

# **EXPLORATION AND MINING DIVISION IRELAND**

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## **THE TARA MINES LTD. AIRBORNE MAGNETIC, VLF AND RADIOMETRIC SURVEY (1999) OVER THE LIMERICK AREA**

December 2003



**Department of Communications, Marine  
and Natural Resources**

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Compiled by  
Orla Dardis

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## INTRODUCTION

Between May and June 1999 Tara Mines Ltd flew a 4027 line km magnetic, VLF and radiometric survey, over the Adare Block in Co. Limerick, encompassing approximately 714 km<sup>2</sup> (Figure 1).

Block	Line km	Area (sq. km)	Prospecting Licences covered/partially covered by Survey
Limerick	4027	714	635, 786, 1302, 1303, 1583, 1584, 1942, 1945, 2579, 2638, 2696, 2762, 2835, 2845, 2872, 2927, 3267, 3366, 3367, 3368, 3369, 3488, 3489, 3509, 3544, 3545, 3608, 3661, 3824, 3859

This survey was acquired over four years ago and is available to the general public in fulfillment of the 'Open Skies' policy of the Exploration and Mining Division (EMD). The Division acknowledges the cooperation of Tara Mines Ltd.

At this time EMD is primarily concerned with prompt data release and no attempt was made to reprocess or correct survey data. Data is released as submitted and no liability is accepted on the part of the EMD for data quality or accuracy. However, to facilitate ease of use, several grids are provided with an Ordnance Survey base map for ease of geographical reference.

Tesla Exploration Geophysics conducted the survey. Very low frequency (VLF) electromagnetic, magnetic, radiometric, radar altimeter and navigation data was acquired. All processing was carried out by Tesla-10 PTY Ltd, which is now part of Fugro Airborne Surveys.

The survey acquisition and processing procedures are outlined in a report submitted by Tara Mines. A listing of all digital and hardcopy data (databases, grids, maps and company reports) lodged with the Exploration and Mining Division is included in this publication and outlined below in the data listings section.

## **SURVEY EQUIPMENT AND SPECIFICATIONS**

<b>Flight Line Spacing</b>	200m
<b>Flight Line Direction</b>	170°
<b>Tie Line Spacing</b>	1000m
<b>Mean Terrain Clearance</b>	80 m
<b>Nominal Survey Speed</b>	125 knots ( 65 m/s )
<b>Total Survey Area</b>	714 km <sup>2</sup>
<b>Total Line Km</b>	4027 line km
<b>Magnetometer</b>	Geometrics G-822A
<b>Sensitivity</b>	0.001 nT
<b>Sample Rate</b>	10 samples /sec
<b>Mounting</b>	Tail stinger
<b>Sensor Height above ground</b>	80 m
<b>VLF</b>	Totem-2A VLF Electromagnetic system
<b>Sample Rate</b>	10 samples/sec
<b>Sensor Height above ground</b>	80 m
<b>Spectrometer</b>	Exploranium GR820 self
<b>Total Sensor Volume</b>	16.8 litres
<b>Number of Channels</b>	4 regions of interest (TC, K, U,
<b>Sample Rate</b>	1 sample/sec

## **PROCESSING OVERVIEW AND MAP GENERATION**

The information provided in this section was taken from the Tara Mines report, channel listing files for the survey (included on CD) and from examination of the data.

### **Magnetics Processing Sequence**

Section 4 in Part B of the Tara Mines report outlines the processing sequence in more detail. A system lag correction was applied followed by noise editing (de-spiking). The diurnal field was removed from the data. The regional magnetic field (IGRF) was also removed. The data was then leveled, microlevelled and culture edited.

### **Radiometrics Processing Sequence**

Section 5 in Part B of the Tara Mines report outlines the processing sequence.

## **Electromagnetics Processing Sequence**

Section 4.8 in Part B of the Tara Mines report outlines the processing in more detail. The TOTEM-2A receives the magnetic component of fields radiated from VLF transmitters in the 15 to 25 kHz frequency range. Two VLF transmitters were used in the survey, Rugby in England and Culter in Maine, USA. Four VLF components were analysed as part of the survey, the in-line total field, orthogonal-to-line total field, the in-line horizontal quadrature and the orthogonal-to-line horizontal quadrature. The four components were parallax corrected and low pass filtered.

## **Grid and Map Generation**

Hardcopy maps lodged by Tara Mines (as part of their report) were created from the data with a 50 m grid cell spacing using a bi-cubic spline interpolation. All grids for the release were generated in EMD as no grids were lodged by Tara Mines. The final magnetics channel (INTERP), DTM channel (DTM), radiometrics channels (CORPOT, CORTHO, CORURA) and VLF channels (TOTA\_RES, TOTB\_RES, QUADA\_RES, QUADB\_RES) were used to generate EMD grids and maps.

All digital and hardcopy products are in the Irish National Grid (ING) coordinate system:

Datum:	TM65 / Airy Modified 1849
Ellipsoid:	Airy Modified 1849
	Major axis: 6377340.189
	Eccentricity: 0.081673374
	1/f: 299.3249646
Projection	Transverse Mercator
Central Meridian	-8.00.00.000
Latitude of origin	53.30.00.000
False Northing:	250,000 m
False Easting:	200,000 m
Scale factor:	1.000035

## **DATA LISTING**

### **Geosoft polygon files of survey boundary**

A Geosoft polygon file (\*.ply) for the survey area is included on the CD. The file is in ASCII format and can be opened in any text editor to view survey boundary coordinates (in ING).

## Databases

The raw and final data was supplied in ASCII format and imported into Geosoft Database format (GDB) by EMD. Readme files with channel listings are included on the CD and summarised on pages 6 and 7. The processed magnetics and EM data is released on CD in Geosoft format.

### Raw and Processed Survey Data (Geosoft GDB)

Database	Number of Channels	Approx. Size (Mb)	File Name (.gdb)
Limerick digital terrain model (DTM)	10	29.8	tara99_lim_dtm
Limerick VLF	15	24.4	tara99_lim_vlf
Limerick magnetics	13	36.1	tara99_lim_mag
Limerick radiometrics	19	7.0	tara99_lim_rad

## Grids

As no grids were lodged by Tara Mines, all grids for the release were generated in EMD with a 50 m grid cell spacing using a minimum curvature interpolation.

Grid Name	Grid
tara99_dtm_emd	Digital terrain model
tara99_vlftota_emd	In-line total field (filtered)
tara99_vlftotb_emd	Orthogonal-to-line (filtered)
tara99_vlfquada_emd	In-line horizontal quadrature (filtered)
tara99_vlfquadb_emd	Orthogonal-to-line horizontal quadrature (filtered)
tara99_mag_emd	Total Magnetic Intensity (INTERP channel)
tara99_Kcount_emd	Potassium total count
tara99_Thcount_emd	Thorium total count
tara99_Ucount_emd	Uranium total count

## Maps

Five maps were submitted as part of the Tara Mines report and are listed below. All colour hardcopy maps lodged by Tara Mines for this release were scanned and stored in a compressed TIFF format, using LZW compression to keep file sizes manageable, and can be opened in most standard packages. Compression was carried out using Imaging for Windows, which is available under the Accessories menu in Windows. *LZW compressed TIFF images can only be viewed in Geosoft when they are imported as a GeoTIFF file.* Maps produced in EMD, on an Ordnance Survey 1:50,000 base, with permission from Ordnance Survey Ireland, are available on the release CD as uncompressed images in JPEG format, or in hardcopy format on request.

**Supplied by Tara Mines**  
(as part of Tara Mines Report)

Map Title	Filename	Scale
Regional Geology Limerick Block (Figure 1 of otr24_1)	otr24.1.1	1:100,000
Magnetics Slices C,D,E (Figure 2 of otr24_1)	otr24.1.2	1:100,000
Digital Terrain Map (Figure 3 of otr24_1)	otr24.1.3	1:100,000
Radiometrics K, Th, U (Figure 4 of otr24_1)	otr24.1.4	1:100,000
VLF Limerick Block (Figure 5 of otr24_1)	otr24.1.5	1:100,000

**Supplied by EMD on Ordnance Survey base**

Map	Filename	Scale
Radiometric ternary image	tara99_ternary_emd	1:100,000
Digital terrain model	tara99_dtm_emd	1:100,000
Final processed magnetics	tara99_mag_emd	1:100,000
VLF total field	tara99_vlf_emd	1:100,000

These maps are available, on an Ordnance Survey 1:50,000 base, as scanned images (jpeg format) or in hardcopy format (Ordnance Survey Permit DNE 001001).

**Company reports**

The Tara Mines report for the survey is included on the release CD.

Report Title	Filename (.pdf)	No. of pages
Tara Mines Airborne Geophysical Survey County Limerick.	otr24_1	84



# GEOSOFTE DATABASE CHANNEL LISTING

## Magnetics Database

CHANNEL NAME	DESCRIPTION	UNITS
X	Easting (ING)	metres
Y	Northing (ING)	metres
X_UTM	Easting (WGS84)	metres
Y_UTM	Northing (WGS84)	metres
LAT	Latitude	
LONG	Longitude	
WEEK		
FID	Fiducial	
DIURNAL	Diurnal magnetics	nT
COMP_MAG	Compensated magnetics	nT
LEV_MAG	Levelled magnetics	nT
DECULT	Decultured magnetics	nT
INTERP	Final processed and decultured magnetics	nT

## VLF Database

CHANNEL NAME	DESCRIPTION	UNITS
X	Easting (ING)	metres
Y	Northing (ING)	metres
X_UTM	Easting (WGS84)	metres
Y_UTM	Northing (WGS84)	metres
LAT	Latitude	
LONG	Longitude	
FID	Fiducial	
TOTA	In-line total field	
TOTB	Orthogonal-to-line total field	
QUADA	In-line horizontal quadrature	
QUADB	Orthogonal-to-line horizontal quadrature	
TOTA_RES	In-line total field (filtered)	
TOTB_RES	Orthogonal-to-line (filtered)	
QUADA_RES	In-line horizontal quadrature (filtered)	
QUADB_RES	Orthogonal-to-line horizontal quadrature (filtered)	

## Radiometrics Database

CHANNEL NAME	DESCRIPTION	UNITS
X	Easting (ING)	metres
Y	Northing (ING)	metres
X_UTM	Easting (WGS84)	metres
Y_UTM	Northing (WGS84)	metres
LAT	Latitude	
LONG	Longitude	
FID	Fiducial	
RAWCOS	Raw cosmic count	Counts /sec
RAWTOT	Raw total count	Counts /sec
RAWPOT	Raw potassium count	Counts /sec
RAWURA	Raw uranium count	Counts /sec
RAWTHO	Raw thorium count	Counts /sec
CORTOT	Processed total count	Counts /sec
CORPOT	Processed potassium count	Counts /sec
CORURA	Processed uranium count	Counts /sec
CORTHO	Processed thorium count	Counts /sec
RADALT	Radar altimeter	metres
PRESSURE	Barometric pressure	mbar
TEMP	temperature	Degrees celsius

## DTM Database

CHANNEL NAME	DESCRIPTION	UNITS
X	Easting (ING)	metres
Y	Northing (ING)	metres
X_UTM	Easting (WGS84)	metres
Y_UTM	Northing (WGS84)	metres
LAT	Latitude	
LONG	Longitude	
FID	Fiducial	
RADALT	Radar altimeter	metres
GPSALT	GPS elevation	metres
DTM	Digital terrain model	metres

# SURVEY LOCATION

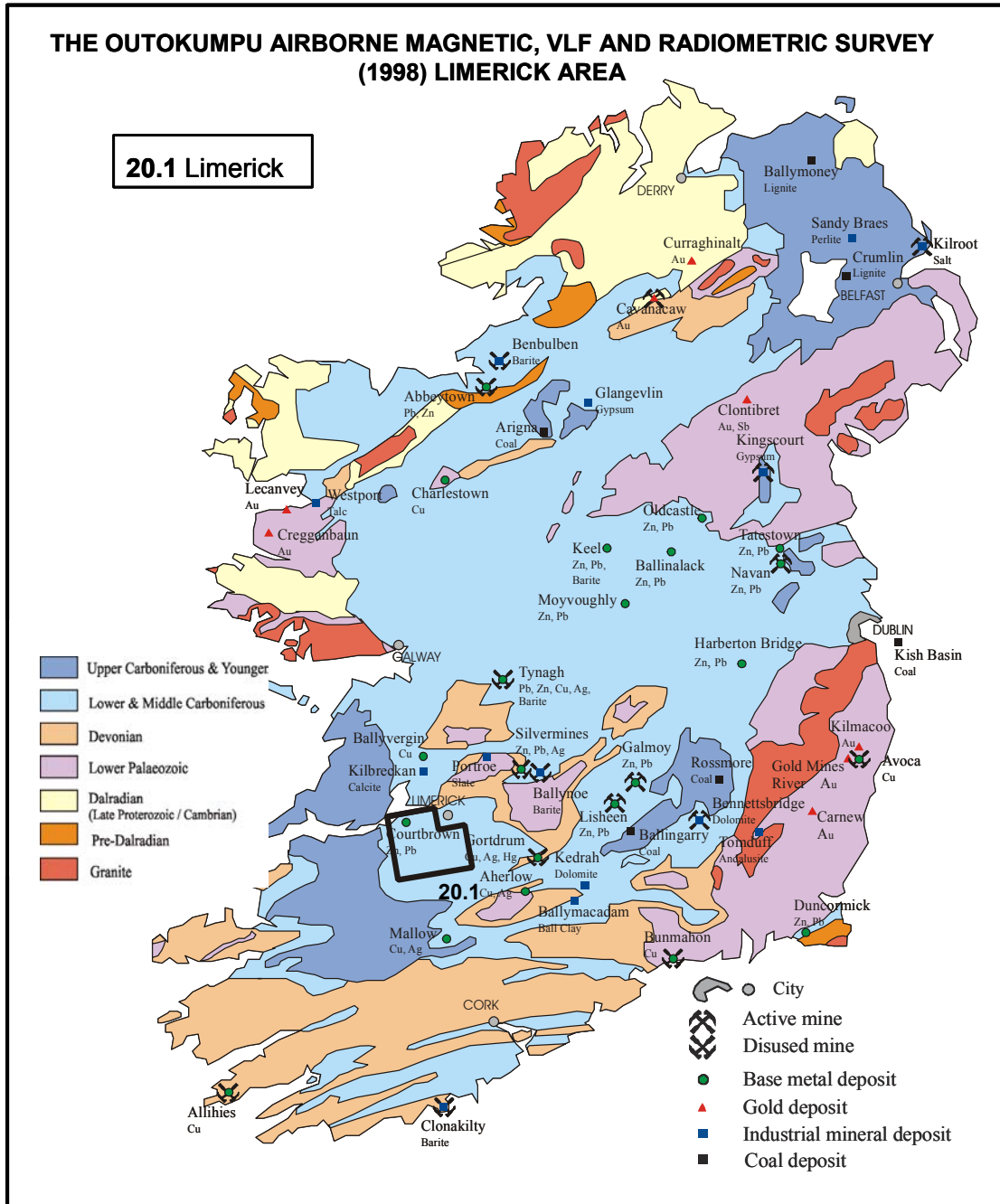
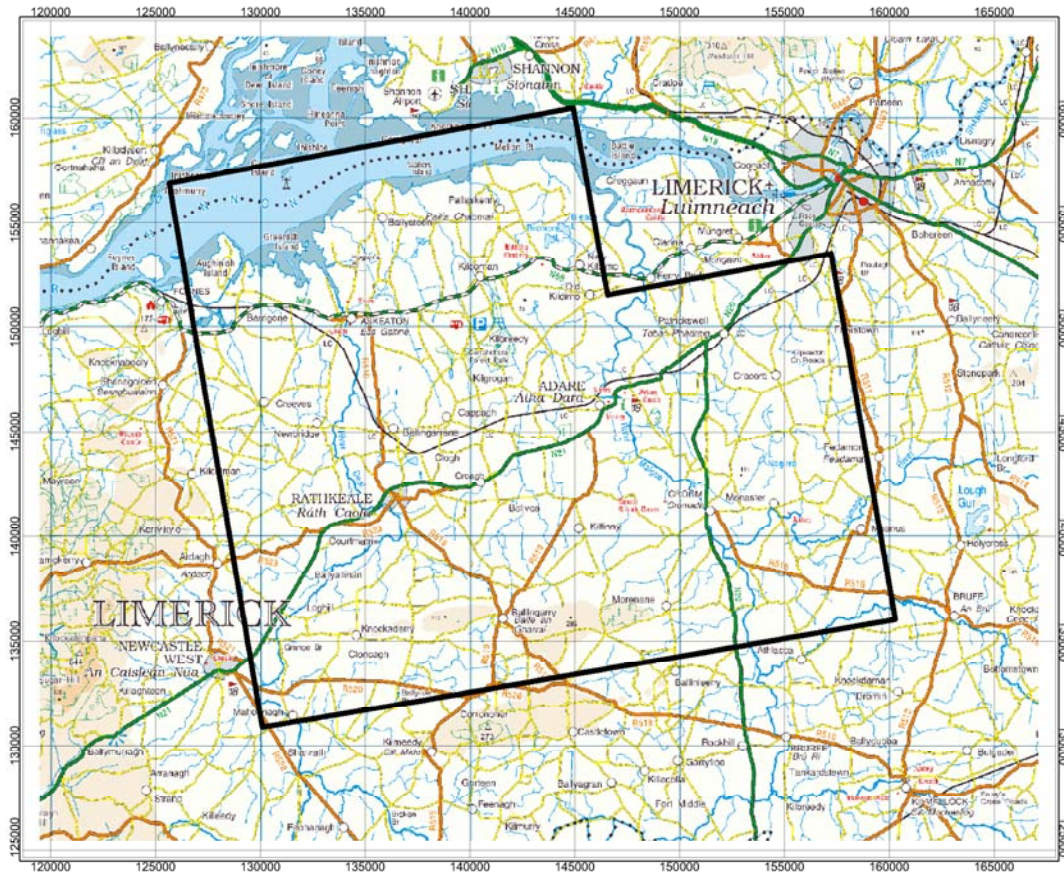


Figure 1. Location of the survey area on a simplified geology map of Ireland.



**Figure 2. The Limerick survey area on a 1:250,000 Ordnance Survey base.**  
 (Ordnance Survey Permit DNE 001001).