PROPOSED BROAD ENVIRONMENTAL GUIDELINES FOR THE EXPLOITATION, DEVELOPMENT AND PROTECTION OF GEOTHERMAL RESOURCES

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A strategy for early assessment of the implications of developing geothermal resources for both power generation and non-electric application.

Broad principles governing the basis of a procedure for assessing the implications of potential geothermal development:

1. An initial identification of major environmental issues for priority development areas naming the chief value and any conflicting ones.

2. Summaries of available baseline data including fauna and flora inventories and monitoring programmes under way and flowing from this, establiah what research needs to be carried out.

3. Contact and involvement with all interested parties, local authorities etc, to ascertain at a very early stage a consensus of interests implying a free and open flow of information.

4. Consideration of development alternatives for the area and their regional implication.

5. Establishing steps that need to be taken to protect the (1) main value of the resource, (2) allow for multipurpose use (where appropriate) and (3) enhance and/or compensate for change (damage).

The function of the assessment then, having raised certain questions in the enquiry is if need be to help shape and influence the development of geothermal power.

This programme should commence at the investigation phase about the time statutory processes for water rights are being applied for and would be carried out in parallel with the geothermal exploration and testing programme. These guideline6 are intended to be applied as a specific study for each site.

(1) Appraisal process

This should cover activities related to:

(a) drilling and testing
(b) construction
(c) power plant and industrial use and well operation
(d) monitoring

Some of the more important items that should be Included in an appraisal of the physical environment are:

(i) The definition and description of the area likely to be affected by civil engineering and monitoring works - (the immediate impact).

(a) the probable extent of the geothermal field and its location uith respect to rivers, streams, towns, etc.

(b) existing environmental situation, including adverse effects

(c) topography

(d) vegetation ·

(e) birdlife, wildlife, fish urd important known ecological aspects

(f) historical, cultural and archaeological sites

(g) ownership of land

(h) present land-use

(ii) Establish what monitoring needs to be carried out

(a) prior to development

(b) during the project lifetime

(iii) Outline likely benefits to the area of the development of the geothermal field including -

(a) likely scale of the power station

(b) other "uees" of the developed field such as tourirt, scenic, industrial, domestic or therapeutic

(c) potential community/township development close to the field, due to its exploitation.

The Commission for the Environment acccptr that at the investigation stage it will be difficult to isolate and identify all likely impacts that any development of the geothermal field may effect. However, it is felt that as the drilling programme is likely to be taken as an indication of intent to develop the geothermal resource, the following points merit consideration -

(iv) In the description of the geothermal system, consideration to be given to the effects of exploiting the field on natural thermal activity and consequent potential modification in adjacent areas which may include concern for -

(a) possible grouod temperature changer

(b) trends in reservoir prereures

(c) phreatic explosions - rafety of drilling mechanism

(d) subsidence and conrequent effluent. on land value

(e) seismicity

(v) An indication of proposals to contain or dispose of geothermal effluent, mud urd drilling oils.

(a) The likely impact of chemical and thermal fluids on rivers, streams and laker in the vicinity; the

effects on existing -

sediment and chemical loading

biological rtatur

temperatures

(b) The likely impact of gaseous effluent especially hydrogen sulphide and ammonia.

(vi) Assess the likelihood, nature and effects of accidental spillages occurring through both mechanic failure and human error and discuss the contingency plans and how these will be activated.

(vii) Assess the impact on the environment of the -

(a) noise

(b) visual aspect

(viii) Changes in the land - degradation brought about by erosion affecting its use.

(ix) Ascertain the need for aite rehabilitation and opportunities for further enhancement. Consider what compensation may be neceseary and if it is possible to provide the community with an amenity to replace that lost or degraded by development.

(2) Social Aspects

Consider and detail other possible uses as development options €or the field as well as long range regional planning objectives and schemes.

(i) Establish what further information would be needed to enable competing/conflicting user to be evaluated should the field prove commercial.

(ii) What are the likely population trendr in the area.

(a) Would development affect existing communities or involve the establishment of new communities?

(b) Is further commercial or industrial growth in the area likely to be stimulated by geothermal exploitation?

These guidelines (uith a little amen dment) to be incorporated Into MWD drilling programme - the responsibility of seeing these carried through will become that of thu Hinistry of Energy as the Administrator of the Geothermal Energy Act.