



**PPM** PROGRESSIVE  
PIPELINE  
MANAGEMENT  
THE INFRASTRUCTURE RENEWAL SPECIALISTS

**MARKET SEGMENT**

NATURAL GAS

**LOCATION**

JESSUP ROAD, NEW JERSEY

**DATE**

FEBRUARY 2022

**CLIENT**

NEW JERSEY UTILITY

**PROJECT PROFILE**

# PIPELINE WALL CONDITION ASSESSMENT BROADBAND ELECTROMAGNETIC (BEM) 135 FEET / 12" MAIN UNDER RAILROAD CROSSING

**BACKGROUND & SITUATION**

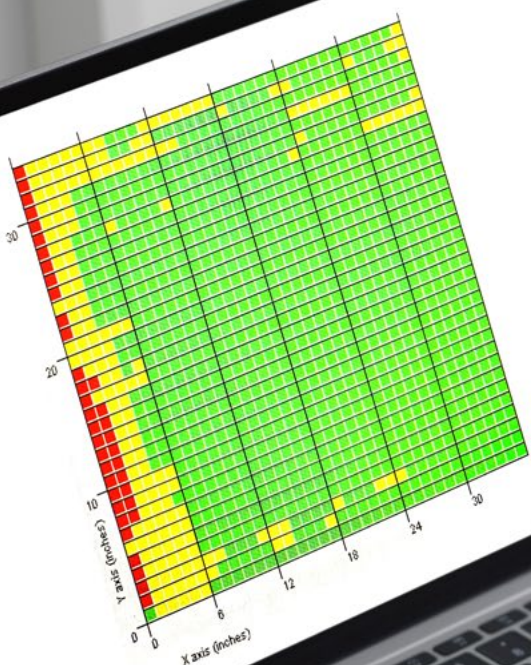
Identifying and measuring the integrity of ferrous pipe walls provides critical data to determine the condition and integrity of an underground facility. PPM's Broadband Electromagnetic Probe (BEM) accurately assesses the condition of pipelines and identifies the degree of corrosion or graphitization. A major eastern gas utility needed to assess a segment of a cast iron main that runs under a railroad crossing belonging to a large-scale import and export provider. Progressive Pipeline Management was asked to use BEM technology on the 135 foot section of 12-inch steel main along Jessup Road in Wenonah, New Jersey.

The goal was to determine if the pipe was a good candidate for Starline® Cured-in-place-lining, a technology that the utility has successfully deployed to rehabilitate hundreds of miles of their distribution system. The railroad owner required that the condition of the line be verified as suitable for lining prior to approving the work. It would have been extremely costly and difficult to trench and replace the section with a new pipe.

**SCOPE**

The 135 foot section is integral for the utility's gas distribution operations because it connects to a substation. BEM technology measures the structural integrity and the thickness of a pipe wall. It's a patented, main ferrous assessment tool that's been in operation over twenty years in non-destructive assessment of cast iron and other ferrous piping. The BEM tool allows pipeline assessments to be performed in-line or externally.

The external application, or Flexible Array Scanning Tool (FAST) was ideal for this 12" main. The pipe wall was scanned externally and pipe wall integrity was determined without interrupting the pipe flow or disrupting gas service. The technology works by inducing eddy currents to flow in close proximity to the transmitter. In a ferrous pipe, these eddy currents migrate, allowing a complete profile of the ferrous pipe to be obtained. Data were recorded at distinct frequency increments.



BEM heatmap with colors indicating wall thickness



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### CHALLENGES

Working in excavations with pipelines in the winter always presents challenges. PPM follows the highest standards of PPE, process, and preventative safeguards for tooling and road safety. Parameters were set with the aid of a pre-survey calibration. OSHA approved measures were instituted for personnel access of the excavation site in order for the BEM Technician to safely position the sensors and antennae that surrounded the exposed section of the gas pipe.

Complete coverage of the pipe was obtained without diameter or shape restrictions. Individual readings were taken along the surface of a pipe.

### OUTCOMES & RESULTS

The acquired data was downloaded to a laptop via a data cable. Graphs depicted as heat maps with color contours indicate the level of wall thickness. If the pipe wall thickness is between 90 to 100 percent, meaning a loss of 0 - 10 percent, it shows as green. If the pipe wall thickness is between 70 to 89 percent, a loss of 11 to 30 percent, it shows yellow, which is an indication of some metal loss at that particular sensor location. If the pipe wall thickness is less than 70 percent of the original thickness, it would be red, indicating an area of major concern.

The results of the project (in the image above) provided sufficient evidence and data to show the railroad company owner that the section of pipe running underneath the railroad was well within the standards required to proceed with Starline® Cured-in-Place-Lining technology. With the evidence to present to the railroad owner, the utility was cleared to remediate the main and avoid a costly and disruptive pipeline replacement.