TETRA TECH

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# Technical Memorandum

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|---|---|---|---|
| **To:** | Document Control Desk | **From:** | Rebecca Bilodeau –Tetra Tech |
| **Company:** | NRC | **Date:** | May 26, 2009 |
| **Re:** | Highland Tt Monitor Wells Installation Report | **Project #:** | 180549.2009 |
| **CC:** | Keith McConnell – NRC<br>Thomas McLaughlin – NRC<br>Mahesh Vidyasagar – ExxonMobil | | Bruce Wielinga – AMEC<br>Anna Krzyszowska-Waitkus – WDEQ<br>Rob Boner – Property owner |

This data transmittal covers the results from the 2009 first quarter for the new eight monitoring TT wells, three MFG wells and four BBL wells at the ExxonMobil Highland Reclamation Project Site located near Douglas, Wyoming.

The wells were sampled in February - March, 2009 and analyzed for field parameters (pH, conductivity and temperature) and water quality parameters. The results, along with water level elevations, are attached.

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## Highland 2009 First Quarter -Water Quality Data

| Well ID | As | Cd | Cr | Ni | Pb | Se | U | Ca | Mg | Na | K | Cl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/l | mg/l | mg/l | mg/l | mg/l | mg/l | mg/L | mg/l | mg/l | mg/l | mg/l | mg/l |
| TT-1 | <0.00095 | <0.00021 | <0.00068 | <0.0005 | <0.00005 | <0.00099 | 0.0004 | 61.9 | 13.7 | 135 | 4.36 | 4.7 |
| TT-2 | <0.00095 | <0.00021 | <0.00068 | 0.0016 | 0.00018 | <0.00099 | 0.0123 | 250 | 67.5 | 103 | 5.2 | 16.8 |
| TT-3 | 0.0026 | <0.00021 | <0.00068 | 0.00074 | 0.0011 | <0.00099 | 0.0038 | 222 | 51.6 | 80.1 | 7.37 | 47.4 |
| TT-4 | <0.00095 | <0.00021 | <0.00068 | 0.00092 | 0.00043 | <0.00099 | 0.0269 | 187 | 42.5 | 85.9 | 7.4 | 21 |
| TT-5 | 0.002 | <0.00021 | <0.00068 | <0.0005 | 0.00016 | <0.00099 | 0.0093 | 78.2 | 21.4 | 131 | 3.2 | 7.5 |
| TT-6 | 0.0046 | <0.00021 | <0.00068 | 0.0012 | 0.0001 | <0.00099 | 0.0199 | 227 | 65.3 | 274 | 5.52 | 28.9 |
| TT-7 | <0.00095 | <0.00021 | <0.00068 | 0.0019 | 0.00067 | 0.0025 | 0.0442 | 316 | 76.6 | 106 | 5.86 | 97.7 |
| TT-8 | 0.0017 | <0.00021 | <0.00068 | 0.0262 | 0.00024 | 0.004 | 0.117 | 643 | 172 | 194 | 8.52 | 267 |
| MfG-1 | <0.00095 | <0.00021 | <0.00068 | 0.0078 | 0.00089 | 0.0029 | 0.358 | 739 | 232 | 241 | 11.8 | 326 |
| MfG-2 | <0.00095 | <0.00021 | <0.00068 | <0.0005 | 0.0002 | <0.00099 | 0.0075 | 705 | 198 | 171 | 12.6 | 164 |
| MfG-3 | <0.00095 | <0.00021 | <0.00068 | 0.00061 | 0.00012 | <0.00099 | 0.0051 | 234 | 53.1 | 131 | 10.3 | 66.5 |
| BBL-1 | <0.00095 | <0.00021 | <0.00068 | <0.0005 | 0.000057 | <0.00099 | <0.0003 | 34.6 | 7.57 | 69.2 | 4.00 | 3.1 |
| BBL-2 | <0.00095 | <0.00021 | <0.00068 | 0.0116 | 0.0018 | 0.0596 | 0.0479 | 398 | 94.8 | 129 | 4.52 | 70.3 |
| BBL-3 | 0.0022 | <0.00021 | <0.00068 | 0.0037 | <0.00005 | <0.00099 | 0.0476 | 584 | 168 | 145 | 8.47 | 222 |
| BBL-4 | <0.00095 | <0.00021 | <0.00068 | 0.0102 | 0.00017 | 0.0011 | 0.0343 | 434 | 102 | 111 | 8.54 | 170 |

| Well ID | (NO2+NO3)-N | Bicarbonate | Carbonate | Alkalinity to pH 4.5 | Alkalinity to pH 8.3 | SO4 | pH (lab) | TDS | Gross Alpha | Ra-226 | Ra-228 | Th-230 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/l | mg/l as CaCO3 | mg/l as CaCO3 | mg/l as CaCO3 | mg/l as CaCO3 | mg/l | Std. Units | mg/l | pCi/L | pCi/L | pCi/L | pCi/L |
| TT-1 | <0.04 | 155 | <0.46 | 155 | <0.46 | 315 | 7.8 | 637 | <0.6 | 0.3 | 0.35 | <0.2 |
| TT-2 | <0.04 | 187 | <0.46 | 187 | <0.46 | 910 | 7.6 | 1520 | 1.2 | 0.5 | 2.3 | <0.1 |
| TT-3 | <0.04 | 175 | <0.46 | 175 | <0.46 | 728 | 7.3 | 1220 | 0.7 | 0.32 | 1.2 | <0.1 |
| TT-4 | <0.04 | 245 | <0.46 | 245 | <0.46 | 545 | 7.3 | 1070 | 1.5 | <0.17 | 0.23 | <0.1 |
| TT-5 | <0.04 | 249 | <0.46 | 249 | <0.46 | 281 | 7.5 | 684 | <0.6 | 0.23 | 0.18 | <0.2 |
| TT-6 | <0.04 | 310 | <0.46 | 310 | <0.46 | 984 | 7.1 | 1780 | <0.6 | 0.39 | 1.1 | <0.2 |
| TT-7 | <0.04 | 268 | <0.46 | 268 | <0.46 | 964 | 7.1 | 1740 | 0.7 | <0.17 | 0.84 | <0.1 |
| TT-8 | <0.4 | 577 | <0.46 | 577 | <0.46 | 1760 | 6.8 | 3620 | 2.2 | 0.73 | 3.3 | <0.1 |
| MfG-1 | 2.8 | 741 | <0.46 | 741 | <0.46 | 2040 | 6.6 | 4380 | 1.4 | <0.18 | 2.5 | <0.2 |
| MfG-2 | <0.2 | 657 | <0.46 | 657 | <0.46 | 1920 | 6.6 | 3690 | 3.1 | 1.6 | 4.4 | <0.2 |
| MfG-3 | 0.14 | 266 | <0.46 | 266 | <0.46 | 776 | 7.5 | 1490 | 1.5 | 0.9 | 3.1 | <0.2 |
| BBL-1 | <0.04 | 175 | <0.46 | 175 | <0.46 | 91.3 | 7.8 | 334 | 1.0 | 0.26 | 2.5 | <0.2 |
| BBL-2 | 4.8 | 305 | <0.46 | 305 | <0.46 | 1180 | 7.4 | 2150 | 1.1 | <0.17 | 1.8 | <0.1 |
| BBL-3 | <0.04 | 461 | <0.46 | 461 | <0.46 | 1680 | 6.9 | 3280 | 2.1 | 0.91 | 4.9 | <0.1 |
| BBL-4 | <0.04 | 209 | <0.46 | 209 | <0.46 | 1300 | 7.2 | 2290 | 0.9 | 0.24 | 1.5 | <0.2 |

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## Highland 2009 First Quarter – Field Parameters

| Well | pH | Conductivity (µS/cm) | Temperature (C°) | Water Level Elevation (ft.) |
|---|---|---|---|---|
| Tt-1 | 7.50 | 998 | 10.4 | 5081.07 |
| Tt-2 | 7.47 | 1917 | 12.5 | 5074.25 |
| Tt-3 | 7.30 | 1562 | 12.3 | 5061.36 |
| Tt-4 | 7.15 | 1475 | 12.5 | 5052.34 |
| Tt-5 | 7.36 | 955 | 9.3 | 5052.51 |
| Tt-6 | 7.15 | 2400 | 10.2 | 5050.98 |
| Tt-7 | 7.08 | 2200 | 10.7 | 5048.20 |
| Tt-8 | 6.66 | 4020 | 12.0 | 5065.01 |
| MfG-1 | 6.54 | 4740 | 12.6 | 5072.20 |
| MfG-2 | 6.57 | 3760 | 12.6 | 5066.32 |
| MfG-3 | 7.32 | 1871 | 11.7 | 5067.20 |
| BBL-1 | 7.69 | 529 | 11.8 | 5063.65 |
| BBL-2 | 7.22 | 2490 | 12.5 | 5064.33 |
| BBL-3 | 6.83 | 3600 | 12.3 | 5063.43 |
| BBL-4 | 7.09 | 2770 | 12.8 | 5053.55 |