Jim Doolittle file

United States Department of Agriculture | Soil Conservation Service | 160 East 7th Street Chester, PA 19013-6092

Subject: EM Investigation of a portion of Lloyd Fricke's property, Deer Park, Washington **Date:** 12 August 1993

To: Scott Pattee
Hydrologic Technician
USDA - Soil Conservation Service
Rock Point Tower II, Suite 450
West 316 Boone Avenue
Spokane, Washington 99201-2354

I have enclosed two, two-dimensional plots of the EM data collected at the Fricke Farm. The plots display the variability of apparent conductivity values across the site. Plots were prepared from data collected with the EM31 meter in both the horizontal and vertical dipole orientations at each of the grid intersects. In each plot, the contour interval is 2 mS/m.

The Em survey reveals no apparent source of contamination emanating from the Stevens County gravel pile. In each plot, values of apparent conductivity decrease towards the north and towards the gravel pile.

Measurements taken with the EM31 meter in the horizontal dipole orientation reveal a zone of relatively high (>12 mS/m) apparent conductivity values immediately east of the house in the area of the septic tank. While it would be easy to infer that the septic tank was the source of these higher values, land disturbance and proximity to "cultural noises" from the house should also be considered.

In addition, on the plot of the data collected in horizontal dipole orientation, a zone of higher apparent conductivity values (>22 mS/m) is evident immediately to the northwest of the well and to the south of equipment shed. While cultural noise from the equipment sheds is considered a possible source for these values, the location and possible source of these values should be discussed with the landowner.

Measurements taken with the EM31 meter in the vertical dipole orientation reveal a zone of relatively high apparent conductivity values immediately east of the house in the area of the septic tank. While these values are believed to reflect "cultural noises" from the house, contaminants from the septic system should not be ruled out.

In addition, on the plot of the data collected in vertical dipole orientation, a weak zone of higher apparent conductivity values

(>14 mS/m) extends from the house to the well. This may represent the pipeline.

Please review the enclosed charts, they may be used to guide further investigations. These plots can be used to guide further soil sampling. In areas where patterns suggest possible sources of contamination, I would suggest discussions with the landowner, and if necessary, a more detail survey with the EM31 meter using a narrower grid interval (10 or 15 feet). If I can be of further assistance, please do not hesitate to call.

With kind regards .

James A. Doolittle

cc:
James Culver, National Leader, SSQAS, NSSC, SCS, Lincoln, NE
Julian Meuer, SCS, SCS, Rock Point Tower II, Suite 450,
West 316 Boone Avenue, Spokane, Washington 99201-2354

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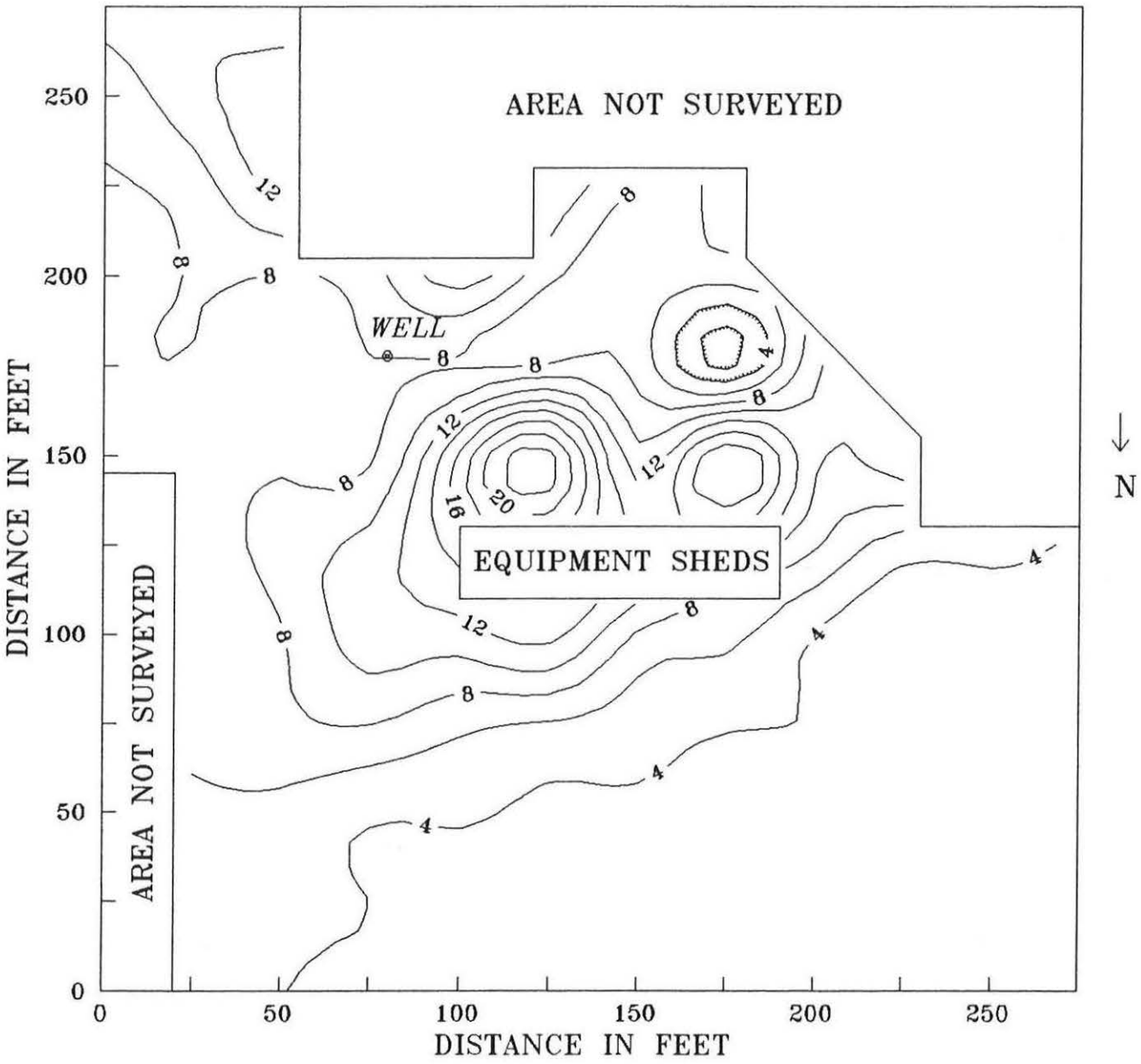
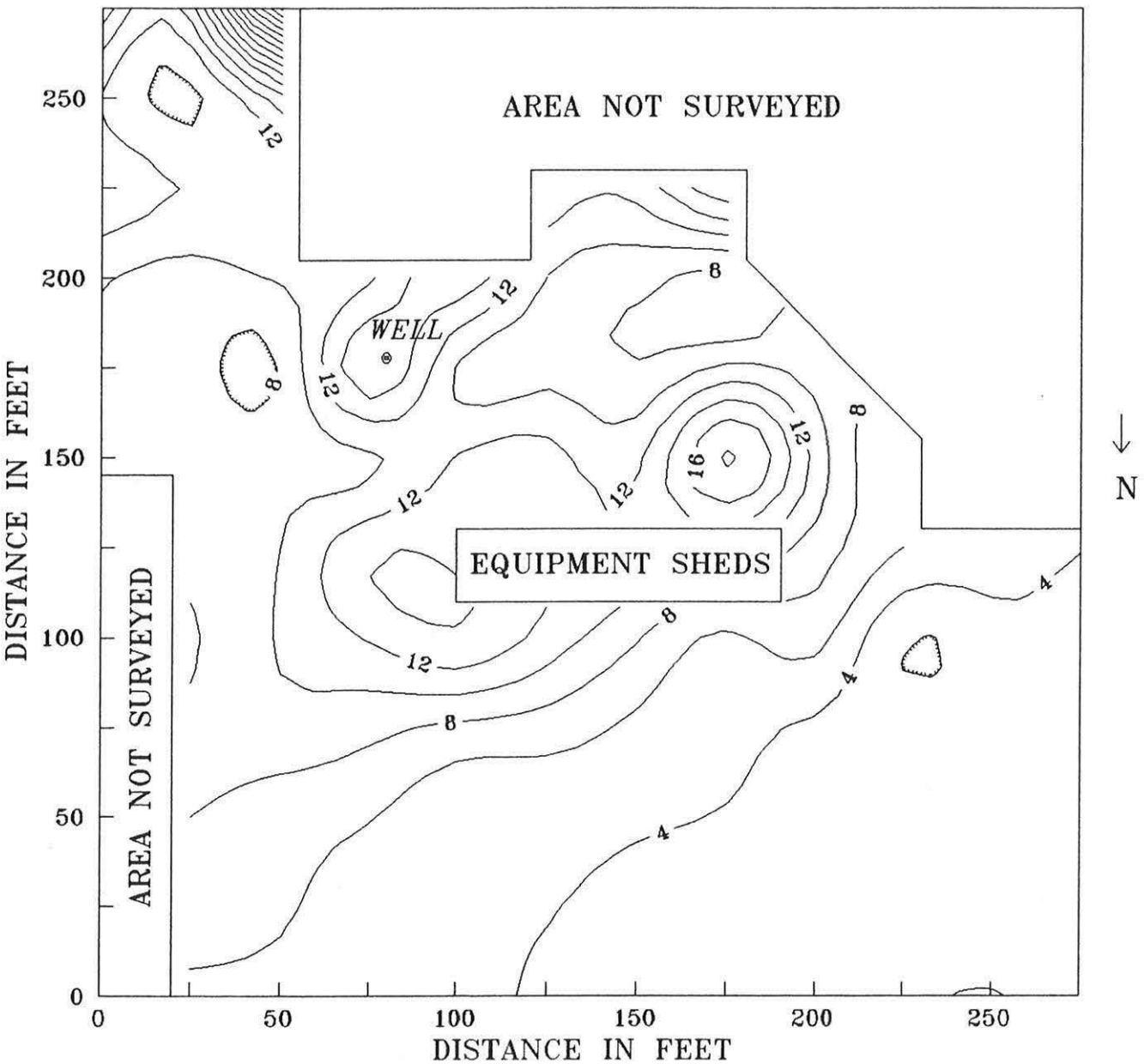
EM31 SURVEY OF FRICKE'S PROPERTY

HORIZONTAL DIPOLE ORIENTATION



EM31 SURVEY OF FRICKE'S PROPERTY

VERTICAL DIPOLE ORIENTATION