MAR 19690071: VERMILION

Received date: Dec 31, 1969

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To: Mr. J. S. MacDonald  
From: D. W. Holmes  
Subject: Final Report - Atlantic Sulphur Permit  
Date: January 3, 1969  

No. 183, Twp. 106, Rges. 12, 13 & 14, W5  
Vermilion Area - Alberta

Enclosures:  
(1) Paleozoic Structure Map  
(2) Sulphur Permit Map - December, 1968  
(3) Atlantic Shotpoint Map  
(4) Sulphur Analyses  
(5) Shothole Sample Descriptions

Introduction
The Atlantic Richfield Company filed for sulphur permit #183 containing 39,680 acres on March 21, 1968. A limited program of surface and subsurface mapping has been conducted over the area. In addition a large number of shothole samples have been collected and examined over the permit (see enclosed shotpoint map). Samples were collected at 15, 30, 45 and 60 foot depths.

Discussion
Photographs were examined over the subject area, however they proved to be of little value to our study. The photos showed a low lying area of muskeg and swamp mixed with considerable light forest and bush. No surface expressions of sulphur or outcrops were recognized.

The paleozoic structure map although sparsely controlled shows considerable relief on the Wabamun erosional surface. What relationship, if any, the Wabamun has to the sulphur occurrences has not been established.

All the shothole samples collected on the Arco permit were examined under a binocular microscope. The upper 15' - 30' zone generally contained tan to light grey colored mud with some silt. Small gypsum crystals were commonly seen as well as occasional iron stain. Small quartz and feldspar pebbles were encountered in some samples.

The lower section (30' - 60') generally consisted of light grey to grey colored muddy shales. In many cases only mud was encountered in this interval. No sulphur was seen in any of the shothole samples. The samples are presently stored at Stacs Exploration Services Ltd., 2042 - 10th Avenue S.W.

Twenty-five scattered samples were sent out to Chemical and Geological Laboratories for sulphur analysis. The analyses (see enclosed sheet) show extremely small quantities of sulphur to be present on Atlantic's permit. The highest sulphur analysis obtained was 1.317 sulphur. This value compares very poorly with the generally accepted minimum cut-off of 20%.

We have thus completed our exploration of sulphur permit #183 and have obtained very negative results.

For this reason we recommend cancelling our reservation on the next rental date of March 21, 1969.

D. W. Holmes

DWH:py
Encl.

INDEXING DOCUMENT NO. 700567
December 13th., 1968.

Atlantic Richfield Company,
650 Guinness House,
Calgary, Alberta.

Attention: Mr. D. Holmes

Dear Sir:

Re: Laboratory Report #C68-4424
50 shot hole samples composited in two's
that make up 25 samples for elemental sulphur
determinations. (Arco Vermilion Samples.)

<table>
<thead>
<tr>
<th>SAMPLE NUMBER</th>
<th>DEPTH</th>
<th>% ELEMENTAL SULPHUR BASED ON DRY WEIGHT</th>
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<tbody>
<tr>
<td>20-804</td>
<td>15-30'</td>
<td>Trace</td>
</tr>
<tr>
<td>136</td>
<td>15-30'</td>
<td>Trace</td>
</tr>
<tr>
<td>154</td>
<td>15-45'</td>
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<tr>
<td>188</td>
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<td>Trace</td>
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<tr>
<td>196</td>
<td>15-30'</td>
<td>Trace</td>
</tr>
<tr>
<td>206</td>
<td>30-45'</td>
<td>Trace</td>
</tr>
<tr>
<td>225</td>
<td>15-30'</td>
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<tr>
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<td>Trace</td>
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<tr>
<td>308</td>
<td>15-30'</td>
<td>0.68</td>
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<tr>
<td>410</td>
<td>15-30'</td>
<td>0.71</td>
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<td>456</td>
<td>15-30'</td>
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<tr>
<td>446</td>
<td>30-45'</td>
<td>0.60</td>
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<tr>
<td>440</td>
<td>15-60'</td>
<td>Trace</td>
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<tr>
<td>438</td>
<td>15-30'</td>
<td>0.81</td>
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<td>426</td>
<td>30-60'</td>
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<td>488</td>
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<td>482</td>
<td>30-45'</td>
<td>0.89</td>
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<tr>
<td>472</td>
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<tr>
<td>466</td>
<td>15-45'</td>
<td>0.89</td>
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<tr>
<td>502</td>
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<tr>
<td>526</td>
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<tr>
<td>531</td>
<td>45-60'</td>
<td>0.14</td>
</tr>
<tr>
<td>533</td>
<td>15-30'</td>
<td>0.46</td>
</tr>
<tr>
<td>535</td>
<td>15-30'</td>
<td>0.36</td>
</tr>
</tbody>
</table>

W. M. Morrison.
SHOTHOLE SAMPLES DESCRIPTION

ARCO SULPHUR PERMIT #183 (ALB 1609)

535    - mud, light tan, trace of quartz
534    - mud, tan
533    - mud, light tan trace of gypsum
532    - mud, grey
531    - mud, grey, trace of gypsum
             grained quartz and feld, trace of gypsum
530    - mud, tan, occasional pink stain, trace of quartz grains,
             some gypsum
529    - mud, grey, trace of gypsum
528    - mud, light tan, some gypsum
527    - mud, light grey, trace of pink stain, trace of gypsum
526    - mud grey, pink stain, some gypsum, some quartz grains
525    - mud, grey, trace of gypsum
524    - mud, grey, trace of gypsum
523    - mud, light tan, trace of gypsum
522    - mud, tan
514    - mud, grey, trace of gypsum
512    - mud, slight trace of gypsum, tan
510    - mud, slight trace of gypsum, tan
508    - mud, trace of gypsum, very light tan
506    - mud, trace of gypsum, grey
505    - mud, some gypsum, grey
504 - mud, some gypsum, grey
503 - mud, some gypsum, grey
502 - mud, grey and tan, silty, some gypsum
501 - mud, grey, some gypsum
500 - mud, grey
499 - mud, light tan, trace of gypsum
498 - mud, grey
497 - mud, tan, common scattered gypsum blebs
496 - mud, tan, common scattered gypsum blebs
495 - mud, tan, common scattered gypsum blebs
494 - mud, trace of gypsum, tan
493 - mud, trace gypsum, tan
488 - mud, common gypsum crystals
487 - mud, trace gypsum crystals
486 - mud, brown
484 - mud, trace of gypsum, brown
482 - mud, some pinkish stain, tan
480 - mud, some pinkish stain, tan
478 - mud, some pinkish stain, trace of gypsum, tan
472 - mud, trace of gypsum, light tan
470 - mud, brown
468 - mud, grey
466 - mud, light tan, trace of gypsum
464 - mud, light grey
462 - mud, light grey, gypsum
460 - mud, light grey, common gypsum
458 - mud, light grey, some quartz grains, trace of gypsum
456 - mud, light tan to light brown, trace of gypsum, silty common light brown iron stain and small blebs of iron.
454 - mud, grey
453 - mud, grey, trace of pink stain
452 - mud, tan, trace of gypsum
450 - mud, tan, trace of gypsum
449 - mud, light grey, trace of gypsum
448 - mud, light grey, trace of pink stain, trace of gypsum
446 - mud, light tan, trace of gypsum
445 - mud, grey, gypsum
444 - mud, grey gypsum
443 - mud, light grey, common gypsum crystals
442 - mud, grey
440 - mud, grey, trace of pink stain
439 - mud, tan, slightly silty
438 - mud, light tan, gypsum
437 - mud, grey, trace of gypsum
436 - mud, light grey
434 - mud (shale), grey, some pink stain
432 - mud, light tan, silty, common gypsum, quartz grains
430 - mud, tan
428 - mud, tan, trace of quartz, trace of pink stain, trace of gypsum
427 - mud, tan, trace of quartz, trace of pink stain, trace of gypsum
426 - shale, trace of pink stain, grey
425 - mud, tan-grey, some gypsum
<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>423</td>
<td>mud, tan</td>
</tr>
<tr>
<td>417</td>
<td>mud, light tan, some gypsum</td>
</tr>
<tr>
<td>416</td>
<td>mud (shale), trace of pink stain, common gypsum</td>
</tr>
<tr>
<td>414</td>
<td>mud, light tan, silty, some gypsum</td>
</tr>
<tr>
<td>410</td>
<td>mud, light tan, common gypsum</td>
</tr>
<tr>
<td>406</td>
<td>mud, tan-grey</td>
</tr>
<tr>
<td>405</td>
<td>mud, light grey</td>
</tr>
<tr>
<td>404</td>
<td>mud (shale), grey, trace of pink stain</td>
</tr>
<tr>
<td>403</td>
<td>mud, light tan</td>
</tr>
<tr>
<td>401</td>
<td>mud, light tan, trace of gypsum</td>
</tr>
<tr>
<td>344</td>
<td>mud, light grey, trace of pink stain</td>
</tr>
<tr>
<td>343</td>
<td>shale, dark grey, micro micaceous</td>
</tr>
<tr>
<td>308</td>
<td>mud, light grey, some large sypsum crystals</td>
</tr>
<tr>
<td>304</td>
<td>mud (shale), light grey</td>
</tr>
<tr>
<td>300</td>
<td>mud, tan, silty</td>
</tr>
<tr>
<td>298</td>
<td>mud, light tan, trace of pink stain, silty</td>
</tr>
<tr>
<td>294</td>
<td>mud, light tan, common quartz and feld</td>
</tr>
<tr>
<td>290</td>
<td>mud, light pink-tan, common quartz and feld</td>
</tr>
<tr>
<td>289</td>
<td>mud, tan, silty common quartz grains</td>
</tr>
<tr>
<td>284</td>
<td>mud, light grey, silty, trace of pink stain</td>
</tr>
<tr>
<td>275</td>
<td>mud, light tan, sandy</td>
</tr>
<tr>
<td>266</td>
<td>mud, light tan, sandy</td>
</tr>
<tr>
<td>263</td>
<td>mud, light tan, sandy</td>
</tr>
<tr>
<td>256</td>
<td>mud, light tan, sandy, trace of pink stain</td>
</tr>
<tr>
<td>248</td>
<td>mud, light grey, sandy, common pink stain</td>
</tr>
<tr>
<td>225</td>
<td>mud, light tan - light brown, slightly sandy</td>
</tr>
<tr>
<td>223</td>
<td>mud, light tan, very sandy</td>
</tr>
<tr>
<td>209</td>
<td>mud, light tan, very sandy</td>
</tr>
</tbody>
</table>
206 - mud, light tan, some pink stain
196 - mud, light grey - tan, trace of gypsum
192 - mud, light tan, trace of iron stain
188 - mud, light tan, some gypsum
182 - mud, light tan, common gypsum crystals
170 - mud, light tan, trace of gypsum
164 - shale, light grey
158 - mud (shale)
156 - mud, light tan, some gypsum
154 - mud, Kahki, silty, common gypsum
148 - mud, tan, trace of gypsum
136 - mud, light tan, common gypsum
128 - mud, tan, trace of pink stain
122 - mud, tan, some gypsum
20-804 - mud, tan-pink, very sandy, trace of iron stain.
Outline of Sulphur Permit "183 (Alb 1609)"
SULPHUR PROSPECTING PERMIT No. 183

ATLANTIC RICHFIELD COMPANY,
650 - GUINNESS HOUSE,
727 - 7th AVENUE S.W.,
CALGARY, ALBERTA

DATE OF ISSUE - MARCH 21, 1968
AREA - 39,680 ACRES