

**Baldock Radio Station  
Royston Road, Baldock  
Herts SG7 6SH**



**Mobile Phone  
Base-Station Audit**

**Audit Site: Gervais Farm  
Route des Houguets  
St Saviours  
Guernsey**

Work Performed by		Distribution List	
James Loughlin Field Manager	3G measurements & Report	Lloyd Tailby	1
Mike Reynolds Field Officer	2G measurements & Report	Office of Utility Regulation	1
		Technical Manager	1
		Case/Year file	2

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## Report Summary

As the radio spectrum is continually changing, these measurements can only provide information on the radio frequency (RF) conditions for the specific locations at the time of the survey.

The Office of Communications (Ofcom) performed this survey of the RF emission environment in the vicinity of Gervais Farm on 20<sup>th</sup> September 2005. Both second generation (2G) and third generation (3G) base station emissions were measured separately and the signal levels combined to give the Total Band Exposure as detailed below.

The table, sorted in descending order of signal level, summarises the total results obtained at each measurement location.

Summary of results:

Location	* 2G Band Exposure	3G Band Exposure	Total Band Exposure	Relationship to ICNIRP Limit
Entrance to Cow Shed	1.62E-05	4.11E-05	5.73E-05	1/17457
Corner of Workshop	3.73E-05	1.42E-05	5.15E-05	1/19401
By Bulk Milk Tank	7.68E-06	2.36E-05	3.13E-05	1/31928

2G Quotient Exposure values are annexed to this report

Mobile team 2 from Baldock completed concurrent 2G and 3G surveys. The results from both have been combined to provide the summary of results on page 3.

Initially the base station was scanned to ascertain the extent of 3G activity. Only one carrier associated with this base station site was detected.

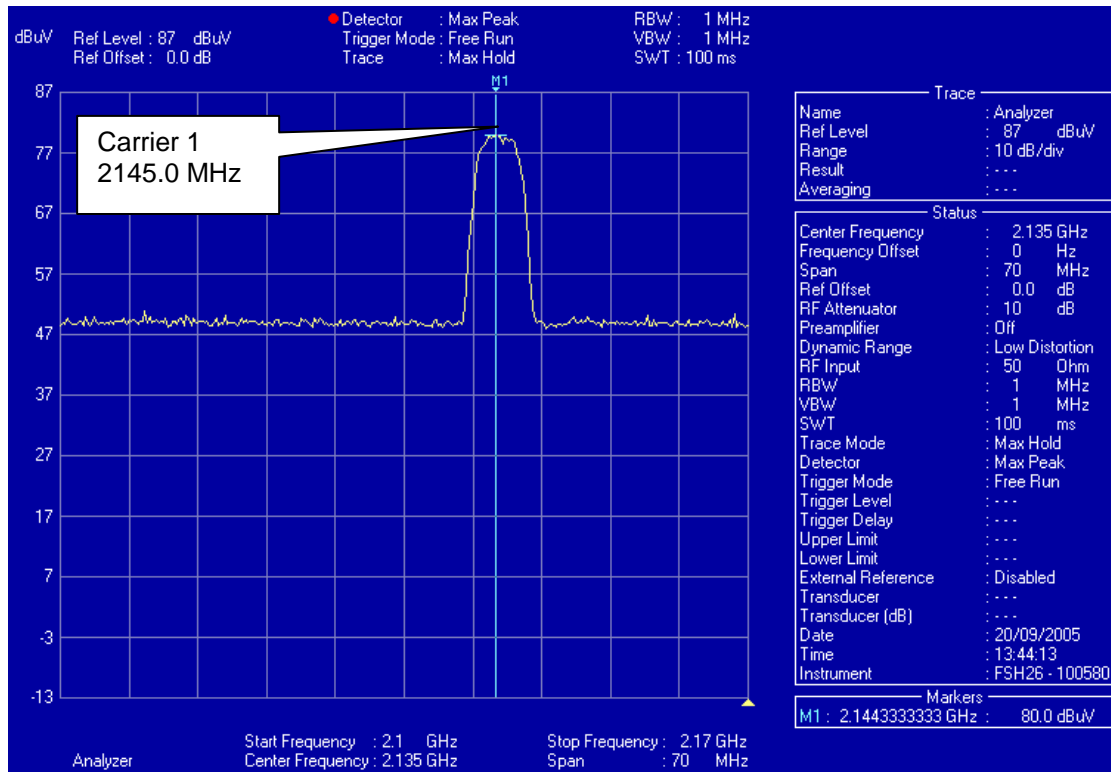


Figure 1

Figure 1 shows the whole band activity. Carrier 1 was active at this site. At each measurement location the measuring antenna was then set up on a tripod 1.5m above ground level. In this position and the carrier's field strength was recorded.

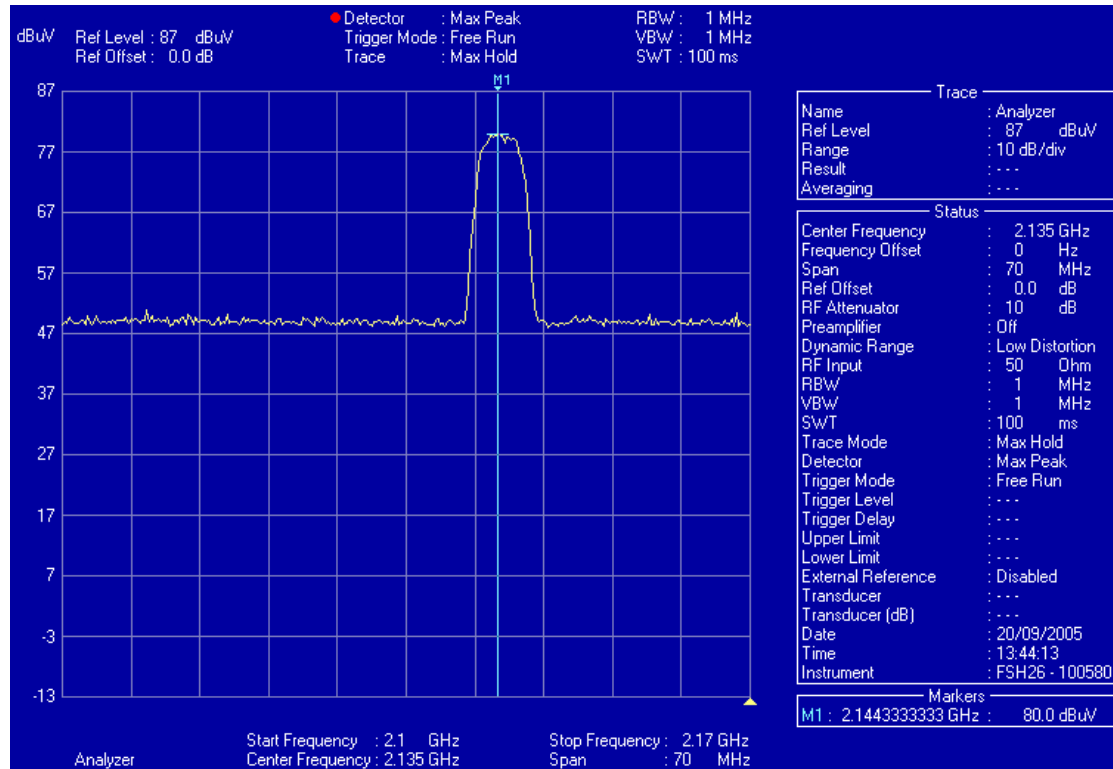
For each measurement location the 3G exposure quotient was then calculated. This in turn was added to the 2G exposure quotient before calculating the Total Exposure Quotient for each survey site.

All the 3G measurement data is given on page 5 together with the Total Band Exposure values, while the 2G data is contained in the annex to this report.

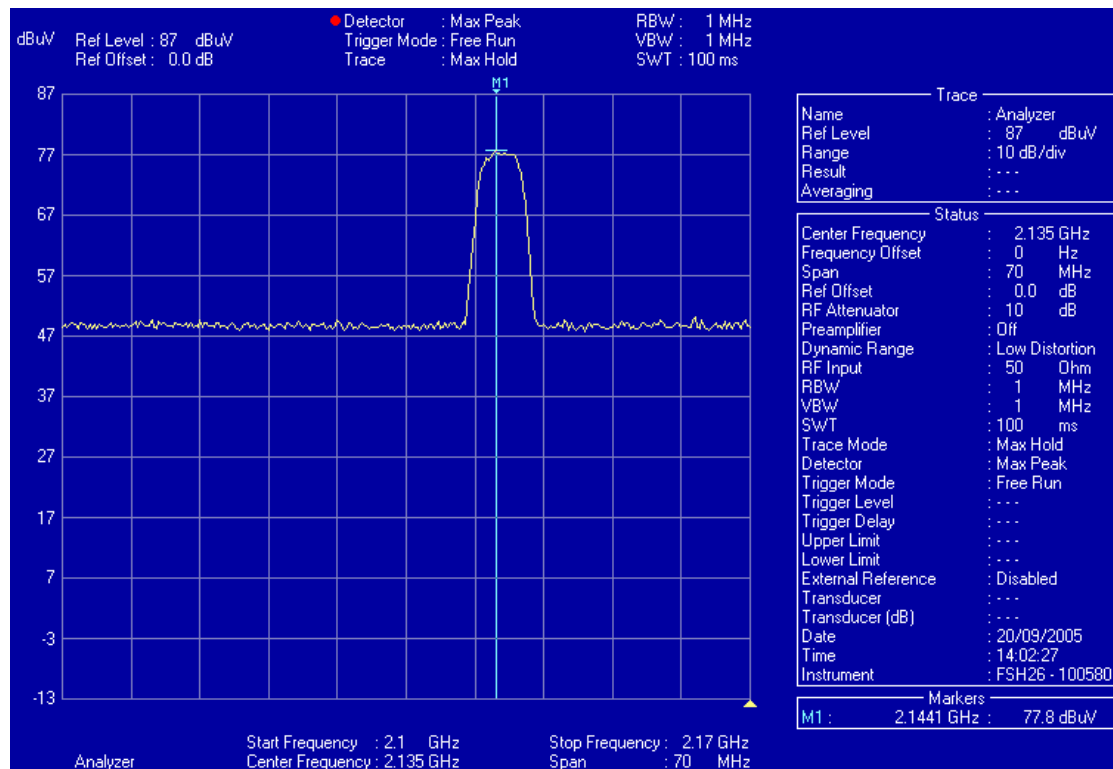
Equipment: Rohde & Schwarz FSH6 Spectrum Analyser serial number: 100580 CEMS number: 200103  
 EMCO DRG 3115 horn Antenna 2153 200005  
 Garmin GPS75 receiver 37524369 200011  
 Reynolds 3 metre cable type ML2/002 196

Location	Frequency	Fieldstrength	Fieldstrength	Fieldstrength	Power	Power	ICNIRP	3G	3G	2G	TOTAL	Related to
Gervais Farm								Exposure	Exposure	Exposure	3G + 2G	
	MHz	dBuV/m	uV/m	V/m	W/m <sup>2</sup>	W/m <sup>2</sup>	W/m <sup>2</sup>	Quotient	Quotient	Quotient	Exp. Quot.	ICNIRP limit
[1] By Bulk Milk tank	2144.3	109.5	298,538.3	0.298538	0.0002364057	0.0002364	10	0.000023640570	2.36E-05	7.68E-06	3.13E-05	1/31928
[2] Corner by Workshop	2144.1	107.3	231,739.5	0.231740	0.0001424494	0.0001424	10	0.000014244940	1.42E-05	3.73E-05	5.15E-05	1/19401
[3] Entrance to Cow Shed	2145.3	111.9	393,550.1	0.393550	0.0004108265	0.0004108	10	0.000041082650	4.11E-05	1.62E-05	5.73E-05	1/17457

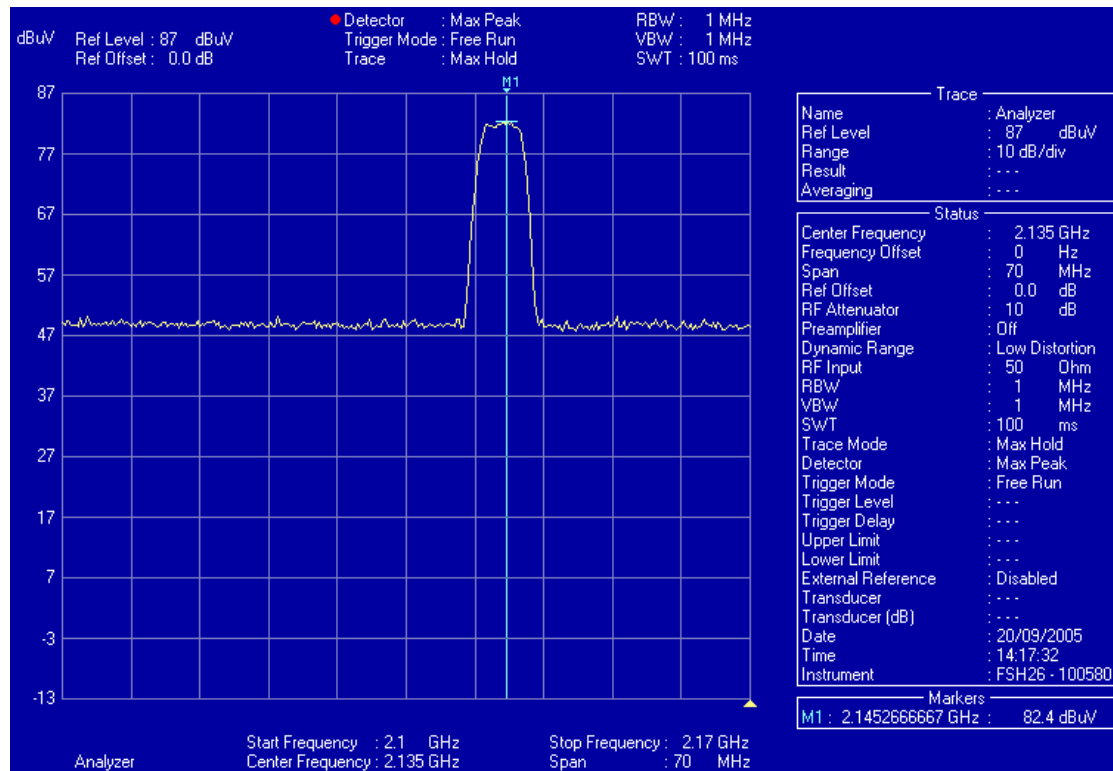
Location 1: By Bulk Milk Tank



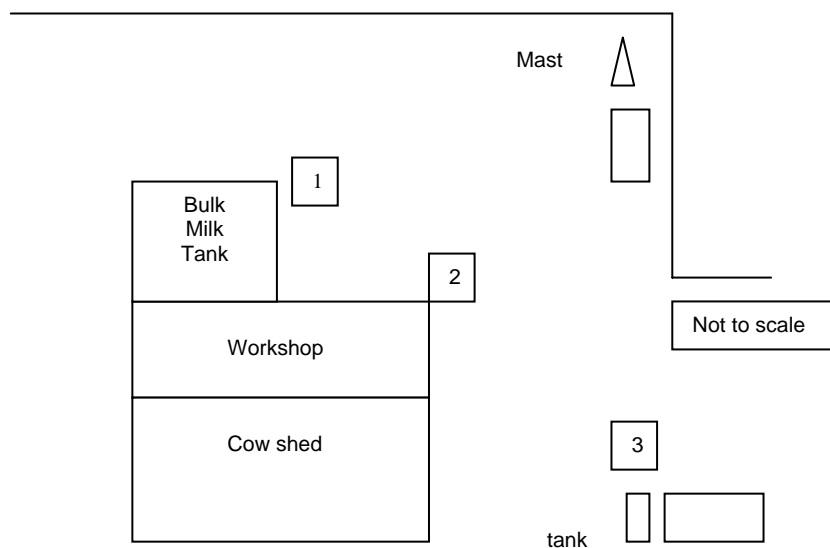
Location 2: Corner by Workshop



Location 3: Entrance to Cow Shed



Site Plan



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## **Annex**

### **2G Mobile Phone Base-Station Audit**

## **Mobile Phone Base-Station Audit**

Audit site: GERVAIS FARM  
Route des Houguets  
St Saviour  
Guernsey  
GY1 2NH

In 2000 the Government asked the Radiocommunications Agency to implement a national measurement programme to ensure that emissions from cellular base stations do not exceed the guidelines for public maximum exposure set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Ofcom took over the functions of the Radiocommunications Agency, along with those of the Independent Television Commission, Radio Authority, Oftel and Broadcasting Standards Commission, on 29 December 2003.

Electric field strength measurements made in various bands are referenced to and presented alongside the relevant ICNIRP public maximum exposure levels. On the left hand side of the results page(s) is a graphical representation of the radio spectrum surveyed at each location on the site. The green line on each graph indicates the ICNIRP guideline exposure level for that frequency band. To the right hand side of each graph is a table showing the ten highest level emissions recorded within a band.

Further explanation of the results and their context within the ICNIRP guidelines can be provided by the Ofcom officers at the time of the audit or by contacting Ofcom on 0845 456 3000, or by email at [contact@Ofcom.org.uk](mailto:contact@Ofcom.org.uk). Results taken from all audit sites and further information on the audit programme can be found on the Ofcom website at [www.ofcom.org.uk](http://www.ofcom.org.uk).

## Report Summary

As the radio spectrum is continually changing, these measurements can only provide information on the radio frequency (RF) conditions for the specific locations at the time of the survey.

Ofcom performed this survey of the RF emission environment prevailing in the vicinity of GERVAIS FARM on 20 September 2005.

The following table, sorted in descending order of signal level, summarises the results obtained at each measurement location.

Summary of results:		
Location	Total Band Exposure Quotient	Relationship to ICNIRP Limit
Corner by Workshop	3.73E-05	1/26803
To entrance of cow shed	1.62E-05	1/61776
By bulk milk tank	7.68E-06	1/130132

Issued on behalf of Ofcom.

Issued by:

Received by:

Mike Reynolds  
Technical Investigation Officer

**Site:** GERVAIS FARM

**Location:** By bulk milk tank

**NGR:** N49 26 48.2 W002 35 50.7

**Start Time:** 20 September 2005 13:52:34

**Officer:** Mike Reynolds

**Receiver:**

Manufacturer: ROHDE&SCHWARZ

Model: EB200

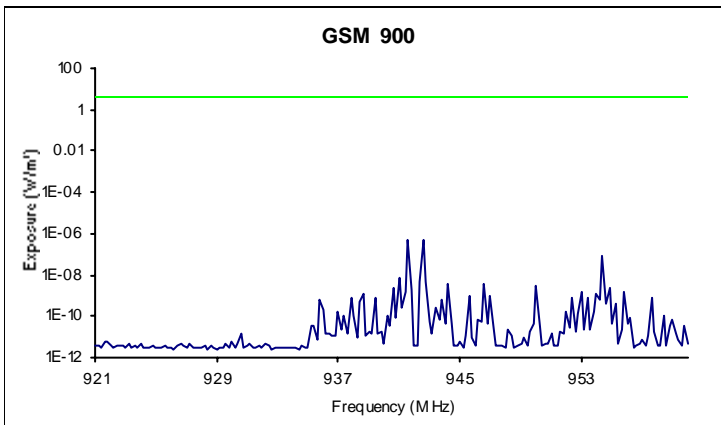
Serial Number: 836.378/017

**Antenna:**

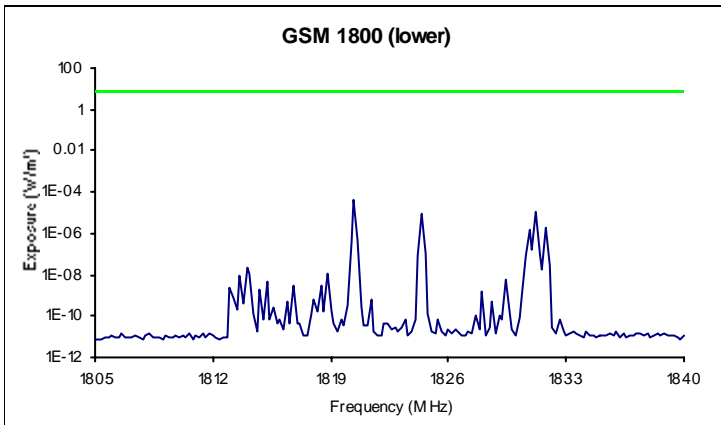
Manufacturer: Rohde & Schwarz

Model: HE200

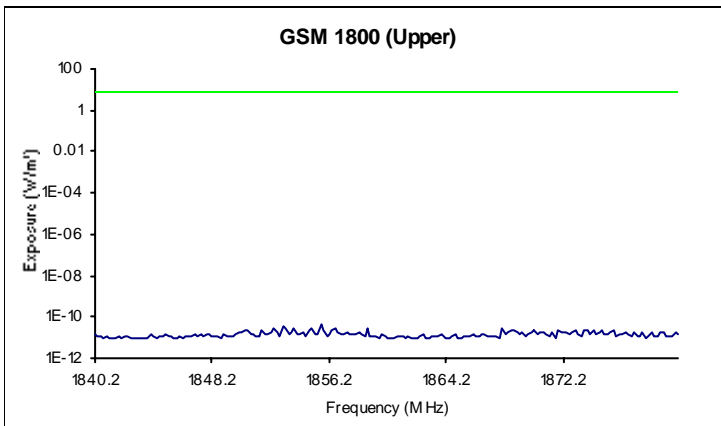
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
942.600	4.64E-07	4.71	9.85E-08
941.600	4.52E-07	4.71	9.61E-08
954.400	7.91E-08	4.77	1.66E-08
941.000	6.84E-09	4.71	1.45E-09
942.400	5.09E-09	4.71	1.08E-09
942.800	4.75E-09	4.71	1.01E-09
944.200	3.70E-09	4.72	7.84E-10
946.600	3.64E-09	4.73	7.68E-10
950.000	3.05E-09	4.75	6.42E-10
940.600	2.66E-09	4.70	5.65E-10
<b>Band Exposure Quotient:</b>			<b>2.23E-07</b>



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,820.400	4.26E-05	9.10	4.68E-06
1,831.200	1.12E-05	9.16	1.22E-06
1,824.400	9.60E-06	9.12	1.05E-06
1,831.800	1.77E-06	9.16	1.93E-07
1,830.800	1.37E-06	9.15	1.50E-07
1,820.600	4.46E-07	9.10	4.90E-08
1,820.200	4.26E-07	9.10	4.68E-08
1,831.000	1.57E-07	9.15	1.72E-08
1,831.400	1.04E-07	9.16	1.14E-08
1,824.600	9.83E-08	9.12	1.08E-08
<b>Band Exposure Quotient:</b>			<b>7.46E-06</b>



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,855.600	3.94E-11	9.28	4.25E-12
1,853.000	3.19E-11	9.27	3.44E-12
1,868.000	3.13E-11	9.34	3.35E-12
1,855.000	2.92E-11	9.28	3.15E-12
1,853.200	2.91E-11	9.27	3.14E-12
1,858.800	2.81E-11	9.29	3.02E-12
1,856.600	2.61E-11	9.28	2.81E-12
1,852.400	2.59E-11	9.26	2.80E-12
1,853.800	2.54E-11	9.27	2.74E-12
1,873.600	2.51E-11	9.37	2.68E-12
<b>Band Exposure Quotient:</b>			<b>3.11E-10</b>

Total number of measurements: 572

**Total Band Exposure Quotient:**

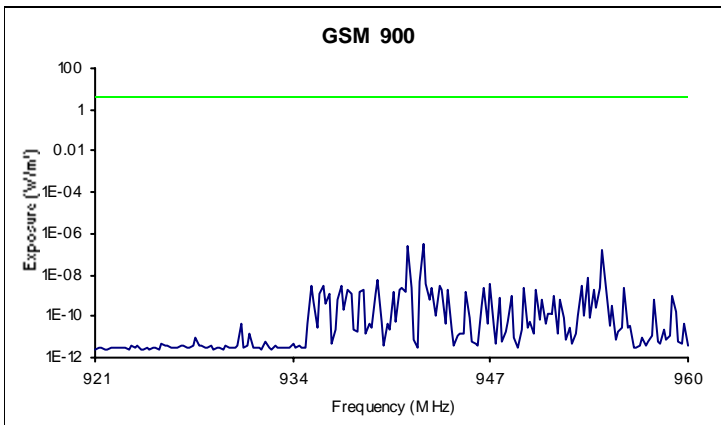
**7.68E-06**

**Site:** GERVAIS FARM  
**Location:** Corner by Workshop

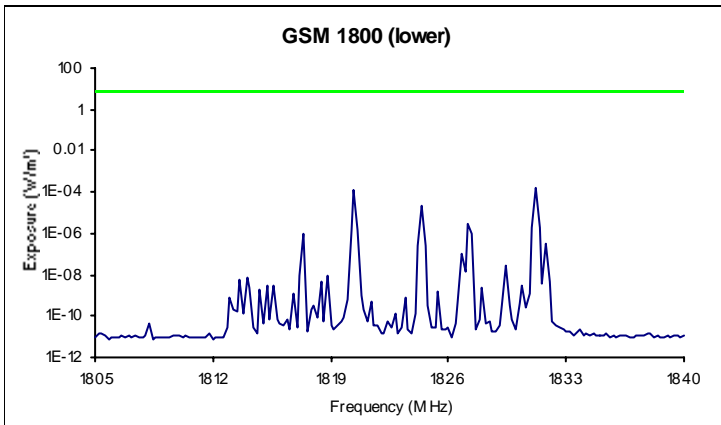
**NGR:** N49 26 48.3 W002 35 49.5  
**Start Time:** 20 September 2005 14:12:11  
**Officer:** Mike Reynolds

**Receiver:**  
Manufacturer: ROHDE&SCHWARZ  
Model: EB200  
Serial Number: 836.378/017

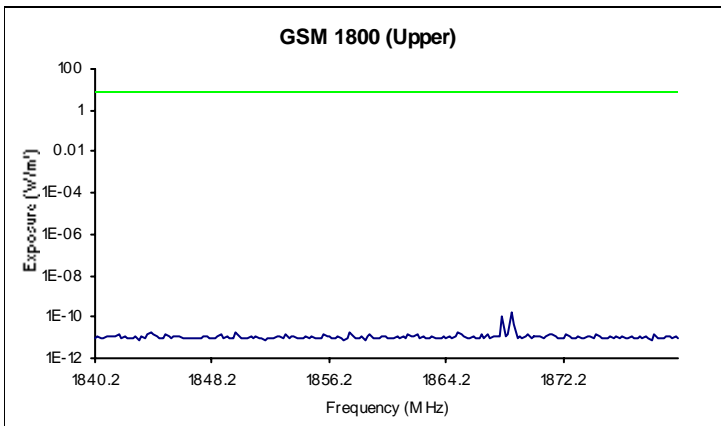
**Antenna:**  
Manufacturer: Rohde & Schwarz  
Model: HE200  
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
942.600	3.52E-07	4.71	7.47E-08
941.600	2.43E-07	4.71	5.16E-08
954.400	1.58E-07	4.77	3.31E-08
953.400	7.54E-09	4.77	1.58E-09
939.600	5.67E-09	4.70	1.21E-09
942.400	4.33E-09	4.71	9.19E-10
947.000	4.08E-09	4.74	8.62E-10
942.800	3.36E-09	4.71	7.14E-10
936.000	3.31E-09	4.68	7.08E-10
943.600	3.29E-09	4.72	6.98E-10
<b>Band Exposure Quotient:</b>			<b>1.80E-07</b>



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,831.200	1.69E-04	9.16	1.84E-05
1,820.400	1.35E-04	9.10	1.48E-05
1,824.400	2.36E-05	9.12	2.58E-06
1,827.200	2.78E-06	9.14	3.05E-07
1,831.400	1.77E-06	9.16	1.93E-07
1,831.000	1.77E-06	9.15	1.93E-07
1,820.600	1.41E-06	9.10	1.55E-07
1,820.200	1.38E-06	9.10	1.51E-07
1,827.400	9.43E-07	9.14	1.03E-07
1,817.400	8.85E-07	9.09	9.74E-08
<b>Band Exposure Quotient:</b>			<b>3.71E-05</b>



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,868.600	1.60E-10	9.34	1.72E-11
1,868.000	1.16E-10	9.34	1.24E-11
1,868.800	4.85E-11	9.34	5.19E-12
1,849.800	1.83E-11	9.25	1.97E-12
1,844.000	1.77E-11	9.22	1.92E-12
1,857.600	1.77E-11	9.29	1.90E-12
1,865.000	1.63E-11	9.32	1.75E-12
1,843.800	1.50E-11	9.22	1.63E-12
1,861.600	1.51E-11	9.31	1.63E-12
1,878.400	1.52E-11	9.39	1.62E-12
<b>Band Exposure Quotient:</b>			<b>2.61E-10</b>

Total number of measurements: 572

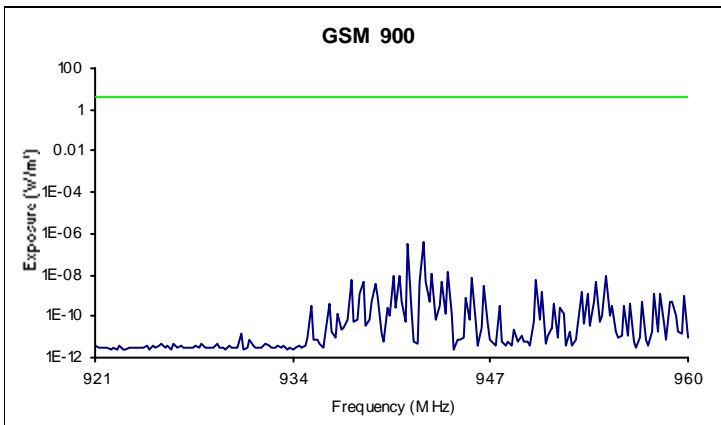
**Total Band Exposure Quotient: 3.73E-05**

**Site:** GERVAIS FARM  
**Location:** To entrance of cow shed

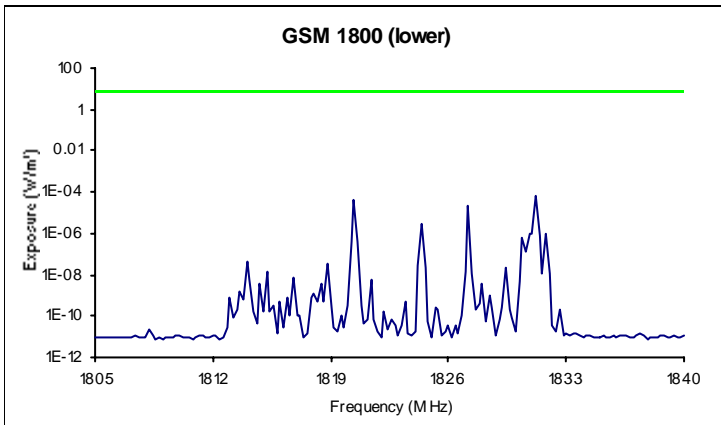
**NGR:** N49 26 48.0 W002 35 48.5  
**Start Time:** 20 September 2005 14:25:33  
**Officer:** Mike Reynolds

**Receiver:**  
Manufacturer: ROHDE&SCHWARZ  
Model: EB200  
Serial Number: 836.378/017

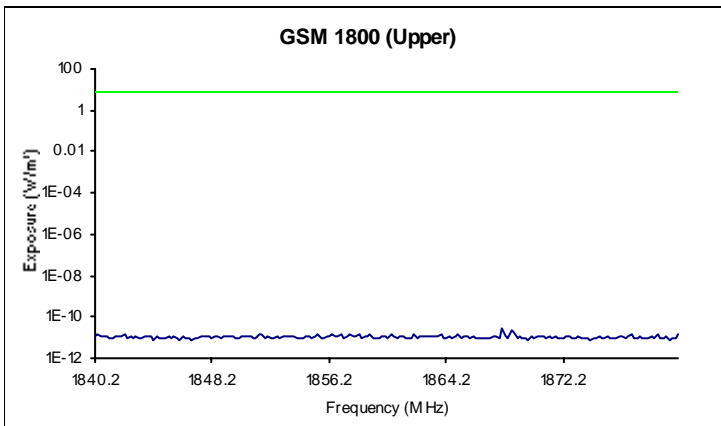
**Antenna:**  
Manufacturer: Rohde & Schwarz  
Model: HE200  
Serial Number: 728264/025



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
942.600	3.77E-07	4.71	8.00E-08
941.600	3.51E-07	4.71	7.46E-08
944.200	1.28E-08	4.72	2.72E-09
943.200	1.11E-08	4.72	2.36E-09
940.600	9.43E-09	4.70	2.01E-09
954.600	9.52E-09	4.77	1.99E-09
941.000	9.02E-09	4.71	1.92E-09
945.800	7.08E-09	4.73	1.50E-09
950.000	6.08E-09	4.75	1.28E-09
937.800	5.78E-09	4.69	1.23E-09
<b>Band Exposure Quotient:</b>			<b>1.80E-07</b>



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,831.200	7.20E-05	9.16	7.86E-06
1,820.400	4.16E-05	9.10	4.57E-06
1,827.200	2.42E-05	9.14	2.65E-06
1,824.400	2.97E-06	9.12	3.25E-07
1,831.000	9.94E-07	9.15	1.09E-07
1,831.800	9.72E-07	9.16	1.06E-07
1,830.800	9.06E-07	9.15	9.90E-08
1,831.400	8.08E-07	9.16	8.83E-08
1,830.400	5.71E-07	9.15	6.24E-08
1,820.600	3.80E-07	9.10	4.17E-08
<b>Band Exposure Quotient:</b>			<b>1.60E-05</b>



Frequency (MHz)	Maximum Exposure (W/m²)	ICNIRP Limit (W/m²)	Frequency Exposure Quotient
1,868.000	3.05E-11	9.34	3.27E-12
1,868.600	2.49E-11	9.34	2.66E-12
1,868.800	1.68E-11	9.34	1.80E-12
1,859.000	1.54E-11	9.29	1.66E-12
1,857.000	1.50E-11	9.29	1.62E-12
1,851.400	1.45E-11	9.26	1.57E-12
1,856.400	1.43E-11	9.28	1.54E-12
1,851.600	1.42E-11	9.26	1.54E-12
1,865.000	1.39E-11	9.32	1.49E-12
1,860.400	1.38E-11	9.30	1.48E-12
<b>Band Exposure Quotient:</b>			<b>2.33E-10</b>

Total number of measurements: 572

**Total Band Exposure Quotient:** 1.62E-05

## Glossary

- Site:** The building or area around which sets of measurements are taken
- Location:** The position within a site at which a single set of measurements is taken. A set of measurements consists of multiple scans of many frequencies within a number of bands
- Band:** A portion of the electromagnetic spectrum reserved for specific radio services
- NGR:** The Ordnance Survey national grid reference coordinates of the location. In this survey NGRs are specified to 8-digit (10-metre) resolution. E.g. SJ 9755 9888
- GPS:** The Global Positioning System
- Start Time:** The date and time at which the receiver started taking its measurements at a location
- Officer:** The name of the RA representative who carried out the audit
- Receiver:** The receiver used to perform the measurements
- Antenna:** The antenna used to perform the measurements
- Exposure:** The maximum measured electric field strength (dB( $\mu$ V/m)) converted to an equivalent power density (W/m<sup>2</sup>)
- Power Density:** The electromagnetic energy flowing through a unit area normal to the direction of propagation in a unit time. Measured in Watts per square metre (W/m<sup>2</sup>)
- ICNIRP Limit:** The reference level given by the International Commission for Non-Ionizing Radiation Protection (ICNIRP) for general public exposure to electromagnetic fields

<i>Frequency</i>	<i>ICNIRP limit</i>
10MHz to 400 MHz	2 W/m <sup>2</sup>
400MHz to 2GHz	f / 200 W/m <sup>2</sup>
2GHz to 300GHz	10 W/m <sup>2</sup>

(where f is frequency in MHz)

**Frequency Exposure Quotient:**

The ratio of the measured maximum power density to the ICNIRP limit at a given frequency. A value close to 1 signifies that exposure levels could be near to the ICNIRP limit for that frequency

**Band Exposure Quotient:**

The sum of the frequency exposure quotients for a single band at a location

**Total Band Exposure Quotient:**

The sum of the frequency exposure quotients for all of the measured bands at a location

- GSM:** Global System for Mobile communication
- ETACS:** Extended Total Access Communications
- TETRA:** Terrestrial Trunked Radio
- 3G:** Third Generation mobile-phone services

- 1.00E-03:** Exponential (or 'scientific') number format. Equal to one thousandth
- 1.00E-06:** Equal to one millionth
- 1.00E-09:** Equal to one thousand-millionth
- 1.00E-12:** Equal to one million-millionth