500</b>

**Rates include:** block valve, shutoff valve  
relief valve and pressure gauge  
piping and high level switch  
installation

## 1.060

**FREE WATER KNOCKOUTS**

Diameter (m)		Length (m)		Base Rate (\$)
	(ft)		(ft)	
1.83	6.0	3.0	10.0	<b>105 450</b>
1.83	6.0	4.6	15.0	<b>111 500</b>
2.44	8.0	4.6	15.0	<b>123 600</b>
3.05	10.0	6.1	20.0	<b>150 150</b>
3.05	10.0	9.1	30.0	<b>162 250</b>
3.05	10.0	12.2	40.0	<b>237 800</b>

**Rates include:** dump valve  
 block valve  
 pipe fittings and flanges  
 level controllers  
 gas back pressure valve  
 gauge glass and pressure gauge  
 PSV and thermometer  
 skids and installation

## 1.070

**GAS BOOTS**

Diameter (mm)	(in.)	Base Rate (\$)
600	24	<b>28 700</b>
750	30	<b>31 500</b>
900	36	<b>33 500</b>
1 050	42	<b>38 050</b>
1 200	48	<b>40 600</b>
1 500	60	<b>45 950</b>

**Rates include:** guy wires  
 pressure gauge, PSV and block valve  
 piping, flanges and fittings  
 steel caged ladder and top platform  
 foundation and installation

**Note:** Average heights used are 9.1 to 12.2m (30 to 40 feet).

## 1.080

**FLARE SYSTEMS**

## 1.080.100

**VENT STACKS 100 MM (4 IN.) STACK**

Height (m)	(ft)	Base Rate (\$)
9.1	30	<b>11 050</b>
12.2	40	<b>11 250</b>
15.2	50	<b>11 650</b>
18.3	60	<b>15 250</b>

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**1.080.120 VENT STACKS 150 MM (6 IN.) STACK**

<b>Height (m)</b>	<b>(ft)</b>	<b>Base Rate (\$)</b>
9.1	30	<b>14 250</b>
12.2	40	<b>14 500</b>
15.2	50	<b>14 850</b>
18.3	60	<b>16 200</b>

**1.080.140 VENT STACKS 203 MM (8 IN.) STACK**

<b>Height (m)</b>	<b>(ft)</b>	<b>Base Rate (\$)</b>
9.1	30	<b>17 500</b>
12.2	40	<b>17 750</b>
15.2	50	<b>18 100</b>
18.3	60	<b>20 750</b>

**1.080.200 FLARE STACKS PILOT & SHOTTUBE 100 MM (4 IN.) STACK**

<b>Height (m)</b>	<b>(ft)</b>	<b>Base Rate (\$)</b>
9.1	30	<b>13 200</b>
12.2	40	<b>13 450</b>
15.2	50	<b>13 950</b>
18.3	60	<b>17 700</b>

**1.080.220 FLARE STACKS PILOT & SHOTTUBE 150 MM (6 IN.) STACK**

<b>Height (m)</b>	<b>(ft)</b>	<b>Base Rate (\$)</b>
9.1	30	<b>16 450</b>
12.2	40	<b>16 650</b>
15.2	50	<b>17 150</b>
18.3	60	<b>19 700</b>

**1.080.240 FLARE STACKS PILOT & SHOTTUBE 200 MM (8 IN.) STACK**

<b>Height (m)</b>	<b>(ft)</b>	<b>Base Rate (\$)</b>
9.1	30	<b>19 650</b>
12.2	40	<b>19 900</b>
15.2	50	<b>20 650</b>
18.3	60	<b>23 150</b>



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**1.080.300 FLARE STACKS—MANUAL OR AUTOMATIC OR SOLAR IGNITER 100 MM (4 IN.) STACK**

Height (m)	(ft)	Base Rate (\$)
9.1	30	15 300
12.2	40	15 950
15.2	50	16 550
18.3	60	20 500

**1.080.320 FLARE STACKS—MANUAL OR AUTOMATIC OR SOLAR IGNITER 150 MM (6 IN.) STACK**

Height (m)	(ft)	Base Rate (\$)
9.1	30	18 550
12.2	40	19 150
15.2	50	19 750
18.3	60	22 550

**1.080.340 FLARE STACKS—MANUAL OR AUTOMATIC OR SOLAR IGNITER 200 MM (8 IN.) STACK**

Height (m)	(ft)	Base Rate (\$)
9.1	30	21 800
12.1	40	22 400
15.2	50	23 350
18.2	60	26 000

**Rates include:** flare tips  
base and foundation  
piping and flange  
regulator, valve and gauge  
retractable assembly  
electric service, flame failure switch  
guy wires and installation

**1.080.500 INCINERATORS**

Height (m)	(ft)	Base Rate (\$)
14.3	47	87 350
15.2	50	90 150
18.3	60	99 350
21.3	70	108 500
24.4	80	117 700
27.4	90	126 900
28.6	94	130 600

**Rates include:** stack, guy wires and incinerator  
piping and flange and electric ignition and switch  
base and installation

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**1.090 COMPRESSORS**

**1.090.100 VAPOUR RECOVERY –BLOWER**

Size (kW)	(hp)	Base Rate (\$)
1.5	2	12 500
3.7	5	19 750
7.5	10	29 600

**1.090.200 VAPOUR RECOVERY–SINGLE STAGE**

Size (kW)	(hp)	Base Rate (\$)
3.7	5	40 000
11.0	15	50 200
18.7	25	68 050
37.3	50	82 700
74.6	100	119 900
111.9	150	160 550

**1.090.300 VAPOUR RECOVERY–TWO STAGE**

Size (kW)	(hp)	Base Rate (\$)
11.0	15	76 050
18.7	25	88 650
37.3	50	120 850
56.0	75	156 700
74.6	100	192 750
93.3	125	202 600
111.9	150	212 150

**Rates include:** compressor package  
inlet separator  
piping, flanges and fittings  
controls  
lube system  
skids and installation

**Note:** Horsepower (electric) x 0.746 = kW

**1.090.400 GAS COMPRESSORS—TWO STAGE ELECTRIC DRIVE – PACKAGED**

Size (kW)	(hp)	Base Rate (\$)
14.9	20	<b>95 800</b>
37.3	50	<b>96 300</b>
44.8	60	<b>152 550</b>
74.6	100	<b>157 700</b>
93.3	125	<b>182 700</b>
149.2	200	<b>195 100</b>
223.8	300	<b>263 700</b>
additional stages		
<b>each add</b>		<b>30 250</b>

**Rates include:** compressor package  
 discharge air exchanger each stage  
 suction scrubber  
 controls, control panel  
 electrical and switches  
 electric motor and drive  
 piping, flanges and fittings  
 skids and installation

**1.090.500 GAS COMPRESSORS—TWO STAGE GAS DRIVE—PACKAGED**

Size (kW)	(hp)	Base Rate (\$)
14.9	20	<b>112 700</b>
37.3	50	<b>112 700</b>
44.8	60	<b>179 450</b>
74.6	100	<b>189 050</b>
93.3	125	<b>212 550</b>
149.2	200	<b>244 850</b>
223.8	300	<b>331 000</b>
additional stages		
<b>each add</b>		<b>30 250</b>

**Rates include:** compressor package  
 discharge air exchanger each stage  
 suction scrubber  
 controls, control panel and switches  
 gas motor and drive  
 piping, flanges and fittings  
 skids and installation

**1.100****PUMPS****1.100.100****VERTICAL TURBINE PUMPS**

Inlet (mm)	(in.)	Motor		Base Rate (\$)
		(kW)	(hp)	
100	4	1.5	2.0	<b>7 600</b>
100	4	2.2	3.0	<b>7 900</b>
100	4	3.7	5.0	<b>8 750</b>
100	4	5.6	7.5	<b>9 900</b>
150	6	2.2	3.0	<b>8 150</b>
150	6	3.7	5.0	<b>9 300</b>
150	6	5.6	7.5	<b>10 300</b>
150	6	7.5	10.0	<b>10 700</b>
150	6	11.2	15.0	<b>12 050</b>
150	6	14.9	20.0	<b>13 400</b>
150	6	18.7	25.0	<b>13 900</b>
150	6	22.4	30.0	<b>15 250</b>

**Rates include:** pump and base plate  
explosion proof electric motor and drive assembly  
piping, couplings, flanges and valves  
electrical service and motor switch  
installation

**1.100.200****CENTRIFUGAL PUMPS—END SUCTION**

Inlet (mm)	(in.)	Motor		Base Rate (\$)
		(kW)	(hp)	
38	1.5	1.5	2.0	<b>6 050</b>
38	1.5	2.2	3.0	<b>6 200</b>
38	1.5	3.7	5.0	<b>6 300</b>
75	3.0	1.5	2.0	<b>6 200</b>
75	3.0	2.2	3.0	<b>6 350</b>
75	3.0	3.7	5.0	<b>6 450</b>
100	4.0	2.2	3.0	<b>8 450</b>
100	4.0	3.7	5.0	<b>8 600</b>
100	4.0	5.6	7.5	<b>8 850</b>
100	4.0	7.5	10.0	<b>9 500</b>
100	4.0	11.2	15.0	<b>10 300</b>

**Rates include:** pumps and base plates  
explosion proof motor and drive assembly  
piping, couplings, flanges and valves  
electrical service and motor switch  
installation

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**1.100.300 CENTRIFUGAL PUMPS—VERTICAL INLINE**

Inlet (mm)	(in.)	Motor		Base Rate (\$)
		(kW)	(hp)	
50	2.0	1.5	2.0	<b>6 650</b>
50	2.0	2.2	3.0	<b>6 800</b>
50	2.0	3.7	5.0	<b>6 900</b>
75	3.0	1.5	2.0	<b>6 900</b>
75	3.0	2.2	3.0	<b>7 050</b>
75	3.0	3.7	5.0	<b>7 150</b>
100	4.0	2.2	3.0	<b>9 500</b>
100	4.0	3.7	5.0	<b>9 650</b>
100	4.0	5.6	7.5	<b>9 900</b>
100	4.0	7.5	10.0	<b>10 600</b>
100	4.0	11.2	15.0	<b>11 600</b>

**Rates include:** pumps and base plates  
explosion proof motor and drive assembly  
piping, couplings, flanges and valves  
electrical service and motor switch  
installation

**1.100.400 ROTARY GEAR PUMPS**

Inlet (mm)	(in.)	Motor		Base Rate (\$)
		(kW)	(hp)	
38	1.5	1.5	2.0	<b>5 250</b>
38	1.5	2.2	3.0	<b>5 400</b>
38	1.5	3.7	5.0	<b>5 500</b>
63	2.5	1.5	2.0	<b>7 250</b>
63	2.5	2.2	3.0	<b>7 400</b>
63	2.5	3.7	5.0	<b>7 500</b>
75	3.0	7.5	10.0	<b>8 250</b>
75	3.0	11.2	15.0	<b>8 800</b>

**Rates include:** pump, base plates and mechanical seal  
explosion proof motor and drive assembly  
piping, couplings and flanges  
valves and PSV  
electrical service and motor switch  
paint and installation

**1.100.500 PROGRESSIVE CAVITY PUMPS**

Inlet (mm)	(in.)	Motor		Base Rate (\$)
		(kW)	(hp)	
50	2.0	1.5	2.0	<b>8 250</b>
63	2.5	2.2	3.0	<b>9 150</b>
75	3.0	2.2	3.0	<b>10 000</b>
100	4.0	3.7	5.0	<b>14 200</b>
150	6.0	5.6	7.5	<b>15 900</b>
150	6.0	7.5	10.0	<b>16 150</b>
150	6.0	11.2	15.0	<b>16 700</b>

**Rates include:** pump, base plates and mechanical seal  
 steel rotor and stator, pin joints  
 explosion proof motor, drive assembly and guard  
 piping, couplings and flanges  
 valves and PSV  
 electrical service and motor switch  
 paint and installation

**1.100.600 PISTON / PLUNGER PUMPS**

Type	Motor		Base Rate (\$)
	(kW)	(hp)	
Simplex	3.7	5.0	<b>8 400</b>
Duplex	7.5	10.0	<b>11 950</b>
Triplex	11.2	15.0	<b>12 750</b>
Triplex	22.4	30.0	<b>22 250</b>
Triplex	37.3	50.0	<b>26 150</b>
Triplex	74.6	100.0	<b>40 900</b>
Quintuplex	22.4	30.0	<b>24 550</b>
Quintuplex	37.3	50.0	<b>29 750</b>
Quintuplex	56.0	75.0	<b>41 600</b>
Quintuplex	74.6	100.0	<b>49 300</b>
Quintuplex	186.5	250.0	<b>124 700</b>

**Rates include:** pump, base plates and mechanical seal  
 explosion proof motor, drive assembly and guard  
 piping, couplings and flanges  
 valves and PSV  
 electrical service and motor switch  
 paint and installation  
 equipment skids for 30 hp and larger

**1.100.700 WATERFLOOD PUMPS**

Type	Motor		Base Rate (\$)
	(kW)	(hp)	
Triplex	22.4	30	<b>29 950</b>
Triplex	44.8	60	<b>36 000</b>
Triplex	74.6	100	<b>56 200</b>
Triplex	123.1	165	<b>79 250</b>
Triplex	149.2	200	<b>91 400</b>
Triplex	279.8	375	<b>231 500</b>
Quintuplex	186.5	250	<b>122 150</b>
Quintuplex	223.8	300	<b>146 800</b>
Quintuplex	373.0	500	<b>275 950</b>
Quintuplex	466.3	625	<b>298 850</b>

**Rates include:** pump, base plates and mechanical seal  
 explosion proof motor, drive assembly and guard  
 piping, couplings and flanges  
 valves and PSV  
 electrical service and motor switch  
 paint and installation  
 equipment skids for 30 hp and larger

**Note:** Horsepower (electric) x 0.746 = 1 kW

**1.110 AIR COMPRESSORS**

**1.110.100 UTILITY AIR COMPRESSORS**

Size (kW)	(hp)	Base Rate (\$)
1.5	2.0	<b>4 950</b>
3.7	5.0	<b>5 550</b>
7.5	10.0	<b>7 350</b>
11.2	15.0	<b>8 000</b>

**Rates include:** reciprocating compressor  
 lubricated, 2 stage  
 air receiver and motor  
 electrical and switch  
 piping, flange and installation

**1.110.200 INSTRUMENT AIR COMPRESSORS—RECIPROCATING**

Size (kW)	(hp)	Base Rate (\$)
3.7	5.0	<b>10 050</b>
7.5	10.0	<b>12 150</b>
11.2	15.0	<b>14 900</b>

**Rates include:** reciprocating compressor  
 air receiver and electric motor  
 electrical and switch  
 after cooler, air dryer package  
 piping, flange and installation

**1.110.300 INSTRUMENT AIR COMPRESSORS—ROTARY SCREW**

Size (kW)	(hp)	Base Rate (\$)
11.2	15.0	<b>17 950</b>
18.7	25.0	<b>22 900</b>
37.3	50.0	<b>34 100</b>
74.6	100.0	<b>57 300</b>

**Rates include:** lubricated oil injection compressor receiver and electric motor  
 electrical and switch  
 oil separator with pump  
 after cooler, air dryer package  
 piping, flange and installation

**1.120 CHEMICAL INJECTORS**

**1.120.100 ELECTRIC DRIVE**

<b>Single Head—6 mm</b>			
Motor (kW)	(hp)	Phases	Base Rate (\$)
0.19	0.25	1	<b>2 200</b>
0.19	0.25	3	<b>3 400</b>
0.37	0.50	1	<b>2 300</b>
0.37	0.50	3	<b>3 500</b>

<b>Two Heads—6 mm</b>			
Motor (kW)	(hp)	Phases	Base Rate (\$)
0.19	0.25	1	<b>2 450</b>
0.19	0.25	3	<b>3 600</b>
0.37	0.50	1	<b>2 500</b>
0.37	0.50	3	<b>3 700</b>

**Rates include:** pump and base  
 electric motor and service  
 tubing  
 installation

**1.120.200 AIR/GAS DRIVERS**

Plunger Size (mm)	(in.)	Base Rate (\$)
6	0.25	<b>2 800</b>
12	0.50	<b>2 800</b>
19	0.75	<b>2 950</b>
25	1.00	<b>3 000</b>
31	1.25	<b>3 400</b>

**Rates include:** pump and base  
 tubing, couplings  
 installation



**1.120.300 OSCILLAMATIC**

Size	Base Rate (\$)
All sizes	1 900

**1.130 CONTROL VALVES**

**1.130.100 EMERGENCY SHUTDOWN VALVES (ESD)**

Type	Size (mm) (in.)		Base Rate (\$)
WKM Ball Valve	60	2	2 950
	89	3	4 200
	114	4	6 700
	168	6	11 200

**Rates include:** valve and actuator  
 high/low pressure pilot switch  
 flanges and tubing  
 installation

**1.130.200 2-WAY PNEUMATIC VALVES**

Valve size (mm) (in.)		ANSI size	Actuator size	Base Rate (\$)
25	1.0	Level	Control Valve	1 900
25	1.0	NPT	30	3 300
25	1.0	300	30	3 750
25	1.0	600	30	3 800
38	1.5	NPT	34	3 950
38	1.5	300	34	4 450
38	1.5	600	34	4 600
50	2.0	300	40	5 050
50	2.0	600	45	5 300
75	3.0	300	45	6 950
75	3.0	600	45	7 000
100	4.0	300	45	8 700
100	4.0	600	45	8 950
150	6.0	300	70	15 150
150	6.0	600	70	15 800

**Rates include:** valve and actuator  
 level controller and pilot switch  
 flanges and tubing  
 installation

**Note:** 3-Way Pneumatic Valves are considered obsolete.

**2-Way Electric** - valve actuation                    **add**                    **170**  
**3-Way Electric** - valve actuation                    **add**                    **280**

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**1.130.300 INTERMITTER-TIME CYCLE CONTROLLER**

<b>Size (mm)</b>	<b>Base Rate (\$)</b>
51	<b>4 440</b>
76	<b>5 480</b>
102	<b>6 620</b>
152	<b>10 120</b>

**1.140 CHOKES****1.140.100 WELLHEAD/MANIFOLDS-WILLIS MANUAL**

<b>Size (mm)</b>	<b>(in.)</b>	<b>Model</b>	<b>Base Rate (\$)</b>
33	1	M-1A	<b>1 200</b>
60	2	M-2	<b>2 450</b>
89	3	M-3	<b>5 350</b>
114	4	M-4	<b>5 800</b>

**Rates include:** installation

**1.140.200 WELLHEAD/MANIFOLDS-MASTER FLO MANUAL**

<b>Size (mm)</b>	<b>(in.)</b>	<b>Model</b>	<b>Base Rate (\$)</b>
33	1	P-1	<b>1 800</b>
60	2	P-2	<b>2 450</b>
89	3	P-3	<b>4 550</b>
114	4	P-4	<b>13 750</b>
168	6	P-6	<b>29 350</b>

**Rates include:** installation

**1.140.300 WELLHEAD/MANIFOLDS-WILLIS PNEUMATIC**

<b>Size (mm)</b>	<b>(in.)</b>	<b>Model</b>	<b>Base Rate (\$)</b>
33	1	M-1A	<b>3 200</b>
60	2	PA-2	<b>4 450</b>
89	3	M-3	<b>8 150</b>
114	4	M-4	<b>8 900</b>
Pressure		<b>add</b>	<b>2 120</b>

**Rates include:** valve and actuator  
tubing and flanges  
installation

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**1.140.400 WELLHEAD/MANIFOLDS—MASTER FLO PNEUMATIC**

Size (mm)	(in.)	Model	Base Rate (\$)
33	1	P-1	<b>3 300</b>
60	2	P-2	<b>4 350</b>
89	3	P-3	<b>8 750</b>
114	4	P-4	<b>19 150</b>
168	6	P-6	<b>34 700</b>
Pressure		<b>Add</b>	<b>2 120</b>

**Rates include:** valve and actuator  
tubing and flanges  
installation

**1.150 ORIFICE FITTING AND METER RUNS**

**1.150.100 SENIOR**

Size (mm)	(in.)	Base Rate (\$)
60	2	<b>4 750</b>
89	3	<b>5 200</b>
114	4	<b>5 950</b>
168	6	<b>7 450</b>
219	8	<b>10 250</b>
273	10	<b>13 000</b>

**Rates include:** orifice fittings, plate and holder  
meter run and flanges  
tubes and couplings  
installation

**1.150.200 SIMPLEX**

Size (mm)	(in.)	Base Rate (\$)
60	2	<b>1 700</b>
89	3	<b>2 000</b>
114	4	<b>2 600</b>
168	6	<b>3 650</b>
219	8	<b>6 200</b>
273	10	<b>8 850</b>

**Rates include:** orifice fittings and plate  
meter run and flanges  
plate holder  
tubes and couplings  
installation

**1.160 METERING AND ANALYSIS**

**1.160.100 MECHANICAL LIQUID METERS**

Type	Size		Base Rate (\$)
	(mm)	(in.)	
Barton FL 10*	33	1.0	<b>1 550</b>
Barton Flotrac 306	33	1.0	<b>1 050</b>
Barton Flotrac 380	33	1.0	<b>1 050</b>
Floco F-2500	33	1.0	<b>1 750</b>
Floco 382 NPT	60	2.0	<b>5 250</b>
Floco 382 600 ANSI	60	2.0	<b>6 950</b>
Floco 383 NPT	89	3.0	<b>5 250</b>
Floco 383 600 ANSI	89	3.0	<b>7 650</b>
Automatic Sampler–sweet service	<b>add</b>		<b>1 260</b>
Automatic Sampler–sour service	<b>add</b>		<b>1 410</b>

\*Model FL 10 is a flow meter.

**Rates include:** valves  
pipe and fittings  
installation

**Note:** The above meters are positive displacement meters for the measurement of brine, production water and oil production.

**1.160.200 MECHANICAL GAS METERS**

Type	Size		Base Rate (\$)
	(mm)	(in.)	
Dresser Roots	48	1.5	<b>2 000</b>
Dresser Roots	60	2.0	<b>2 450</b>

**Rates include:** pipe and fittings  
Installation

**1.160.300 LIQUID TURBINE METERS**

Type	Size		Base Rate (\$)
	(mm)	(in.)	
Smith Watchman	27	0.75	<b>1 950</b>
Smith Watchman	33	1.00	<b>2 200</b>
Smith Guardsman	48	1.50	<b>3 950</b>
Smith Guardsman	60	2.00	<b>3 950</b>
Smith Guardsman	89	3.00	<b>4 750</b>
Halliburton	10-51	0.38-2.00	<b>1 000</b>
Halliburton	76	3.00	<b>2 150</b>
Halliburton	102	4.00	<b>2 900</b>

**Rates include:** pipe and fittings  
electrical  
installation

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**1.160.400 TOTALIZERS AND ANALYZERS**

Type	Base Rate (\$)
CMOS CTC-61 Totalizer	4 350
Halliburton LO-11 Totalizer	1 100
Halliburton MC-11 Analyzer	1 250
Halliburton Net Oil Analyzer	4 900

**Rates include:** remote panel mounted installation

**Note:** Totalizers are used with turbine meters.  
Analyzers are used a probe to measure water in an oil stream.

**1.160.500 CAPACITANCE PROBES**

Size (mm)	(in.)	Base Rate (\$)
60	2	3 650
89	3	4 950
114	4	5 700

**Rates include:** probe and electric cable Installation

**1.160.600 CHART RECORDERS**

Type	Base Rate (\$)
2 Pen Circular-6900 kPa element	3 100
3 Pen Circular-6900 kPa element	3 650

**Rates include:** tubing, valves and manifold pressure element temperature element spring chart drive installation

**1.160.700 TRANSMITTERS**

Type	Base Rate (\$)
Differential Pressure Flow	2 250
Pressure	1 650
Temperature	1 100

**Rates include:** electrical installation

**Note:** Rates are for Barton, Rosemount or Foxboro types.

**1.170 PRODUCTION MANIFOLDS**

**1.170.100 MANUAL—PER WELL**

Size (mm)	(in.)	Base Rate (\$)
60	2	8 000
89	3	10 400
114	4	12 000
168	6	16 000

**Rates include:** piping and fittings to headers per well  
 multiple valves per well  
 inlet, test, pigging and group headers per well  
 installation

**Note:** To determine the total cost of a multiwell manual manifold, multiply the cost per well (above) by the number of wells entering the manifold.

**1.170.200 ROTARY SELECTOR VALVE**

Type	Base Rate (\$)
Rotary Selector Valve	6 150
60 mm (2 in.) Inlets—per well, <b>add</b>	1 900
Electric auto—actuator <b>add</b>	3 750

**Rates include:** piping and fittings to rotary valve—per well  
 piping from rotary to test header—per well  
 valves—per well  
 installation

**Note:** To determine the total cost of a rotary selector manifold:

inlet manifold cost per well X number of wells entering the rotary valve

Add this cost to the cost of a rotary selector valve and add the cost of an auto—actuator if found.

**Example:** Rotary Valve Manifold—5 Wells

5 well inlet manifolds @ \$1 900	=	\$9 500
1 Rotary Selector Valve	=	\$6 150
1 Electric auto— actuator	=	\$3 750
<b>Total Manifold Cost</b>	=	<u>\$19 400</u>

**1.180 PIGGING EQUIPMENT**  
**1.180.100 PIG LAUNCHER/RECEIVER TRAPS**

Size (mm)	(in.)	Base Rate (\$)
60	2	5 000
89	3	5 200
114	4	6 650
168	6	12 100
219	8	13 150

**Rates include:** inlet, outlet and bypass valves  
 bleed valve and bypass  
 piping and fittings  
 structural support  
 installation

**1.180.200 PIG ENTRY TEES**

Size (mm)	(in.)	Base Rate (\$)
60	2	2 150
89	3	2 250
114	4	2 550

**Rates include:** block valves each side  
 bleed valve  
 installation

**1.180.300 PIG BALL VALVES—MANUAL INJECTORS**

Size (mm)	(in.)	Base Rate (\$)
60	2	2 650
89	3	3 250
114	4	5 450
168	6	12 700

**Rates include:** bleed valve  
 Installation

**1.190 ELECTRICAL SERVICES**

**1.190.100 GENERAL SERVICE ENTRANCE ON THE SITE**

<b>Unit</b>	<b>Base Rate (\$)</b>
Single Phase Service, 120/240V, 101A to 200A*	<b>2 780</b>
Three Phase Service, 480V, 201A to 400A*	<b>7 820</b>
Three Phase Service, 480V, 401A to 800A*	<b>14 850</b>

\*Does not include line up to and including the meter.

**Rates include:** circuit panel, main disconnect, branch circuit breakers, splitter, disconnects and grounding trenching, cable, miscellaneous installation

A Sub-Station Transformer is required to step-down a 480 Volt service to circuits of 460 Volt 3 Phase for motors and circuits of Single Phase 120/208 Volts for buildings, lights, etc.

A Sub-Station Transformer may be located inside a building or at an exterior plywood shelter and are found in association with electrical vaults, panels and switching gear.

**1.190.400 THERMO-ELECTRIC GENERATORS**

<b>Unit</b>	<b>Base Rate (\$)</b>
Less than 40W	<b>5 200</b>
over 40W	<b>9 750</b>

**1.190.500 REMOTE SYSTEM RADIO TOWERS**

<b>Self-Supporting Height (m)</b>	<b>(ft)</b>	<b>Base Rate (\$)</b>
8.5	28	<b>1 550</b>
11.0	36	<b>2 050</b>
13.4	44	<b>2 550</b>
16.5	54	<b>3 050</b>
20.7	68	<b>3 500</b>
Radio Antennas—building mounted antenna		<b>420</b>

**1.190.600 FIRE AND GAS DETECTION SYSTEMS**

<b>Unit</b>	<b>Base Rate (\$)</b>
Fire detection controller	<b>4 500</b>
Fire detector heads <b>add each</b>	<b>2 000</b>
Gas detection controller	<b>2 200</b>
Gas detector heads <b>add each</b>	<b>1 250</b>
Horn	<b>350</b>
Warning lights <b>add each</b>	<b>500</b>



**1.230**

**DEHYDRATORS**

**1.230.100**

**CALCIUM CHLORIDE DRYERS**

Diameter (mm)	(in.)	Height		Base Rate (\$)
		(m)	(ft)	
300	12	8.2	27	<b>12 850</b>
400	16	8.2	27	<b>15 550</b>
500	20	8.2	27	<b>17 250</b>
600	24	8.2	27	<b>22 000</b>
750	30	8.2	27	<b>25 550</b>
Pellet loading arm assembly <b>add</b>				<b>2 780</b>
Meter run and dry flow recorder <b>add</b>				<b>As found</b>

**Rates include:** vessel with integral scrubber  
 calcium chloride pellets  
 600 mm (24 in.) bed of glass beads  
 scrubber heating coil  
 dump valve, piping and flanges  
 fuel gas scrubber with controls  
 installation

**1.230.200**

**GLYCOL DEHYDRATOR PACKAGE - 2 PHASE**

Diameter (mm)	(in.)	Height		Base Rate (\$)
		(m)	(ft)	
300	12	4.3	14	<b>50 400</b>
400	16	4.3	14	<b>57 200</b>
500	20	4.3	14	<b>67 750</b>
600	24	4.3	14	<b>73 350</b>
750	30	4.3	14	<b>79 400</b>
Meter run and dry flow recorder <b>add</b>				<b>As found</b>

**Rates include:** 4 tray vessel and 2 phase integral scrubber  
 glycol regenerator including reboiler  
 glycol/glycol exchanger  
 fire tube, flame arrestor, burner and pilot assembly  
 fuel gas scrubber and control package  
 standard dehydrator instrument package  
 glycol pump, piping, fittings, tubing and valves  
 process piping, controllers, gauges and glass  
 installation

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**1.230.300 GLYCOL DEHYDRATOR PACKAGE OPTIONS**

The following costs should be added to the glycol dehydrator rates found under Section 1.230.200

**ADDITIONAL TRAYS**

Vessel Diameter (mm)	(in.)	Rate/Tray (\$)
300	12	<b>580</b>
400	16	<b>810</b>
500	20	<b>990</b>
600	24	<b>1 090</b>
750	30	<b>1 820</b>

**Note:** Each additional 450 mm (18 in.) of vessel height above 4.3 m (14 ft) is assumed to contain one tray. Vessel heights are measured from seam to seam.

**THIRD PHASE ADDITION**

Vessel Diameter (mm)	(in.)	Rate/Tray (\$)
300	12	<b>3 050</b>
400	16	<b>3 150</b>
500	20	<b>3 450</b>
600	24	<b>3 750</b>
750	30	<b>4 100</b>

**Note:** For a third phase, the above rates are added to the scrubber and controls.

**STANDBY GLYCOL PUMP ADDITION**

Vessel Diameter (mm)	(in.)	Rate (\$)
300	12	<b>4 100</b>
400	16	<b>4 100</b>
500	20	<b>4 900</b>
600	24	<b>4 900</b>
750	30	<b>6 650</b>

**Note:** For a standby glycol pump complete with piping and valves, add the above rates.

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**1.240 FILTERS****1.240.100 PECO LIQUID FILTERS**

Diameter (mm)	(in.)	Height (mm)	(in.)	Base Rate (\$)
168	6.6	787	31	<b>1 800</b>
168	6.6	1 168	46	<b>1 900</b>
219	8.6	813	32	<b>2 150</b>
219	8.6	1 422	56	<b>2 350</b>

**Rates include:** block valve and bypass valves  
drain valve  
piping and fittings  
installation

**1.240.200 PECO GAS FILTER SEPARATIONS**

Diameter (mm)	(in.)	Height (mm)	(in.)	Base Rate (\$)
168	6.6	1 391	55	<b>4 450</b>
168	6.6	1 772	70	<b>4 600</b>
168	6.6	2 002	79	<b>4 750</b>
219	8.6	2 178	86	<b>6 900</b>

**Rates include:** block valves, bypass valve  
drain valve  
piping and fittings  
installation

**1.240.300 PECO DRY GAS FILTERS**

Diameter (mm)	(in.)	Height (mm)	(in.)	Base Rate (\$)
168	6.6	660	26	<b>3 500</b>
168	6.6	1 041	41	<b>3 700</b>
168	6.6	1 270	50	<b>3 950</b>

**Rates include:** block valves, bypass valve  
drain valve  
piping and fittings  
installation

**Note:** No instrumental or PSVs have been included in any of the rates. Filters may be applied in the removal of particles and liquid separation such as hydrocarbon fluids, glycols, process fluids, salt water, fresh water, and water solutions as well as filtering and separating gases. Filter pressure vessels can be vertical or horizontal with removable end closures.

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**1.250****LACT UNITS****1.250.100****60 MM AND 89 MM PIPING UNITS**

<b>Pump Size (kW)</b>	<b>(hp)</b>	<b>Base Rate (\$)</b>
7.5	10	<b>47 350</b>
11.2	15	<b>54 750</b>
14.9	20	<b>63 400</b>
18.6	25	<b>76 750</b>
22.4	30	<b>85 000</b>
29.8	40	<b>107 000</b>
37.3	50	<b>145 700</b>
74.6	100	<b>151 750</b>

**1.250.200****114 MM PIPING UNITS**

<b>Pump Size (kW)</b>	<b>(hp)</b>	<b>Base Rate (\$)</b>
7.5	10	<b>49 450</b>
11.2	15	<b>56 850</b>
14.9	20	<b>65 500</b>
18.6	25	<b>78 800</b>
22.4	30	<b>87 100</b>
29.8	40	<b>107 650</b>
37.3	50	<b>146 350</b>
74.6	100	<b>152 350</b>

**Rates include:** skids and foundation  
piping, valves and fittings  
suction strainer, sampler  
BS & W monitor, temperature indicator  
charge pump and motor  
shipping pump and motor  
divert valve and metering  
low pressure switch, motor switches  
vibration switch, PSV  
high discharge pressure switch  
discharge pressure transmitter  
electrical, controls and panels  
installation

**Note:** 1 hp = 0.7460 kW  
LACT Units found with pump sizes exceeding 74.6 kW (100 hp) should be considered as special installations and costs obtained.

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**2.000****SCHEDULE B—ASSESSMENT YEAR MODIFIERS**

The following assessment year modifiers are for machinery and equipment described in the *Alberta Machinery and Equipment Assessment Manual*.

<b>Assessment Year</b>	<b>Assessment Year Modifier</b>
2002	1.19
2001	1.17
2000	1.14
1999	1.14
1998	1.10

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### 3.000 SCHEDULE C–DEPRECIATION

Depreciation factors for machinery and equipment described in the *Alberta Machinery and Equipment Assessment Manual* is listed in Table 2–Depreciation Factors. Depreciation for machinery and equipment that is *not* described in the manual shall be determined in a manner that is fair and equitable with the depreciation factors listed in Table 2.

The anticipated age life for machinery and equipment described in Schedule A is 20 years. The anticipated age life for machinery and equipment located in specific classes of property is listed in Table 1.

**Age** refers to the chronological age or the effective age, in years.

**Chronological age** is the actual number of years elapsed from the year the machinery and equipment was built, to the assessment year.

**Effective age** refers to the estimated age of machinery and equipment based on its present condition, design features and engineer amenities. Effective age may be less than, equal to, or greater than actual age. Effective age is determined by examining the present condition, design features and engineer amenities of comparable types of machinery and equipment.

3.001

TABLE 1—ANTICIPATED AGE LIFE

<b>CLASS OF PROPERTY</b>	<b>ANTICIPATED AGE LIFE OF M &amp; E</b>
Acid Plant	20 years
Brewery	25 years
Brick Plant	25 years
Cannery	20 years
Chemical Plant	20 years
Cement Plant	20 years
Coal Processing Plant	20 years
Distillery	25 years
Dairy, Creamery	25 years
Enhanced Oil Recovery	15 years
Feed or Flour Mill	25 years
Gas Processing (including sour gas)	20 years
Gas Injection or Compression	20 years
Insulation Plant	20 years
Meat Packing Plant	25 years
Methanol Plant	15 years
Oil Sand Processing Plant	15 years
Oilfield Battery	20 years
Plywood/OSB*/Wallboard Manufacturing Plant	20 years
Pulp Mill	15 years
Pelitzing Plant (Feed)	20 years
Refinery (Metal)	15 years
Refinery (Oil)	20 years
Refinery (Sugar)	20 years
Roofing Plant	20 years
Saw or Stud Mill	20 years
Seed Cleaning Plant	25 years
Soft Drink Plant	20 years
Steel Mill	20 years
Sulphur or Fertilizer Plant	15 years
Tire Plant	15 years
Water Flood	20 years

\*OSB—Oriented Strand Board

## 3.002

TABLE 2—DEPRECIATION FACTORS - ANTICIPATED AGE LIFE

Age (Years)	10 Years	15 Years	20 Years	25 Years	30 Years	35 Years	50 Years	60 Years
0	75	75	75	75	75	75	75	75
1	75	75	75	75	75	75	75	75
2	75	75	75	75	75	75	75	75
3	73	75	75	75	75	75	75	75
4	66	75	75	75	75	75	75	75
5	59	71	75	75	75	75	75	75
6	53	66	74	75	75	75	75	75
7	48	62	70	75	75	75	75	75
8	43	58	66	72	75	75	75	75
9	40	54	63	69	74	75	75	75
10		50	60	67	71	75	75	75
11		47	57	64	69	73	75	75
12		44	54	61	67	71	75	75
13		41	51	59	64	69	75	75
14		40	49	57	62	67	75	75
15			46	54	60	65	74	75
16			44	52	58	63	72	75
17			42	50	56	61	71	75
18			40	48	54	59	70	74
19				46	53	58	68	73
20				44	51	56	67	72
21				42	49	54	65	70
22				41	47	53	64	69
23				40	46	51	63	68
24					44	50	62	67
25					43	48	60	66
26					41	47	59	65
27					40	46	58	64
28						44	57	63
29						43	56	61
30						42	55	60
31						41	54	59
32						40	52	58
33							51	57
34							50	57
35							49	56

**Note:** Expressed as percentage remaining.



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**Anticipated Age Life (cont.)**

<b>Age (Years)</b>	<b>10 Years</b>	<b>15 Years</b>	<b>20 Years</b>	<b>25 Years</b>	<b>30 Years</b>	<b>35 Years</b>	<b>50 Years</b>	<b>60 Years</b>
36							48	55
37							47	54
38							46	53
39							46	52
40							45	51
41							44	50
42							43	49
43							42	49
44							41	48
45							40	47
46								46
47								45
48								45
49								44
50								43
51								42
52								42
53								41
54								40

**Note:** Expressed as percentage remaining.

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**4.000****SCHEDULE D—ADDITIONAL DEPRECIATION**

For any depreciation that is not reflected in Schedule C, the assessor may adjust for additional depreciation provided acceptable evidence of such loss in value exists.

