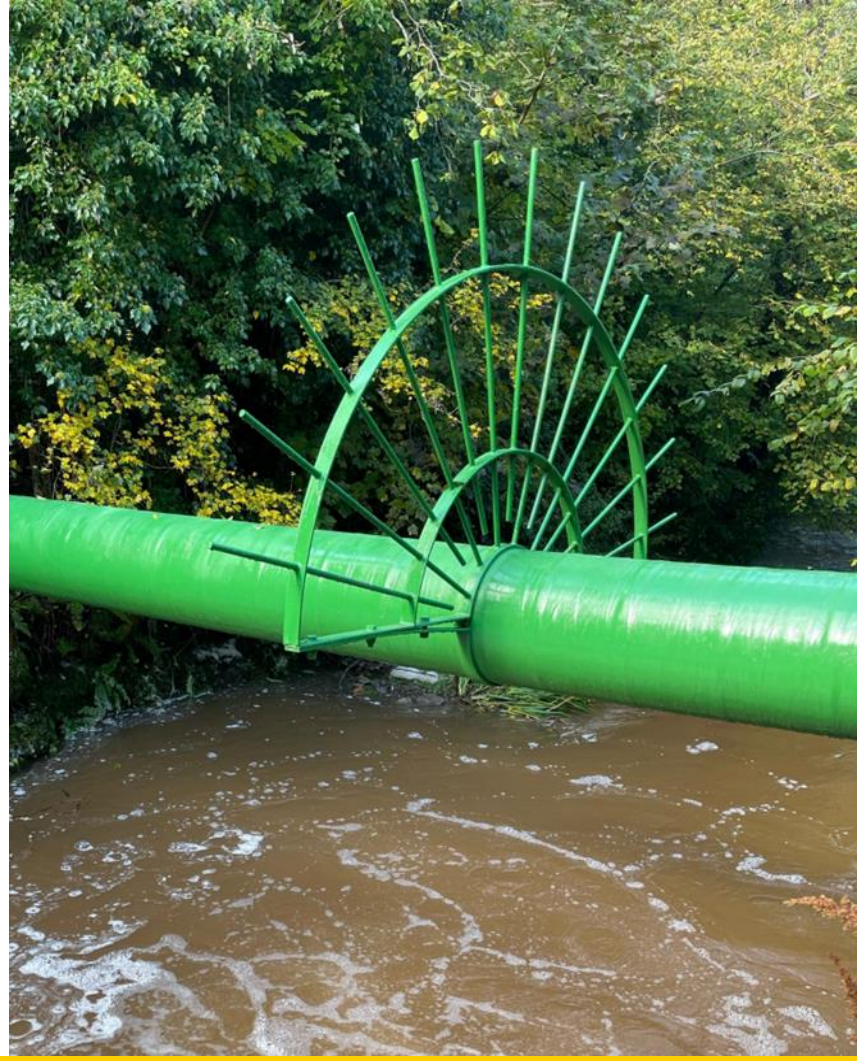
MAINLINE PIPELINES LIMITED

A Valero Company



Above Ground River Crossing Pipeline Corrosion And Impact Protection

Carl Scott & Rob Balson

9th October 2025

Aboveground Crossings

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- MLP has a number of aboveground river crossings
- 5 of these were areas of concern, they had external casings applied in early 1980's
  - No installation records
  - No design calcs
- Visual inspection in 2023 showed these to be in poor condition
- Two particularly raised concerns – longer crossings, casings appeared to be sagging
- One crossing has some minor external corrosion reported beneath sleeve
- CEASAR analysis confirmed pipe can tolerate load of casing sleeves at current support distances
- In 2024 MLP approved a work program to remove casings and replace with impact protective coating (Fibreglass)
  - Lighter weight
  - No potential for crevice corrosion
  - No impact on ILI accuracy
  - Work scope included - Full enclosure scaffold, remove original sleeve, Blast, Inspect, STOPAQ & Armourguard

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Project Overview

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Challenges:

- Located in a National Park and only 1 Km upstream of a Site of Special Scientific Interest (SSSI) and a Special Area of Conservation (SAC)
- Pipeline positioned within waterfall splash zone, directly above river
- Hydrology reports indicated that in extreme 1 in 100-year flood events the pipeline could become submerged
- Limited site access, so only equipment that could be carried by hand could be used

Objective:

- Provide long-term, maintenance free, corrosion protection
- Provide impact resistance from debris during floods
- Ensure compliance with strict environmental regulations
- Hand applied system within enclosed habitat

Who are Presserv?

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- Presserv Group specialize in providing preservation and corrosion prevention solutions. We employ over 100 people worldwide and our teams currently work from six permanent locations around the globe.

- 1996 – Norway
- 2010 – Brazil
- 2012 – UK
- 2018 – USA
- 2019 – Australia
- 2020 – Brunei

- Within those territories we have various distribution rights for brands such as Cortec, Stopaq, Monti Power, Sponge Jet, Inductosense, Pipe Proteq, Precision Piping Products, Icon Protection, Trusted Global

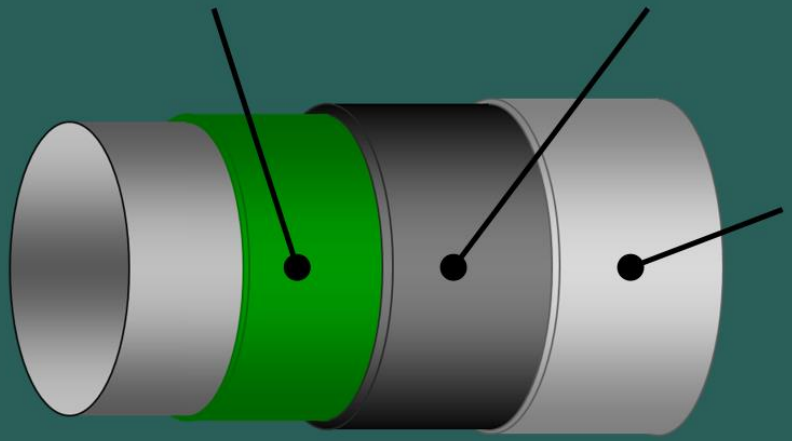
Proposed Three Layer Solution

Proposed Three Layer Solution

PRESSERV

1) Corrosion Prevention layer
STOPAQ® Wrappingband CZ
300mm x 10m Rolls

2) Mechanical Protection layer
STOPAQ® Outerwrap PVC
100mm x 30m Rolls



3) Impact Resistance Layer
STOPAQ® Outerglass Shield
200mm x 20m rolls

Application Of Corrosion Prevention

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- The pipe was prepared to meet the specification of Sa2.5 (STOPAQ requires a minimum of St2)
- Surface degreased with Isopropanol wipes prior to application.

Corrosion Prevention

STOPAQ® Wrappingband CZ 300mm x 10m Rolls

- Polyisobutene-based viscoelastic layer
- 2mm thick (2,000 microns)
- Wide rolls were cut into strips equal to the pipe circumference + 50mm.
- Strips were applied as circumferential wraps allowing for quick and easy application in cramped conditions.
- Immediate, permanent adhesion upon application.
- Permanently flexible within its continuous working temperature range of -45C to +50C (Thermal resistance +70C)

Application Of Corrosion Prevention

- **Mechanical Protection**
- STOPAQ® Outerwrap PVC 100mm x 30m Rolls
- A robust, flexible tape, applied over the STOPAQ® Wrappingband CZ for mechanical protection.
- Provides reinforcement and stability to the STOPAQ® Wrappingband layer.
- Applied with tension to support the system's self-healing ability
- STOPAQ® Outerwrap PVC was applied in 100mm wide rolls which allowed a large volume of material to be applied quickly , whilst also being small enough to pass under the pipe during application.
- STOPAQ® Outerwrap PVC has a continuous operating temperature range from -45C to +70C
- Thermal resistance of +90C

Application Of Impact Resistance

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STOPAQ® Outerglass Shield

This is a composite wrap material consisting of a glass-fibre fabric, impregnated with a solvent free polyurethane resin.

After consulting with the manufacturer's technical team, the STOPAQ® Outerglass Shield was applied six layers thick to provide significant impact and abrasion resistance.

Thickness at 6 layers = approx. 4.2mm

Impact strength of 150 kJ/m2. (ISO 180:2023)

Abrasion resistance $\leq$ 0.11mm / 1000 cycles CS-17 Wheel (ASTM D4060)

Tensile Strength – 250 MPa @ 2 layers (1.4mm) (ISO 527)

For long term UV Protection and for Environmental factors the STOPAQ® Outerglass Shield was painted green using a long-life topcoat.

Key Project Benefits

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- Minimum 30-year design life
- Minimal maintenance requirements
- High resistance to mechanical impact & environmental stressors
- Environmentally responsible application
- Virtually no waste. 90% of packaging is recyclable.
- Quick, safe application. (Stopaq application completed in 2 days)
- Resistant to very low temperatures without getting brittle
- Lessons learned – environmental permitting timescale took far longer than anticipated. Access issues to site caused delays.