

# EXPLORATION AND MINING DIVISION IRELAND

ZINC • LEAD • COPPER • GOLD • SILVER • BARYTES • GYPSUM • COAL • DOLOMITE • TALC



LAND OF  
MINERAL  
OPPORTUNITIES



Department of Communications, Marine and Natural Resources

# Favourable Business Climate

*“... I can assure the industry that mineral exploration and development continue to have the full support of myself and my Government colleagues.”*

Mr. Noel Dempsey T. D., Minister for Communications,  
Marine and Natural Resources, February 2005

## Proactive government commitment

The Irish Government is firmly committed, as a high priority, to encouraging exploration and development in an environmentally responsible manner. A recent review of national minerals policy has already resulted in a number of policy changes and new initiatives. The Government remains willing and ready to consider proposals emanating from its close contacts with the industry. The main elements of current Government policy are:

- Exploration and mining by private enterprise
- Security of tenure. Only holders of exploration permits will be considered for mining facilities
- No State shareholding in mines
- Continuous streamlining of permitting procedures
- An equitable fiscal regime that compares favourably with those of other countries
- Proactive support from Departmental agencies

## User-friendly legislation

**Prospecting Licences (PL)**, give the holder the right to explore for specific minerals and the exclusive right to seek mining facilities. A PL covers some 35 sq. km, and is issued for 6 years with renewal if required. Administrative procedures are simple, and ground is typically issued within 4 months of application. Minimum expenditure requirements for metals exploration increase from €5,000 in the first year to €10,000 in the sixth year, with higher levels on renewal. Lower requirements are applied for industrial minerals. There are fiscal incentives for taking up underexplored ground, and joint ventures are welcomed.



Heliborne geophysical surveying, Connemara.

Mining facilities are either as **Mining Leases** for State owned minerals or **Mining Licences** for privately- owned minerals. Terms are currently on a “case-by-case” basis. In the most recent case of the 18.9 Mt Zn-Pb orebody at Lisheen, royalties have been fixed at 4.5% of revenues with concessionary rates for the first five years. Applicants are also required to obtain planning permission and an Integrated Pollution Control Licence. For a large deposit containing State-owned minerals the timescale in obtaining these permits should be within 18 months. For privately-owned minerals the process is a little longer.

## Ease of exploration

Virtually all of the country is freely accessible for exploration, and the temperate climate permits year-round fieldwork. There is a highly developed road network, good railroads, and good communications facilities. A wide range of specialist indigenous services (consultants, drilling, geochemical laboratories, etc.) is available, and drilling costs are amongst the cheapest in the world at some €40/m for carbonate terrain.

## Pragmatic environmental controls

Exploration activity is undertaken under straightforward guidelines designed to ensure best contemporary environmental practice in the achievement of exploration aims. At the development stage, all applicants are required to provide an Environmental Impact Statement, and to satisfy the relevant permitting agencies that appropriate standards are met for development, operational activities, and mine rehabilitation.

## Foreign investment attractions

There are no restrictions on foreign investment in Ireland, and no difficulties with capital repatriation. Tax incentives relevant to mining include:

- Immediate write-off of development and exploration expenditure
- Corporation Tax of 25%
- Capital Allowance of up to 120%
- Expenditure on rehabilitation of mine sites after closure is tax-deductible

For the downstream mineral processing industry, the Corporation Tax rate is only 12.5%, a benefit that can be enjoyed by foreign parent companies under bilateral tax treaties.

# Why Ireland?

Because Ireland has a great deal to offer to the exploration and mining industry. It is a stable parliamentary republic with a long-standing policy of encouraging free enterprise, a long mining tradition, diverse geology with a wealth of mineral potential, and a highly developed infrastructure. In a climate of strong Government support for responsible development, major mineral deposits found to date include Zn-Pb deposits at Navan (70 Mt) and Lisheen (18.9 Mt), while for several years the Ballynoe barite deposit was amongst the top five producers in the world. In terms of tonnes of zinc discovered per square kilometre, Ireland ranks 1st in the world; for lead, 2nd in the world. The high grade, shallow occurrence and clean metallurgy, all result in a relatively low cost of mining for the Irish carbonate-hosted Zn-Pb deposits.

## A Wealth of Mineral Potential

Ireland has a widely varied geological framework, ranging from Proterozoic to the Present, that includes a number of mineral provinces endowed with a diverse suite of base and precious metals as well as industrial mineral deposits. Mining dates back to copper mining during the Bronze Age (2000-400 B.C.), and Ireland is now internationally known as major base metal territory with a string of discoveries over the past 40 years, including the world class Navan deposit (70 Mt).

### Proterozoic

- **North-Western Basement**

This province contains Pre-Dalradian orthogneisses overlain by variably metamorphosed Dalradian clastics, carbonates and volcanics, that are intruded by Palaeozoic granites. Demonstrated potential for base metals is shown by widespread 18th and 19th century small workings, allied with the presence of stratabound base metal and barite mineralisation. Quartz veins and shear zones are prime Au targets (Curraghinalt, Cavanacaw), and Au is also associated with massive sulphides. Skarn and porphyry style Mo-Cu deposits are associated with granites. Worked dimension and ornamental stone include the famed green Connemara marble. Diamond and other gemstone targets have also been identified (Inishowen Peninsula).

- **Longford-Down Massif**

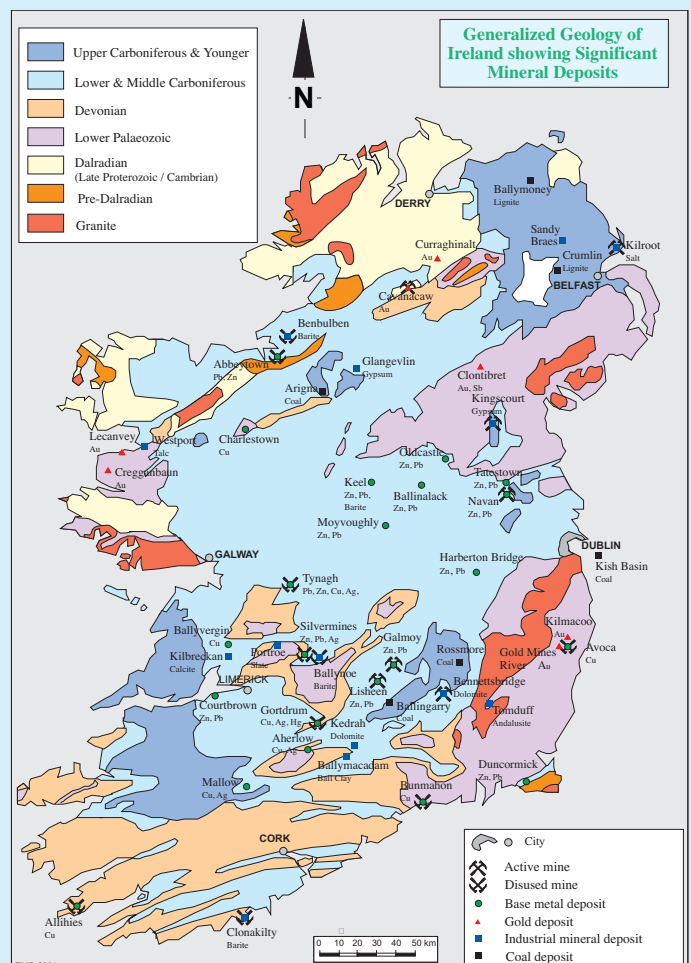
Minor stratiform Fe deposits and Pb vein deposits are known, a number of which have been historically worked, together with a significant vein-hosted Sb-Au deposit (Clontibret).

### Lower Palaeozoic

This consists of turbidite sequences associated with acidic or calcalkaline volcanics, deformed by the Caledonian orogeny with resulting low-grade metamorphism and subsequently intruded by major early Devonian granites. Major shear zones host known mineralisation.



Quartz vein with visible gold at Cregganbaun.



# A Wealth of Mineral Potential

- **Leinster Massif**

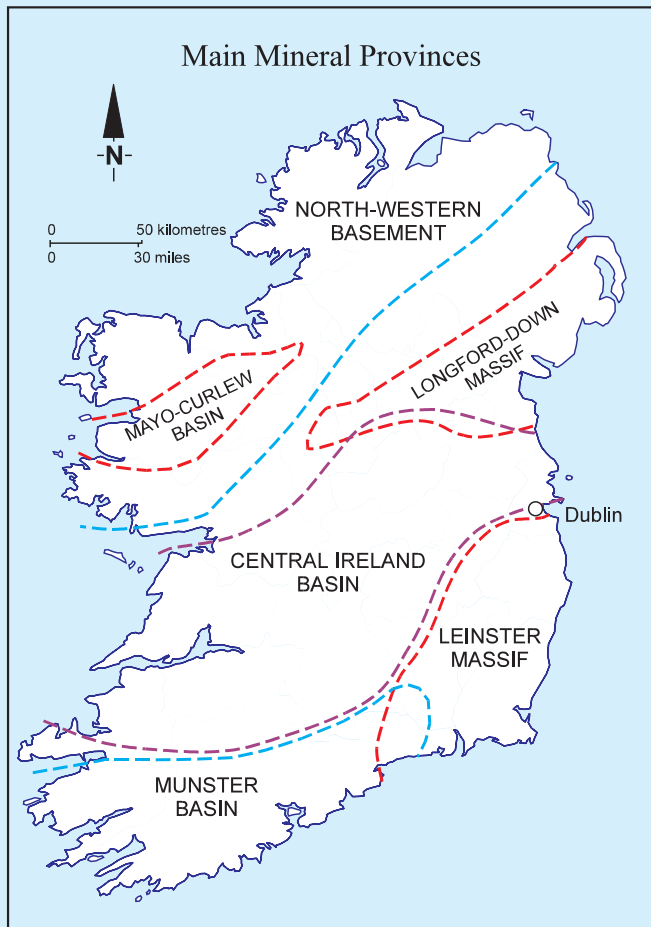
This area hosts the large low-grade VMS Cu-pyrite deposit at **Avoca**, sub-economic W and Li associated with granite, and historically mined Au (**Gold Mines River**), as well as a number of minor vein-type Cu and Pb deposits.



Open pit at Avoca Cu-pyrite deposit.

- **Mayo - Curlew Basin**

Significant vein/shear-hosted Au deposits are known at **Lecanvey** and **Cregganbaun**, the latter occurring in a 30km long shear zone. Other deposits include talc-magnesite (**Westport**) and Cu (**Charlestown**).



## Upper Palaeozoic

- **Munster Basin**

In this province Devonian terrestrial clastics with minor volcanics are overlain by Carboniferous marine sandstones and shales with subordinate carbonates. Major folding and strike faulting has resulted from the Variscan orogeny. Vein-hosted Cu (**Allihies**) and barite (**Clonakilty**) are amongst a variety of mineral deposits worked in the past. The Devonian sequences contain potential palaeoplacer Au targets, while shale-hosted Zn-Pb mineralisation has been recently discovered in the Carboniferous strata.



Calcite deposit at Kilbreckan.

- **Central Ireland Basin**

Thick Lower Carboniferous carbonates in a number of sub-basins are the host in this important Zn-Pb province. Known Zn-Pb deposits contain some 11 Mt of zinc metal. Target horizons are stratabound 'Irish type' deposits in the basal Navan Group (**Navan, Tatestown, Oldcastle, Keel, Moyvoughly**), the overlying Waulsortian limestones (**Tynagh, Silvermines, Ballinalack, Galmoy, Lisheen**), and stratigraphically higher cross-cutting deposits of MVT type (**Harberton Bridge**). Vein and massive replacement Cu-Ag deposits (**Gortdrum, Aherlow, Mallow**), are associated with the structurally controlled southern margin of the Basin. Other significant deposits include barite (**Ballynoe, Tynagh**), gypsum (**Glangevlin**), calcite (**Kilbreckan**) and dolomite. There are possible 'Carlin-type' Au targets in major structural zones (Navan-Silvermines, Mallow).



Barytes vein at Benbulbin.

# Vigorous Mining and Processing Industry

The Irish mining and processing industry is a significant contributor to the national economy. In 2001, the most recent year for which detailed figures are available, the total value of mineral production and value-added processing output was over €1.3 billion, of which the majority was exported. Notable contributions were €202 million for non-ferrous metals, €45 million for gypsum and gypsum-based products, €168 million for the sand, gravel and aggregate industry, €290 million for the cement industry, €35 million for magnesia and €23.5 million for the dimension stone industry. The contribution to the Exchequer is estimated at 22% of turnover. The value of products from non-resource-based processing included €234 million for alumina and in excess of €327 million for industrial diamonds.

Ireland currently accounts for over 4.5% of world zinc mine production and 2% of world lead mine production from three mines at Navan, Lisheen and Galmoy.

## Major producers

- **Zn - Pb Navan, Co. Meath**

Discovered in 1970, and brought into production in 1977, the Navan deposit supports the largest zinc mine in Europe. Initial tonnage was 70Mt at 10.1% Zn and 2.6% Pb. The mine is owned by New Boliden and operated by its wholly-owned subsidiary, Tara Mines. During 2004 the mine produced 2.5 Mt of ore grading 9.15% Zn and 1.82% Pb. Total production (1977-2004) is 60.2 Mt grading 8.37% Zn and 2.04% Pb. At the end of 2003, total Ore Reserves (Proven and Probable) were 16.9 Mt grading 9.3% Zn and 2.0% Pb, with additional Mineral Resources (Measured, Indicated and Inferred) totalled 20.7 Mt grading 7.3% Zn and 2.1% Pb.

- **Gypsum Kingscourt, Co. Cavan**

Gypsum Industries Ltd. have an output of some 500,000 tpa from their opencast mine near Kingscourt, an area where some 13Mt of gypsum has been produced to date. Much of the production is used in their nearby plaster and plasterboard factory, while the remainder is supplied to cement producers. The company have commenced development of a new underground mine at Drummond, adjacent to their opencast operation.

- **Rock Aggregate**

In 2001, crushed rock production was over 65 Mt, of which some 1.2 Mt were produced for export from a deep water coastal quarry in Co. Cork by Wimpey Fleming Ltd. Reserves here are in excess of 100 Mt.

- **Dimension and Ornamental Stone**

Substantial increase in production (limestone, granite, flagstones, Connemara marble) for export has occurred in the last 5 years. This is dominated by blue slab limestone (over 100,000tpa), of which Feeley and Sons Ltd. are a major producer.

- **Zn - Pb Galmoy, Co. Kilkenny**

Discovered in 1986, and with an initial reserve of 6.18Mt, production at Galmoy commenced in early 1997. Production in 2004 was 640,000t at 12.9% Zn and 5.5% Pb.



*Underground Zn-Pb mining at Navan, Co. Meath (Courtesy: Tara Mines Ltd.).*

Total production (to end 2004) was 3.96 Mt at 14.1% Zn and 4.3% Pb. Reserves at 30th September 2004 were 2.62 Mt at 15.9% Zn and 4.9% Pb (Proven) and 1.34 Mt at 10.6% Zn and 3.0% Pb (Probable).

- **Zn-Pb Lisheen, Co. Tipperary**

The most recent of Ireland's three underground zinc mines, Lisheen was discovered in 1990. The initial mineable reserve of 18.9Mt was brought into production in 1999. During 2004, ore milled amounted to 1.46 Mt grading 11.71% Zn and 1.76% Pb. Ore milled to date (1999-2004) totals 6.58 Mt grading 11.62% Zn and 2.27% Pb. Reserves at end 2004 were 11.97 Mt at 11.69% Zn and 1.94% Pb, with additional Resources of 1.77 Mt at 12.14% Zn and 2.10% Pb.



*Dimension stone quarry, Co. Roscommon. (Courtesy Feely and Sons Ltd.)*

# Vigorous Mining and Processing Industry

## Value-added opportunities

Manufacturing is taxed at only 12.5% of profits, and as Ireland is a member of the European Union, operations in the country have free access to one of the largest trading communities in the world.

- **Alumina** **Aughinish, Co. Limerick**  
Aughinish Alumina Ltd. (a subsidiary of Glencore) have a long-established plant for processing imported bauxite. In 2002, more than 1.4Mt of alumina was exported to Europe and Russia.

- **Cement** **Platin, Co. Meath**  
Two plants are operated by Irish Cement Ltd. (a subsidiary of the CRH Group), using local limestones and shales with gypsum from Kingscourt. Annual output is some 3Mt.

- **Diamonds** **Shannon, Co. Clare**  
De Beers Industrial Diamond Division Ltd. at Shannon are major producers of industrial diamonds as well as processing natural diamonds for industrial use, and are the largest supplier of industrial diamonds in the world.

- **Magnesia** **Drogheda, Co. Louth**  
Premier Periclase Ltd. (a subsidiary of the CRH Group) produce 90-100,000tpa of sinter magnesia from local limestone and seawater. The output is exported, mainly to basic refractory producers.

- **Plaster/Plasterboard** **Kingscourt, Co. Cavan**  
Gypsum Industries Ltd. process gypsum to produce plaster and plasterboard for most of the market in the island of Ireland.

## Excellent Support

### Service sector

Ireland has internationally recognized companies with wide ranging expertise in all aspects of mineral exploration and development. Services available include:

- Consultants specializing in project generation and management, the full range of exploration programmes, reserve estimates and technical audits, geotechnical services, hydrogeology, environmental assessments, etc.
- Specialized drilling contractors
- Analytical laboratories
- Computerized data management and remote sensing expertise
- Major engineering and construction groups

### Departmental

The Minister for Communications, Marine and Natural Resources is responsible for policy and the regulation and promotion of mineral exploration and development in Ireland. Under this mandate, the role of the Department is:

- To encourage and facilitate minerals exploration
- To promote the responsible development of mineral resources for the economic benefit of the State
- To administer the regulatory framework
- To disseminate relevant data through maps and publications
- To improve public awareness of the benefit of mining
- To advise and assist the public in exploration and development matters



Exploration drilling in Co. Mayo.

Within the Department, these functions are dealt with by the **Exploration and Mining Division (EMD)**. The **Geological Survey of Ireland (GSI)**, also of this Department, is the national earth science agency whose mandate is the provision of earth science information and advice.

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