LAND USE practices are the dominant influence over the distribution and concentration of nitrate in ground water. Nitrogen fertilizers applied to fields are the primary source of nitrate in shallow ground water. Nitrogen fertilizers not used by crops can be carried to the underlying aquifer by water percolating through the soil. In the arid Central Columbia Plateau, irrigation water carries nitrate into shallow ground water. Irrigated agriculture is consequently associated with high nitrate concentrations and high frequencies of contamination of ground water in the study area.

Agriculture covers 8,000 square miles, or 61%, of the study area. Range land covers an additional 4,000 square miles (31%) of the study area. The remaining 1,000 square miles (8%) is largely forested or water (see map below). Patterns in land use, climate, geology, and hydrology divide the study area into natural subunits suitable for comparison. Different land uses and irrigation practices in each subunit account for much of the variation of nitrate concentration across the study area (see table at right).

Quincy-Pasco subunit
The Quincy-Pasco area is one of the most productive agricultural areas in the country. 99% of water used in the study area supports agricultural irrigation in the dry southwestern region—mainly in Grant, Franklin, and Adams Counties.

CBIP influence
The Columbia Basin Irrigation Project (CBIP) brings more than 2,500,000 acre-feet of water per year from the Columbia River through Banks Lake to the Quincy-Pasco subunit.

Nitrates in drinking water is a health issue in parts of the Central Columbia Plateau.