

# ORNL

## INSTRUMENT EVALUATION SUMMARY

### Bicron Surveyor M with an A-50 Alpha Scintillation Probe

**Description:** The Surveyor M is a four-range portable instrument. This instrument/detector combination includes the A-50 ZnS alpha scintillation probe. The ranges are X 1 (0 - 500 cpm), X 10 (0 - 5000 cpm), X 100 (0 - 50000 cpm), and X 1000 (0 - 500000 cpm).

**Ranges Tested:** X 1 and X 10

**Report Date:** September 22, 1995

**General Comments:**

1. Readings on the X 1 range were somewhat erratic due to the level of radiation required to test the range. This was expected and considered normal unless indicated otherwise.

#### RADIATION RESPONSE

**Probe Surface Sensitivity:** Not performed

#### ELECTRONIC and MECHANICAL REQUIREMENTS and TESTS

**Line Noise:** N/A

#### INTERFERING RESPONSES TEST RESULTS

**Radio Frequency Fields:** All instruments tested indicated that the instrument/probe combination may be susceptible to RF at frequencies from 0.3 MHz to 35 MHz. Response abnormalities were inconsistent and could be attributable to the generally erratic nature of the X 1 range.

Two of the three instruments tested were acceptable on each range tested when exposed to 140 MHz. One instrument had low responses on both the X 1 and X 10 ranges. Frequency intensity was 50 volts/meter.

**Microwave Fields:** Results were acceptable at 915 MHz and 2.45 GHz at 0.4 watts/meter<sup>2</sup> and 2.0 watts/meter<sup>2</sup> respectively.

**Electric Fields:** Results were acceptable for the electrostatic field (5000 volts/meter), and 60 and 400 Hz at 100 volts/meter.

**Magnetic Fields:** One of the three instruments tested responded low when operated on the X 1 range. The remaining instruments were acceptable. Results were acceptable when operated on the X 10 range to the 10 Gauss (10 Oersted) field.

**Interfering Ionizing Radiations:** Not performed.

## **ENVIRONMENTAL FACTORS**

**Temperature:** Results were acceptable over the temperature range of -10 °C to +50 °C (14 °F to 122 °F).

**Temperature Shock:** Acceptable from 22 °C to -10 °C and to +50 °C. Acceptable from 50 °C to 22 °C. Condensation on the probe face reduced the efficiency when shocked from -10 °C to 22 °C.

**Humidity:** Results were acceptable over the test range of 40% to 95% relative humidity.

**Ambient Pressure:** Results were acceptable at pressures from 690 mmHg to 795 mmHg (27.16 inHg to 31.3 inHg).