

IRRIGATION WATER SUPPLY

PROBLEM OVERVIEW

CUES was contracted by Coachella Valley Water District (CVWD) for an effort of mapping an existing 14-inch diameter concrete irrigation water supply line that is part of their irrigation system. Multiple efforts had been made by CVWD personnel in attempting to determine this pipeline's actual location. Issues surrounding this project were that the pipeline crossed under a two-lane road (Desert Cactus Drive) and both the South and North bound lanes of California State Route 86.

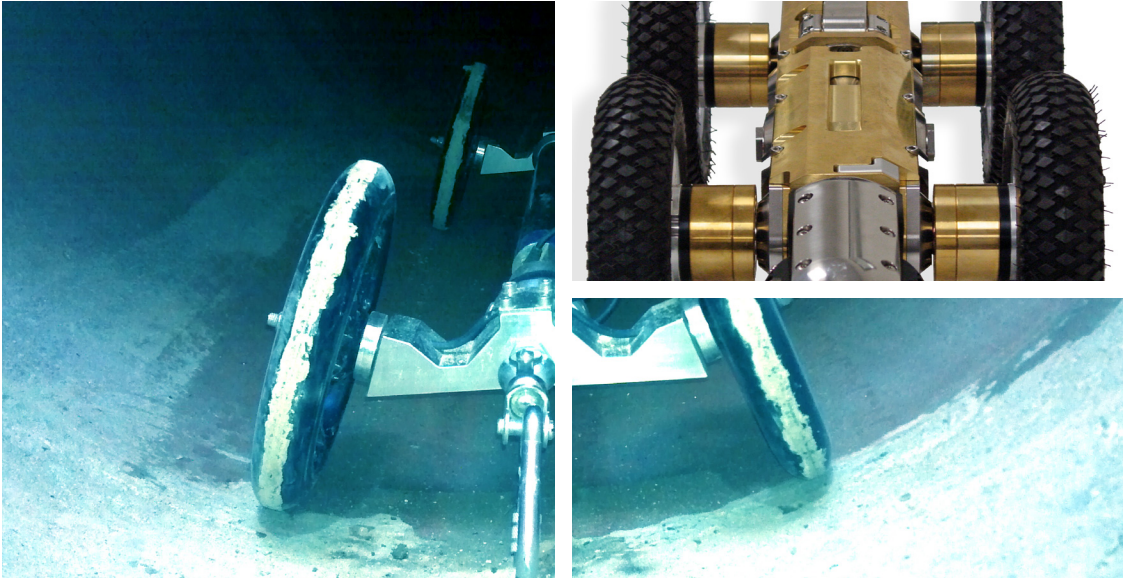
CUES APPROACH

CUES utilized the Accurate Mapping Probe (AMP™) technology to map the in-pipe horizontal coordinate location of the pipeline and also the vertical elevation. The AMP™ technology collects horizontal coordinates and vertical elevation measurements at the rate of 100 readings/second through the use of onboard: Gyroscopes; Accelerometers; and Inclometers. Because this technology maps from within the pipeline itself issues such as worker safety surrounding the closing of lanes on State Route 86 did not need to be considered.

CUES affixed the AMP™ (refer to Figure 1) to the power and communications cable directly behind the CUES steerable compact pipe ranger (SCPR) (refer to Figure 2). Because the SCPR has a built-in 512 MHz sonde located within the camera, the ending point of the irrigation pipeline was able to be determined. The SCPR was then lowered into the access point of the pipeline along with the AMP™. High accuracy mapping grade GPS was utilized in obtaining the starting and ending coordinates and elevations; this information was uploaded into the AMP™ software. The SCPR was then advanced through the 14-inch concrete pipeline with the AMP™ directly behind it, as the camera crawler system was advanced through the pipeline the AMP™ was recording positional measurements. Once the SCPR reached the end of the pipeline the entire system AMP™ and SCPR was advanced back to the original starting position. The equipment was removed from the pipeline and positional AMP™ information was downloaded on-site for processing.



Operational range of 3.5in ID (90mm) to 58in ID (1473mm). Whether the pipeline is made of steel, concrete, PE, or PVC, this mapping system can be used to accurately locate any pipe.



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RESULTS

This particular pipeline had a length of over 429 ft and did have water within the pipeline during mapping operations. CUES was able to map this pipeline under these conditions. Positional data collected from the AMPs were averaged together and compiled into one plan and profile drawing provided as [Figure 3](#). Additionally, through the use of AMPVUE™ (web-based AMP™ data deliverable production service) the plan view of this pipeline was also generated and has been provided as a Google Earth KML file and is depicted as [Figure 4](#).

Figure 1: Accurate Mapping Probe (AMP™)



Figure 2: CUES Steerable Compact Pipe Ranger (SCPR)



Figure 3: Plan and Profile

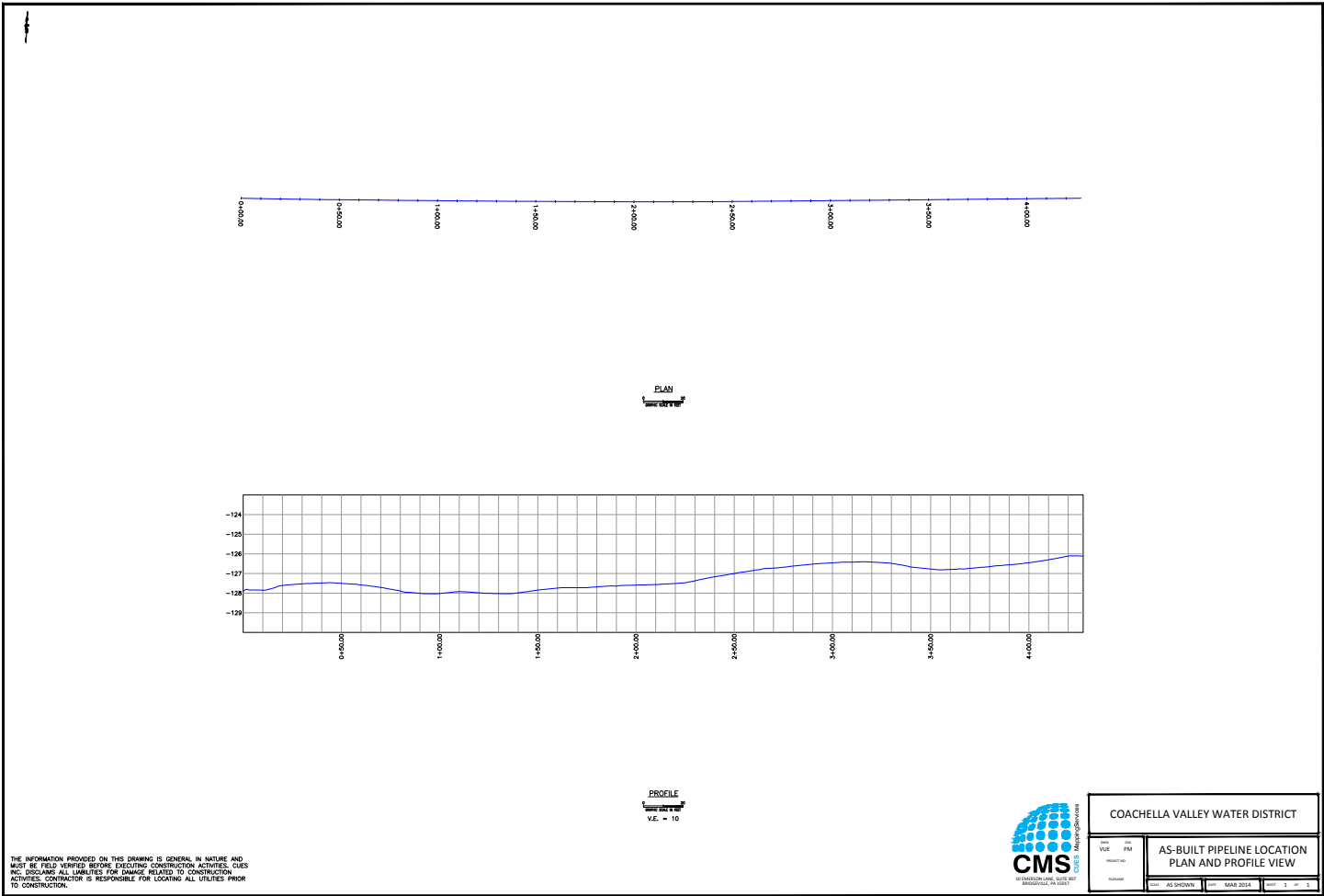


Figure 4: Google Earth KML

