Sandstone Dikes
in the
Parachute Creek Member

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Sandstone dikes

Outline

• What they are

• Occurrences

• Hydrological significance
Clastic dikes: A respectable bibliography


P 439: “On the voyage of the Beagle in the winter of 1883-’34 Darwin observed three vertical dikes composed of fragmental material some miles up the harbor above Port Desire, Patagonia…”

“In July, 1841, Professor J.D. Dana discovered a series of sandstone dikes at Astoria, near the mouth of the Columbia River, Oregon…”
Clastic dikes in Israel

Levy et al, Geology, July 2006
Locations in Piceance Creek Basin
<table>
<thead>
<tr>
<th>Stratigraphic location</th>
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</thead>
<tbody>
<tr>
<td>Uinta Formation</td>
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<tr>
<td>Green River Formation</td>
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<tr>
<td>Parachute Creek Member</td>
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<tr>
<td>Garden Gulch M</td>
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<tr>
<td>Douglas Ck M</td>
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<tr>
<td>Wasatch Fmn</td>
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<tr>
<td>Dikes</td>
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<tr>
<td>R8</td>
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<td>R7</td>
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<td>R6</td>
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<td>L5</td>
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<td>R5</td>
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<td>R4</td>
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<td>R3</td>
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<td>R1</td>
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</tbody>
</table>
Parachute Creek
Parachute Creek
Parachute Creek
Parachute Creek dikes in plan
Nick Stellavato, 1982
15th Oil Shale Symposium
Piceance Creek Canyon
Piceance Creek Canyon, close up
Borehole intersection
Clay = 75% smectite, 25% illite
Dawsonite < 0.5%

Porosity ~ 1%
Hydrological significance

- Vertical leakage
- Hydraulic testing
Relation of vertical & horizontal impacts of dikes

\[ K_{\text{vertical}} = \frac{n \cdot b \cdot K_{\text{dike}}}{d} \]

\[ K_{\text{effective}} = \frac{d}{\sum \frac{d_i}{K_i}} \]

- \( K \) = saturated hydraulic conductivity
- \( n \) = # dikes per sq.mile
- \( b \) = dike thickness
Boundaries in pumping tests

Drawdown in pumping well

(Q 40 gpm, R 500 ft, T 300 ft²/d, S 0.0003)
Sandstone Dikes, Conclusion

Sandstone dikes are a fabric component to be aware of in hydrogeology in the Piceance Creek Basin

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