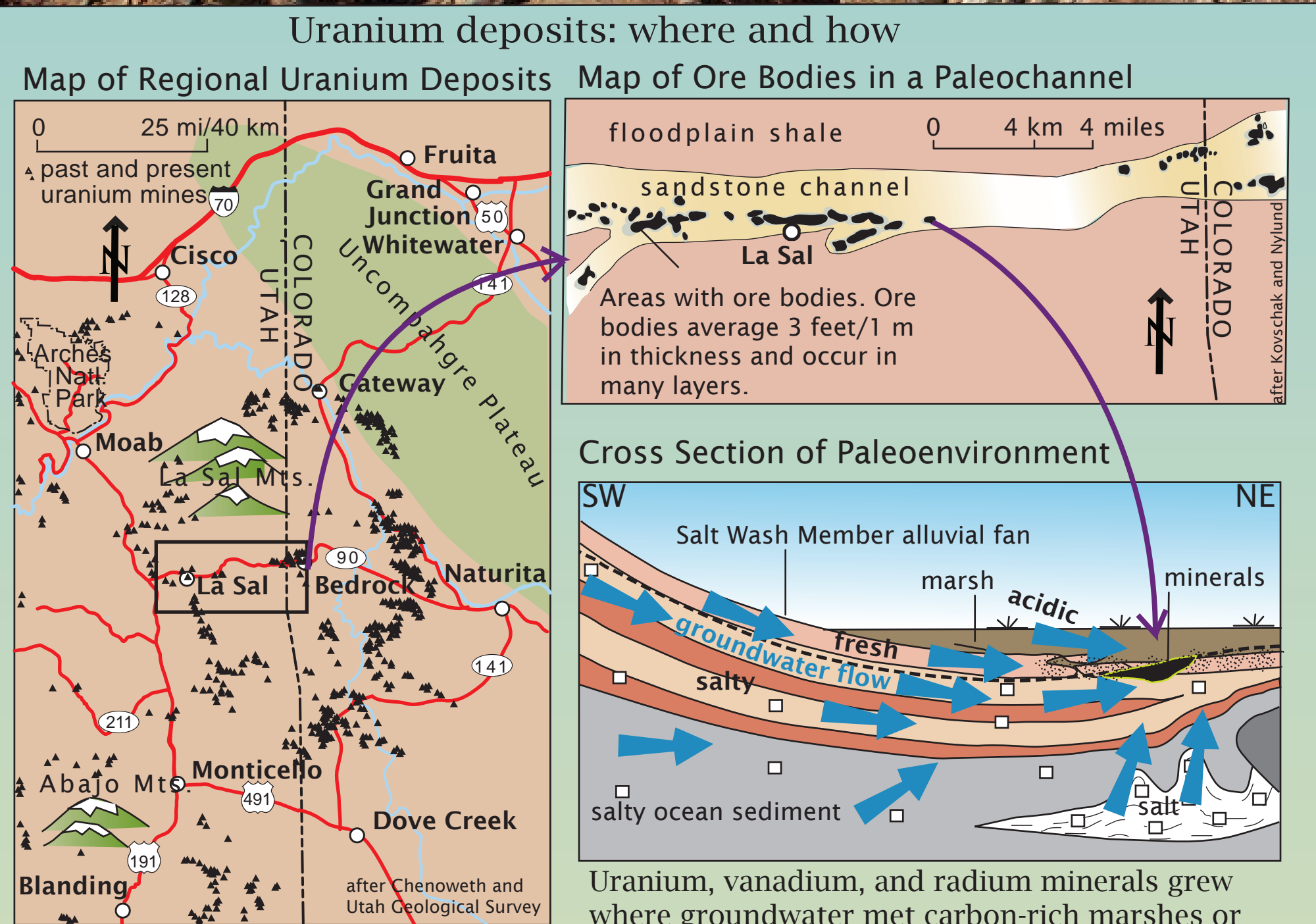


13. The Morrison Formation's Salt Wash Member: Known for its Radioactive Minerals

This entire hill is made up of the Salt Wash Member, a set of sandy beds near the middle of the Morrison Formation. They are river channel deposits, and they contain most of the uranium-vanadium-radium deposits in the region.

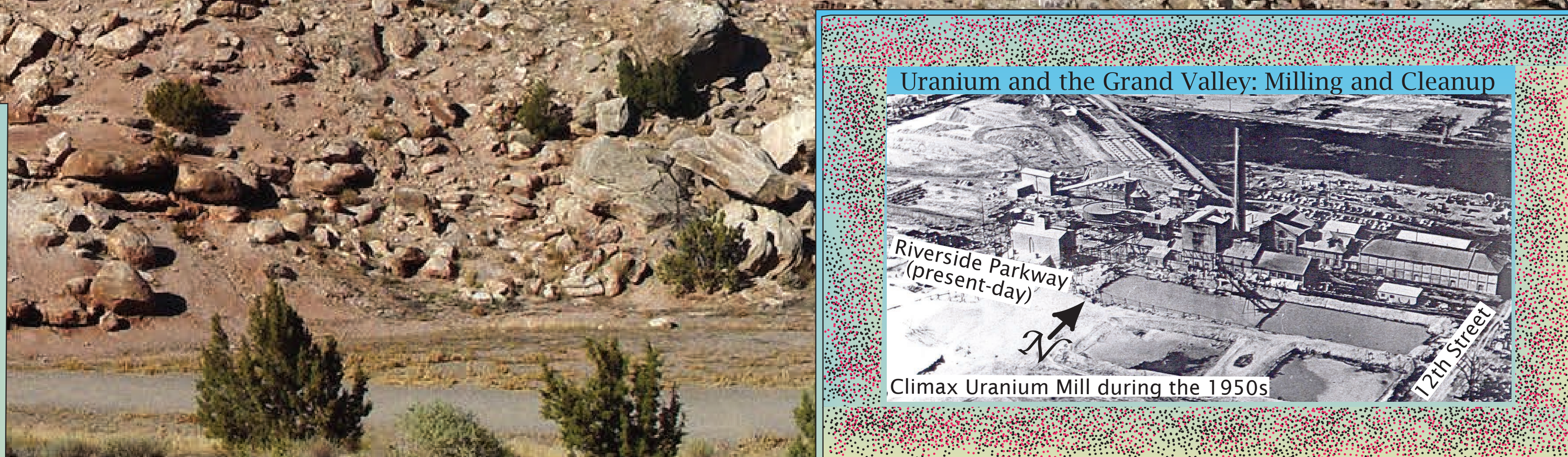
This sandstone bed with a rounded end was the edge of a river channel.

Yellow carnotite, which contains radioactive elements, is easy to spot. After World War II, Geiger counters and scintillometers (like this green one that was built here in western Colorado) also helped to find ore. During the early years of the Cold War, the government bought all the ore that miners could bring in.



The deposits are all west of the Uncompahgre Plateau. A large mill for processing ore was built in Grand Junction, near the railroad, the water, and the workforce.

Uranium, vanadium, and radium minerals grew where groundwater met carbon-rich marshes or plant debris in river channels. Mineralization often included small amounts of chromium, copper, selenium, barium, and molybdenum. It is uncertain where all these elements came from; they may have been dissolved from the sediment that the water flowed through.



Uranium and the Grand Valley: Milling and Cleanup

Riverside Parkway (present-day)

Climax Uranium Mill during the 1950s

12th Street

The Climax Mill, near the bank of the Colorado River south of Grand Junction, crushed the ore down to sand and extracted 90 to 95 percent of the uranium, vanadium, and radium. From 1950 to 1966, the mill gave away the cleaned sand, or tailings. People used it for backfilling, landscaping, and mixing into cement. By the time the Colorado Department of Health stopped the giveaway, around 300,000 tons of tailings were spread around the valley.

Each of the 8,100 dots in the frame above represents a radioactive tailings site found in the Grand Valley. Black dots have been cleaned up. Red ones have not!

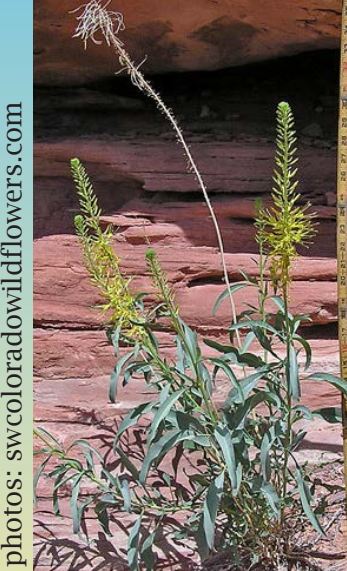
By 2003, 4,700 sites had been cleaned up, including the Climax millsite and a government pilot plant. Tailings remain for many reasons. At first only areas within 10 feet of buildings were cleaned. Some tailings were too expensive to clean up: those around buried pipes are removed as the city replaces the pipes. About 400 homeowners refused to have their properties inspected. Now, sites are checked before building permits are issued.

You can find out about your home by checking the files at the Colorado Department of Health and the Environment. Call (970) 248-7171.

The Poison Strip



locoweed



prince's plume

Locoweed and prince's plume are "indicator plants"—the plants thrive on the unusually high amount of selenium in the Salt Wash Member, concentrating selenium in their leaves. Geologists look for these plants to help them locate the Salt Wash Member. Unfortunately selenium is poisonous. It is deadly to cattle, so the outcrop of the Salt Wash Member is known to ranchers as the "Poison Strip."

Why are Uranium, Vanadium, and Radium Mined?

Uranium is used for its radioactivity to generate power in nuclear reactors. Its decay product, Plutonium, is used to make bombs. Spent uranium is very dense and is used to harden armor and to make armor-penetrating bullets. In the past, uranium was used for its yellow color in glass and ceramics. **Vanadium** is very useful to strengthen steel and titanium, as a catalyst, in superconductor and battery research, and to block infrared radiation in glass. **Radium** is over a million times more radioactive than uranium—so radioactive it glows in the dark. It was long used in luminescent paint for watch and instrument panels. It is a decay product of uranium, found with uranium in very tiny amounts. Radium, in turn, decays into radon gas. Radium is not used much now because it is so dangerous to health.

