

IDENTIFIES SEVERAL POTENTIAL LEAKS ALONG A 4KM HEADRACE TUNNEL IN CENTRAL AMERICA

Willowstick LLC



The tunnel where tests and studies were conducted

Introduction

Our client observed their 4km headrace tunnel had major leakage problems. In an attempt to better understand the problem, the client underwent several inspections which ultimately proved unsuccessful. Complicating matters even further was the fact that it cost the client about \$1M USD for every day the plant was out of service, so any inspection needed to be done quickly.

Willowstick performed a leak detection investigation from inside the tunnel, using an ROV and highly sensitive instrument. By injecting electric current into the tunnel we were able to measure the anomalies inside and determine the most likely leak locations. The low gradient (macro-scale) anomalies were most likely caused by geologic changes on the outside of the tunnel, and the high gradient (micro-scale) anomalies indicate the potential leakage from the tunnel [see following page for the results]. The results showed two areas with several high gradient anomalies that are the most probable leak locations; one of which was confirmed visually using the ROV. Using this approach, we were able to quickly (less than 48 hours) identify several potential leak locations, while also helping the client prioritize which leaks needed remediation first.

With this information, the client is able to target their remediation in the highest priority areas, saving time and money by eliminating guess work.

SUMMARY

LOCATION

Central America

CHALLENGE

Major water leakage in a tunnel was giving signs of a collapse. Previous inspections had yielded very little valuable information. The high cost of shutting down the area was circumvented with our non-intrusive studies.

SOLUTION

Willowstick's Leak Detection Technology allows studies to be conducted while the area continues operational functionality, while securing the data that is necessary for continued safety for the area

BENEFIT

Willowstick identified 11 potential leakage locations in the tunnel that will allow the client to target their remedial efforts

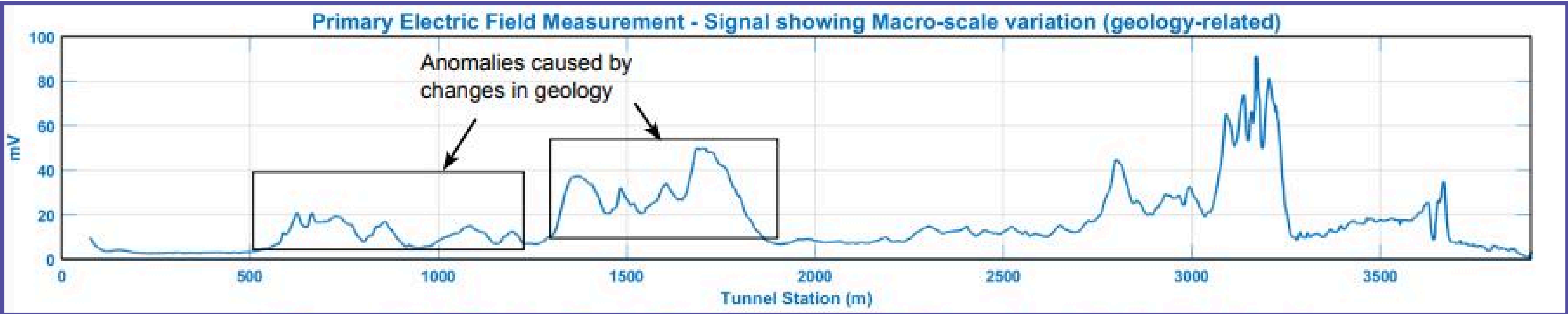
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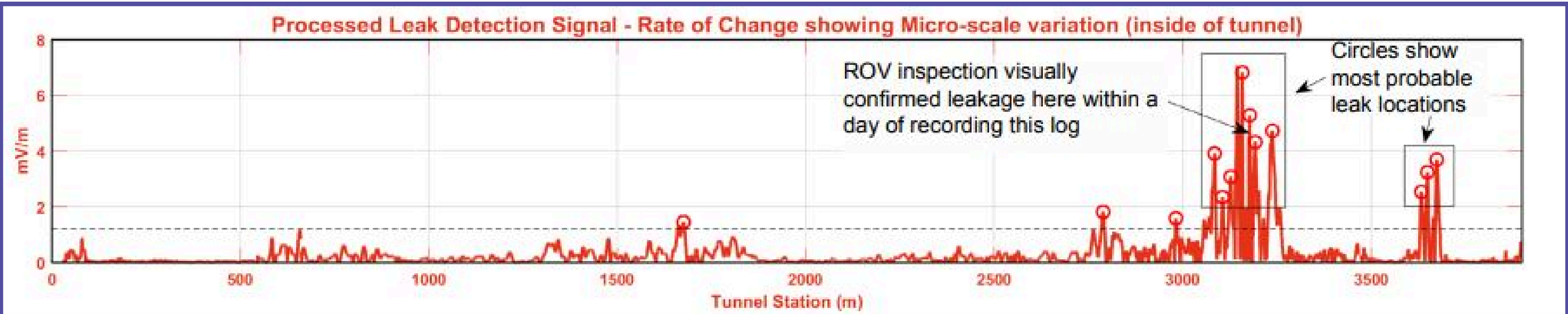
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Leak Detection Results



Primary Electric Field Measurement - Signal showing Macro-scale variation (geology-related)



Processed Leak Detection Signal - Rate of Change showing Micro-scale variation (inside of tunnel)

