

## ***TAR SANDS OF NORTHERN ALABAMA***

Asphaltic rocks or "tar sands" of Mississippian age crop out in north-central and northwest Alabama at various locations dispersed throughout a 70-mile-long belt that extends from central Morgan County westward to the far west-central part of Colbert County near the Alabama and Mississippi boundary. The development of this resource has been limited to surface mining for road construction material. The widespread Hartselle Sandstone contains the largest petroleum reserves, and these bituminous rocks are considered to have the best potential for future oil extraction operations.

Bituminous Hartselle Sandstone is present within a large outcrop area and also for a considerable distance downdip of the outcrop. As in the outcrop, the Hartselle Sandstone in the subsurface displays a wide variation in porosity, permeability, bitumen saturation, and thicknesses of impregnated intervals, both within the same deposit and from one deposit to another. Individual deposits may exceed 20 feet in thickness, and some test wells have encountered multiple impregnated zones with a combined thickness exceeding 30 feet. Porosities of bitumen-impregnated intervals may range from less than 5 percent to as much as 24 percent, and permeabilities may range from less than 10 to hundreds of millidarcies and even more than 1,000 millidarcies in some thin zones.

At most outcrop locations, the bitumen is immobile; however, asphalt seeps or "tar springs" are found locally along bedding planes and fractures, particularly during the warm summer months. The more mobile character of the bitumen in some areas is further indicated by the reports of oil seeping into domestic water wells. Laboratory tests show that API oil gravities may range from 1 to as high as 27 degrees or even more, and viscosities may range from a little more than 1,000 to as much as several million centipoise at a temperature of 75 degrees Fahrenheit.

Asphalt saturations vary widely and may approach as much as 10 percent by weight, or more than 1,000 barrels per acre-foot in the richer deposits. Reserve estimates, however, are considered to be speculative since core data are not available throughout much of the region. Based on assumptions of average saturations and thicknesses measured in outcrops and available cores, reserves within 50 feet of the surface in the outcrop region are estimated to be about 350 million barrels, and the total subsurface reserves within a 2,800 square mile area are estimated to be 7.5 billion barrels. Thermal recovery techniques have the best potential for future in situ recovery projects.

[For more information on tar sand deposits in Alabama, click on "Publications" and search by keyword for "tar sand."]