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### **Assessment of in-place nahcolite resources in the Green River Formation, Piceance Basin, Colorado**

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The U.S. Geological Survey (USGS) recently completed an assessment of in-place nahcolite ( $\text{NaHCO}_3$ ) resources in the Parachute Creek Member of the Eocene Green River Formation in the Piceance Basin, northwestern Colorado. Eight nahcolite-bearing oil shale zones were assessed. Nahcolite occurs as disseminated aggregates, nodules, bedded units of disseminated brown crystals, and white crystalline beds associated with dawsonite [ $\text{NaAl}(\text{OH})_2\text{CO}_3$ ] and halite ( $\text{NaCl}$ ). Nahcolite-bearing facies includes a unit containing the nahcolite and halite, which is estimated to be as thick as 1,130 ft, and an upper leached unit several hundreds of feet thick containing minor nahcolite aggregates and nodules. Locally, thick beds of halite and fine-grained nahcolite are at the center of the nahcolite depocenter and thin and grade laterally into beds of white, coarse-grained nahcolite towards the depocenter margin. The top of the nahcolite-bearing interval in the center part of the nahcolite depocenter ranges in depth from about 1,300 to 2,000 ft. Dissolution of water-soluble minerals, mostly nahcolite and halite, in the upper part of the nahcolite-bearing facies has created a collapsed leached zone up to 580 ft thick, which consists of laterally continuous units of solution breccias and fractured oil shale containing solution cavities that once were filled with nahcolite. Resources are as much as 600 million tons per  $\text{mi}^2$  in the thickest deposits. The total in-place nahcolite resources is estimated to be about 43.3 billion short tons in the Piceance Basin, or about 35 percent more than the previous assessment of 32 billion short tons in 1974.