

# Radiation Protection Adviser Visit Report

Report No: RPD/RPA/VR/3/16308

Subject: Radiation survey of Tollerton Mobile Home Park

Report for:   
Rushcliffe Borough Council  
Civic Centre  
Pavillion Road  
West Bridgford  
Nottingham  
NG2 5FE

Date of survey: 6 October 2008

Date of report: 8 October 2008

## DESCRIPTION OF SURVEY

The survey was commissioned by Rushcliffe Borough Council to check for residual radioactive materials arising from the site's previous use. In particular, the survey was designed to check for the presence of radium-226, historically used for luminising dials and other components in aircraft.

The survey consisted of a walk-over survey of:

- the main residential part of the site occupied by static mobile homes;
- the immediately adjacent parts of the airfield just outside the site perimeter, where direct access is possible from the mobile home site;
- the area at the bottom of the site used to park caravans and other touring vehicles; and
- the car park and approach lane at the entrance to the site.

The bulk of the measurements were made using sensitive scintillation detectors capable of detecting the gamma ray emissions from low level radium-226 contamination. In addition a number of ambient gamma radiation dose rate measurements were made at set locations within the site. Two areas (see below) were found to have elevated levels of gamma radiation; in these areas, additional gamma dose rate and gamma spectrometry measurements were taken.

A full list of the equipment used during the survey is given in Appendix 1.

## SURVEY RESULTS AND DISCUSSION

A full description of the measurement results is given in Appendix 2. The majority of the areas surveyed gave results within the normal range of background radiation levels within the UK.

In terms of above-background readings, two locations were identified, as follows:

### 1. Outside of the site perimeter (Home no. 25) on the adjacent airfield

This consists of a small rectangle (approx 2 metres by 4 metres) of bare ground immediately beyond the site boundary. The gamma spectrometry results indicate the presence of shielded radium-226, i.e. the activity is likely to be buried beneath the surface layer of soil.

Elevated levels of gamma radiation are detectable over the entire patch of ground, with a maximum gamma dose rate of 1  $\mu\text{Sv/h}$  at the ground surface. The radiation levels reduce rapidly with distance; at the nearest occupied position on the site (the garden decking to the rear of home no. 25) the dose rate is within the normal background range.

### 2. Caravan parking area at the far end of the site (parking plot 42)

This consists of a small patch (approx 30 cm in diameter) of ground. The gamma spectrometry results indicate the presence of radium-226, and the overall pattern of measurement results suggest that the activity is in the upper few centimetres of the ground.

The maximum dose rate at the surface of the affected patch is 0.7  $\mu\text{Sv/h}$ , but reduces rapidly with distance, such that radiation levels are close to background at 1 metre away.

## CONCLUSIONS AND RECOMMENDATIONS

The results of the survey indicate that there is no evidence of radioactive contamination from radium-226 within the residential area occupied by static mobile homes. However, two areas of radium-226 contamination were detected outside this area: one in the airfield just outside the perimeter of the site, and one in the caravan parking area. It is stressed that the levels of contamination detected in these locations are not considered

sufficient to pose a significant radiation hazard to mobile home residents<sup>1</sup>. Nevertheless, the results do provide evidence of some historical contamination, and it is recommended that this is brought to the attention of the Ministry of Defence and the Environment Agency, who may wish to undertake further investigations on the site.

[REDACTED]

*The advice provided in this report has been prepared by the HPA Radiation Protection Division, acting as an appointed Radiation Protection Adviser (RPA) within the meaning of the Ionising Radiations Regulations 1999. As such this advice may, if the recipient wishes, be treated as evidence of consultation with the RPA within the provisions of Regulation 13 of the regulations.*

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<sup>1</sup> This is based primarily on a consideration of the potential external radiation exposure of persons. However, the location, distribution and level of contamination are such that potential internal exposures (from either intakes of dust or inhalation of radon) are unlikely to be significant.

## APPENDIX 1: Radiation survey at Tollerton Mobile Home Park 6 October 2008

### LIST OF SURVEY EQUIPMENT USED

| Make and model   | Serial No:               |
|--|--------------------------|
| Rotem Ram DA2000<br>with PM-11 probe                                 | 8207-021<br>(P:0707-012) |
| Bicron Analyst<br>with Osma probe                                    | B421U<br>(P:54514)       |
| Exploranium GR-135 plus  | 6210                     |
| Bicron microSievert gamma<br>survey meter                            | B615R                    |
| Mini Instruments<br>Environmental Meter type<br>6.80 with MC71 probe | 01023<br>(P:00525)       |

## APPENDIX 2: Radiation Survey of Tollerton Mobile Home Park 6 October 2008

### MEASUREMENT RESULTS GAMMA DOSE RATES AND GAMMA SPECTROSCOPY

#### 1. The main residential part of the site occupied by static mobile homes

| Location  | Ambient dose rate ( $\mu\text{Sv/h}$ ) <sup>2</sup> |
|---|---|
| Whole site –walkover survey   | 0.03 – 0.05   |
| Set measurement positions <ul style="list-style-type: none"><li>• between Nos. 3 and 4</li><li>• between Nos. 9 and 10</li><li>• between Nos. 16 and 18</li><li>• in front of No. 34</li><li>• On decking behind No. 25</li></ul> | 0.04<br>0.04<br>0.04<br>0.05<br>0.05                |
| Typical UK background (for comparison)  | 0.02 – 0.05   |

#### 2. The airfield just beyond the site perimeter (behind No. 25)

| Location   | Ambient dose rate ( $\mu\text{Sv/h}$ ) <sup>2</sup> |
|--|---|
| Surface of bare patch of ground<br>At 1 metre above the ground | 1.0 (maximum reading)<br>0.1 – 0.2                  |
| Other adjacent areas   | 0.03 – 0.04   |

A gamma spectrometry measurement indicated that the contamination was due to (shielded) radium-226.

#### 3. The area at the bottom of the site used to park caravans

| Location   | Ambient dose rate ( $\mu\text{Sv/h}$ ) <sup>2</sup> |
|--|---|
| Parking plot 42 <ul style="list-style-type: none"><li>• Surface of small patch of ground</li><li>• 1 metre above the patch</li></ul> | 0.7 (maximum reading)<br>0.07                       |
| Other areas  | 0.03 – 0.05   |

A gamma spectrometry measurement indicated that the contamination was due to (shielded) radium-226.

#### 4. The car park and approach lane at the entrance to the site

| Location      | Ambient dose rate ( $\mu\text{Sv/h}$ ) <sup>2</sup> |
|---------------|---|
| Car park      | 0.03 – 0.05   |
| Approach lane | 0.03 – 0.05   |

<sup>2</sup> Results are in terms of terrestrial gamma dose rate in ambient dose equivalent (cosmic radiation and intrinsic radiation components have been subtracted from the results obtained).