

The isoconcentration contour plates for the Operable Unit 5 RI Report present soil and groundwater data with interpretive contours that represent soil and groundwater conditions. Please note that soil borings and Type 1 wells located inside shaded waste units are samples of soil and leachate of other operable units. The maps present other operable unit data for illustrative purposes only -- these data are not used in the Operable Unit 5 fate and transport modeling or risk assessment.

### Soil Plates (D-1 through D-151)

Soil isoconcentration contour plates present each parameter by sampling depth interval; however, each soil boring shown on the plates may not have been sampled at every depth interval evaluated. For instance, a contour may appear on the 0- to 0.5-foot plate for a given parameter. However, in the 0.5- to 1.0-foot interval, no samples may have been collected and therefore no contaminant concentrations or contours would be shown. If samples were subsequently collected in the 1.0- to 1.5-foot sampling interval and contamination was detected, the contour line would reappear. In such cases, interpolation of the data suggests that contamination exists in the intermediate level, although no data were collected to verify its presence.

Pertinent points regarding surface and subsurface soil plates include the following:

- \* Surface and subsurface soil isoconcentration contour plates show all soil data within other operable unit boundaries. However, contours stop at the edges of waste units, and isoconcentration contours do not extend inside the waste units. The exception to this is found on Plate D-10, where total uranium was contoured within Operable Unit 2 subunits.
- \* Contour lines were generated by hand to best portray estimated areas of contamination. Solid contour lines indicate areas of specific parameter contamination. For comparative purposes, each plate also has a dashed contour line depicting the uranium envelope, based on the 20 mg/kg total uranium contour from depths of 0 to 0.5 foot (Reference Plate D-10).
- \* For mapping purposes, the maximum result was selected from each sampling location by depth. Validated data were searched first. If data with validated qualifiers were not available, nonvalidated data were used. The selection criteria were as follows. Select the maximum concentration from "-" qualified data; if no "-" qualified data were available, then the maximum J qualified datum was selected; if no J qualified datum was available, then the maximum UJ qualified datum was selected; etc., . . . where the relative preferences of data were ranked "-" > J > UJ > U > NV > UNV > R.
- \* Data with "-", "J", and "NV" qualifiers were contoured with respect to the concentration value depicted on the plates. Data with "U" and "UJ" qualifiers were not contoured; they are nondetection values and were treated as such. Data with an "R" qualifier were ignored when generating contour lines.
- \* Contour maps of total uranium and isotopic uranium were drawn based on the assumption that uranium isotopes occur in natural concentrations. Isoconcentration lines representing an isotope of uranium do not cross lines representing total uranium at a lower concentration. For example, the 2 pCi/g U-238 line is equivalent to a total uranium level of approximately 6 mg/kg. Thus the 2 pCi/g contour on the U-238 soil map follows a pattern similar to the 5 mg/kg line on the total uranium map and is inside the 5 mg/kg line. Similar logic was used for the other uranium isotopes.
- \* The plates portray concentrations and data qualifiers for each sampling location by depth. Appendix T contains tabulated data files for each plate. For reference, each table lists the parameter, sample number, sample date, boring number, coordinates (northing and easting), and result for data presented on each plate.
- \* Several radiological parameters have separate plates for validated and nonvalidated data. Because of the large number of samples for some parameters, an additional inset plate is used so the data supporting the contours are readable. All validated and nonvalidated data were plotted on a single, larger drawing for the contouring. The contours were then transferred to the C-size plates. The same contours are shown on the validated, nonvalidated, and inset plates. For example, Plate D-10 shows the location of each surface soil sample with a total uranium value. Plate D-10A shows the validated total uranium values; Plate D-10B and the inset, Plate D-10C, show the nonvalidated total uranium values. The contours on Plates D-10, D-10A, D-10B, and D-10C are identical and are derived from the combined validated and nonvalidated data.

### Groundwater Plates (E-1 through E-152)

The 1993 sampling programs provide the most comprehensive data set constrained to a relatively short period. Consequently, the plates presented in the RI Report are primarily based on the 1993 data set.

Although the 1993 data set is extensive, it does not have a concentration value for every parameter in every well. If a well was not sampled during the 1993 data set period, a representative value was selected from the Operable Unit 5 database by choosing the chronologically most recent maximum value in the database. In some cases this value was a 1994 datum. In most cases the chronologically most recent datum predated the 1993 data set. The selection sequence first searched for the maximum 1993 datum; if no 1993 datum was available, then other years were successively searched in the following order until a datum was located:

1994, 1992, 1991, 1990, 1989, 1988.

Pertinent points regarding the groundwater plates are as follows:

- \* Plates depicting perched groundwater data show data from Type 1 wells, Type 1 Hydropunch samples, and Type 1 lysimeters.
- \* Three lysimeter locations have paired shallow and deep lysimeters. In these instances, only the data from the shallow lysimeters (11130, 11132, 11134), completed in the glacial overburden, are shown; data from the deep lysimeters (11129, 11131, 11133), completed below the base of the glacial overburden, are not shown.
- \* Type 1 well data were contoured using data from all wells except:
 

1178	1180	1181	1183	1185	1188	1190	1194	1196	1199	1202	1203	1204	1205	1215
1221	1227	1231	1233	1250	1411	1780	1781	1783	1784	1785	11099			
- \* These wells were omitted because it was not possible to fit all data on the E-size drawings used to generate the contours. However, data from these wells were included in perched groundwater summary statistics. All omitted wells are within the Plant 2/3 and pilot plant areas, where wells are numerous and closely spaced.
- \* Plates for Type 1 wells show all groundwater and leachate data within other Operable Unit boundaries; however, contours stop at the edges of below-grade waste units. The only exception to this is total uranium in the South Field area of Operable Unit 2, where isoconcentration contours are portrayed through the waste units.
- \* Plates for Types 2, 3, and 4 wells show data collected from wells only. Total uranium data collected with a Hydropunch during the drilling of Types 2, 3, and 4 wells are portrayed on cross sections in Section 4.8.1 (Figures 4-102 to 4-111).
- \* Plates for Types 2, 3, and 4 wells show data from within other Operable Unit boundaries, and contours continue beneath waste units of other Operable Units.
- \* Contours were generated by hand to best portray estimated plume shapes in terms of known groundwater flow directions and known or suspected sources.
- \* Solid contour lines indicate specific parameter concentrations. For reference, each plate also shows 5 and 20 µg/L, dashed contour lines for total uranium based on the 1993 filtered or unfiltered total uranium data.
- \* Contour maps of total uranium and isotopic uranium were drawn based on the assumption that uranium isotopes occur in natural concentrations. Isoconcentration lines representing an isotope of uranium do not cross lines representing total uranium at a lower concentration. For example, the 20 µg/L total uranium line is equivalent to a uranium-238 level of approximately 6.6 pCi/L. Thus the 5 pCi/L contour on the U-238 groundwater maps is outside the 20 µg/L total uranium line, and the 10 pCi/L U-238 line is inside the 20 µg/L total uranium line. Similar logic was used for the other uranium isotopes.
- \* Each datum was selected from data for a given year according to the following search criteria. Validated data were searched first. If data with validated qualifiers were not available, nonvalidated data were used. The selection criteria were as follows. Select the maximum concentration from "-" qualified data; if no "-" qualified data were available, then the maximum J qualified datum was selected; if no J qualified datum was available, then the maximum UJ qualified datum was selected; etc., . . . where the relative preferences of data were ranked "-" > J > UJ > U > NV > UNV > R.
- \* The plates distinguish 1993 data from non-1993 data by showing 1993 data in parentheses with the qualifier outside the parentheses, e.g., (72.5)NV.
- \* Types 3 and 4 well data are plotted on the same plate. Only Type 3 well data were contoured. Type 4 well data are in italics and are not contoured because of the small number of data points.
- \* The plates portray concentrations and data qualifiers for each well. Appendix T contains tabulated data files for each plate. For reference, each table lists the parameter, sample number, sample date, well location number, coordinates (northing and easting), and result for data presented on each plate. The tables depicting Type 1 data include the data for the 28 Type 1 wells that are not shown on the plates.