

Case Study

Mouldsworth Borehole
Wilo UK

United
Supply
Chain



Mouldsworth Borehole

BACKGROUND

United Utilities have a raw water extraction site at Mouldsworth in Cheshire.

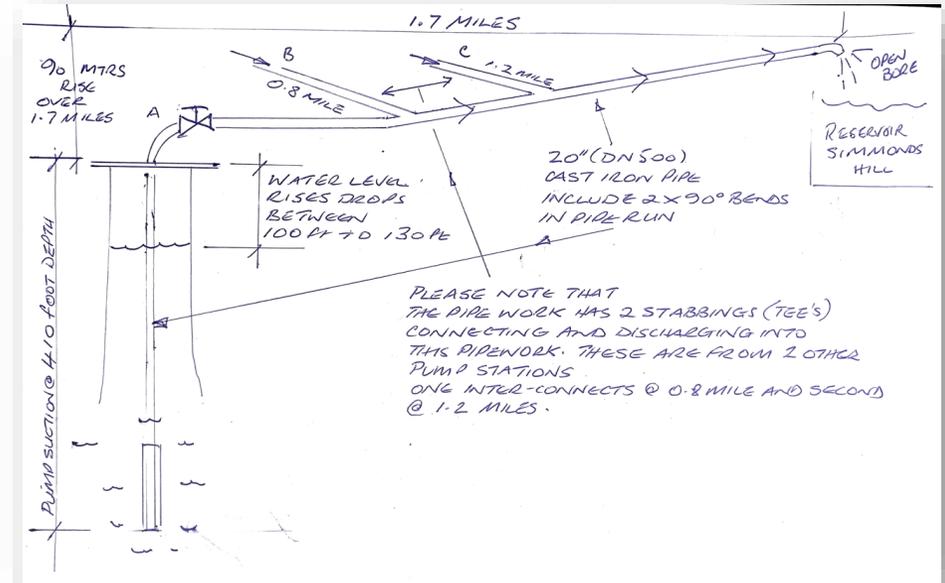
This site delivers 3 million litres of water per day through 1.7 miles of pipework to a reservoir.

This is a key part of United Utilities' clean water operations allowing them to deliver 1.8 billion litres of water a day to more than 3 million homes and businesses in the North West.



Mouldsworth Borehole

CASE STUDY



Pump failure after 12 months



Site survey undertaken by Wilo UK



Solution proposed

Mouldsworth Borehole



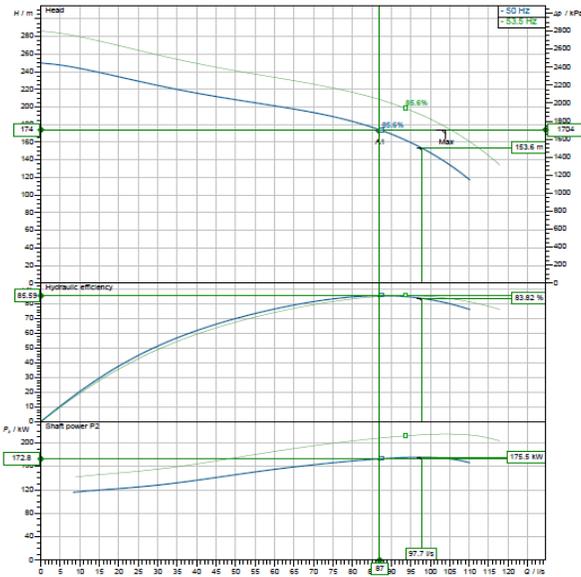
Water for the North West

Site surveying and analysis was undertaken to understand the site pumping requirements and to optimise the sites operations.

CASE STUDY

Project: PRO_0221971/CG
 Project number: Monmouth UU Plc
 Created on: 30/06/2020
 Created by: **wilo**

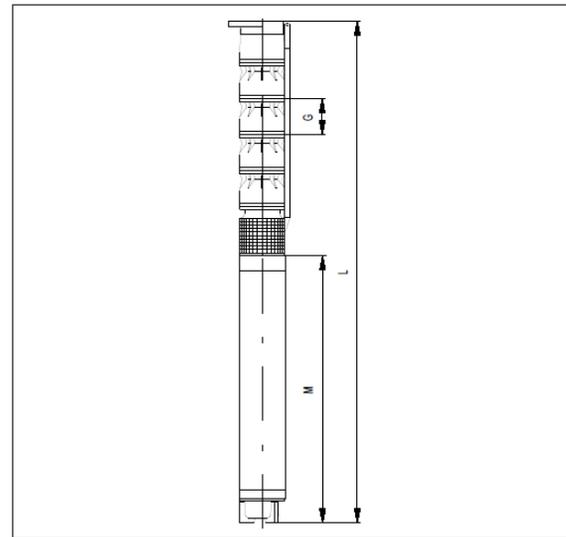
Performance curves Pump K10.310 Stages 6 Motor NU 122T-2/90
 Submersible pump



Pump		Duty point data	
Stages	6	Volume flow	87.00 l/s
Impeller Ø	designed 183.7 mm	Head	174 m
Nominal speed	2900 l/min	Shaft power P ₂	172.8 kW
Frequency	50 Hz	Pump efficiency	85.6 %
Impeller type	Semi axial impeller	Power input P ₁	197.5 kW
Rated power	240 kW	Required pump NPSH	10.2 m
Sel. explosion protection		Speed	2928 1/min

Project: PRO_0221971/CG
 Project number: Monmouth UU Plc
 Created on: 30/06/2020
 Created by: **wilo**

Technical data Pump K10.310 Stages 6 Motor NU 122T-2/90
 Submersible pump



Dimensions in mm		Connections	
G	185	Discharge port	Intake piece
L	3720	G 61	
M	2070	PN63	
		RV G 61 PN 63	

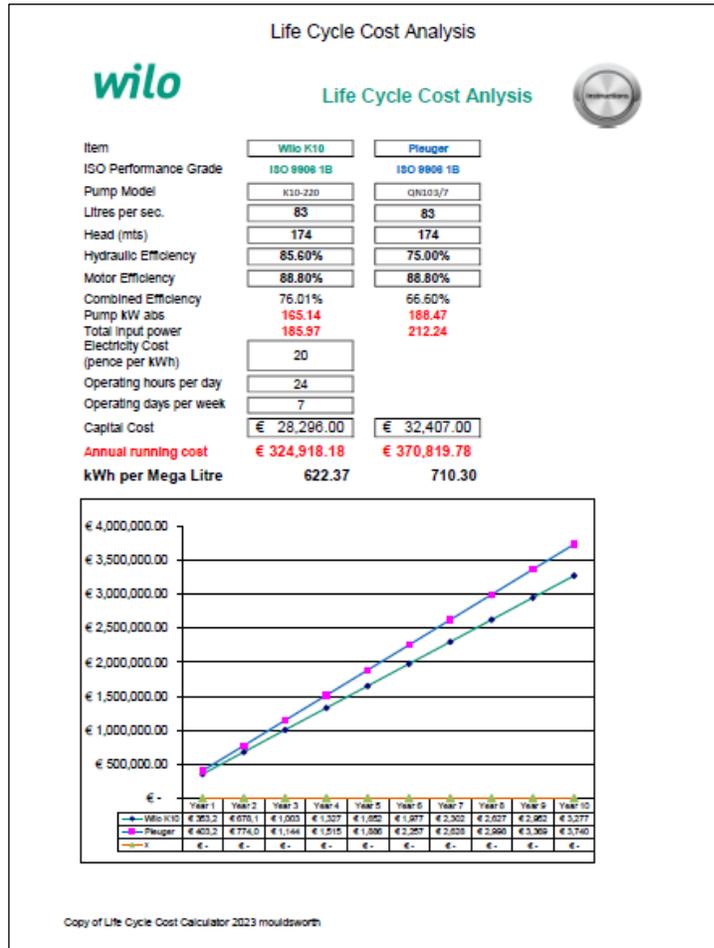
Project: PRO_0221971/CG
 Project number: Monmouth UU Plc
 Created on: 30/06/2020
 Created by: **wilo**

Technical data Pump K10.310-S Stages 6 Motor NU 122T-2/90
 Submersible pump

Operating data specification			
Pumped fluid	Water	Rated flow	87 l/s
Solids	Type	Rated head	174 m
	Weight %	Geodetic head	0 m
Operating temperature t A	20 °C	Available system NPSH	m
pH at t A	7	Max. inlet pressure	0 kPa
Density at t A	998.2 kg/m³	Altitude above sea level	100 m
Kin. viscosity at t A	1 mm²/s	Installation type	Vertical installation
Vapour pressure at t A	2.23 kPa	Borehole Ø	mm
Voltage	V	Duty point data	
Frequency	50 Hz	Volume flow	87.00 l/s
		Head	174 m
Make	WIL0	Shaft power P ₂	172.8 kW
Pump type	K10.310-S	Pump efficiency	85.6 %
Frame size	10" (Ø245 - Ø275)	Power input P ₁	197.5 kW
Sense of rotation	Counter clockwise	Required pump NPSH	10.2 m
Max. operating pressure	2446 kPa	Speed	2900 1/min
Discharge port	Pressure rating PN63	Manufacturer / Type	NU 122T-2/90
	Rated diameter G 61	Specific design	NU (drinking water filling)
	Standard DIN ISO 228-1 (1)	Stages	6
Impeller Ø	Standard	Rated power	240 kW
		Electric voltage	400 ~3 V
		Frequency	50 Hz
		Power input with rated power	269.7 kW
		Current input with rated power	457.9 A
		Number of poles	2
		Rated speed	2900 1/min
		Load	125 / 100 / 75 / 50 / 25 %
		cos phi	0.87/0.85/0.82/0.76/0.58
		cos phi with starting	0.28
		efficiency	88.5/88.9/87.8/84.7/77.8
		Operation type (VDE 0530)	51 immensed
		Max. fluid temperature	20 °C
		Min. flow velocity	0.1 m/s
		Starting curr. d-o-U VD	2500 / 833.3 A
		Starting torque	750 Nm
		Inertia moment	0.284 kg m²
		Starts per hour max.	10
		Degree of protection	IP 68
		Weight of motor	620 kg
		Motor connection cable	7x1x70 50/75B
		Max. possible motor connection cable	- mm²
		Motor materials	
		Material design:	C
		Shaft sealing:	mech. shaft seal
		Stator pipe	St
		Upper bearing casing	EN - G3L 200
		Lower bearing casing	EN - G3L 200
		Shaft part:	EN - G3L 200
		Shaft pivot:	1.4462
		Rubber parts:	EPDM
		Screws and nuts:	A2 - 70
			A4 - 70
Remarks:			
Warranty as per IEC 34/VDE 530 + ISO 9906/2			

Mouldsworth Borehole

Result



- 10% Hydraulic efficiency gain
- 27 Kilowatts per hour energy saving
- £64,000 Running cost saving per annum
- £640,000 Saving based on life expectancy
- 23% Savings in capital costs
- Reduction in CO2 emissions of 194 tonnes per annum
- Reduction in CO2 emissions of 1940 tonnes per 10-year life expectancy.
- Wilo pump has no embedded CO2 in manufacturing process

Case Study

Carbon Neutral manufacturing



READ MORE

United Supply Chain: <https://www.unitedutilities.com/corporate/about-us/governance/suppliers/delivering-value/united-supply-chain/>

Supply Chain Sustainability School: <https://www.supplychainschool.co.uk/>

Wilo Sustainability Report: <https://wilo.com/en/Pioneering/Sustainability/Sustainability-Report/>