Screening of Field Sample Reactivity using Chemical Reactivity Probes

SERDP ER-2621
Screening of field sample reactivity is an important new tool for assessing remediation performance.

As part of SERDP ER-2621 we are developing chemical reactivity probes (CRPs) to assay chemical reduction.

In the following video, core samples are treated with resazurin, a redox-sensitive dye, to assess reduction rate ~5 years after creation of a ZVI soil mixing zone.
50 μM Resazurin

ZVI Mixing Zone Core

50 μM Resazurin

4 minutes

Reduce dye is red

Outside of Mixing Zone Core
ZVI mixing zone

Outside mixing zone

10 seconds
ZVI mixing zone

Outside mixing zone

20 seconds
ZVI mixing zone

Outside mixing zone

40 seconds
ZVI mixing zone

Outside mixing zone

60 seconds
ZVI mixing zone

Outside mixing zone

70 seconds
ZVI mixing zone

Outside mixing zone

80 seconds
ZVI mixing zone

Outside mixing zone

90 seconds
ZVI mixing zone

Outside mixing zone

100 seconds
ZVI mixing zone

Outside mixing zone

110 seconds
ZVI mixing zone

Outside mixing zone

120 seconds
ZVI mixing zone

Outside mixing zone

130 seconds
ZVI mixing zone

Outside mixing zone

140 seconds
ZVI mixing zone 

Outside mixing zone 

150 seconds
ZVI mixing zone

Outside mixing zone

160 seconds
ZVI mixing zone

Outside mixing zone

170 seconds
ZVI mixing zone

Outside mixing zone

180 seconds
ZVI mixing zone

Outside mixing zone

200 seconds
ZVI mixing zone

Outside mixing zone

210 seconds
ZVI mixing zone

Outside mixing zone

220 seconds
ZVI mixing zone

Outside mixing zone

230 seconds
ZVI mixing zone

Outside mixing zone

240 seconds
Reduction of the dye shows that the ZVI mixing zone still has the capacity to reduce contaminants present in the subsurface.
For additional information, please contact

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