APPENDIX "C" FIELD TEST REPORT

USEFUL FORMULAS

1) Head (ft.) = $\frac{\text{Pressure (psig)} \times 2.31}{\text{S.G.}}$ S.G. = Specific gravity; S.G. of water = 1.0 at 70° F

2) TDH (ft.) = Total Dynamic Head (ft.) = (Disch. Pressure gauge reading - Suct. Pressure gauge reading +
(Discharge velocity head - Suction velocity head +
(Elevation correction to disch. gauge - Elevation correction to suct. gauge)

3) PUMP INPUT HP (BHP) - calculated:

Single Phase Motor	Three Phase Motor
$BHP = \frac{Amps \times Volts \times n_m \times p.f.}{746}$	$BHP = \frac{Avg.\ Amps \times Volts \times 1.732 \times n_m \times p.f.}{746}$

Where n_m = motor efficiency, p.f. = Motor power factor, Avg. Amps = $\frac{leg\ 1 + leg\ 2 + leg\ 3}{3}$

4) Pump Efficiency (n_p): $n_p = \frac{GPM \times TDH}{3960 \times BHP}$

5) Affinity Laws for correcting GPM, TDH, and BHP for speed (RPM):

$$\frac{GPM_1}{GPM_2} = \frac{RPM_1}{RPM_2} \quad \text{or} \quad GPM_1 = GPM_2 \times \frac{RPM_1}{RPM_2}$$

$$\frac{TDH_1}{TDH_2} = \left(\frac{RPM_1}{RPM_2}\right)^2 \quad \text{or} \quad TDH_1 = TDH_2 \times \left(\frac{RPM_1}{RPM_2}\right)^2$$

$$\frac{BHP_1}{BHP_2} = \left(\frac{RPM_1}{RPM_2}\right)^3 \quad \text{or} \quad BHP_1 = BHP_2 \times \left(\frac{RPM_1}{RPM_2}\right)^3$$

6) NPSHA determination:

NPSHA = Net Positive Suction Head Available

NPSHA = (Atmospheric pressure - Vapor pressure of liquid + Total suction head)

Total Suction Head = (Suction pressure gauge reading + Suction velocity head + Elevation correction to suction gauge)

NOTE: NPSHA must always be greater than NPSHR (NPSHA ≥ NPSHR) for the pump to operate without concern of cavitation.

NPSHR refers to Net Positive Suction Head Required by pump. This is a published value obtained from the Pump Manufacturer's curve.

APPENDIX "C" FIELD TEST REPORT

Field Test Report

Date _____

Pump Size _____ Pump Type _____

Pump Serial Number _____ Impeller Diameter (in.) _____

Manufacturer's Pump Curve Number _____

MOTOR:** Rated HP _____ Volts _____ S.F. _____

F.L. Amps _____ F.L. Eff _____ P.F. _____

Phase _____

RATING: GPM _____ Head _____ RPM _____

Suction gauge pipe size _____ inches

Discharge gauge connection pipe size _____ inches

Discharge gauge elevation corr. _____ feet

Suction gauge elevation corr. _____ feet

Barometric pressure _____ inches Hg x 1.13 = _____ feet water

Liquid pumped _____ S.G. _____

Liquid temperature _____ °F

Liquid vapor pressure _____ psi x 2.31 = _____feet water

POINT	Discharge Pressure Gauge		Suction Pressure Gauge		Velocity Head (feet)		Total Dynamic Head (TDH_2)	FLOW		RPM_2	Motor Volts	Motor Amps			Avg. Amps	Pump BHP_2 (calc'd)	Pump Eff. (calc'd)	Affinity Law Corrections				Calc'd NPSHA	NPSHR*
								Reading	Convert to GPM_2			Leg 1	Leg 2	Leg 3				RPM_1	TDH_1	GPM_1	BHP_1		
	(PSI.)	(ft.)	(PSI.)	(ft.)	Disc.	Suct.																	
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							

* NPSHR taken from manufacturer's pricebook curve.

** Motor information taken off motor nameplate.

See sheet 2 of 2 for useful formulas.

Type of flow measurement device: _____

Readings taken by: _____

Comments: _____

_____

APPENDIX "C" FIELD TEST REPORT

Field Test Report

Date _____

Pump Size _____ Pump Type _____

Pump Serial Number _____ Impeller Diameter (in.) _____

Manufacturer's Pump Curve Number _____

MOTOR:** Rated HP _____ Volts _____ S.F. _____

F.L. Amps _____ F.L. Eff _____ P.F. _____

Phase _____

RATING: GPM _____ Head _____ RPM _____

Suction gauge pipe size _____ inches

Discharge gauge connection pipe size _____ inches

Discharge gauge elevation corr. _____ feet

Suction gauge elevation corr. _____ feet

Barometric pressure _____ inches Hg x 1.13 = _____ feet water

Liquid pumped _____ S.G. _____

Liquid temperature _____ °F

Liquid vapor pressure _____ psi x 2.31 = _____feet water

POINT	Discharge Pressure Gauge		Suction Pressure Gauge		Velocity Head (feet)		Total Dynamic Head (TDH_2)	FLOW		RPM_2	Motor Volts	Motor Amps			Avg. Amps	Pump BHP_2 (calc'd)	Pump Eff. (calc'd)	Affinity Law Corrections				Calc'd NPSHA	NPSHR*
								Reading	Convert to GPM_2			Leg 1	Leg 2	Leg 3				RPM_1	TDH_1	GPM_1	BHP_1		
	(PSI.)	(ft.)	(PSI.)	(ft.)	Disc.	Suct.																	
1																							
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							

* NPSHR taken from manufacturer's pricebook curve.

** Motor information taken off motor nameplate.

See sheet 2 of 2 for useful formulas.

Type of flow measurement device: _____

Readings taken by: _____

Comments: _____

_____