Objectives To evaluate the mortality experience among all workers (n = 3199) employed at a phosphate fertiliser plant in central Florida beginning 1953 and followed through 2005.

Method All-cause, all-cancers, and cause-specific standardised mortality ratios (SMRs) were calculated with the U.S. population as referent. Lung cancer and leukaemia risks were further evaluated using conditional logistic regression. Employment duration was used as an exposure surrogate for dose-response analyses.

Results The mortality due to all causes combined (SMR=1.07, 95% confidence interval (CI)=1.01–1.13, observed deaths n = 1124), lung cancer (SMR=1.25, 95% CI=1.04–1.49, n = 122), leukaemia (SMR=1.76, 95% CI=1.02–2.81, n = 17), and chronic obstructive pulmonary disease (SMR=1.45, 95% CI=1.09–1.89, n = 54) were significantly elevated. All-cancer mortality was elevated (SMR=1.09, 95% CI=0.97–1.22, n = 303) but not statistically significant for the cohort. Dose-response modelling with adjustments for gender and race did not show statistically significant associations between employment duration (in years) and lung cancer (Odds Ratio (OR) =0.99, 95% CI=0.97–1.02) or leukaemia (OR=1.01, 95% CI=0.96–1.06) mortality.

Conclusions Findings are suggestive of increased lung cancer and leukaemia mortality from exposures encountered in the phosphate fertiliser industry. Increased employment duration, however, did not have significant associations with increased lung cancer or leukaemia mortality.