

HELIUM ACTIVITIES HEADQUARTERS

Amarillo Helium Plant

In 1928-29, the U.S. Bureau of Mines constructed the Amarillo helium plant in West Texas. In addition to processing helium, the plant housed the administrative headquarters as well as the research and development activities for the federal helium program. During the initial construction, the plant consisted of nine permanent structures. As demand for helium increased, additional buildings were added.

Growing demands during World War II and the postwar "space race," required new facilities to house storage tanks, equipment, and research offices with experimental instrumentation. In 1942, the bureau hired Stearns & Roger Manufacturing of Denver, Colorado, to expand the Amarillo facility. In 1947, in part because of the Amarillo plant's responsibility to improve the cryogenics process, the research facilities were expanded to include a modernized laboratory and later a technical library. In addition the plant expanded its shipping capabilities.

After the 1956 expansion, activities at the Amarillo plant shifted more towards research rather than production. Consequently, the additions after 1960 were made mainly to improve safety and to ship helium produced at Exell. The height of the Cold War, required improved security measures and an increased storage capacity in 1962.



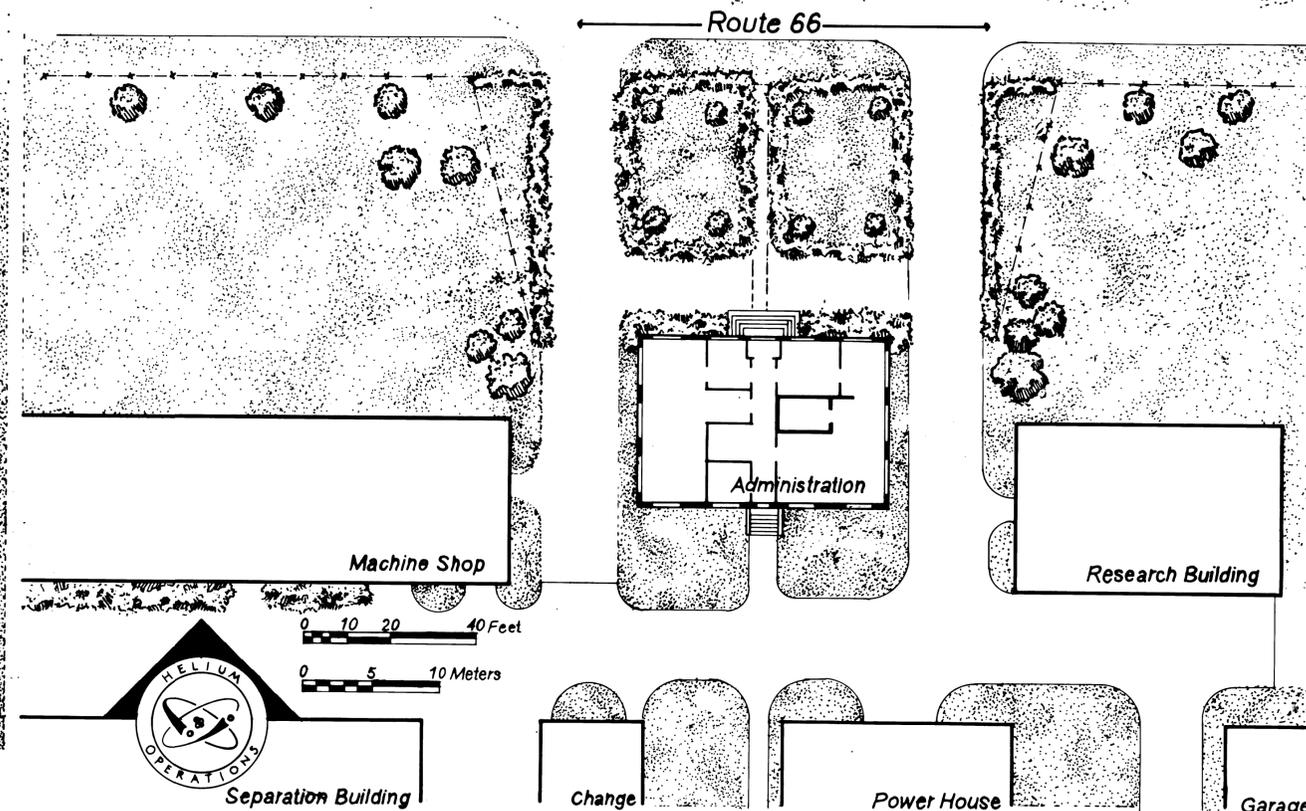
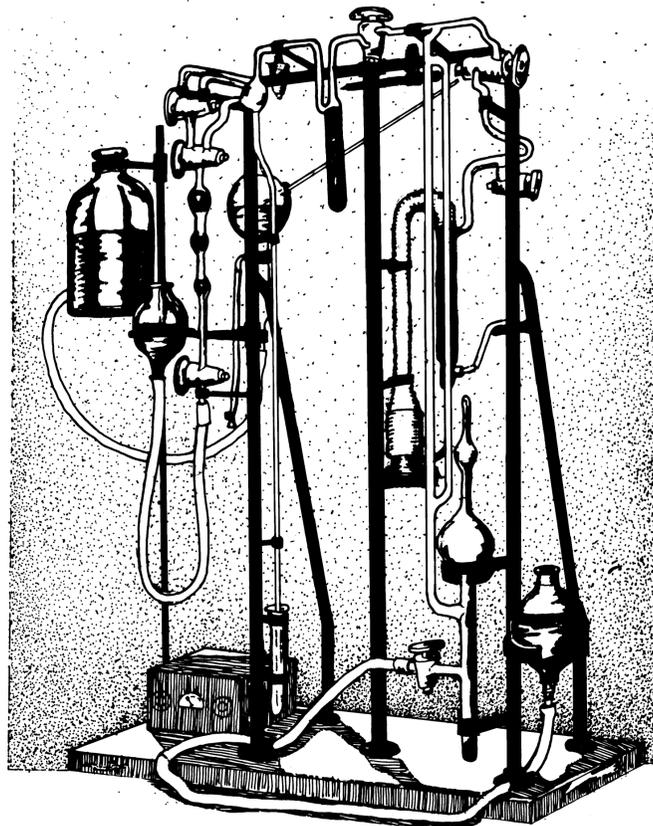
Initially, research and development at the Amarillo Helium Plant focused on bringing down the production costs of helium. After 1917 cost reductions from \$2,500 per thousand cubic feet to \$7.10 per thousand in 1933, researchers concentrated more on upgrading the purity of the helium produced at Amarillo. Thus cryogenics became the focal point of research and development. The Cryogenic Laboratory had two principal functions: to improve processing techniques and to test natural gas samples collected from across the United States. The lab also conducted research into new uses for helium.

Among the more productive research activities was experimentation with refrigerated charcoal filtering of helium-bearing natural gas. Researchers experimented with railroad charcoal-purification cars, which provided the data for the bureau to construct a small purification plant at the Naval Air Station in Lakehurst, New Jersey, and other mobile units at the Army Air Station at Scott Field in Belleville, Illinois.

Perhaps the most actively used experimental instrument at Amarillo was the Frost Apparatus, a device used for separating and measuring helium in gas samples. This research allowed chemists to determine the best natural gas well sources for helium in the United States. Unlike the production equipment, the Frost Apparatus used charcoal filtering for purification. In the 1930s, the apparatus was improved and several were made for use in the field as mobile units. In 1945-46, experiments revealed the potential use of charcoal filtering in removing contaminant gases in the actual processing plants. This discovery allowed for the implementation of refrigerated charcoal filtering, capable of producing 99.995% helium at the Exell plant in 1946.

This new grade A helium was used primarily for heliarc welding, a technology key to the evolution of the aerospace program in the 1950s and 1960s. The efforts of Amarillo plant researchers, under Clifford W. Seibel's leadership, gave the United States a decided advantage in atomic weaponry and energy and in aerospace research and development during the Cold War.

Frost Apparatus



Heliarc Welding



HISTORIC AMERICAN ENGINEERING RECORD
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 TEXAS
 10,001 INTERCHANGE 502
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 U.S. BUREAU OF MINES, HELIUM PLANTS, AMARILLO HELIUM PLANT 1929
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