



EXPLANATION
Contours indicate approximate altitude of uranium-bearing zones
● Sample locality
Atomic Energy Commission

LOCALITIES IN BILLINGS COUNTY FROM WHICH BULK SAMPLES OF URANIUM-BEARING LIGNITE AND CARBONACEOUS SHALE WERE COLLECTED

Chemical analyses, in percent, of uranium-bearing lignite and carbonaceous shale samples, Billings County, N. Dak
Analyses by National Lead Company, Inc.; Raw Materials Development Laboratory; Winchester, Mass., at the request of the Atomic Energy Commission

| Locality | Sample description | Weight of samples (lbs) | Sample | Ash | LOI* | Total carbon | U ₃ O ₈ | Mo | E ₂ O ₅ | V ₂ O ₅ | SiO ₂ | Al ₂ O ₃ | Fe | CaO | MgO | Na ₂ O and K ₂ O | CO ₂ | Soluble SO ₄ | | |
|----------|-----------------------------|-------------------------|--------|-----|------|--------------|-------------------------------|-------|-------------------------------|-------------------------------|------------------|--------------------------------|------|------|------|--|-----------------|-------------------------|------|--|
| 1 | 1ft 6in-bed | 509 | 185-46 | 37 | 63 | 29.0 | 0.131 | 0.110 | 0.10 | 0.015 | 11.9 | 2.9 | 4.32 | 6.48 | 2.40 | --- | 1.51 | 0.38 | | |
| 2 | 1ft 3in-bed | 144 | 185-48 | 34 | 66 | 27.9 | .119 | .095 | .13 | .014 | 14.0 | 4.3 | 4.66 | 4.77 | 2.20 | 0.97 | .72 | 1.72 | | |
| 3 | 2ft 1/2in-bed | 567 | 185-39 | 40 | 60 | 24.6 | .347 | .213 | .20 | .012 | 12.5 | --- | 5.54 | 4.24 | 3.20 | .84 | .47 | 2.30 | | |
| 4 | 2ft 0in-bed | 545 | 185-44 | 41 | 59 | 28.5 | .560 | 1.310 | .42 | .013 | 22.1 | 3.8 | 3.96 | 2.27 | .74 | --- | .43 | .35 | | |
| 5 | 2ft 8in-bed | 507 | 185-41 | 36 | 64 | 27.8 | .202 | .223 | .13 | .017 | 12.3 | --- | 7.66 | 3.40 | --- | .30 | .32 | .13 | | |
| 6A | 2ft 2in-bed; upper 1ft | 173 | 185-42 | 36 | 64 | 29.3 | .058 | .081 | .12 | .017 | 10.9 | --- | --- | 3.45 | 1.10 | --- | .78 | .25 | 2.27 | |
| 6B | 2ft 0in-bed | 507 | | | | | | | | | | | | | | | | | | |
| 7 | 10in-bed | 602 | 185-43 | 86 | 14 | 3.0 | .090 | .080 | .24 | .045 | 46.1 | 14.3 | 5.39 | 3.06 | 1.41 | --- | 1.31 | 2.32 | | |
| 8A | 1ft 7 1/2in-bed | 546 | 185-40 | 39 | 61 | 28.0 | .157 | .434 | .19 | .014 | 10.1 | --- | --- | 6.60 | 5.41 | .89 | 1.60 | .32 | 3.11 | |
| 8B | 1ft 4in-bed | 346 | | | | | | | | | | | | | | | | | | |
| 8C | 1ft 5in-bed | 500 | | | | | | | | | | | | | | | | | | |
| 8D | 9in-bed | 320 | | | | | | | | | | | | | | | | | | |
| 9A | 1ft 10in-bed | 394 | 185-47 | 63 | 37 | 19.4 | .143 | .290 | .26 | .029 | 36.1 | 9.6 | 5.72 | .54 | .45 | --- | .22 | .47 | | |
| 9B | 1ft 10in-bed; lower 11in | 404 | | | | | | | | | | | | | | | | | | |
| 9C | 3ft 5in-bed; upper 1ft 10in | 395 | | | | | | | | | | | | | | | | | | |
| 9D | 3ft 6in-bed; upper 1ft 10in | 686 | | | | | | | | | | | | | | | | | | |
| 9E | 4ft 1in-bed; upper 1ft 1in | 383 | | | | | | | | | | | | | | | | | | |
| 10A | 9 1/2in-bed | 407 | 185-45 | 48 | 52 | 23.5 | .260 | .328 | .23 | .030 | 10.9 | 6.9 | 6.92 | .65 | .37 | --- | .71 | .38 | | |
| 10B | 6 1/2in-bed | 390 | | | | | | | | | | | | | | | | | | |

*At 450° C for 2 hours

EXPLANATION
Sandstone
Sandy claystone
Clay or shale
Carbonaceous clay or shale
Lignite
Bracket on right side of column indicates section sampled
FEET
0
1

Altitudes are approximate, determined by single base altimetry or interpolated from Army Map Service topographic maps

Samples collected by R. E. Curtiss, H. B. Young, and G. I. Haynes; U.S. Atomic Energy Commission, July 11-20, 1956

SECTIONS OF URANIUM-BEARING LIGNITE AND CARBONACEOUS SHALE SAMPLED BY THE ATOMIC ENERGY COMMISSION FOR METALLURGICAL STUDIES, BILLINGS COUNTY, NORTH DAKOTA