Pollution Prevention Scheme in Yorkshire

£3.2m scheme focuses on "Hotspots" & "Hawkeye" sensors

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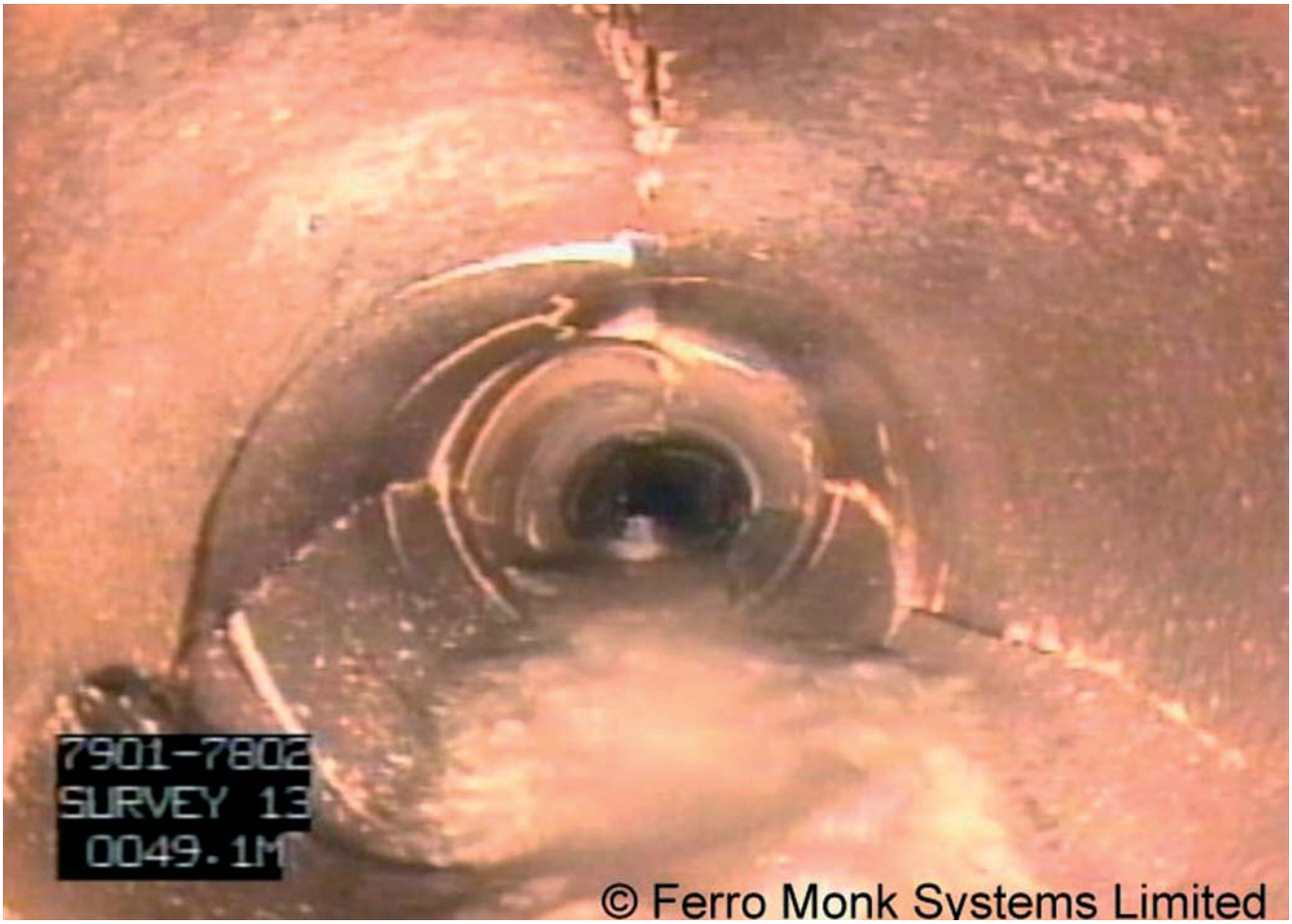
In March 2006, (following a pilot scheme in 2005 by Earth Tech Morrison) Yorkshire Water in conjunction with Watermark and contractor MWH Constructors commenced a two part £3.2m, pollution prevention programme covering a significant number of sites across the Yorkshire region. This innovative and proactive scheme, which was completed in July 2007, has significantly reduced the risk of pollution incidents across the county by targeting known "hotspots" across the sewer network and by the installation of "Hawkeye" sensors in Combined Sewer Overflows (CSO's).



Pollution Prevention: Pipe condition survey prior to lining *courtesy Ferro Monk Systems Ltd*

Hot Spots

The first part of the scheme comprised a £2.0m pro-active programme of work involving over 200 sites containing approximately 550 known 'hot spots'. Initially the scheme involved the identification through the analysis of CCTV footage of areas having either a history of pollution incidents caused by defective pipelines and collapsed sewers, or having the potential for pollution incidents as a result of deteriorating assets. The intention of the scheme, which targeted environmentally sensitive areas as far as possible, was to address a high number of issues with low cost solutions and with individual activity costs being capped at £15K.

With an emphasis on sites in close proximity to watercourses, Sites of Special Scientific Interest, nature reserves and community amenities, CCTV surveys were carried out across the Yorkshire region by specialist contractor *OnSite* under the direction of Yorkshire Water. CCTV footage was subsequently examined by Yorkshire Water who were able to identify existing and potential problem areas (hot spots) and also identify solutions to those problems.

Following problem and solution identification,work was issued to 'Watermark' in batches with an average batch value of £150K. Solutions generally involved one or more of the following activities: sewer desilting, root cutting, jetting, cured in place pipe (CIPP) patching, (CIPP) sewer lining, together with occasional dig down repairs and access (manholes) improvements.

The principal contractor for the scheme, *MWH Constructors,* used mainly 'no dig' techniques keeping open cut excavations to a minimum and thus minimising local disruption. MWHC employed the services of specialist sub-contractors I*nsituform, Ferro Monk and On Site* in order to expedite the works and daily attention to work scheduling, good team work and close co-ordination between

the site and design team was essential because of the large number of work sites and their widespread locations. Savings were achieved by the batching of similar activities, e.g desilting, where these activities were closely related geographically.

A typical rehabilitation technique employed widely throughout the project was the use of cure in place pipe liners. The technique involves using water or air to invert (turn inside out) a Polyurethane coated, resin impregnated, Polyester felt tube into the defective sewer. The water is then heated (or in the case of air inversion steam is introduced) by introduction and maintaining the heat for a designed curing period the resin mix cures and becomes hard leaving a tight fitting, jointless and corrosion resistant 'pipe' within the original pipe. Following remote controlled cutting of the liner at lateral connections, the refurbished pipe is inspected by CCTV to prove the quality of the finished product.

Hawkeye Sensors

The second part of the pollution prevention work involved the installation of *Hawkeye* sensors (by IETG) in over 220 CSO's, at a capital cost of £1.2million. The installations were widespread and included sites in Barnsley, Chesterfield, Sheffield, Wakefield, Dewsbury and Tadcaster catchments.

There is a proven link between the number of Combined Sewer Overflows (CSOs) in a catchment, and the number of serious pollution incidents due to the operation of CSOs in dry weather, caused by structural and service defects in the downstream sewers.

The *Hawkeye* sensor is a low cost, fully integrated, telemetry unit designed to monitor the performance of CSOs by utilising a non-contact ultrasonic sensor to measure levels which are sent for data collection via telemetry. The units, which were developed by IETG specifically for this type of application, are relatively easy to install and use mobile communication technology and battery power. In addition, to continually monitoring water levels, *Hawkeye* sensors have the ability to generate alarms when key thresholds or overflow levels are reached.

Pollution Prevention :'Hawkeye' prior to installation photo Watermark (MWH UK)


Pollution Prevention:'Hawkeye' installed in CSO shaft - 'Watermark' (MWH UK).

The *Hawkeye* sensors supply live data to Yorkshire Water, which gives the company a precise picture of what is happening at selected CSO's in the various catchment areas at all times. This allows appropriate action to be taken as and when necessary, and is likely to result in a significant reduction in the number of pollution incidents. ■

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