



## Optimization Services

**A Century of Combined Experience**

**OUR EXPERIENCE IS OUR SUCCESS**

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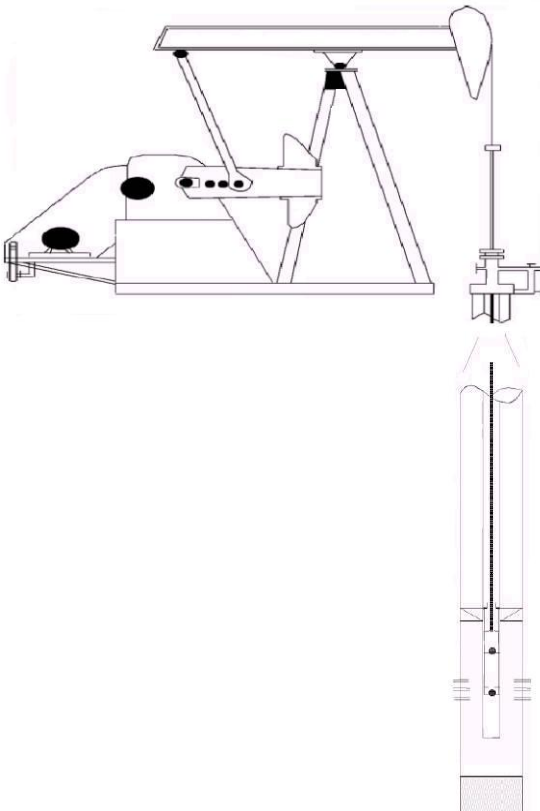
### **SALES OFFICE**

510, 407-2<sup>nd</sup> Street SW  
Calgary, Alberta T2P 2Y3  
Office: (403) 234-7033  
Fax:(403) 234-7014

**Prime Pump Industries Inc.** is a proudly Canadian owned and operated oilfield service company providing optimization services to the Canadian energy industry since 1998. Currently, Prime Pump Industries has several field offices throughout **Alberta** and **British Columbia** with ongoing expansion to provide our customers with the most convenient and economical locations.

**Prime Pump Industries Inc.** considers itself “**second to none**” when it comes to collecting field data by using the most up to date equipment available to our industry and having the most experienced optimization personnel for the services we provide. We take pride in providing more than just a service - **we work with our customers to accomplish a complete optimization solution.**

Prime Pump Industries' goal is to provide our clients with **accurate data** and **rapid service** at **competitive prices** allowing our customers to make **timely decisions**, **reduce down time**, **minimize operating costs** and **optimize their production capabilities.** We are committed on building life long relationships through excellence and pride in our services.



### We Are Your Specialists in:

- Pressure Buildup and Falloff Surveys
- ERCB Requirements and Submissions
- Dynamometer Surveys
- Pressure Transient Analysis
- Fluid Level Determination
- Annular Fluid Depression Tests
- Producing Pressure Determination
- Inflow Performance Relationships
- Surface Casing Vent Testing
- Digital Pressure Logging (Surface)
- Packer Isolation Testing
- Stock Tank Testing

### **Electronic Submission of Pressure Survey Data**

Pursuant to Guide 52, the ERCB requires all Well Data to be submitted to them in an electronic format as of March 1, 1999.

Prime Pump Industries will provide the data in the required electronic format to our clients, and/or submit data directly to the ERCB on their behalf.

### **Acoustic Fluid Level Surveys and Reporting**

#### **Acoustic Fluid Level Survey (Producing\* / Static)**

The report is printed in the field and includes:

- Joints to fluid, location, date and time, tubing and casing pressures, strokes per minute\*, length of stroke\*, pitman position\*, API pump unit description.
- Summary table provided for fluid level surveys of multiple wells.

#### **Static Single-Shot Bottomhole Pressure Calculation**

- Based on acoustic fluid level survey data.
- Report includes surface pressure measurements, calculated subsurface pressure gas and liquid column lengths and gradients. *Note: fluid Level Survey extra.*

#### **Annular Fluid Depression Test (via Manual Acoustic Fluid Levels)**

The *Annular Fluid Depression* test is the most widely accepted method of determining a reliable subsurface producing pressure in pumping wells. Through a series of pumping fluid levels and casing pressures, annular fluid gradients can be determined and a producing bottom hole pressure is calculated. *Note: Analysis and Report extra.*

#### **Annular Fluid Depression Test (via Automated Acoustic Fluid Levels)**

The automated *Annular Fluid Depression* test is performed using a state-of-the-art automatic fluid level unit and pressure transducer. The self-contained unit records as many fluid levels / pressures as desired, and can be set on any schedule required. The automatic unit meets or exceeds all regulatory safety requirements (CSA / ABSA certificates appended). *Note: Analysis and Report extra.*

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## **Acoustic Fluid Level Surveys and Reporting (Continued)**

### **Annular Fluid Depression Test – Analysis and Report**

The *Annular Fluid Depression Test Report* includes calculations and results of gas liquid column pressures; liquid gradients; pressure at reference depth; and graph of gas-liquid interface pressure. The calculated producing pressure and liquid gradients are validated using the two-phase flow correlations of Kabir et al (SPE 1988) as well as the G-50G calculations from the ERCB.

### **Pressure Data Logging**

- Monitor the casing and/or tubing pressure using our Digital Pressure Loggers.
- Sample intervals can be set as low as five seconds or any interval required.

### **Acoustic Bottomhole Pressure Surveys (Automated Data Acquisition)**

- Build-ups and Fall-offs.
- The self-contained unit records as many fluid levels / pressures as desired, and can be set on any schedule required. The automatic unit meets or exceeds all regulatory safety requirements (CSA / ABSA certificates appended). *Note: Pressure Survey Bottomhole Report extra.*

### **Build-up Survey (Multi-Point) Bottomhole Pressure Report**

- Includes the following: calculated subsurface pressures; gas and liquid gradients; gas and liquid column lengths; diagnostic plots (log-log; bottom hole pressure; casing pressure; liquid level) and subsurface pressure data in ASCII format. The report also includes the summary of the entire test and a qualifying comment for ERCB compliance.

### **Monitoring Report for Acoustic Pressure Survey in Progress**

- Systematic updates, represented in both graphical and tabular form as the test proceeds
- Continual data analysis ensures adequate data is collected for a P.T.A. and that the well is put back on production with minimal down time.

### **P.T.A. - Flow and Buildup Analysis Report (Acoustic or Surface Pressure Data)**

- For either oil or gas wells. Analysis of buildup survey using Fekete FAST analysis software. The analysis meets all ERCB pressure survey requirements and includes calculation of permeability, total mobility, skin factor, stimulation potential, stabilized IPR, and average reservoir pressure using state-of-the-art History Matching techniques. *Note: Subsurface pressure calculations charged extra.*

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## **AWS Pressure Survey PAS Files**

### **Static Fluid Level Survey (GRD.PAS) File**

- Includes complete file generation, certification and/or submission to the ERCB. Copy of PAS file or validation receipt also provided to customer.

### **Pressure Survey (TRG.PAS) File**

- Includes complete file generation, certification and/or submission to the ERCB. Copy of PAS file or validation receipt also provided to customer.

**Note:** Validation programs are used to ensure the PAS file that is generated exceeds all of the ERCB requirements. All PAS files are test certified prior to a formal submission either to the ERCB or to our customers for their submission.

## **Dynamometer Surveys and Reporting**

### **Quick Check Dynamometer**

The *Quick Check Dynamometer* consists of a single page report of field acquisition data and is a cost effective method of quantitatively evaluating bottom hole pump performance. The *Quick Check Dynamometer* provides the following:

- Surface Dynamometer Card
- Peak polished rod loading (PPRL)
- Minimum polished rod loading (MPRL)
- Counterbalance Check (CBE)
- Valve Checks (2-Traveling Valve / 2-Standing Valve)
- Stroke Length / Stroke per Minute
- Electronic Deadweight of Tubing / Casing Pressures
- Fluid Level Test

The *Quick Check Dynamometer* can be upgraded to a *Surface Dynamometer Report* or *In-Depth Dynamometer Report* at any time.

### **Surface Dynamometer Report**

The *Surface Dynamometer Report* includes the field data acquisition data provided in the *Quick Check Dynamometer*, in addition to the following:

- Gearbox balance condition
- Permissible load diagram
- Existing and In-balance peak torque and counterbalance
- Percent gearbox rating
- Existing and In-balance polished rod horsepower
- Approximate existing and In-balance motor horsepower
- Maximum and minimum rod loads at surface
- Maximum and minimum rod stresses at surface

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**Dynamometer Surveys (Continued)****In-Depth Dynamometer Report**

The *In-depth Dynamometer Report* provides the following:

**DYNAMOMETER INTERPRETATION AND RECOMMENDATIONS**

- Summary of production potential
- Alternatives to recover additional production
- Weight placement for proper balancing of pump unit
- Possible methods to reduce operating expenses
- Pump card interpretation
- Comments and recommendations regarding miscellaneous equipment loading
- Miscellaneous comments regarding pump efficiency and possible leak

**PUMPING UNIT**

- Maximum and minimum structure loads
- Existing peak torque and counterbalance
- Percent gearbox rating
- Counterbalance for proper balance
- Permissible load diagram
- Measured strokes per minute
- Measured stroke length

**PRIME MOVER**

- Type and rating
- Required horsepower

**ROD STRING**

- Maximum and minimum loads at surface and junction points in the taper rod string
- Maximum and minimum stresses and junction points in tapered rod string

**BOTTOMHOLE PUMP CONDITION**

- Traveling valve and standing valve loads
- Mechanical condition
- Gross and net downhole stroke
- Gross and net pump efficiency
- Determination of downhole friction

**OTHER DIAGNOSTIC INDICATORS**

- Stuffing box friction
- Tubing or check valve leaks
- Lost displacement due to tubing movement

**PLOTS OF**

- Surface and pump dynamometer cards displayed on a common scale
- Pump velocity versus pump position
- Gearbox reducer torque versus rod position
- Valve checks

**VISUAL INSPECTION**

- Complete with report

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## **Dynamometer Surveys (Continued)**

### **In-Depth Dynamometer Report w/ Pumping System Design Match**

Using proprietary design / analysis software, predictive designs can be used:

- As a design match in conjunction with Dynamometer report to estimate a producing pressure when producing from below a packer installation or when a pumping fluid level could not be obtained.
- To more accurately determine optimum operating conditions to provide maximum productivity from a pumping system
- To determine the optimum pumping system to provide maximum productivity from a well.

## **ERCB Requirements and Reporting**

### **Surface Casing Vent Test**

Includes field report and a summary table of field data collected during the test. Data collected includes:

- The type of flow and pressure buildup measurement devices, production casing and tubing pressures, build-up rate, final build-up pressure, days to pressure stabilization, and flow rate ( $m^3/d$ ).

### **Surface Casing Vent Test Report**

Includes the completed ERCB Surface Casing Vent Test report ready for submission and a summary table of field data collected during the test. Data collected includes:

- The type of flow (sweet/sour); production casing and tubing pressures; build-up rate; final build-up pressure; days to pressure stabilization; and flow rate ( $m^3/d$ ) and corrected gas flow rate ( $m^3/d @ STP$ ).

### **Stock Tank Test\***

Includes field report and a summary table of field data collected during the test. (Hourly cost of rig in/rig out separate) Data collected includes:

- The type of flow measurement devices, production casing and tubing pressures, tank gauging and flow rate ( $m^3/d$ ).

*\*Safety regulations require gas measurement to be conducted at ground level – pipe venting from the top of the tank to ground level must be present.*

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## **ERCB Requirements and Reporting (Continued)**

### **Stock Tank Test Report**

Includes the completed ERCB Stock Tank Test report ready for submission and a summary table of field data collected during the test. Data includes:

- The type of flow (sweet/sour); production casing and tubing pressures, tank gauging, flow rate ( $\text{m}^3/\text{d}$ ) and corrected gas flow rate ( $\text{m}^3/\text{d}$  @ STP).

### **Packer Isolation Test**

Includes field report and a summary table of field data collected during the test. Data includes:

- Case classification, production casing and tubing pressures, type of fluid utilized for test, annular fill / bleed-off volumes, and buildup pressure logging.

### **Packer Isolation Test Report**

Includes the completed ERCB Packer Isolation Test report ready for submission and a summary table of field data collected during the test, including Pass / Fail classification.

## **Engineering Services**

The engineering firm, NR-TEC of Calgary provides all the analyses and reporting for Prime Pump Industries Inc.

If the well information is provided prior to a Survey being completed in the field, the results will be faxed/emailed within 48 hours.



Prime Pump Industries Inc. prides itself on its **no surprise pricing** policy. The quoted price is the price charged - no more, no less. We do not charge extra for safety equipment, faxes, extra calls, subsistence (so long as the field person is at his home base in the evening), trucks, technician time, and downloads. A surcharge will be added for work performed on Christmas Day, New Years Day and Easter Sunday.

**Prime Pump Industries Inc.** carries five million in liability coverage and has all field personnel maintain up to date H2S Alive, WHMIS, First Aid, and TDG tickets.

- W.C.B. Alberta Account: 395870-1
- W.C.B. BC Account: 645901-AA (80)

**OPTIMIZATION LOCATIONS:**

<b>CALGARY OFFICE</b>	(403) 234-7033
<b>RED DEER</b>	(403) 356-9774
<b>DRAYTON VALLEY</b>	(780) 542-5419
<b>SLAVE LAKE</b>	(780) 805-4691
<b>GRANDE PRAIRIE</b>	(780) 830-2475
<b>FORT ST. JOHN, B.C.</b>	(250) 262-2019
<b>BROOKS</b>	(403) 362-0730
<b>WHITECOURT</b>	(780) 706-6299

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