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***PC Pumps in Diadema  
oilfield. San Jorge Basin  
Argentina***

*By MARCELO HIRSCHFELDT*

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***SPE Progressing Cavity Pump Workshop  
Pto La Cruz, Venezuela. January 23-24, 2001***

# *Diadema oilfield location*



# *History*

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- **one of the oldest oilfield in Argentina**
- **first operated by Shell, in 1922**
- **then acquired by CAPSA in 1977**
- **in 1987, started first secondary recovery project**

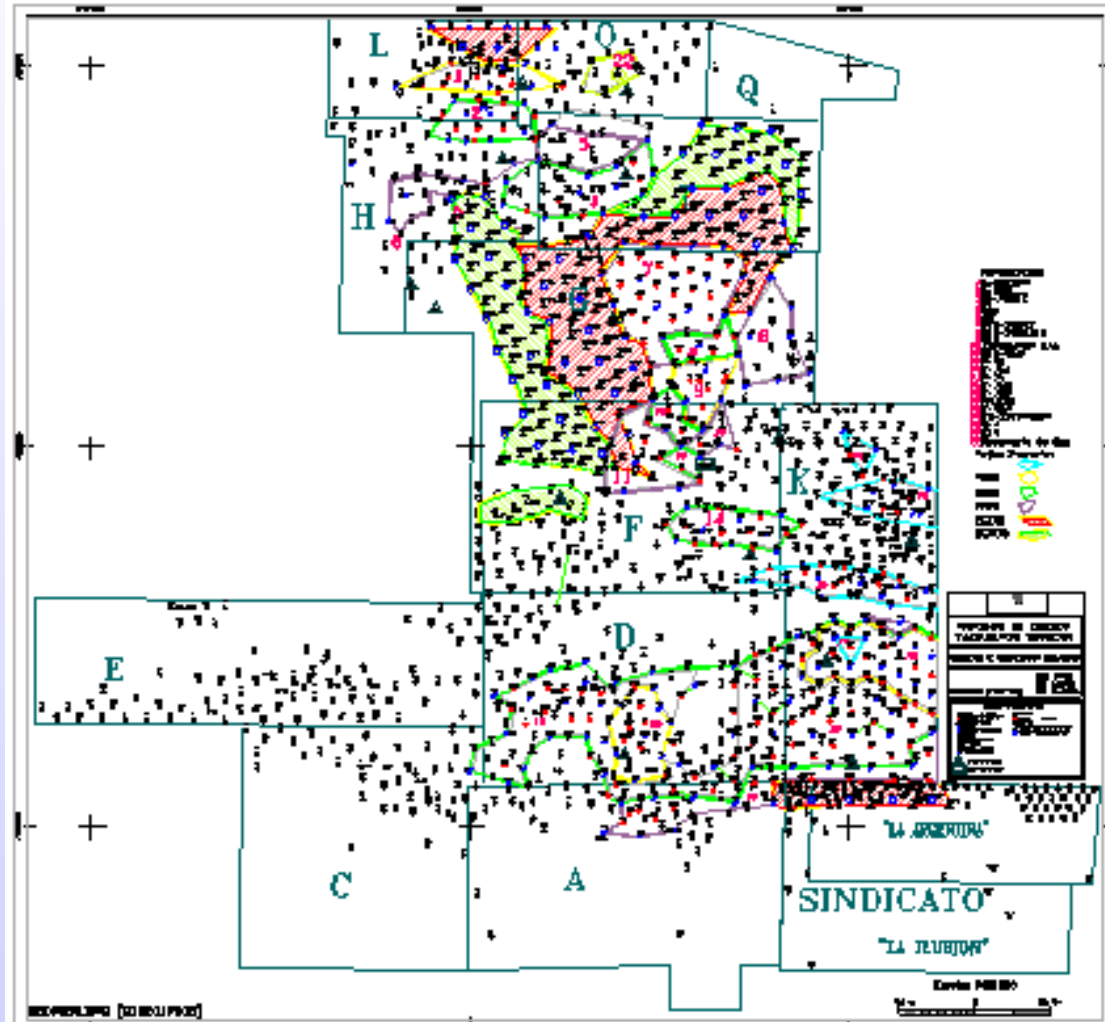
## *Background information*

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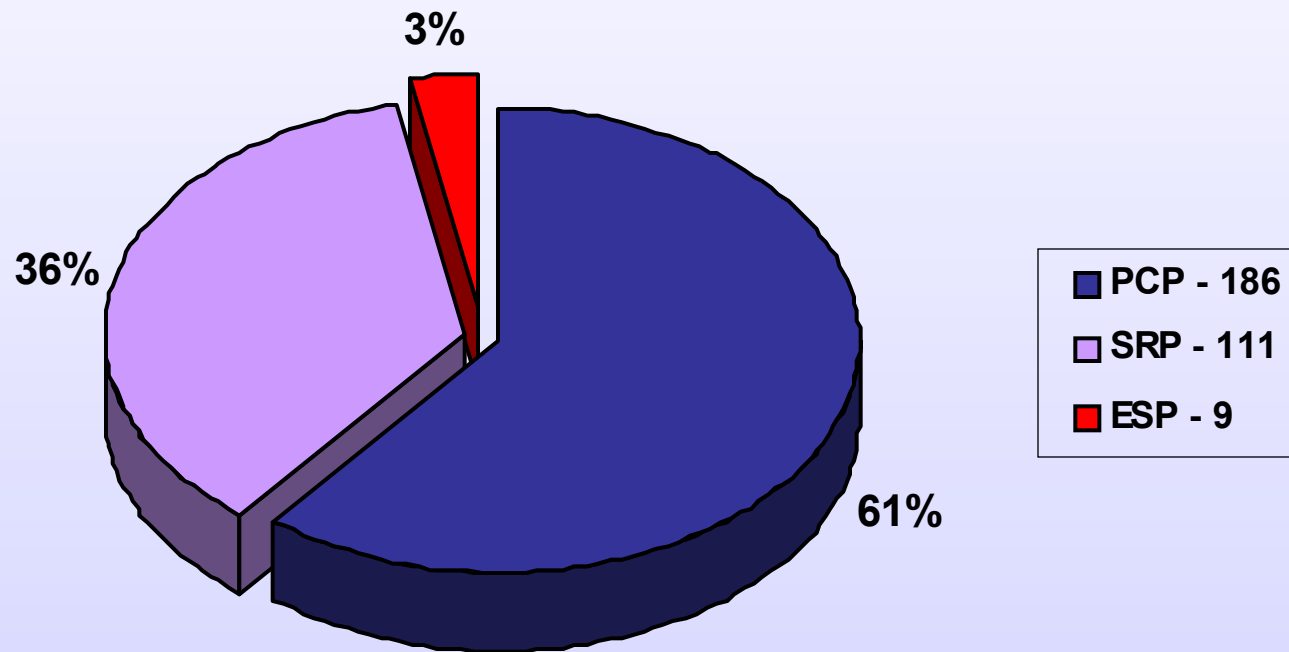
- **productor wells: 306**
- **injector wells: 175**
- **gross production: 174.000 bbl/day**
- **water %: 94.5**
- **injection water: 164.000 bbl/day**

# Background information



- area : 10.500 has
- 11 Secondary Recovery Projects

# *Artificial lift distribution*

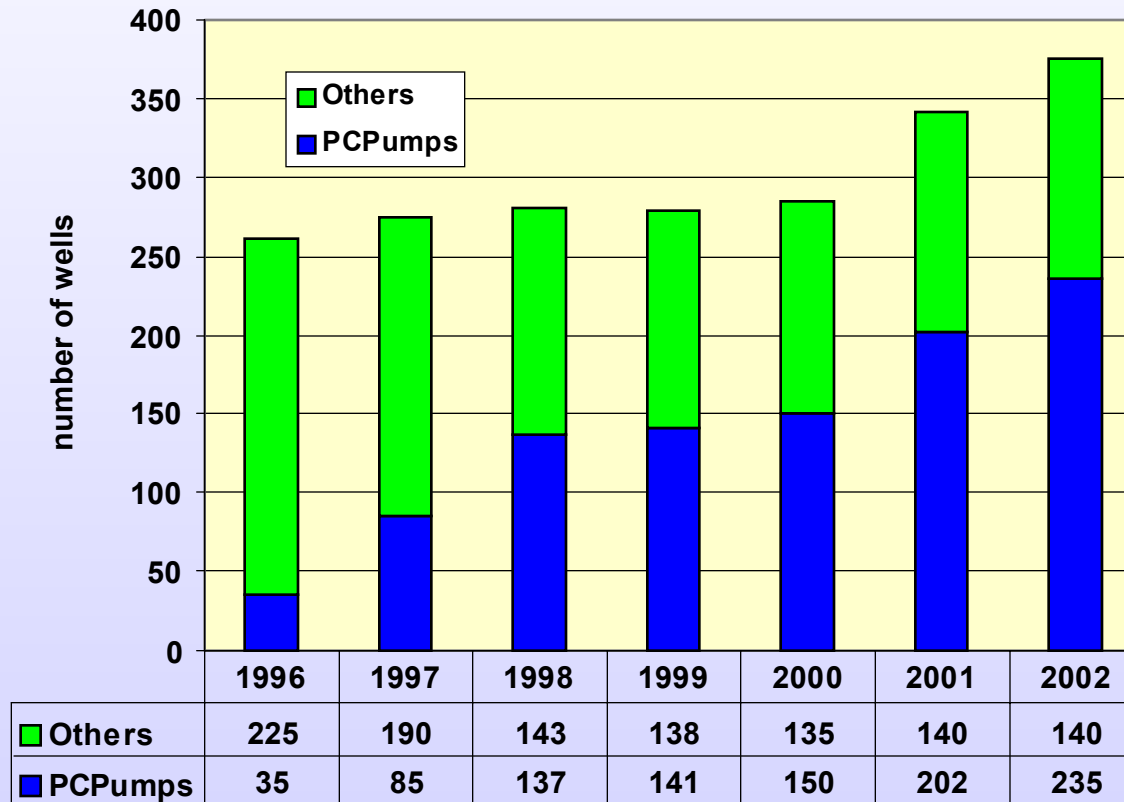




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# *Installation and operating conditions*

# PCPump history





## *Downhole installation*

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- number of PCPumps: 186
- average pump depth: 3.100 ft
- casing diameter: 5 ½"
- tubing diameter: 2 7/8"
- string rod size: 1"
- flow rate range: 125 -1200 bbl/day
- pump specifications:
  - 2000 PSI , 300 - 500 bbl/day/100 rpm
- geometry: single lobe,multi-lobe(2:3)
- stator elastomers: NBR(Nitriles Rubber)

## *Surface equipment*

### Wellhead Drive Units

- direct drive head
- axial load capacity: 20.000 Lbs.
- brake system: External disk brake/mechanical
- electric motor : 50 Hp/380 V/ 980 rpm/ 50 Hz

### Control

- variable frequency drive (VFD)
- characteristic: 37.5 Kw / 460 v max

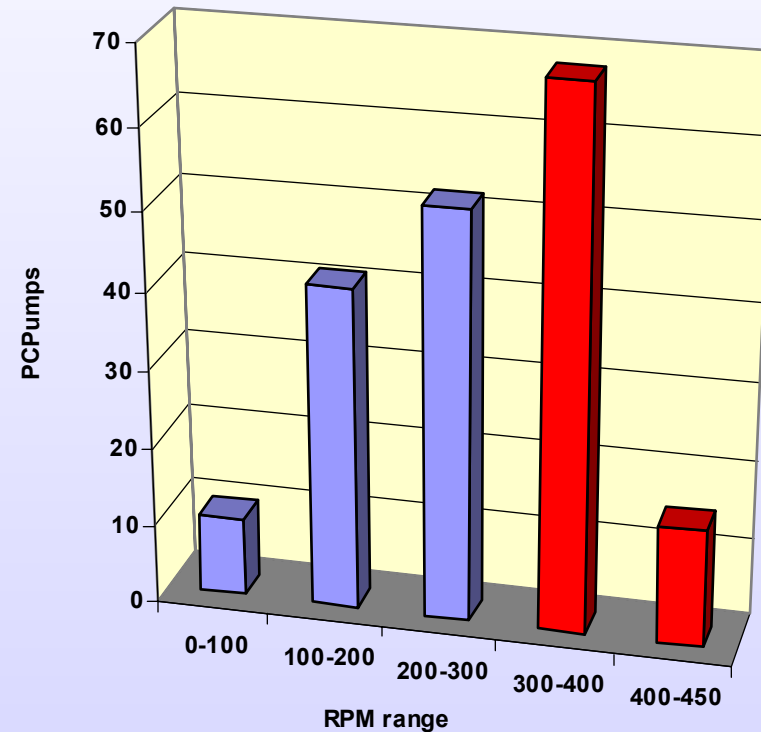
**“ 186 PC Pumps are driven by VFD”**



# Operating speeds distribution



<i>rpm</i>	<i>N°</i>	<i>%</i>
0-100	10	5.38%
100-200	41	22.04%
200-300	52	27.96%
<b>300-400</b>	<b>68</b>	<b>36.56%</b>
<b>400-450</b>	<b>15</b>	<b>8.06%</b>
<b>total</b>	<b>186</b>	





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# *Equipment inspection and supervision*

# *Rotor inspection and recovery*



## 1. Visual inspection

- severe base metal wear
- chrome surface wear






## 2. Dimensional inspection

- chrome thickness
- diameter



## 3. Clasification(color identification)

-  - approved
-  - for re-chroming
-  - scrap



# *Stators inspection and recovery*



## 1. visual inspection

- pin inspection
- missing ruber



## 2. dimentional inspection

- Still being developed



## 3. bench test

## 4. stator inspection and investigation



# *Test bench equipment*



PC Pump test bench



Electromagnetic Flow meter

# PC Pump data base



Well and pump information

failure diagnosis


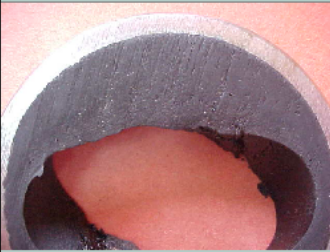
Microsoft Access - [Formulario para Marcelo 2 : Formulario]

Archivo Edición Ver Insertar Formato Registros Herramientas Ventana ?

Actualizar Cross plot PCP Ejecutar consulta

Pozo	desde	hasta	dias func.	Se cortó?	Motivo de la falla	efic.
A-120	22/07/2000	24/08/2000	33	Si	Rotura	Temperatura-Sin flujo

N° Estator	N° Rotor	Modelo	Otra falla en el estator	Max RPM	Max RPM:	Pozo	
088914-00	Cond I	096114-00	Cond I	18-40-1500	145	145	A-120



**Observaciones**  
Tres cuartos de la bomba está quemada- Se cortó muestra

**Diagnóstico de pulling**  
Sin producción

Registro: 102 de 232



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# *New applications*

# *Hollow rods*



## *Hollow rods – Technical info*



Cabezal de varilla maciza



Cabezal de varilla hueca y cupla

### Technical data

- length: 30 ft
- ID: 38 mm
- OD: 48 mm
- Aprox. Weight: 4.15 lb/ft

# *Hollow rods – Installation*





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# *Next targets*

## *Next targets*

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- **PC Pumps life optimization**
- **Downhole and surface monitoring**
- **New products and technology**



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