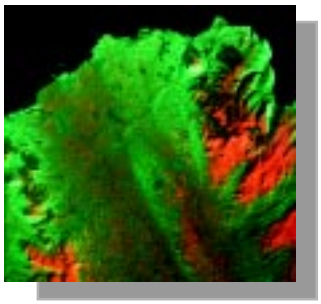

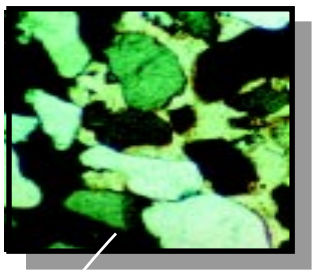

Minerals and Petroleum

Exploration and Development in Northern Ireland

1997 - 2000

DETI

DEPARTMENT of ENTERPRISE, TRADE and INVESTMENT

An Equal Opportunities Organisation

NIA 28/00

Prepared pursuant to section 50(1) of the Mineral Development Act (NI) 1969 as amended by the Northern Ireland Act 1998.

Foreword

Mineral and petroleum exploration and development in Northern Ireland is a significant, though perhaps not widely known, responsibility of my Department. Publication of this triennial report should therefore go some way to raising the profile of this fundamental area of work.

In one way or another virtually everything made and used by man has its origins in the minerals and hydrocarbons beneath our feet. Discovering these resources and exploiting them in an economic and environmentally acceptable manner is a major challenge. That is why we have in place strong, statute-based licensing regimes for Northern Ireland.

This report begins by describing the geology of Northern Ireland (section 1) and then goes on to outline the history of mineral exploration and the current licensing position (section 2). Guidance is also provided for those applying for prospecting and mining licences. Section 3 gives similar information and advice in relation to petroleum. The report concludes with a section on the work of the Geological Survey of Northern Ireland and the services it offers to a wider community.

Encouragment of exploration and sustainable development of minerals and petroleum are key elements to the Department's overall aim of promoting economic growth. This report records the Department's contribution to that important objective.

Sir Reg Empey, MLA
Minister for Enterprise, Trade and Investment

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Section 1

Geology of Northern Ireland

Although Northern Ireland covers only a small area it has a greater variety of rock types than any other region of comparable size in the British Isles. They range in age from Precambrian to recent and include metamorphic schists, quartzites and slates, igneous intrusive and extrusive rocks as well as a wide variety of sedimentary rocks (Figure 1).

The oldest rocks of the region, mostly of Neoproterozoic age outcrop in northeast Antrim and the Sperrin Mountains provide the foundations on which Northern Ireland is built. These metamorphic rocks, mostly ascribed to the Dalradian Supergroup, strike NE-SW in a structural trend imposed by the Caledonian orogeny. Similarly, the Caledonoid trend is well developed in the Lower Palaeozoic Ordovician and Silurian greywackes and shales which form part of the Down-Longford massif and underlie Counties Down and Armagh.

Devonian rocks, consisting predominantly of conglomerates, sandstones and mudstones, are largely confined to the fault-bounded Fintona block with a small outlier in northeast Antrim.

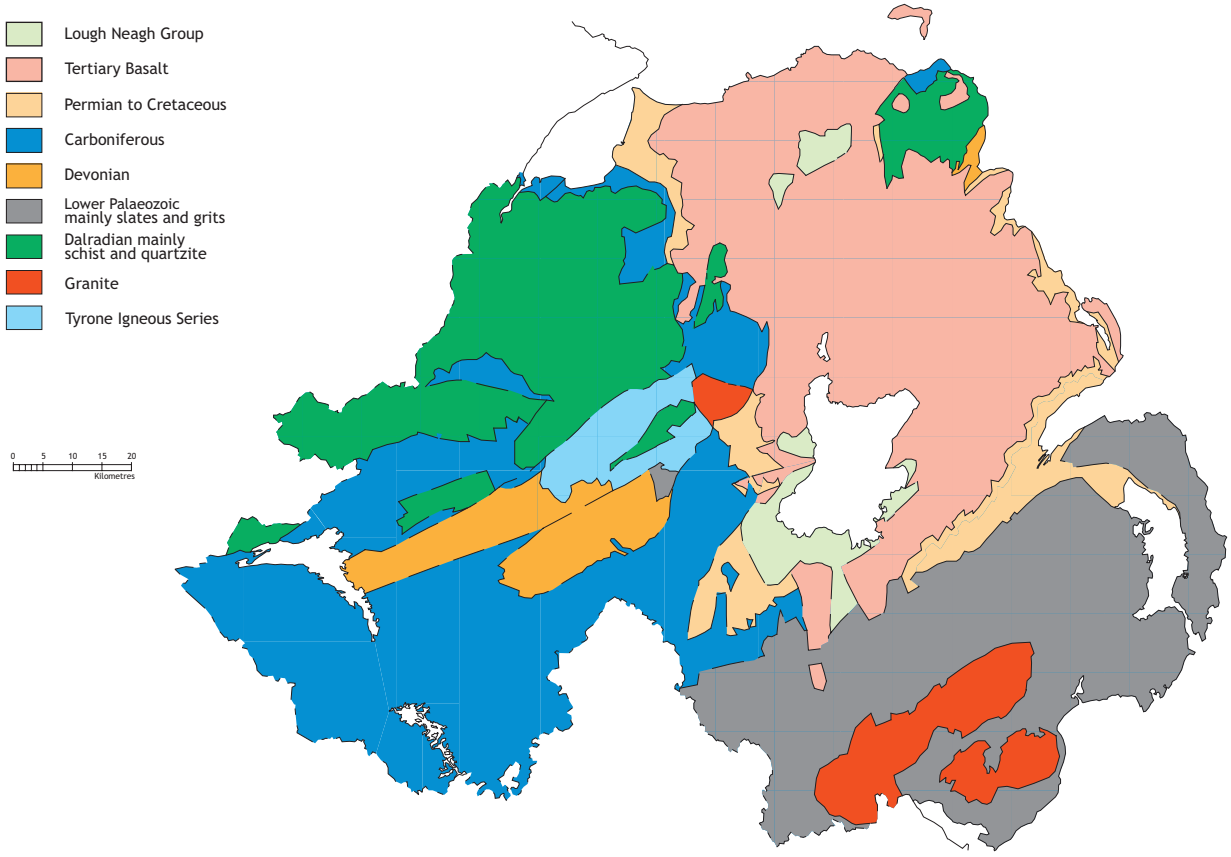


Figure 1 - Simplified Geological Map of Northern Ireland

Rocks of Carboniferous age, consisting largely of a mixed suite of limestones, sandstones and shales, are mostly confined to the south-central area between the Dalradian and the Lower Palaeozoic rocks. In the west, the Carboniferous overlies all the earlier formations and transgresses to the north, over the subdued Dalradian ridge.

The dominant geological feature of the northeast is the Antrim Plateau, consisting of basalt lavas of early Tertiary age. The lavas have acted as a protective carapace covering the softer Cretaceous, Jurassic and Triassic rocks so that the latter are now exposed only round the fringes of the plateau following the lava extrusion, basins which formed in the clays and lignites of Tertiary age were deposited in fault-bounded basins forming depressions in the surface of the lava plain.

Over the whole of the region the relics of Pleistocene events profoundly affect the scenery and human geography. All of Northern Ireland save for the highest hills, is blanketed by glacial clays and gravels (called “drift”) which obscures the underlying rocks and controls the pattern of settlement and agriculture. The advance and decay of successive ice-sheets have left their mark in morainic deposits, drumlins, the relics of glacial lakes, and the moulding of the landscape.

Section 2

Minerals

Section 2.1

Mineral Exploration and Development in Northern Ireland 1969-2000

Within the relatively small area of Northern Ireland (14000 km^2) there are nearly 600 occurrences of economic minerals and approximately 1800 abandoned mine workings, most dating from the last century. The wide variety of geological environments and ages provides a corresponding range of mineral deposit environments.

In 1969 the Mineral Development Act (NI) 1969 was passed which vested mineral rights in the state and a rush of exploration licence applications followed. Over the ensuing years interest in exploration targets tended to follow 'fashionable' ideas; for example at one time Carboniferous-hosted lead-zinc mineralisation was the prime target, while at another gold in Dalradian rocks was the most popular. However, over recent years as more detailed geological maps have been completed and new techniques and analytical methods applied which permits a broader perspective. The most important known mineral occurrences are shown in Table 1, along with a summary of the mineral potential of the main lithostratigraphic units.

Carboniferous Rocks

With the discovery in Carboniferous rocks of the Tynagh orebody in the early 1960s and the Navan orebody in 1971 (both in the Republic of Ireland) it was not surprising that in the initial period after the Mineral Development Act came into operation attention concentrated on rocks of the same age in Northern Ireland.

To begin with most effort was aimed at the potential for base metal mineralisation in the Carboniferous limestone and shale sequences west of Lough Neagh. This culminated in an extensive drilling programme in 1973 which discovered minor amounts of **base metal sulphides,** but these were considered to be present only in subeconomic concentrations.

From 1973-1978 interest in the Carboniferous limestone areas was maintained with drilling to investigate the base metal potential of the reefs and dolomites but only small amounts of base metals and bedded **gypsum** were found.

In 1994 and 1995 GSNI and the British Geological Survey carried out geochemical surveys over the Carboniferous of part of the Clogher Valley in Co. Tyrone. This work enhanced previous results from the 1970s and highlighted a 3km zone of base metal anomalies and mineral occurrences along the Aghintain Fault. As a result this area is currently under licence for base metal exploration.

A number of licences have been issued for **diamond** exploration in the west of Northern Ireland during the past three years. Work has been focused on Carboniferous and older rocks which may be underlain by Archaean or early Proterozoic basement. Companies have announced the results of stream sediment surveys which have yielded indicator minerals possibly derived from deep-rooted minor intrusions which could be diamond-bearing. These surveys are in the same area as the reported discovery of a diamond in the 19th Century. Similar exploration is ongoing in adjacent parts of the Republic of Ireland.

Dalradian and Tyrone Igneous Complex

In the period after 1974, attention turned to the older rocks of Northern Ireland and the first licences were issued to search for **base metal mineralisation**, in the Dalradian rocks. In 1976 the Geological Survey of Northern Ireland (GSNI) published the results of a reconnaissance geochemical survey over the Dalradian rocks in Counties Tyrone, Londonderry and Antrim.

The presence of **alluvial gold** in stream sediments derived from the Dalradian had been known for some time and this was systematically mapped and highlighted during GSNI's survey.

In the early 1980s, with the increase in the gold price, interest switched to the potential for precious metals in the Dalradian strata, particularly in the Sperrin Mountains. Further licences were issued in 1981, and with the discovery of **bedrock gold mineralisation** in 1983 in quartz veins in the Dalradian strata at Curraghinalt, licences were soon issued for other areas underlain by Dalradian rocks.

Active exploration has continued to date and significant additional mineralised vein structures have been discovered. At Cavanacaw, near Omagh, planning permission was granted in 1995 to allow extraction of gold and silver over an eight year period from an 850m long trench.

The Department of Enterprise, Trade and Investment ("the Department") recently sponsored soil and

drainage geochemical studies over Dalradian rocks in west Tyrone. These studies have confirmed that this area also has potential for gold mineralisation, with the presence of gold, arsenic and antimony anomalies and observations of panned gold.

The mineral potential of the Tyrone Volcanic Group was first investigated by drilling in 1974 and low grade **porphyry-style copper mineralisation** was discovered. Further drilling work during the 1980s identified **base metal and gold mineralisation** hosted in rhyolites, tuffs and intrusive rocks. Increased recent interest in this area has focused on the geological

potential of the Tyrone Volcanic Group as a host for **volcanogenic massive sulphide** (VMS) deposits. The region has a very thick drift cover which makes exploration more difficult.

Lower Palaeozoic and Associated Igneous Rocks

The greywackes and shales of the Longford-Down Massif in Counties Down and Armagh contain many occurrences of small **vein type lead mineralisation** which were worked out in the 19th century. Licences were issued in 1996 to explore the fault zone separating the Ordovician and Silurian sediments which is considered to be a prime exploration target for structurally and lithologically controlled **lode gold** mineralisation, and work continues in these areas. The prospectivity of the region is enhanced by the known occurrence of gold mineralisation within rocks of the same Caledonian tectono-stratigraphic terrain in the Southern Uplands of Scotland, where gold is found in a variety of settings, and at Clontibret, Co. Monaghan nearby in the Irish Republic.

The intrusive rocks of the Mourne Mountains and the Newry Massif have received attention intermittently over the years. Earlier work concentrated on the potential for **uranium and tin** mineralisation in these rocks but a regional stream sediment arsenic anomaly also indicated the potential for gold mineralisation. In 1985 studies of the contact zone between the intrusive rocks and the surrounding sediments resulted in the identification of **alluvial gold**. The origin of this gold was not traced but more recent work by GSNI indicated that the gold could be related to mineralisation along shear zones and could be genetically associated with the Mourne Granite.

Devonian Rocks

There has been little exploration in the main area underlain by Devonian strata, the Fintona Block.

A geochemical sampling programme was carried out in the late 1970s to examine the potential for **uranium** mineralisation and in 1989 a licence was issued to examine the gold potential of the sediments and closely associated andestic volcanic rocks. The Devonian

rocks may be considered prospective for **volcanic-related and palaeo-placer style gold** mineralisation.

Triassic Rocks

Bedded halite in the Triassic Mercia Mudstone Group underlies the area between Carrickfergus and Larne and has been worked for over 100 years.

Production of rock salt from brine was carried out until 1958 when the last works were abandoned. A new mine at Kilroot working from an inclined adit started producing rock-salt (halite) in 1967. Production continues to supply road gritting markets in Northern Ireland and further afield.

Tertiary Strata

The potential of the Interbasaltic Formation of the Antrim Lava Group as a source of **iron ore** and alumina has long been recognised and many small mines and adits were opened in the early part of the 20th century. In recent years the only production has been at Clinty Quarry northeast of Ballymena where **bauxite** is quarried and processed to produce aluminium ferric sulphate which is used in water treatment plants and sewage works.

A Department-funded investigation into the mineralogical characteristics of altered basalts was recently undertaken by the British Geological Survey. The results of this preliminary study showed that these rocks, often discarded as a by-product of basalt quarrying, may have economic potential as **cation-exchange clays.** The clay-mineral composition of samples examined to date is such that the material could be used for landfill containment.

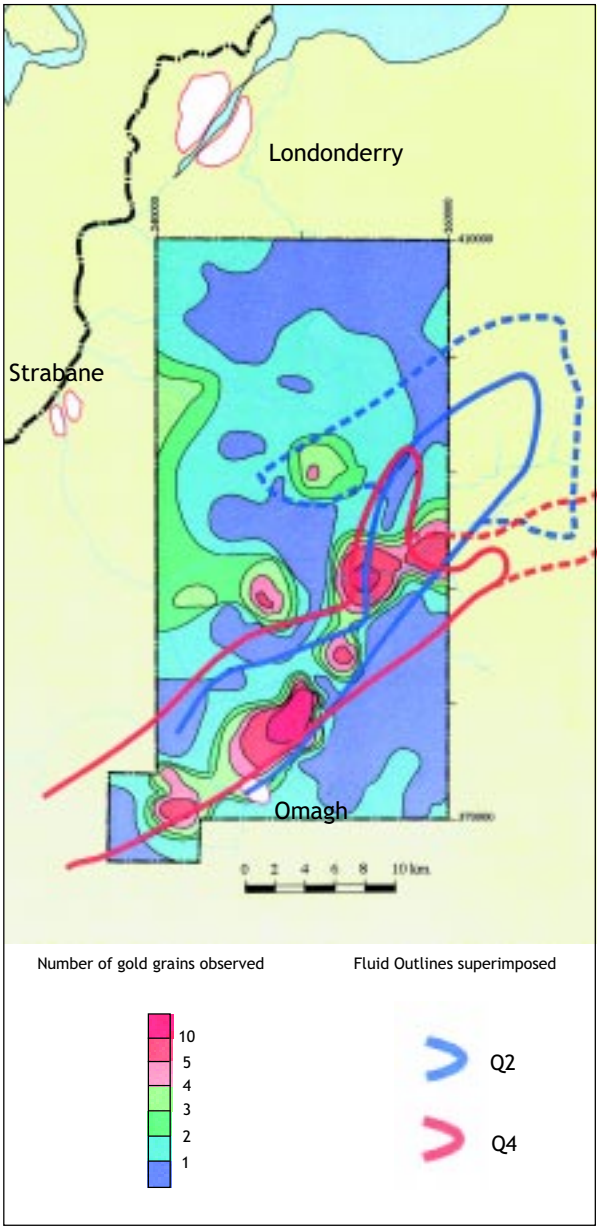


Figure 2 - Gold grains in pan concentrates from the Sperrin Mountains with the distribution of quartz veins of Q2 (Curraghinalt type) and Q4 (basinal brine) superimposed.

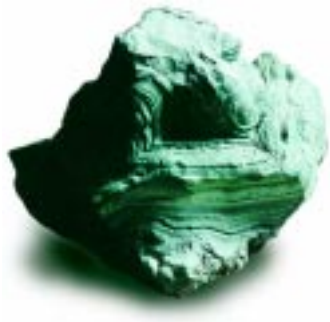
The **perlite** deposits at Sandy Braes in County Antrim were worked on a trial basis in the 1940's. They lie in a volcanic diatreme within the Tertiary rhyolite complex around Tardree. In 1986 an exploration licence was issued, later followed by planning permission to develop an extractive facility.

The presence of **lignite** in the Lough Neagh Group has been known since the 18th century as minor occurrences. Following drilling by GSNI in 1964 and 1976 at Crumlin, the first major lignite deposit was located. From 1983 to 1984, the Department, carried out an extensive drilling programme in the Lough Neagh Group. This programme of 49 boreholes was concentrated around the shores of Lough Neagh near Crumlin and in the Ballymoney area (figure 2) and was specifically designed to explore the prospect that other substantial deposits of lignite might exist.

As a result of this drilling programme, two additional large lignite deposits were discovered, at Ballymoney and in East Tyrone. Subsequently licences were issued to explore for lignite at Ballymoney, East Tyrone and in North Armagh. The licences at Ballymoney and Crumlin are still current and as a result of company exploration the nature of the deposits in these areas is now much better known.

Post-glacial Strata

A licence was first issued in 1989 to enable exploration to take place of the post-glacial **diatomite** deposits of the Bann Valley. This licence covered areas of the deposits not being worked prior to the 1969 Act, but was surrendered in 1992.



	Lithostratigraphic information	Known deposits and mineral potential
Quaternary	Glaciogenic tills, sands and gravels with lake deposits	Diatomite
Oligocene	Oligocene lacustrine clays and sands of the Lough Neagh Group	Lignite
Palaeocene	Palaeocene flood basalts overlying Mesozoic basins.Rhyolites and lateritic horizons in Interbasaltic Formation	Cation-exchange clays Perlite, bauxite and iron-ore
Upper Cretaceous – Lower Jurassic	Chalk, limestone, glauconitic sandstone and mudstone	Chemical–grade limestone
Permo-Triassic	Mudstones, marls, evaporites and sandstones	Hydrocarbons, salt, gypsum, brick-clays and building stone
Carboniferous	Sandstones, mudrocks, evaporites, limestones	Gypsum, blackband ironstone, coal, fire-clay, dolomite. Potential for Irish-style base metal deposits, Carlin-style gold deposits.
Devonian	Mudstones, marls, sandstones and conglomerates, andesitic volcanics	Barytes, copper, potential for uranium, palaeoplacer/epithermal gold mineralisation
Ordovician-Silurian	Slates, black shales and greywackes sandstones of the Longford-Down massif, intruded by late Caledonian (Devonian) Newry Granodiorite and Palaeogene Mourne Granite	Mesothermal lode gold, silver, lead and zinc potential for granite-related gold, tin-tungsten, rare earth elements, gems
	Early Caledonian Tyrone Igneous Complex, including ophiolite assemblage, granitic intrusions, andesitic-rhyolitic volcanics	Porphyry-style sulphide mineralisation, potential for VMS and epithermal gold mineralisation
Upper Proterozoic	Moine-Dalradian metasedimentary-metavolcanic succession	Mesothermal lode gold deposits. Potential for stratabound massive sulphide deposits and Carlin-style gold mineralisation

TABLE 1 Known deposits and mineral potential of the main geological units in Northern Ireland

Section 2.2

Mineral Licensing 1 April 1997-31 March 2000

The information provided in this section has been prepared by the Department of Enterprise, Trade and Investment ("the Department") to comply with section 50(1) of the Mineral Development Act (Northern Ireland) 1969.

Nine licences were issued during the year ended 31 March 1998 and three licences were issued during the year ended 31 March 1999. Some of these licences replaced previous licences which had expired. No licences were issued during the year ended 31 March 2000. The details are set out below.

Period 1 April 1997-31 March 1998

Prospecting Licences Issued

Licensee	Location	Licence ref	Size (Sq Km)	Minerals	Date commenced
Antrim Coal Co Ltd	Crumlin	AC4/97	21	Lignite	1.6.97
Antrim Perlite Ltd	Tardree	AP2/97	10	Perlite	1.12.97
Billiton (UK) Resources BV & Brancote Mining Ltd	Claudy	BB2/97	91	All	1.6.97
Ivernia West plc	Clogher Valley	IW1/97	244	All except diamonds	1.11.97
Omagh Minerals Ltd	Omagh	OM2/97	189	All	18.7.97
Poplar Resources Ltd	Fintona	PR1/97	250	Diamonds	3.11.97
Poplar Resources Ltd	Fivemiletown	PR2/97	250	Diamonds	3.11.97
Poplar Resources Ltd	Lower Lough Erne	PR3/97	250	Diamonds	3.11. 97
Poplar Resources Ltd	Castlederg	PR4/97	250	Diamonds	3.11.97

Period 1 April 1998-31 March 1999

Prospecting Licences Issued

Licensee	Location	Licence ref	Size (Sq Km)	Minerals	Date commenced
Kenmare Resources plc	Irvinestown	KR1/99	248	Diamonds	12.1.99
Meekatharra (NI) Ltd	Ballymoney	MM9/98	91	Lignite	30.6.98
Poplar Resources Ltd	Sixmilecross	PR5/98	250	Diamonds	3.11.98

Period 1 April 1999-31 March 2000

No prospecting licences were issued during this period.

Mineral Licensing position on 31 March 2000

The mineral licensing position on 31 March 2000 is set out overleaf. The locations of all these licences are shown on the map below (Figure 3).

Precious metals (eg gold and silver) are not vested in the Department because they belong to the Crown. Licensing matters for these minerals are dealt with by the Crown Estate Commissioners. Companies prospect for base metals and precious metals under concurrent licences from the Department and the Crown Estate Commisioners. Such concurrent licences are marked on the tables with an asterisk.

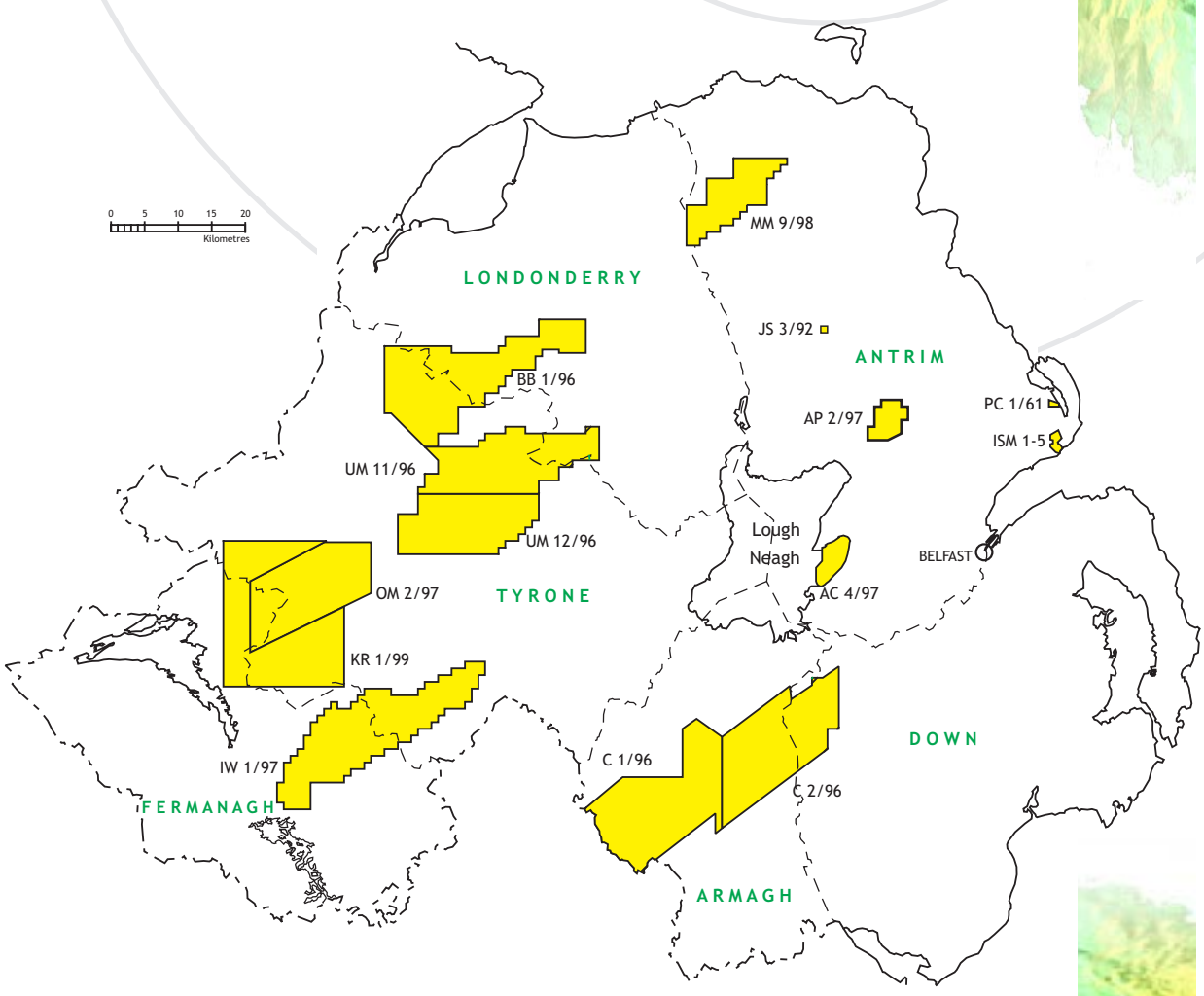


Figure 3 - Map showing mineral licensing position on 31 March 2000

Prospecting Licences

Licensee	Location	Licence ref	Size (Sq Km)	Minerals	Date commenced
Antrim Coal Co Ltd	Crumlin	AC4/97	21	Lignite	1.6.97
Antrim Perlite	Tardree	AP2/97	10	Perlite	1.12.97
Brancote Mining Ltd	Park	BB1/96	250	All*	1.6.96
Conroy Diamonds & Gold plc	Keady	C1/96	230	All*	14.10.96
Conroy Diamonds & Gold plc	Tandragee	C2/96	215	All*	14.10.96
Ivernia West plc	Clogher Valley	IW/97	244	All* except diamonds	1.11.97
Kenmare Resources plc	Irvinestown	KR1/99	248	Diamonds	12.1.99
Meekathara (NI) Ltd	Ballymoney	MM9/98	91	Lignite	30.6.98
Omagh Minerals Ltd	Omagh	OM2/97	189	All*	18.7.97
Ulster Minerals Ltd	Curraghinalt	UM11/97	183	All*	1.1.96
Ulster Minerals Ltd	Mountfield	UM12/96	163	All*	1.1.96

Mining Leases

Lessee	Location	Lease ref	Size(hectares)	Minerals	Date commenced
Blue Circle Industries plc	Whitehead	PC1/61	10	Limestone or chalk	21.10.61
Irish Salt Mining and Exploration Co Ltd	Carrickfergus	ISM1/71	86	Salt	8.3.71
Irish Salt Mining and Exploration Co Ltd	Carrickfergus	ISM2/85	30	Salt	8.9.85
Irish Salt Mining and Exploration Co Ltd	Carrickfergus	ISM4/88	68	Salt	8.3.88
Irish Salt Mining and Exploration Co Ltd	Carrickfergus	ISM5/95	152	Salt	1.7.95

Mining Licence

Licensee	Location	Licence ref	Size(hectares)	Minerals	Date commenced
James Stevenson (Quarries) Ltd	Ballymena	JS3/92	4.2	Bauxite	24.7.92

Section 2.3

Mineral Licences - Guidance for Applicants

General Information

Mineral Development Act

The Mineral Development Act (Northern Ireland) 1969 ("the 1969 Act") vested most minerals in the Department and enables it to grant prospecting licences and mining licences for exploration and development of minerals. This licensing system is based on the provisions of the 1969 Act and on subsequent subordinate legislation. The provisions relating to prospecting for minerals are quite seperate and distinct from those relating to the development of minerals. The legislation, and the licensing process and the requirement for environmental impact assessment reflect the fact that there is no automatic continuity between exploration and development work.

Exceptions to 1969 Act

The legislation covers all minerals with these exceptions (the scheduled substances).

(i) These are: belong to the Crown Estates and were not vested in the Department,
(ii) the few mineral deposits (mainly salt) which were being worked at the time of the 1969 Act were not vested in the Department, and,
(iii) 'common' substances including crushed rock, sand and gravel and brick clays are excluded.

A full list of these exceptions can be found in Schedule 1 to the 1969 Act. Development of these substances, although excluded from the Department's licensing regime, is subject to the normal planning constraints of the Department of the Environment.

Licences for Precious Metals

Prospecting licences for precious metals are issued by the Crown Estate Commissioners (CEC) and companies wishing to explore for precious metals should apply simultaneously to CEC and the Department for licences. Once the Department issues its licence, CEC will normally issue a concurrent licence for a coterminous area.

Prospecting Licences

Preliminary Discussions with the Department's Energy Division and Geological Survey of Northern Ireland

It is useful for any company considering an application for a prospecting licence to have preliminary discussions with the Energy Division of the Department. Officials in the Energy Division Headquarters can advise on administrative aspects while the Geologial Survey of Northern Ireland,GSNI can advise on the prospectivity of any particular area and the data available for inspection or purchase. (Further information about GSNI is provided in Section 4).

Conditions for Prospecting Licences

Prospecting licences are normally granted for an initial period of two years, and may provide for not more than two extensions each of two years' duration. Licensees are required to carry out an agreed scheme of prospecting and to report the result of their work programmes to the Department on an annual basis or more frequently. This information can be kept confidential, if the company so requires, for up to ten years, but after that it becomes publicly available. A licence gives the licensee the exclusive right to explore over the whole licensed area, which can cover up to 250 square kilometres. Depending on the nature of the work to be undertaken, licensees are required to give up to four weeks notice of their intention to enter land. Licensees must seek the agreement of landowners before entering their property. Compensation is payable by the licensee to the landowner for any damage which may be caused during exploration.

Applications for Prospecting Licences

Applications may be made either on an application form (available from the Department) or in the form prescribed in Schedule 1 to the Mineral Development (Applications, Fees and Model Clauses) Regulations (Northern Ireland)1970. Details of the current fees are provided in the 1991 amendment to these regulations.

An application must be accompanied by two original 1:50,000 Ordnance Survey of Northern Ireland outline maps. The application area should be clearly delineated and the boundary should normally follow grid lines. The relevant fee (currently £450 for a prospecting licence) and audited accounts of the applicant company for the three years prior to the making of the application (together with, if applicable, similar audited accounts from any parent company) should also be included.

The Department will expect an applicant to provide a rationale for the proposed work programme showing an understanding of the geological information already available and to submit a phased and costed work programme.

Processing Applications

Applications take approximately four months to process.

When considering any application for the issue of a licence, the Department must be satisfied that the applicant has the technical and financial resources to carry out the proposed exploration.

Under the provisions of the 1969 Act the Department is required to consult other Departments and public bodies concerning its intention to issue a licence. Also in accordance with the 1969 Act the Department is obliged to place notices in the Belfast Gazette and at least one local newspaper circulating in the area to provide an opportunity for the public, particularly the owners of the surface land within the application area, to make their views known.

All representations are considered by the Department and, if appropriate, passed to the company together with the draft licence and a 'letter of offer'. This 'letter of offer' may to contain a large number of conditions as consultees anticipate possible development at a later stage. At the prospecting stage however it is normally sufficient for the company to keep the listed contacts informed of its plans and progress.

When the conditions in the 'letter of offer' are accepted and the terms of the draft licence agreed, the engrossments of the licence are prepared and then executed by the company and the Department.

Every application for a prospecting licence is treated on its own merits and in accordance with the provisions of the 1969 Act.

Planning Permission

Planning permission is not required for the early stages of exploration though the Planning Service of the Department of the Environment should be kept informed of the nature and scale of the company's activities. Companies who hold prospecting licences and are considering extraction should discuss any such proposals with Energy Division and the Planning Service at an early stage.

Mining Licences and Leases

Mineral Development

A company which finds minerals in commercial quantities and seeks to develop these is required to apply to the Department for a mining licence or a mining lease under the provisions of the Mineral Development Act. There are separate and distinct provisions in the 1969 Act dealing with mining licences and leases. It is also necessary to apply to the Department of the Environment for planning permission.

Applications for Mining Licences and Leases

An application for a mining licence should be presented in the form prescribed in Schedule 1 to the 1970 Regulations. Each application should include reserve calculations, details of the geological evidence on which they are based and a scheme of mineral working. Information should also be provided concerning the ownership of the surface land and, if known, about the former ownership of the mineral rights. An application must be accompanied by two original Ordnance Survey 1:10,000 maps showing the application area and three 1:2,500 maps illustrating the proposed mine design. The relevant fee (currently £2,000 for a mining licence or lease) should be included together with audited accounts of the applicant company for the three years prior to the making of the application (and if applicable similar audited accounts from any parent company) if these have not already been supplied.

Processing of Mining Licences and Leases

In considering any applications for mining licences and leases the Department, in accordance with the provisions of the 1969 Act, investigates the technical and financial resources of the applicant and carries out a consultation procedure. Advice is taken from consultants who have expertise in mining to ensure that the proposed mine design is based on adequate geological data and that potentially hazardous conditions have been located and defined. In addition to the usual consultees, the Department consults the Health and Saftey Executive about the safety aspects of the proposed mine, and the Valuation and Lands Agency on the question of royalties.

Every application for a mining licence or lease is treated on its own merits and in accordance with the provisions of the 1969 Act.

Royalties and Compensation to Former Owners of Mineral Rights

Under the 1969 Act compensation becomes payable to 'former mineral rights owners' when minerals are extracted. The Department collects royalties from mining companies based on the quantity of minerals mined, and then pays compensation to the former owners of the mineral rights by apportioning the royalties less a deduction for administrative costs.

In respect of any precious metals extracted royalties are negotiated with and collected by the Crown Estate Commisioners.

Relevant Legislation

Mineral Development Act (Northern Ireland) 1969.

Mineral Development (Application, Fees and Model Clauses) Regulations (Northern Ireland) 1970-SR 1970 No 20.

Mineral Development (Application, Fees and Model Clauses) (Amendment) Regulations (Northern Ireland) 1986-SR 1986 No 152.

Mineral Development (Application, Fees and Model Clauses) (Amendment) Regulations (Northern Ireland) 1991-SR 1991 No 74.

Section 2.4

Statistics on Mineral Production

Although "common substances" are excluded from the Mineral Development Act (NI) 1969, the Department is responsible under the Quarries (NI) Order 1983 for the annual collection of statistics from mines and quarries on output, value and numbers employed.

These bulk mineral commodities are mostly won through quarrying and their production represents one of Northern Ireland's major industries. They are largely natural sand, gravel and crushed rock aggregate plus rock for cement manufacture, all fundamental to our built environment. An "Inventory of Active Quarries, Pits and Mines in Northern Ireland" first published by the Geological Survey of Northern Ireland in April 1997 and updated annually is available from the GSNI office.

Maps published by GSNI help in the identification and assessment of these important resources. Further information about GSNI is contained in Section 4.

Table 2 shows the figures for output and selling value for the years 1997, 1998 and 1999. Production figures for rock salt, chalk, diatomite, fireclay and granite have been combined into "others" to avoid disclosure of confidential information.

Table 3 shows the numbers employed in 1997, 1998 and 1999. These figures include those employed both inside and outside the pit and also administrative and managerial staff.

TABLE 2 Output and Value in 1997, 1998 and 1999

MINERAL	QUANTITY (THOUSAND TONNES)			SELLING VALUE AT MINE OR QUARRY (£000)		
	1997	1998	1999	1997	1998	1999
Basalt and Igneous Rock (other than Granite)	6,286	6,107	9,538	16,750	16,324	20,676
Sandstone	6,042	6,584	3,615	14,493	17,306	9,515
Limestone	3,500	3,892	8,771	10,534	10,930	10,086
Sand and Gravel	5,138	5,300	5,517	10.542	11,973	14,483
Others	625	473	1,579	3,394	2,456	5,181
TOTAL	**21,591**	**22,356**	**29,020**	**55,533**	**58,989**	**59,941**

TABLE 3 Number of Persons Employed at Mines and Quarries in Northern Ireland 1997, 1998 and 1999

MINERAL	TOTAL EMPLOYED		
	1997	1998	1999
Basalt and Igneous Rock (other than Granite)	500	512	590
Sandstone	363	408	223
Limestone	240	235	268
Sand and Gravel	307	297	333
Others	68	71	330
TOTAL	**1,478**	**1,523**	**1,744**