

MINERAL EXPLORATION OF THE LIMERICK BASIN

A COMPILATION OF EXPLORATION DATA FROM PARTS OF
COUNTIES LIMERICK, TIPPERARY, CORK AND CLARE, IRELAND.

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5. Geochemistry (Lead)
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7. Geochemistry (Other)
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1 INTRODUCTION

As part of the regulations governing prospecting in Ireland, exploration companies are required to lodge reports detailing their activities on their licences. Up until 1983 this information remained confidential. However in 1983, and following discussions with the exploration industry, the Department of Energy announced that information from this large databank would be made available to interested parties once the prospecting licences (PLs) in question had been surrendered. All exploration reports for surrendered areas are now available on open-file and can be inspected by any interested party.

The main benefits of the open-file system are threefold. Firstly it eliminates unnecessary duplication of exploration effort. Secondly it allows companies to plan and carry out exploration more efficiently and cost-effectively by allowing them access to work which may help to focus their programmes, and thirdly, it permits companies and others to carry out regional compilations of exploration company data.

In its efforts to highlight the mineral potential of Ireland and to encourage exploration activity in areas which are regarded as being under-explored, the Geological Survey of Ireland has been compiling exploration company data for a number of regions. The first region to be completed is the area which is generally known as the Limerick Basin, covering most of County Limerick but also including small parts of Counties Tipperary, Cork and Clare.



Figure 1 Location map.

The boundaries to the area (Figure 1) are both geological and geographical, and the area approximates a rectangle 70 km (E-W) by 40 km

(N-S) i.e. 2,800 km². The northern boundary is the River Shannon Estuary, the eastern boundary is the Lower Palaeozoic inlier of the Slievefelim Mountains, the southern boundary is the thrust front passing through Charleville, and the western boundary is defined by the Namurian and younger Carboniferous rocks in west Co. Limerick.

The series of twelve maps and report serve:

- i) as an index to the open file information,
- ii) to identify specific anomalies and to see what follow up work has (or has not) been carried out,
- iii) to identify what techniques were used and where they were applied.

The maps have been compiled at a scale of 1" to 1 mile (1:63,360) as most prospecting licence maps are still at this scale, there is full regional coverage from published geological maps, and it has been widely used as a suitable base by exploration companies for their own compilations.

Compilation of the geology has also involved some academic publications, in particular the area covering the 'Limerick Volcanics'. This has been mapped in detail by Strogon (1983), whose work has been used to infill this part of the map.

The maps and report are organized in the following manner. The text of the report describes how each map was prepared. There is no attempt to provide interpretations of the information presented. A brief geological summary is provided to cover the geological map. Each of the twelve maps has the 1:63,360 O.S. topographic base, the National Grid in 10km squares and the geological linework. Appendix A is a simplified exploration history of each prospecting licence in the area, given under headings of the principle techniques used in exploration. Appendix B lists the companies that carried out the different exploration techniques and the areas involved, and is also intended to serve as an acknowledgement of their contribution to each map.

While the compilations, especially in respect of geochemical and geophysical data, serve a purpose in highlighting areas where results have been anomalous, users are strongly advised to examine the original open-file data. There may be information contained in the original reports which has not been included in the compilation but which would be of interest to any given user. It should also be remembered that the region has not been prospected in a systematic way and that coverage is patchy in nature; there are plenty of opportunities still in the region for enterprising companies or individuals with new ideas or new technology to locate other anomalies, some of which, we believe, will represent the surface expression of significant bedrock mineralization.

The compilation work was undertaken mainly through the Geological Survey's Temporary Field Assistant scheme over the period 1986-88 by Graham Reid, Gary Kitchener, Michael Bowler, Paul Carlisle, Brian Carroll and Suzanne Tynan. I would like to thank Loreto Farrell, John Pyne and Ronnie Creighton for their help and suggestions. Piers Gardiner provided the essential backroom assistance and encouragement. The map preparation was supervised by Pdraig Connaughton of the Cartography Unit and typing was by Bernie Glendon. Printing of Maps 2, 10 and 11 was carried out at the Ordnance Survey.

2 PROSPECTING LICENCE AREAS

The outline of current prospecting licence areas are shown on Map 1. Previous PL numbers can be obtained by referring to Appendix 1.

3 GEOLOGY

3.1 STRATIGRAPHY

In very general terms the Carboniferous stratigraphy of the area (Map 2) can be divided in two units. Firstly the lithologies below and including the Waulsortian Mudbank Limestones, and secondly the lithologies above the Waulsortian. The former group will be described first.

The lithologies of the Waulsortian and sub-Waulsortian are mainly Courcayan in age and occur within what has been called the Limerick Province by Philcox (1984). In his work Philcox describes a generalized stratigraphy which comprises:

- Waulsortian Mudbank Limestones
- Upper Ballysteen Limestone
- Middle Ballysteen Limestone
- Lower Ballysteen Limestone
- Ballyvergin Shale
- Ringmoylan Shales
- Mellon House Beds
- (Old Red Sandstone)

In a more detailed description of the Pallaskerry borehole Somerville and Jones (1985) have set up a more formal stratigraphy as follows:

- Waulsortian Limestone Formation
- Ballysteen Limestone Formation
- Ballymartin Limestone Formation
- Ballyvergin Mudstone Formation
- Ringmoylan Shale Formation
- Mellon House Formation
- (Old Red Sandstone facies)

Within the Ballysteen Limestone Formation two discrete Members are recognised viz. the Ballynash Member at the top and the Pallaskerry Member at the bottom, with the main bulk of the Formation in between the two.

From the lithological descriptions, the Upper and Middle Ballysteen Limestones of Philcox (1984) equate with the Ballysteen Limestone Formation of Somerville and Jones (1985), while the Lower Ballysteen Limestone (Philcox 1984) is equivalent to the Ballymartin Limestone Formation of Somerville and Jones (1985).

An earlier stratigraphy (Shephard-Thorn 1963) outlined the following units:

- Waulsortian "Reef" Limestones
- Ballysteen Limestones
- Ringmoylan Shales
- Mellon House Beds
- Old Red Sandstone

This earlier stratigraphy has been largely followed by the exploration companies and forms the basis for the stratigraphy outlined here. The only significant difference between Shephard-Thorn's stratigraphy and the stratigraphical succession as used by most of the companies is that the Ballyvergin Shale is recognized separately as a unit overlying the Ringmoylan Shales and underlying the Ballysteen Limestones. It would not be possible without detailed relogging and outcrop checking to produce a geological map with the more recent stratigraphical nomenclature. The following simplified stratigraphy, therefore, is the one which has been used in this compilation:

Waulsortian Mudbank Limestones
Ballysteen Limestones
Ballyvergin Shale
Mellon House Sandstones and Ringmoylan Shales
Old Red Sandstone

A brief lithological description of each unit follows:

Old Red Sandstone: The Old Red Sandstone is comprised of red and grey sandstones with thin mudstones and some conglomerates.

Mellon House Sandstones: The Mellon House Sandstones are a sequence of mixed calcareous sandstones, siltstones, and calcareous shales.

Ringmoylan Shales: The Ringmoylan Shales is dominantly a black calcareous shale unit with thin limestone beds.

Ballyvergin Shale: The Ballyvergin Shale is a grey-green non calcareous shale and acts as a useful marker in drill-holes.

Ballysteen Limestones: The Ballysteen Limestone is informally divided into three (the Lower, equating with the Ballymartin Limestone Formation of Somerville and Jones (1985), and Middle and Upper units). The Lower Ballysteen Limestone is comprised of nodular argillaceous limestone with some shales. The Middle Ballysteen Limestone is comprised of cleaner bioclastic limestones with little shale material, while the Upper Ballysteen Limestone consists of a sequence of shales and argillaceous limestones.

Waulsortian Mudbank Limestones: The Waulsortian Mudbank Limestones are pale grey stromatactid micrites.

The lithologies above the Waulsortian have not received the same degree of attention as the Waulsortian and the lithologies below it. A further twofold division of these rocks can however be made. Firstly there are the volcanic rocks and their associated sedimentary rocks in East Limerick, and secondly there are the sedimentary rocks which occur elsewhere in the area.

The volcanic rocks and their associated sedimentary rocks have been studied in detail by Strogon (1983, 1988). His stratigraphy is as follows:

Longstone Formation
Dromkeen Limestone Formation
Knockseefin Volcanic Formation
Herbertstown Limestone Formation
Knockroe Volcanic Formation

Knockroe Volcanic Formation: The Knockroe Volcanic Formation, which is Chadian in age, comprises tuffs and mafic to intermediate flows (alkali basalts to trachytes).

Herbertstown Limestone Formation: The Herbertstown Limestone Formation consists of pale blue biosparitic grainstones, locally oolitic, and are of Arundian to Asbian age (Strogen 1988).

Knockseefin Volcanic Formation: The Knockseefin Volcanic Formation comprises mafic flows (ankaramites and limburgites) and tuffs, and are Asbian in age.

Dromkeen Limestone Formation: The Dromkeen Limestone Formation consists of pale grey fine-grained grainstones and packstones, and are late Asbian to Brigantian in age (Strogen 1988).

Longstone Formation: The Longstone Formation comprises basal laminated mudstones and shales overlain by flaggy micaceous siltstones and thin sandstones. These rocks are of Namurian age and lie unconformably on the Dromkeen Limestone Formation.

For the purposes of compilation on Map 2, the following subdivisions have been used:

- Longstone sandstones and shales
- Dromkeen and Herbertstown Limestones
- Igneous Rocks
 - Minor intrusives (Syenites, dolerites)
 - Mafic flows (basalts, trachybasalts, ankaramites)
 - Intermediate flows (trachytes)
 - Tuffs (vitric and lithic)
 - Undifferentiated igneous rocks

The rocks overlying the Waulsortian elsewhere in the area have for the most part been called "Calp" by the exploration companies. In the west these lithologies have been subdivided by Shephard-Thorn as follows:

- Namurian rocks (includes the Foynes Shales at the base)
- Corrig Lodge Beds (shales with limestones)
- Parsonage Beds (dark grey calcite mudstones)
- Shanagolden Limestones (black well-bedded limestones)
- Durnish Limestones (blue-black bioclastic limestones)
- Rathkeale Beds (dark argillaceous limestones and shaly mudstones)

For the most part these units have not been recognized outside the area of Shephard-Thorn's work by the exploration companies. For this reason these lithologies have been grouped together as undifferentiated supra-Waulsortian lithologies on the geological map.

3.2 STRUCTURE

The dominant structural features are the east-west trending synclines and anticlines. A major syncline occurs in the eastern part of the area near Pallas with the volcanic rocks cropping out in and around the structure. To the south, anticlines cored by rocks of Old Red Sandstone facies stretch from just south of Newcastlewest in the west to Emly in the east. To the north along the Shannon Estuary a subsidiary syncline, with undifferentiated supra-Waulsortian rocks in its core, is developed.

These folds are cut by numerous cross faults which for the most part trend north-south.

A southerly-dipping post-Carboniferous thrust occurs at the southern margin of the area.

4 BOREHOLE LOCATIONS

Borehole locations are shown on Map 3. Three types of borehole have been distinguished:

- (i) Diamond drill holes where full core was recovered.
- (ii) Percussion holes where only chips were recovered.
- (iii) Reverse circulation drill holes where either chips or some core was recovered.

Also, a distinction was made between diamond drill holes less than 500ft (150m) and greater than 500ft (150m) in length. This serves to show the distribution of the deeper holes.

5 GEOCHEMISTRY

The geochemical compilations (Maps 4, 5, 6 and 7) show and distinguish geochemical anomalies for sampling media from the secondary environment viz. stream sediments, soils and deep overburden. With regard to the stream sediments and soils, practically all of the area was sampled. However with the deep overburden geochemistry it is general practice to carry out grid surveys over a more restricted area and the area thus sampled is outlined on each of the maps. Also the type of deep overburden sampling carried out, whether power auger or percussion drill, is indicated by the grid outline ornamentation. Reverse circulation drilling (for deep overburden sampling) is either shown as a traverse or as individual points as appropriate. Non-anomalous individual sample points are shown as open circles.

Four maps have been compiled viz. Copper (Map 4), Lead (Map 5), Zinc (Map 6) and "Other" (Map 7).

With respect to Map 7, showing the "other" geochemical anomalies, not all areas have been sampled/analysed for all elements/minerals. However, the extent of the surveys is not shown as to do so would have produced a cluttered map which would have been too difficult to read.

Plotted on the maps are the anomalous areas for each element. The anomalies are represented by symbols which for larger anomalies have been placed at the centre of the anomaly. For the most part the anomalies as identified by the company concerned have been plotted, although there is a wide disparity between companies as to what is considered anomalous for any one particular element. In very general terms the following values are considered anomalous by companies for stream sediments, soils and deep overburden: Cu - 30ppm, Pb - 50ppm, Zn - 200ppm, BaSO₄ - 2000ppm, Hg - 400ppb and Total Heavy Metals - 500ppm.

6 GEOPHYSICS

There are four separate compilations of geophysical data viz.

aeromagnetics, gravity, VLF-EM and IP/Resistivity.

6.1 AEROMAGNETICS

The aeromagnetics map (Map 8) is derived solely from data obtained in 1979-80 during an airborne magnetometer survey flown for the Geological Survey. A report on this survey, carried out by Hunting Geology and Geophysics Ltd., is available from the Geophysics Section of the Geological Survey.

A number of companies conducted their own aeromagnetic and ground magnetic surveys during their exploration programmes (Appendix B), but these are so few it was not considered appropriate that they be included. The current presentation serves as a uniform survey which covers the entire area.

6.2 GRAVITY

The Gravity (Bouguer Anomaly) map (Map 9) has been derived from the Dublin Institute for Advanced Studies Bouguer Anomaly Map for the southwest part of Ireland. The Gravity data was originally compiled by Prof. T. Murphy and published at a scale of 1:250,000. For this publication the relevant area has been photoenlarged and is reproduced here.

As in the case of magnetics a number of exploration companies have carried out gravity surveys (Appendix B). Again it was not considered worthwhile to reproduce these as there are so few and they are widely spread apart.

6.3 VLF-EM

For the VLF-EM compilation (Map 10) each individual survey was contoured on the basis of high, medium and low values of the in-phase component. Surveys adjacent to each other cannot therefore be linked contour-wise together. The data generally may be used to obtain structural information on an area. As it was seldom indicated which transmitting station was used, these are not indicated on the map.

6.4 INDUCED POLARIZATION AND RESISTIVITY

There are three components to the Induced Polarization and Resistivity map (Map 11) viz. Induced Polarization (IP), Resistivity (measured during IP surveys) and VLF-Resistivity.

For the first two the grid outline or the survey line is indicated. In case the of a grid the line direction is shown by an arrow. The type of array is also indicated - as explained on the legend. In the case where grids or surveys have overlapped, each grid outline is shown in a different colour. Within the grid the anomalies of a particular survey are outlined in the same colour as the grid boundary.

In some surveys the IP anomalies as defined by the company are shown. In other cases where no anomalies were defined the data were examined and an anomalous value was estimated for the particular survey.

For the resistivity which was measured while the IP was being carried out, inspection of the data has led to a three-fold resistivity classification - low medium and high. Typically 400 ohm/metres and 1000

ohm/metres were used to define the cutoffs. Again the outline of these highs (red) and lows (blue) are indicated in the same colour as the respective grid boundary. Resistivity was not carried out in every case and these surveys can be identified by a lack of resistivity ornamentation within the survey boundary outline.

Resistivity measured during VLF surveys is also shown. Again a three-fold low, medium and high division has been made and these regions are outlined in the same colour as the boundary of the survey. There have not been as many VLF-R surveys carried out as VLF-EM surveys. This is because the resistivity system was developed later than the EM system and consequently in earlier VLF work only EM measurements were taken.

7 MINERAL LOCALITIES AND LITHOGEOCHEMISTRY

The mineral localities and lithogeochemistry map (Map 12) represents a compilation of those localities where minerals of economic interest are visible to the naked eye and localities where rock samples have yielded anomalous values but with no visible indication of any minerals of economic interest.

Three different categories of mineral locality are distinguished viz. float mineralization, mineralization seen in outcrop and mineralization seen in core. These are indicated separately on the Map.

The mineral localities have been compiled from existing data (mainly Cole 1922) and from the prospecting work of the exploration companies. In the case of galena and sphalerite all such occurrences within the open file system have been recorded on the Map. Pyrite occurrences present a different problem. Only those that are regarded as significant pyrite occurrences have been plotted, so only stratiform pyrite occurrences and localities where pyrite occurs in amounts greater than 10% by volume have been included.

The most notable mineral occurrences are the mineral deposits of Gortdrum, Courtbrown and Carrickittle. These have been described in detail in articles by Steed (1986), Grennan (1986) and Brown and Romer (1986), respectively.

Only a small number of lithogeochemical surveys have been carried out in the area. The outline of each survey is shown on the Map and all sampling points are indicated. Non-anomalous samples are shown by open circles. Anomalous samples are shown by filled-in circles with a notation as to the anomalous element(s). The thresholds used to identify anomalous geochemical values are as follows: Copper - 3000ppm, Lead - 10000ppm, Zinc - 10000ppm.

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APPENDIX A

SUMMARY EXPLORATION HISTORY FOR EACH PROSPECTING LICENCE

For location of prospecting licence area see Map 1

Current P.L. Number	450																									
Previous P.L. Number	450																									
Company	TARA EXPLN. DEV. CO. LTD.																	*								
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching					/			/		/	/		/							/						
Drilling D.D/R.C.D															/	/										
Soil geochem				/	/						/									/						
Stream sed. geochem																										
Deep overburden geochem.												/	/	/						/						
VLF/VLF-R												/			/											
I.P./Resistivity					/							/														
Magnetics					/							/														
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* NORANDA EXPLN. LTD.

Current P.L. Number	468																									
Previous P.L. Number	468																									
Company	RIOFINEX (IRE) LTD																		*							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching							/			/	/															
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* DRESSER MINERALS INT.

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Company	TARA EXPLN. DEV. CO.																		*							
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Geol. Map/Prospecting /Trenching							/			/	/															
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Geol. Map/Prospecting /Trenching					/			/	/	/		/								/						
Drilling D.D/R.C.D															/	/										
Soil geochem				/	/						/									/						
Stream sed. geochem																										
Deep overburden geochem.												/	/	/						/						
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Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* NORANDA EXPLN. LTD.

Current P.L. Number	469																									
Previous P.L. Number	469																									
Company	RIOFINEX (IRE) LTD.																		*							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching						/			/	/		/									/					
Drilling D.D/R.C.D													/										/			
Soil geochem									/				/													
Stream sed. geochem																										
Deep overburden geochem.																					/					
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics													/	/							/					
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry																								/		

* TARA PROSPECTING LTD.

Current P.L. Number	593																									
Previous P.L. Number	247	297				593																				
Company	*	TURKO SYN.				IRISH BASE METALS																				
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching					/								/	/	/	/	/									
Drilling D.D/R.C.D					/										/	/	/									
Soil geochem	/				/	/				/	/															
Stream sed. geochem		/																								
Deep overburden geochem.									/			/			/	/										
VLF/VLF-R								/								/										
I.P./Resistivity	/				/	/						/	/													
Magnetics																										
Gravity																										
Hydro geochem																/										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry															/											

* IRISH COPPER MINES LTD.

Current P.L. Number	636																									
Previous P.L. Number	636																									
Company	GREENHILLS MINING CO'L																		*							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/				/						/						
Drilling D.D/R.C.D														/												
Soil geochem																				/						
Stream sed. geochem										/																
Deep overburden geochem.																				/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics														/												
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry														/												

* NORANDA EXPLN. LTD.

Current P.L. Number	786																												
Previous P.L. Number	786																												
Company	TARA EXPLN DEV. CO. LTD.																										*		
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88			
Geol. Map/Prospecting /Trenching						/		/	/			/	/																
Drilling D.D/R.C.D							/	/						/	/														
Soil geochem						/							/																
Stream sed. geochem						/																							
Deep overburden geochem.													/		/														
VLF/VLF-R										/																			
I.P./Resistivity						/	/																						
Magnetics																													
Gravity																													
Hydro geochem																													
Airborne geophysics- INPUT																													
Airborne geophys- magnetics																													

* TARA EXPLN. DEV.

Current P.L. Number	816																									
Previous P.L. Number	816																									
Company	DENISON MINES LTD.																		*							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching									/	/		/	/		/					/						
Drilling D.D/R.C.D																										
Soil geochem						/		/	/	/		/	/	/						/						
Stream sed. geochem																										
Deep overburden geochem.												/			/											
VLF/VLF-R														/												
I.P./Resistivity							/	/																		
Magnetics						/																				
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* NORADA EXPLN. LTD.

Current P.L. Number	1303																											
Previous P.L. Number	566												1303															
Company	BASIN EXPLN (IRE) LTD.												IRISH BASE METALS														*	
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88		
Geol. Map/Prospecting /Trenching					/				/					/														
Drilling D.D/R.C.D															/													
Soil geochem					/			/	/							/												
Stream sed. geochem																												
Deep overburden geochem.											/	/	/	/														
VLF/VLF-R															/													
I.P./Resistivity										/	/	/	/															
Magnetics																												
Gravity																												
Hydro geochem																												
Airborne geophysics- INPUT																												
Airborne geophys- magnetics																												

* DRESSER MINERALS INT.

Current P.L. Number	1359																									
Previous P.L. Number	100			528			1359																			
Company	*			**			TARA EXPLN DEV. LTD															***				
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching				/			/	/			/				/	/			/							
Drilling D.D/R.C.D										/	/		/			/				/						
Soil geochem	/			/			/	/		/	/				/											
Stream sed. geochem																										
Deep overburden geochem.											/	/				/				/						
VLF/VLF-R									/																	
I.P./Resistivity	/														/		/									
Magnetics																										
Gravity															/											
Hydro geochem																/										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* SOUTHERN OILS LTD.
** BASIN EXPLN. LTD.
*** BILLITON EXPLN. LTD.

Current P.L. Number	1487																									
Previous P.L. Number		414						1487																		
Company		*						TARA EXPLN. DEV. CO. LTD.												**						
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching			/						/		/				/	/										
Drilling D.D/R.C.D																	/									
Soil geochem			/						/	/																
Stream sed. geochem																										
Deep overburden geochem.											/	/	/	/	/	/				/						
VLF/VLF-R										/	/															
I.P./Resistivity																										
Magnetics									/																	
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* IRISH BASE METALS LTD.

** BOLLINGTON EXPLN. LTD.

Current P.L. Number	1582																									
Previous P.L. Number	36												1582													
Company	IRISH COPPER MINES LTD.												AMERICAN SMELTING + REFINING CO. LTD.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching	/										/				/			/	/	/						
Drilling D.D/R.C.D	/	/		/															/	/						
Soil geochem	/										/				/			/								
Stream sed. geochem																										
Deep overburden geochem.																	/	/	/							
VLF/VLF-R		/		/											/											
I.P./Resistivity													/		/											
Magnetics															/											
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry																		/								

Current P.L. Number	1584																									
Previous P.L. Number	527												1584													
Company							*						**						***							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching					/						/		/	/						/						
Drilling D.D/R.C.D						/														/	/					
Soil geochem					/	/					/		/		/											
Stream sed. geochem																										
Deep overburden geochem.																			/							
VLF/VLF-R																/										
I.P./Resistivity					/	/							/													
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* BASIN EXPL. SYN

*** AMERICAN SMELTING + REFINING CO. LTD.

*** BILLITON EXPN. (IRE) LTD.

Current P.L. Number	1613																									
Previous P.L. Number	1613																									
Company											*										**					
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching																				/						
Drilling D.D/R.C.D																				/						
Soil geochem										/	/															
Stream sed. geochem																										
Deep overburden geochem.																				/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* GORTDRUM MINES (IRE) LTD.

** AQUITAINE MINING (IRE) LTD.

Current P.L. Number	1657																																						
Previous P.L. Number	503													1657																									
Company														* DENISON MINES LTD.													**												
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88													
Geol. Map/Prospecting /Trenching												/	/		/					/																			
Drilling D.D/R.C.D																																							
Soil geochem				/		/						/	/		/																								
Stream sed. geochem				/																	/																		
Deep overburden geochem.																																							
VLF/VLF-R																																							
I.P./Resistivity						/																																	
Magnetics																																							
Gravity																																							
Hydro geochem																																							
Airborne geophysics- INPUT																																							
Airborne geophys- magnetics																																							

* TARA EXPLN. DEV. LTD.

** BILLITON EXPLN. LTD.

Current P.L. Number	1658																												
Previous P.L. Number	524 + 523													1658															
Company	BASIN EXPLN (IRE) LTD.													DENISON MINES LTD.														*	
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88			
Geol. Map/Prospecting /Trenching					/							/	/		/					/									
Drilling D.D/R.C.D																													
Soil geochem					/	/				/		/	/		/														
Stream sed. geochem																													
Deep overburden geochem.												/	/		/						/								
VLF/VLF-R																													
I.P./Resistivity										/	/																		
Magnetics										/																			
Gravity																													
Hydro geochem																													
Airborne geophysics- INPUT																													
Airborne geophys- magnetics																													

* BILLITON EXPLN. LTD.

Current P.L. Number	1940																									
Previous P.L. Number	1940																									
Company													*													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/					/							
Drilling D.D/R.C.D																		/								
Soil geochem													/	/	/	/										
Stream sed. geochem																		/								
Deep overburden geochem.																			/							
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* ATHLONE PROSPECTING + DEV. CORP. LTD.

Current P.L. Number	1941																									
Previous P.L. Number	425												1941													
Company	MARATHON PETROLEUM (IRE) LTD.												*													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/					/							
Drilling D.D/R.C.D					/														/							
Soil geochem	/												/	/	/	/				/						
Stream sed. geochem																										
Deep overburden geochem.																			/							
VLF/VLF-R																			/							
I.P./Resistivity																				/						
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* ATHLONE PROSPECTING + DEV. CORP. LTD.

Current P.L. Number	1942																											
Previous P.L. Number	779														1942													
Company	TARA EXPLN. DEV.														ATHLONE PROSPECTING + DEV. CORP.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88		
Geol. Map/Prospecting /Trenching													/	/				/	/									
Drilling D.D/R.C.D																		/	/	/								
Soil geochem						/							/	/	/	/												
Stream sed. geochem					/																							
Deep overburden geochem.																		/	/	/								
VLF/VLF-R																												
I.P./Resistivity																												
Magnetics																												
Gravity																												
Hydro geochem																												
Airborne geophysics- INPUT																												
Airborne geophys- magnetics																												
Litho geochemistry																					/							

Current P.L. Number	1943																									
Previous P.L. Number	782												1943													
Company	TARA EXPLN. DEV.												ATHLONE DEVELOPMENT + PROSPECTING CORP. LTD.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/				/	/							
Drilling D.D/R.C.D																			/	/						
Soil geochem						/							/	/	/	/			/							
Stream sed. geochem					/																					
Deep overburden geochem.																			/							
VLF/VLF-R																			/							
I.P./Resistivity																				/						
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry																				/						

Current P.L. Number	1944																									
Previous P.L. Number	780												1944													
Company	TARA EXPLN DEV.												*						BILLITON EXPLN (IRE) LTD.							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/		/			/							
Drilling D.D/R.C.D																			/							
Soil geochem						/							/	/		/										
Stream sed. geochem						/																				
Deep overburden geochem.																										
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* ATHLONE PROSPECTING + DEV. CORP. LTD.

Current P.L. Number	1945																									
Previous P.L. Number	781												1945													
Company													* ATHLONE PROSPECTING + DEV. CORP. LTD.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/				/	/							
Drilling D.D/R.C.D																		/	/							
Soil geochem						/							/	/	/	/										
Stream sed. geochem						/																				
Deep overburden geochem.																		/								
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* TARA EXPLN. DEV.

Current P.L. Number	1946																									
Previous P.L. Number	783												1956													
Company	TARA EXPLN. DEV.												*													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/				/	/							
Drilling D.D/R.C.D																		/								
Soil geochem						/							/	/	/	/										
Stream sed. geochem						/																				
Deep overburden geochem.																		/								
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* ATHLONE PROSPECTING + DEV. CORP. LTD.

Current P.L. Number	1947																									
Previous P.L. Number	784												1947													
Company	TARA EXPLN. DEV.												ATHLONE PROSPECTING + DEV. CORP.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching													/	/				/	/							
Drilling D.D/R.C.D																		/	/	/						
Soil geochem						/							/	/												
Stream sed. geochem						/																				
Deep overburden geochem.																		/		/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry																					/					

Current P.L. Number	2028																											
Previous P.L. Number	680														2028													
Company								*							**							DRESSER MINERALS						
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88		
Geol. Map/Prospecting /Trenching													/		/	/												
Drilling D.D/R.C.D															/	/		/										
Soil geochem						/							/	/	/													
Stream sed. geochem													/		/													
Deep overburden geochem.														/		/		/										
VLF/VLF-R																												
I.P./Resistivity																												
Magnetics																												
Gravity																												
Hydro geochem																												
Airborne geophysics- INPUT																												
Airborne geophys- magnetics																												

* RIOFINEX LTD.

** CENTRAL MINING FINANCE LTD.

Current P.L. Number	2289																									
Previous P.L. Number	1551																2289									
Company	BOURKE + McNAMARA																*									
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/																
Drilling D.D/R.C.D																										
Soil geochem										/																
Stream sed. geochem																										
Deep overburden geochem.																										
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* IRISH BASE METALS

Current P.L. Number	2529																									
Previous P.L. Number	639																	2529								
Company	GREENHILLS MINING CO.																	*		**						
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/										/						
Drilling D.D/R.C.D																										
Soil geochem																	/			/						
Stream sed. geochem										/																
Deep overburden geochem.																				/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry																										

* CENTRAL MINING FINANCE

** NORANDA EXPLN. LTD.

Current P.L. Number	2530																									
Previous P.L. Number	640																		2530							
Company	GREENHILLS MIN. CO.												*			**										
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/										/						
Drilling D.D/R.C.D																										
Soil geochem																/				/						
Stream sed. geochem										/																
Deep overburden geochem.																										
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* CENTRAL MINING FINANCE

** NORANDA EXPLN. LTD.

Current P.L. Number	2531																									
Previous P.L. Number	641																		2531							
Company	GREENHILLS MINING CO.															*			**							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/										/						
Drilling D.D/R.C.D																										
Soil geochem																/										
Stream sed. geochem										/																
Deep overburden geochem.																				/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* CENTRAL MINING FINANCE

** NORANDA EXPLN. LTD.

Current P.L. Number	2594																									
Previous P.L. Number	923																2594									
Company	TARA EXPLN. DEV. CO. LTD.																*									
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching						/	/	/											/							
Drilling D.D/R.C.D																			/							
Soil geochem						/	/	/				/					/									
Stream sed. geochem						/													/	/						
Deep overburden geochem.																										
VLF/VLF-R																			/							
I.P./Resistivity											/									/						
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* ATHLONE PROSPECT. DEV. CO.

Current P.L. Number	2638																									
Previous P.L. Number	778																		2638							
Company	TARA EXPLN. DEV. CO.															*			**							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching									/		/									/						
Drilling D.D/R.C.D																										
Soil geochem						/			/	/	/		/							/						
Stream sed. geochem						/																				
Deep overburden geochem.											/		/							/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* GREENHILLS MINING CO. LTD.

** NORANDA EXPLN. CO. LTD.

Current P.L. Number	2692																														
Previous P.L. Number	1581															2692															
Company																*					**										
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88					
Geol. Map/Prospecting /Trenching											/		/	/																	
Drilling D.D/R.C.D																				/											
Soil geochem													/			/	/														
Stream sed. geochem																															
Deep overburden geochem.																															
VLF/VLF-R																															
I.P./Resistivity																															
Magnetics																															
Gravity																															
Hydro geochem																				/											
Airborne geophysics- INPUT																															
Airborne geophys- magnetics																															

* AMERICAN SMELTING + REFINING CO. LTD. (ASARCO)

** DRESSER MINERALS INTN.

Current P.L. Number	2756																									
Previous P.L. Number	324												2325					2756								
Company	RIONFINEX + GOULDING LTD.												*					**								
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching				/		/			/	/				/					/							
Drilling D.D/R.C.D																										
Soil geochem				/					/					/		/										
Stream sed. geochem																										
Deep overburden geochem.																				/						
VLF/VLF-R																				/						
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* AMERICAN SMELTING + REFIN. CO. LTD.

** ATHLONE PROSPECT. + DEV. CORP.

Current P.L. Number	2762																													
Previous P.L. Number	50												2762																	
Company	BALLYMENE MINES LTD.												*			**			***											
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88				
Geol. Map/Prospecting /Trenching	/									/	/						/	/												
Drilling D.D/R.C.D	/				/		/	/									/	/												
Soil geochem																														
Stream sed. geochem																														
Deep overburden geochem.														/	/															
VLF/VLF-R																														
I.P./Resistivity	/								/						/															
Magnetics																														
Gravity																														
Hydro geochem																														
Airborne geophysics- INPUT																														
Airborne geophys- magnetics																														

* PENNARDA

*** BALLYMENE MINES LTD.

*** DRESSER MINERALS INT.

Current P.L. Number	2764																									
Previous P.L. Number	91										633										2764					
Company	*					GREENHILLS MINING CO. LTD.															DRESSER MINERALS INT					
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/				/			/	/		/						
Drilling D.D/R.C.D														/			/	//		/						
Soil geochem		/								/																
Stream sed. geochem																										
Deep overburden geochem.																	/	/								
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* ANGLO AUSTRAL MINES LTD.

** DRESSER MINERALS INT.

Current P.L. Number	2770																									
Previous P.L. Number	61						631						2770													
Company	DENISON MINES LTD.						GREENHILL MINING CO.						* DRESSER MINS. INT.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/				/												
Drilling D.D/R.C.D																										
Soil geochem			/			/																				
Stream sed. geochem			/						/																	
Deep overburden geochem.																										
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics														/												
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry														/												

* IRISH BASE METALS LTD.

Current P.L. Number	2835																									
Previous P.L. Number	282							1041							2835											
Company	CONSOL MOGUL MINES							IRISH BASE METALS									*									
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching	/								/						/											
Drilling D.D/R.C.D																										
Soil geochem	/								/																	
Stream sed. geochem																										
Deep overburden geochem.															/											
VLF/VLF-R															/											
I.P./Resistivity	/								/						/											
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* DRESSER MINERALS INT.

Current P.L. Number	2838																									
Previous P.L. Number	336																	2838								
Company	IRISH BASE METALS LTD.																	*								
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching																			/							
Drilling D.D/R.C.D																			/							
Soil geochem			/	/		/	/																			
Stream sed. geochem																										
Deep overburden geochem.														/	/				/							
VLF/VLF-R																										
I.P./Resistivity						/																				
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* BILLITON EXPLN. LTD.

Current P.L. Number	2839																									
Previous P.L. Number	337																	2839								
Company	*			RIOFINEX + GOULDING														BILLITON EXPLN (IRE) LTD.								
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching			/		/	/				/	/								/							
Drilling D.D/R.C.D			/																							
Soil geochem			/		/					/					/											
Stream sed. geochem			/								/															
Deep overburden geochem.																			/							
VLF/VLF-R																										
I.P./Resistivity														/	/											
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* IRISH BASE METALS LTD.

Current P.L. Number	2840																										
Previous P.L. Number	428																2840										
Company	IRISH BASE METALS																*			**							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88	
Geol. Map/Prospecting /Trenching																		/	/								
Drilling D.D/R.C.D			/	/									/					/	/								
Soil geochem				/	/	/																					
Stream sed. geochem																											
Deep overburden geochem.																/											
VLF/VLF-R														/				/									
I.P./Resistivity			/	/																							
Magnetics																											
Gravity																											
Hydro geochem																											
Airborne geophysics- INPUT																											
Airborne geophys- magnetics																											

* BILLITON EXPN. (IRE) LTD.

** NORANDA EXPLN. LTD.

Current P.L. Number	2842																											
Previous P.L. Number	787																	2842										
Company	TATA EXPLN DEV. CO. LTD.																	*										
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88		
Geol. Map/Prospecting /Trenching						/		/	/			/	/					/										
Drilling D.D/R.C.D							/	/	/						/			/										
Soil geochem						/		/					/															
Stream sed. geochem						/												/										
Deep overburden geochem.													/					/		/								
VLF/VLF-R										/																		
I.P./Resistivity						/	/																					
Magnetics																												
Gravity																												
Hydro geochem																												
Airborne geophysics- INPUT																			/									
Airborne geophys- magnetics																												
Litho geochemistry																/												

* BILLITON EXPLN. (IRE) LTD.

Current P.L. Number	2843																									
Previous P.L. Number	59+58	391	818														2843									
Company	*	DENISON MINES LTD														**										
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching	/								/	/									/							
Drilling D.D/R.C.D																			/	/						
Soil geochem	/		/				/		/	/																
Stream sed. geochem			/															/	/	/						
Deep overburden geochem.										/										/						
VLF/VLF-R																			/							
I.P./Resistivity							/		/																	
Magnetics									/	/																
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* P.F. MATTHEWS

** BILLITON EXPLN. (IRE) LTD.

Current P.L. Number	2844																										
Previous P.L. Number	71									819									2844								
Company	*									DENISON MINES LTD.									BILLITON EXPLN. (IRE) LTD.								
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88	
Geol. Map/Prospecting /Trenching			/						/	/			/						/								
Drilling D.O/R.C.O		/	/				/					/	/	/					/								
Soil geochem		/					/		/	/			/														
Stream sed. geochem														/				/	/								
Deep overburden geochem.						/				/																	
VLF/VLF-R														/					/								
I.P./Resistivity		/					/		/																		
Magnetics									/	/																	
Gravity																											
Hydro geochem																											
Airborne geophysics- INPUT																											
Airborne geophys- magnetics																											

* ROUNDTOWER MINS. LTD.

Current P.L. Number	2872																									
Previous P.L. Number	49															2872										
Company	BALLYMENE MINES LTD												*	**					DRESSER MINS. INT INC.							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching	/								/	/	/	/							/	/						
Drilling D.D/R.C.D		/							/	/				/	/				/	/						
Soil geochem	/					/	/	/	/	/																
Stream sed. geochem																										
Deep overburden geochem.															/											
VLF/VLF-R										/																
I.P./Resistivity	/							/	/	/																
Magnetics								/																		
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry		/																	/	/						

* MUNSTER BASE METALS/PENARROYA/PREUSSAC LTD.

** BALLYMENE MINES LTD.

Current P.L. Number	2876																										
Previous P.L. Number	380																		2876								
Company	RIOFINEX + GOULDING																		*								
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88	
Geol. Map/Prospecting /Trenching					/		/	/		/	/																
Drilling D.D/R.C.D					/	/		/	/				/														
Soil geochem					/	/	/	/		/			/														
Stream sed. geochem					/																						
Deep overburden geochem.																					/						
VLF/VLF-R																											
I.P./Resistivity					/																						
Magnetics													/	/													
Gravity																											
Hydro geochem																											
Airborne geophysics- INPUT																											
Airborne geophys- magnetics																											

* NORANDA EXPLN. LTD.

Current P.L. Number	2877																									
Previous P.L. Number	381																		2877							
Company	RIOFINEX + GOULDING																		*							
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching					/		/			/	/			/												
Drilling D.D/R.C.D													/													
Soil geochem					/					/				/												
Stream sed. geochem																										
Deep overburden geochem.														/						/						
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics														/	/											
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* NORANDA EXPLN. LTD.

Current P.L. Number	2927																									
Previous P.L. Number	638												2927													
Company	GREENHILLS MINING CO.												BILLITON EXPN (IRE) LTD.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching										/									/							
Drilling D.D/R.C.D																										
Soil geochem																										
Stream sed. geochem										/									/							
Deep overburden geochem.																		/	/							
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Lithochemistry																			/							

Current P.L. Number	3249																									
Previous P.L. Number	522												1950													
Company	BASIN EXPLN (IRE)												ATHLONE PROSPECTING + DEV. CORP. LTD.													
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting/Trenching				/									/	/	/	/		/	/	/						
Drilling D.D/R.C.D																/		/								
Soil geochem				/	/								/	/	/	/										
Stream sed. geochem																										
Deep overburden geochem.															/	/		/	/	/						
VLF/VLF-R																		/								
I.P./Resistivity																	/									
Magnetics																										
Gravity																/	/									
Hydro geochem																	/									
Airborne geophysics-INPUT																										
Airborne geophys-magnetics																/	/									
Litho geochemistry																						/				

Current P.L. Number	3319																									
Previous P.L. Number	470												2614			3319										
Company	RIOFINEX (IRE) LTD.												*			NORANDA EXPLN. LTD.										
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching							/			/	/			/				/								
Drilling D.D/R.C.D																										
Soil geochem										/			/					/								
Stream sed. geochem																										
Deep overburden geochem.														/												
VLF/VLF-R																										
I.P./Resistivity																										
Magnetics														/	/											
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										

* MUNSTER BASE METALS LTD.

Current P.L. Number	3342																										
Previous P.L. Number	413									1694									2771			3342					
Company	IRISH BASE METALS									BASIN EXPLN (IRE) LTD									*			NORANDA BASIN LTD.					
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88	
Geol. Map/Prospecting /Trenching			/		/							/															
Drilling D.D/R.C.D					/																						
Soil geochem			/		/							/		/	/												
Stream sed. geochem																											
Deep overburden geochem.															/		/	/									
VLF/VLF-R																											
I.P./Resistivity					/																						
Magnetics																											
Gravity															/												
Hydro geochem																											
Airborne geophysics- INPUT																											
Airborne geophys- magnetics																											

* IRISH BASE METALS

Current P.L. Number	3344																									
Previous P.L. Number	1001															2472										
Company	CON-MOG EXPLORATIONS LTD															AQUITAINE MINING (IRE) LTD.										
Method	62-63	-64	-65	-66	-67	-68	-69	-70	-71	-72	-73	-74	-75	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85	-86	-87	-88
Geol. Map/Prospecting /Trenching								/										/	/							
Drilling D.D/R.C.D																			/	/						
Soil geochem								/	/	/																
Stream sed. geochem								/																		
Deep overburden geochem.																	/	/	/	/						
VLF/VLF-R																										
I.P./Resistivity																			/							
Magnetics																										
Gravity																										
Hydro geochem																										
Airborne geophysics- INPUT																										
Airborne geophys- magnetics																										
Litho geochemistry																				/						

APPENDIX B

**Exploration techniques as used by the individual companies, together with
the prospecting licence areas involved.**

