June 23, 1958

Report No. 1475

Pacific Gas and Electric Company
Department of Engineering
Bureau of Tests and Inspection

EXAMINATION OF SECTION OF 34" PIPE
REMOVED FROM MAIN 300B NEAR TRONA

Requested By: [redacted]
Department of Gas Operations

GENERAL:

In pressure testing main 300B, a leak developed in the 34" pipe near mile 1.72 close to Trona. The defective section was removed from the main and sent to the Bureau of Tests for examination.

Photograph No. 1 shows the inside of the section as received with the areas from which samples were cut marked as A and B. Photograph No. 2 shows Area A (where the leak developed) from the inside and Photograph No. 3 shows the same area from the outside Photograph No. 4 shows Area B from the inside.

As may be noted from these photographs, there is evidence of extensive grinding over most of the section sent us, and, as indicated in Photo No. 4, evidence of rewelding over the ground portion. In addition, there had been a crude attempt to cover up a defect apparently discovered in Area A.

Small sections were cut from the pipe with a Do-All Saw, at Areas A and B which were polished, etched and photographed. These sections are shown in Photograph No. 5.

In addition, samples were cut as indicated by "T" for tensile tests on the plate.

RESULTS OF EXAMINATION AND TESTS:

	Tensile Tests on Plate		
Sample Mark	T_1	T_2	Requirements for API Grade X52 Pipe
Yield Point (psi)	52,200	60,000	52,000 min.
Ultimate Strength (psi)	68,400	71,100	66,000 min.
Elongation (%)		25.0	22.0 min.

These tests indicate that the base metal meets all requirements for API Grade X52 pipe, but that there is a marked difference in quality between two edges of the same plate. The edge on which failure developed, as represented by sample T1, shows a coarser and more laminated structure than the other edge, and barely meets the API requirements.

Weld Structure: Photograph No. 5A shows the weld structure in the area of failure. Apparently there have been at least three welds made in this area, and it appears that attempts have been made to repair defects in either the plate or the weld by building out the plate with weld metal, grinding and reveeing and rewelding. The exact sequence of these operations can not be determined, but it is obvious that such repairs are unsatisfactory and should have been caught during shop inspection.

Photograph No. 5B shows the excellent reweld obtained some fifteen inches from the area of failure.

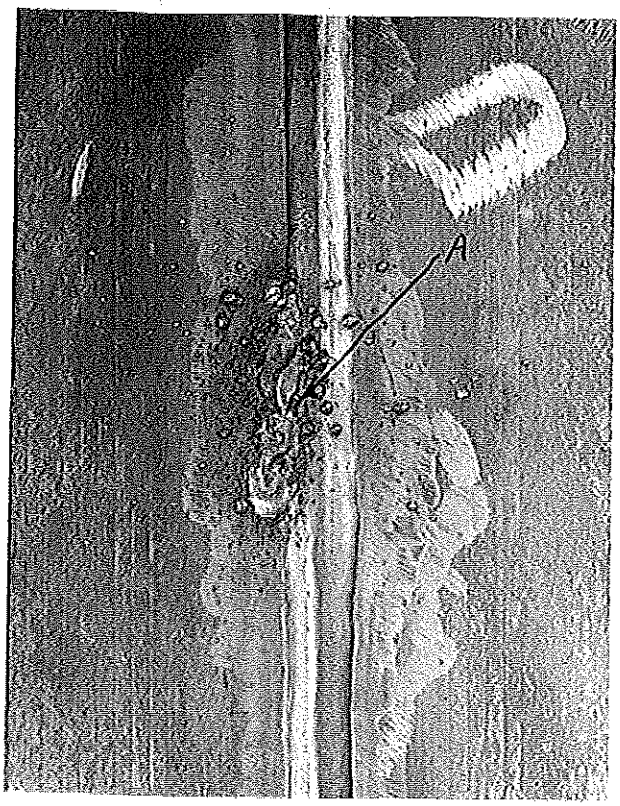
W.O. 8549

Tests Performed By:

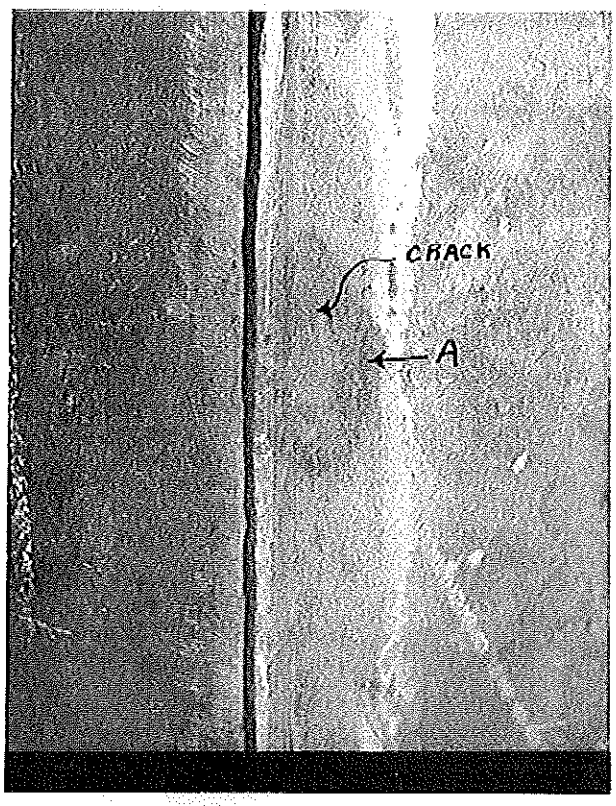
Supervised By: [redacted]

APPROVED [redacted]

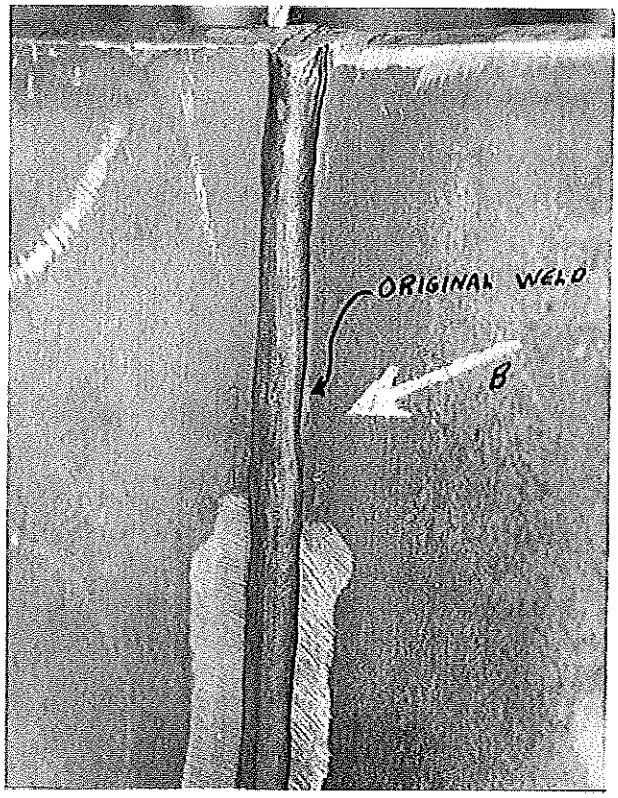
Photograph No. 1
General view of section of pipe from main 300B, mile 172.



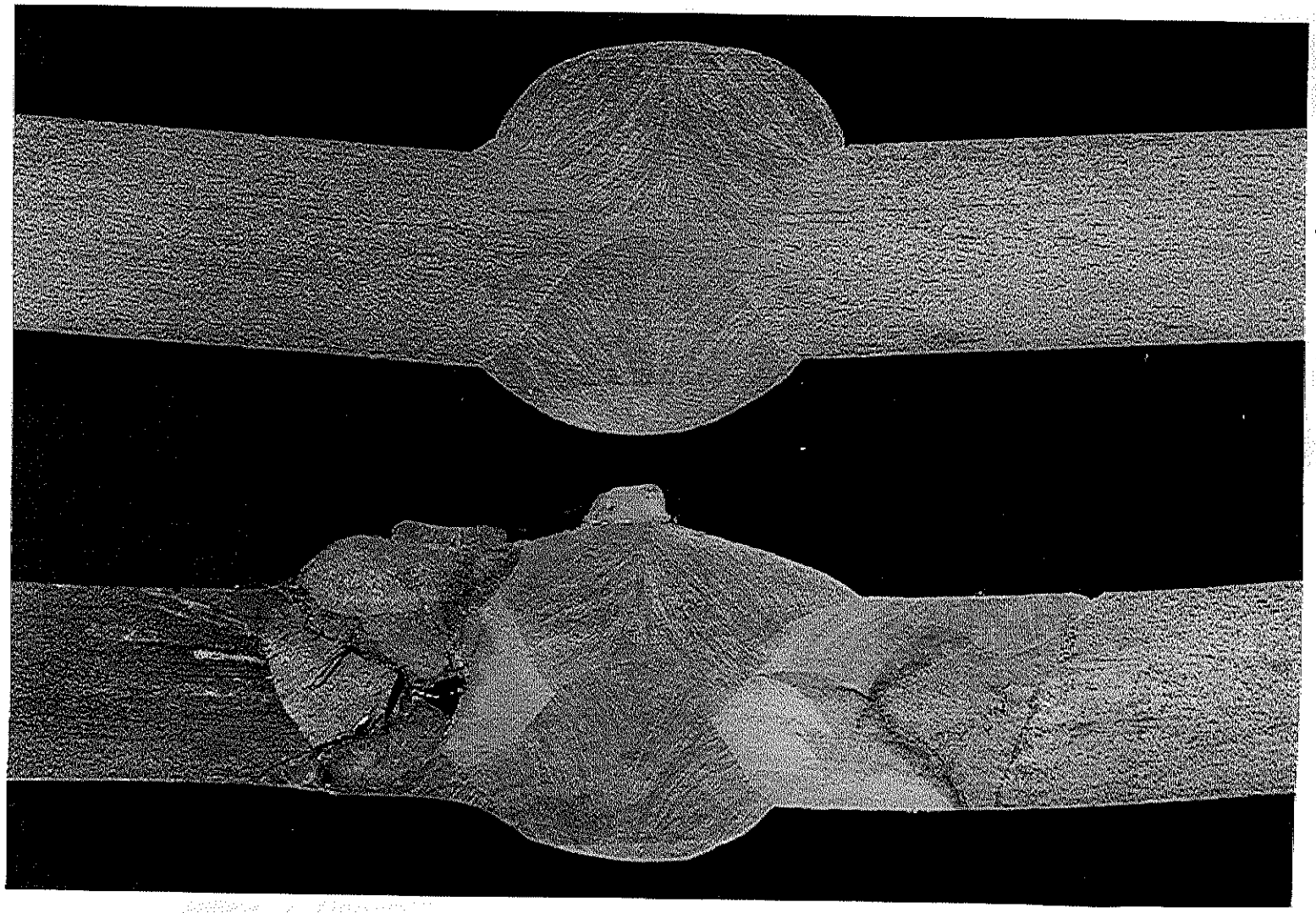
Photograph No. 2
Inside of 3¼" pipe showing area of failure.



Photograph No. 3
Outside of 34" pipe at area of failure showing crack.



Photograph No. 4
Inside of 34" pipe at area "B", showing overwelding.



PHOTOGRAPH No 5