

## 8.3 EXTRACTIVE INDUSTRY

### 8.3.1 BACKGROUND

#### 8.3.1.1 General

The Hauraki District has had a long history of extractive industry with a particular focus on the mining of gold and silver. This activity has concentrated in the Ohinemuri area. The Hauraki Goldfield lies partly within the Hauraki District. This is an area of precious metal mineralisation stretching over 200km from Te Puke to Great Barrier Island and is approximately 40km wide. The Hauraki Goldfield yielded 43 million ounces of gold and silver bullion from the 1860's until 1954. This production came from about 50 individual deposits around the Coromandel Peninsula with the largest mining centres being at Thames, Coromandel, Waitekauri, Karangahake and Waihi. Of these, the Martha Mine at Waihi stands out. On the Hauraki Plains, peat mining has become an important industry. Various quarries operate in the District supplying aggregate for a range of purposes.

An improved gold price in the 1980's saw an upsurge in mineral exploration in the Coromandel Peninsula and Ohinemuri area. Two large new mines were developed during this period, one at Martha Hill and the other at Golden Cross.

There are a number of prospecting licences currently in the District.

There are several peat mining licences granted and applications to mine or prospect pending (Torohepe, Pouarua Road South) on the Hauraki Plains.

Extractive Industry is a very important source of income and employment in the district. For example, wages and salaries for the Martha Hill and Golden Cross Mines are approximately \$16m p.a. Payments for goods and services for the two mines total some \$69.4m (1994). The Martha Mine and Golden Cross Mine produce over 160,000 ounces of gold and large volumes of silver annually.

Waihi Gold Mining Company Ltd and Coeur Golden Cross jointly employ about 270 people in a direct sense (excludes main earthmoving contractors on each site). Including the main earthmoving contractors, the projects employ some 350 people.

It must also be noted that in addition to these people, more are employed indirectly in providing services to the mining industry.

#### 8.3.1.2 Statutory Aspects

##### *Crown Owned Minerals and Other Minerals*

The former Town and Country Planning Act 1977 did not apply to certain types of extractive industries. The mining of coal (including peat) was controlled under the Coal Mines Act 1971 and the development of Crown owned minerals was handled under the Mining Act 1971. Whilst these activities were not controlled in terms of the Town and Country Planning Act 1977, the development of coal and Crown owned minerals nevertheless required the obtaining of necessary water rights pursuant to the former Water and Soil Conservation Act 1967. Crown owned minerals were defined as gold and silver existing in their natural condition and minerals reserved in favour of the Crown where Crown land had been alienated. Petroleum was, like coal, the subject of separate legislation.

Outside of the above, the conducting of extractive industry including exploration, prospecting and mining was required to comply with the Town and Country Planning Act 1977. Accordingly, quarrying of aggregates, sand mining, clay pits and the like were generally managed through the normal planning process.

With the repeal of the Town and Country Planning Act 1977 the new procedures of the Resource Management Act 1991 and Crown Minerals Act 1991 have come into force.

##### *Resource Management Act 1991*

The purpose of the Act is to promote the sustainable management of natural and physical resources. The term "sustainable management" means managing the use, development and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic and cultural wellbeing and for their health and safety while:

1. *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
2. *Safeguarding the life-supporting capacity of air, water, soil and ecosystems; and*
3. *Avoiding, remedying or mitigating any adverse effects of activities on the environment.*

The finite characteristics of minerals is to be noted. However, any proposal to develop mineral resources is to comply with the other tests of sustainability.

##### *Crown Minerals Act 1991*

This Act relates to the management of Crown owned minerals and differs significantly from the provisions of the former Mining Act 1971.

- ✂ Again the Crown Minerals Act 1991 relates only to Crown owned minerals (petroleum, gold, silver, uranium, minerals reserved to the Crown, minerals occurring on/under Crown land).
  - ✂ Compliance with the Crown Minerals Act 1991 does not remove the need to comply with all other Acts, regulations, bylaws and rules of law. This means that necessary land use, water and discharge consents must be obtained. This position contrasts with that described above for the Mining Act 1971. It is to be noted that the Resource Management Act includes within the term "use of land" any excavation, drilling, tunnelling or other disturbance of the land (Section 9 RMA). The Crown Minerals Act 1991 **does not deal with the effects** of the activities which it licences. The effects are dealt with under the Resource Management Act 1991 and normal land use consent requirements apply to the development of Crown owned minerals (and other minerals).
  - ✂ The Minister of Energy is responsible for the preparation of minerals programmes. Such programmes will establish policies, procedures and provision for the efficient allocation of rights to prospect, explore for and mine Crown owned minerals and also provide the basis for the Crown's financial return on its minerals.
  - ✂ A structure of permits is provided whereby the Minister grants permits for the following phases of mineral development:
    - ✂ prospecting
    - ✂ exploration
    - ✂ mining.
- There is no provision for public input into the application procedure. Provision is made for a permit holder to hold certain priority rights to subsequent permits. The grant of a permit does not provide the holder with access to the land (exception for minimum impact activities).
- ✂ Procedures are established for access to land for mineral development activities. Except for minimum impact activities, a mineral permit holder (other than for petroleum) may not exercise the permit unless an access arrangement is in place with the landowner and occupier. An access arrangement may be obtained by agreement with the landowner or occupier or, in certain circumstances by arbitration. The focus of the legislation is on

obtaining access by agreement. Where no agreement is reached, there is provision for a declaration to be made by Order in Council that an access arrangement may be determined by an arbitrator if this is in the public interest (does not apply to some classes of land eg Crown land, Maori land).

Access arrangements with regard to Crown land are different. The appropriate Minister (eg Minister of Conservation), in considering entering into an access arrangement, must have regard to:

1. the objectives of any Act under which the land is administered;
2. the purpose for which the land is held by the Crown;
3. any policy statement or management plan of the Crown in relation to the land;
4. safeguards against any potential adverse effects of carrying out the proposed work programme.

Access to Crown land is not to be the subject of arbitration as provided for with regard to most other land. Further, the Crown Minerals Act provides that access may be prohibited in respect of any Crown land by Order in Council made on the recommendation of the Minister of Energy and the Minister administering the land concerned (eg the Minister of Conservation).

Existing privileges under the Mining Act 1971 continue to have effect as if the Crown Minerals Act 1991 had not been enacted. However, the roles and responsibilities of the Crown and the District and Regional Councils have changed significantly. Where the powers and duties previously resting with the Minister of Energy in respect of an existing privilege concern matters that now are within the functions of Regional or District Councils under the Resource Management Act 1991, the local authority will exercise those functions. This includes some monitoring activities (eg noise, dust, traffic), varying conditions on existing licences where doing so would involve effects on the environment.

Within the District there are several outstanding prospecting licence applications which may be deemed to be still valid for consideration under the provisions of the former Mining Act.

The holders of existing privileges under the Mining and Coal Mines Acts cannot claim priority to the permit for the next phase of development (eg exploration or prospecting to mining) in terms of those previous enactments. The rights of existing licence holders to a subsequent permit are established in Section 32 of the Crown Minerals Act 1991. Activities conducted under any subsequent permit granted by the Minister of Energy under Section 32 would be treated as any other land use activity and compliance with Council's District Plan is required (necessary consents) in terms of the Resource Management Act 1991.

Clearly, the Council now has an important role in the management of extractive industry activities. Even existing privileges granted under previous legislation require and involve Council input.

### 8.3.1.3 What Constitutes "Extractive Industry"

#### ***Distinction Between Quarrying And Mining***

In considering if there is a real distinction between quarrying and mining the key element from a resource management perspective is the effects of the activity. From this perspective, a quarry and an opencast gold mine of similar size are likely to generate very similar effects in certain facets although quarry activities seldom generate nearly as much overburden/waste rock relative to ore. Also quarrying does not normally involve extensive processing of ore through beneficiation and metallurgical processes.

On balance it is concluded that no distinction should be drawn from a resource management perspective between quarrying and mining. The activities will be treated as extractive industry, and the following definition is adopted for this district plan:

#### ***Extractive Industry***

*Means taking, winning or excavation by whatever means of naturally occurring minerals from under or on the land surface and includes prospecting and exploration activities but does not include "excavations". (Refer Section 8.4). The term includes the processing of minerals by such means as screening, crushing, chemical separation, smelting etc.*

To ensure that it is clear that the term "minerals" is broad in its coverage, a definition that makes clear that aggregate, topsoil and sand are included as well as metallic and non metallic minerals, precious stones and coal is provided.

#### ***Mineral***

*A naturally occurring organic or inorganic substance beneath or at the surface of the earth whether or not under water and includes all metallic minerals, non-metallic minerals, fuel minerals, precious stones, industrial rocks and building stones, peat, topsoil, sand and a prescribed substance within the meaning of the Atomic Energy Act 1945.*

#### ***The Activities That Extractive Industry Involves***

In order to properly examine the effects extractive industry has or is likely to have on the environment, it is necessary to identify the various activities that are included within this broad heading. The following section provides this breakdown.

#### ***Prospecting and Exploration***

The purpose of prospecting is to identify areas likely to contain economic minerals. Prospecting usually occurs in three phases:

##### ***A. Initial Investigating Phase***

This is essentially a desk top exercise aimed at assessing the mineral potential of a region and determining where to look for a particular mineral resource.

In the event that this desk top exercise indicates that further investigations are warranted, the reconnaissance phase is then entered.

##### ***B. Reconnaissance Phase***

The objective of reconnaissance is to appraise rapidly the mineral potential of a large area using standard geological surveying techniques and to rank any mineralisation worthy of detailed investigation. A reconnaissance exploration survey could be conducted under either a prospecting or an exploration permit under the Crown Minerals Act 1991.

The activities include:

- (a) Geophysical Surveys  
Some are done by aerial survey and more detailed work is by ground survey.
- (b) Seismic Surveys  
May involve use of small amounts of explosives.
- (c) Geochemical Surveys

Obtaining chemical evidence as to the presence of minerals. Activities include:

- ✍ stream sediment sampling - samples taken by hand
- ✍ soil sampling - samples taken either by hand or mechanical post hole borer
- ✍ rock sampling - samples are usually collected by hand and involve 1-5kg of material
- ✍ vegetation and water sampling.

(d) Griding and Line Surveying

Provide survey control and access for sampling surveys and mapping.

**C. Detailed Exploration Phase**

The detailed exploration phase may be embarked on if positive results come from the reconnaissance phase. This phase may include any of the activities set out in the preceding phases as well as the following (and ancillary activities such as tracking, helicopter pads, drilling platforms, sheds):

(a) Trenching or Costeaning

Typically 1m wide, 2-3m deep and 5-25m long.  
The exposed faces are sampled and examined. The costeans are backfilled and rehabilitated.

(b) Exploration Drilling

Drilling rigs used are essentially the same as those used for water bores or for site investigation work for building work. Rigs may be track, truck or skid mounted.

Land disturbance is usually minimal. In areas already cleared (such as farmland) drill sites can be returned to pasture in a matter of months. In bush clad areas small pads, generally 10 metres by 15 metres, are cleared.

(c) Bulk Sampling

Bulk samples may vary in size from a large diameter drill core to a few hundred tonnes of mineralised material. They are taken for the purpose of testing for mineral extraction and processing feasibility studies.

The impacts of bulk sampling vary considerably depending on sample size, location and method of extraction. In the case of large diameter drill holes, pits and underground bulk samples, impacts are similar to trenching or drilling and can be rehabilitated in the same way. For larger samples more sophisticated management procedures are likely to be necessary.

(d) Exploration Tunnels

When exploration reaches the stage at which it appears that there may be an economic resource, information regarding mining and processing options, variation of grade, geotechnical data, waste disposal and characteristics, is required for feasibility studies so that reliable cost estimates can be determined before any major capital investment decision is made.

To this end exploration declines, shafts, drives or crosscuts may be required.

Ore and waste rock is produced and the latter requires dumping and rehabilitation. Water treatment systems will be required in most circumstances and will be managed by the Regional Council.

**Mining**

The mining phase covers the mining/quarry activities, processing aspects and long term rehabilitation of the site.

Mining is undertaken either by opencast or underground methods and a large range of mining methods are employed within these two broad categories. Various means of digging, blasting, ore and waste collection and haulage, stockpiling etc are used in opencast mines. Hydraulic mining techniques are also undertaken in some areas. Likewise, underground mining techniques are various and will depend on the nature and size of the ore body, the geology of the area (strong or weak rock), surface effects of different techniques etc.

Processing of mined ore is often undertaken in close proximity to the mine (eg at Martha Hill and Golden Cross). In the case of extracting road metals, aggregates, sand, peat etc the ratio of "ore" to total mined material is usually very high. This contrasts with the situation for precious metal mining where the end product (eg gold and silver) generally makes up a very small proportion of total mined material (ore and waste rock).

Little processing is undertaken in aggregate, sand and peat mining, other than crushing, screening, cleaning, drying and so on. On the other hand, ore containing metallic minerals needs to be extensively processed to produce the desired (metal) product. There are three broad types of processing, within which a number of specific processes can be utilised:

- Benification (including grinding, concentration and flotation)
- Smelting of concentrates
- Refining of metal bullion

For example, at the Martha Mine, the ore is crushed and ground into small particles. Gold and silver within the ground ore is then dissolved using a cyanide solution. The gold and silver is then absorbed by carbon granules. The precious metal is separated from the carbon and using an electrical process, attaches to steel wool cathodes which are then smelted to produce a 99% pure concentrate of gold and silver.

Processing techniques will differ for the various minerals sought and further, changes in technology are likely to result in new techniques being developed. There is significant potential for environmental effects arising from mineral processing.

Rehabilitation, mine closure and long term site security must be attended to in an appropriate manner.

**8.3.2 OBJECTIVES AND POLICIES**

There are no specific objectives and policies for this activity as such. The District Plan provides objectives and policies in various zones that are of relevance to activities that constitute extractive industry and these objectives and policies (together with the appropriate Rules) will provide the resource management framework for the District.

**8.3.3 PROVISIONS IN THE DISTRICT PLAN FOR EXTRACTIVE INDUSTRY**

The activity status for extractive industry is set out under the rules applying to each zone and policy area.