



ROTORUA DISTRICT COUNCIL
GEOTHERMAL SAFETY
BYLAW 2008

ROTORUA DISTRICT COUNCIL
G E O T H E R M A L S A F E T Y B Y L A W 2 0 0 8

1. **INTRODUCTION**

- 1.1 In pursuance of the powers and authorities vested in it by the Local Government Act 2002 the Health Act 1956 and amendments thereto, and of all and every other power and authority in that behalf enabling it, The Rotorua District Council hereby resolves to make the following Bylaw.
- 1.2 This Bylaw shall be referred to as "The Rotorua District Council Geothermal Safety Bylaw 2008".
- 1.3 This Bylaw shall come into force and take effect on the **1st day of August 2008**.
- 1.4 The Rotorua District Council Geothermal Safety Bylaw 1988 shall hereby be revoked.

2. **OBJECTIVES**

- 2.1 The objectives of this bylaw include:
- The safety of the general public from the effects of Hydrogen Sulphide gas so far as is practically possible.
 - The safe operation of and proper maintenance of, the headworks and associated pipework and plant of geothermal production and re-injection bores.

3. **INTERPRETATION**

- 3.1 In this Bylaw, unless inconsistent with the context,

Approved means approved by an employee of Council appointed to carry out general or specific duties arising from any of the provisions of the Bylaw.

Authorised Officer means an employee of the Council appointed to carry out general or specific duties arising from any of the provisions of this Bylaw.

Bath means any place, room or building which is used for bathing, ablution or changing purposes, the water supply to which is wholly, or in part, derived from geothermal energy.

Bore means any well, hole, pipe or excavation of any kind fully or partially lined which is bored, drilled, sunk, or made in the ground for the purpose of investigation, prospecting, obtaining, producing, or disposing of geothermal energy and includes any operative or inoperative bore but does not include a closed bore.

Cellar means an excavation around the top of a bore to accommodate part or all of the wellhead.

Closed means any bore which has been sealed or closed permanently by means of grouting or other approved means.

Council means Rotorua District Council.

Delivery pipework means pipes used to transfer fluid (of geothermal origin or otherwise) from a well or heat exchanger to an end user.

Geothermal energy means energy derived or derivable from and produced within the earth by natural heat phenomenon;

Geothermal extraction means to extract geothermal fluid by way of a bore, well, or otherwise.

Geothermal fluid means all steam, water, and water vapour and every mixture of all or any of them that has been heated by such energy and every kind of matter derived from and for the time being with, or in, any such steam, water, water vapour, or mixture.

Geothermal Work means any work or operation connected in any way with the boring, sinking, drilling, making or maintenance of any well and includes all buildings, plant, machinery, and fittings associated with any such well; and includes every such well; but in respect of any such well that has been brought in and is under control, and has had installed a well-

head master valve, does not include any pipes or fittings beyond the well-head master valve, nor anything connected with the use of geothermal energy beyond the well-head master valve; and, in respect of any such well that has been brought in and is under control, but which has no well-head master valve, does not include any pipes or fittings above ground.

Grouted means a permanently closed bore sealed by way of a suitable cement and water mix with appropriate additives as required, pumped into a well from its base to the surface in an uninterrupted pour.

Headworks means the same meaning as Wellhead.

Heat exchanger means a device used to transfer heat from one fluid to another without bringing the two fluids into direct contact.

Natural Geothermal Spring means a place where groundwater, heated by geothermal energy, emerges naturally to the surface of the ground.

Occupier means the inhabitant occupier of any property and includes any agent, employee, or other person acting or apparently acting in the general management or control of the land, or any plant or machinery on that land.

Owner means in relation to any land, means the person who is for the time being entitled to the rack rent of the land or who would be so entitled if the land were let to a tenant at a rack rent; and includes:

- (i) The owner of the fee simple of the land; and
- (ii) Any person who has agreed in writing, whether conditionally or unconditionally, to purchase the land or any leasehold estate or interest in the land, or to take a lease of the land, while the agreement remains in force.

Pool means any water retaining structure including a bath designed for recreational swimming or therapeutic bathing, the water supply to which is wholly, or in part, derived from geothermal energy.

Rotorua Geothermal Field encompasses all geothermal systems within the Taupo Volcanic Zone that fall within the Rotorua District Council's boundary.

Short Term Exposure Limit means the total level of Hydrogen Sulphide gas to which anyone may be exposed to over a continuous period of 15 minutes.

Time Weighted Average means the average level of exposure to Hydrogen Sulphide gas over an 8 hour period.

Quench/Quenching means the injection of cold liquid into a well to prevent hot fluids or steam coming to the surface.

Well means a fully or partially-lined hole in the ground.

Wellhead means a set of valves and other pressure-rated components, connected to the top of the well and used to contain the well fluids.

4. POOLS

- 4.1 Where in the opinion of an authorised officer of Council there exists on any land or premises any natural geothermal spring, geyser, other feature of geothermal activity, or artificially created pool which is, or is likely to be, dangerous or injurious to health, the authorised officer may require the owner and/or occupier of such land or premises to take such steps, including the adequate fencing of any such pool, spring, geyser or other geothermal activity, as the authorised officer directs, so as to protect any person or persons who may be in or about the land or premises or any member of the public, from any associated danger.
- 4.2 **In those parts of the Rotorua Geothermal Field where geothermal fluid is known to contain Hydrogen Sulphide gas,** no person shall use or permit the use of any natural or artificially created pool/bath where:
- (a) At any time the Short Term Exposure Limit (15 min) for **Hydrogen Sulphide gas** of 5 parts per million is exceeded following agitation of the pool water.
 - (b) Over an eight (8) hour period the time weighted average exceeds 3 parts per million of **Hydrogen Sulphide gas** at any point within the pool or its immediate environs.
- 4.3 **In those parts of the Rotorua Geothermal Field where geothermal fluid is known to contain Hydrogen Sulphide gas,** any bath house or other building containing any natural or artificially created pool or bath shall be permanently ventilated so that there is created at all times a through draft across the surface of each pool or bath as the case may be.

- 4.4 In those parts of the Rotorua Geothermal Field where geothermal fluid is known to contain **Hydrogen Sulphide gas**, geothermal water shall not enter the pool without first passing through a gas separator which ensures compliance with the provisions of Clause 4.2(a) and (b).
- 4.5 **In those parts of the Rotorua Geothermal Field where geothermal fluid is known to contain Hydrogen Sulphide gas**, the water level of the pool/bath shall not be lower than 100mm from the lip of the pool/bath.
- 4.6 **In those parts of the Rotorua Geothermal Field where geothermal fluid is known to contain Hydrogen Sulphide gas**, testing of H₂S levels in pools or baths shall be carried out **six monthly** and evidence of such test shall be provided to an authorised officer of Council upon request, or within 7 days of being requested in writing.
- 4.7 In any instance where the limits specified in either of clause 4.2(a) and (b) have been exceeded, the pool/bath shall be closed for use and not used until such time as a gas extraction system, capable of bringing the levels of gas into compliance with those specified in clause 4.2(a) and (b) has been fitted to the water supply system to the pool. The pool/bath may only be reopened for use after evidence of compliance with the levels specified in clause 4.2(a) and (b) is available, following testing by an authorised officer of Council.
- 4.8 Hot pipes shall be located, shielded or insulated in such a way as to prevent injury from burns.
- 4.9 A cold water supply for cleaning and emergency use must be available and in working order within the pool/bath house.
- 4.10 No person shall cause or permit any bore effluent, geothermal water, steam, or geothermal gases from any geothermal work, pool/bath, pipes or fittings to escape or to be discharged as the case may be, into any public or private sewer or drain or stormwater drain or any gutter or channel connected to any sewer or drain or stormwater drain and no person shall cause or permit to be discharged any waters as above to any lake, stream or water course without having first obtained the necessary rights and permits under the Resource Management Act 1991.

5. **BORE HEADWORKS AND ASSOCIATED PIPEWORKS**

- 5.1 The owner or occupier of any property on which is located a wellhead shall have the wellhead inspected annually by a suitably experienced/trained person to ensure that the wellhead is in sound condition and fit for purpose. Evidence of such inspection shall be produced to an authorised officer of Council upon request, or within **fourteen** days of being requested in writing.
- 5.2 Any owner or occupier of any property on which geothermal extraction or delivery pipework and/or heat exchangers are located, shall have them inspected annually, by a suitably experienced/trained person to ensure they are in a sound condition and fit for purpose. Evidence of such inspection shall be produced to an authorised officer of Council upon request, or within **fourteen** days of being requested in writing.
- 5.3 Any rust or leaks of gas, steam or fluids within the extraction or delivery pipework associated with any bore shall be repaired/replaced by a suitably qualified person forthwith and evidence of the satisfactory completion of such for remedial work as is necessary, shall be produced to an Authorised Officer of Council upon request, or within **fourteen** days of being requested.
- 5.4 All valves throughout the extraction or delivery pipework of the system must be kept in safe and reliable working order at all times.
- 5.5 A well identification number as allocated by the **Bay of Plenty Regional Council** shall be placed on or adjacent to any new well established at any time after the coming into force of this Bylaw.
- 5.6 At all times a circle of cement shall be maintained around the **well head**. This must be raised and graded and kept in such a state of repair as to ensure water cannot accumulate around the **well head**.
- 5.7 Site drainage around any cellar shall be constructed so as to prevent surface runoff entering the cellar.
- 5.8 Drainage from within the cellar shall be provided and maintained so that moisture cannot accumulate around the well.
- 5.9 The cellar shall at all times be kept clear of debris that may promote rusting of the well.
- 5.10 Well vent pipes must be designed to safely disperse **dangerous air discharges**. The height of the vent pipe shall be 3 metres above the ridge line **of the nearest building**.
- 5.11 A working cold water supply shall be available at all times, close enough to the well to assist with any necessary quenching of a well.
- 5.12 Site access to any well shall be maintained in such a condition as to allow access to the well by a drilling rig at all times.

- 5.13 Heat exchangers shall not be located in a habitable building.
- 5.14 Plant associated with any well shall not be located below ground level.
- 5.15 Permanent ventilation of a plant room shall be provided at ground level, with vents not able to be closed, thus creating a permanent through draft of adequate volume to clear any accumulation of gas.
- 5.16 Venting of geothermal fluid, steam or gases into any building, room or shelter shall not be permitted.
- 5.17 If steam, hot water, dead or dying grass or gas is observed around or near a well, the owner or occupier of the land on which the well is located, shall inform the Rotorua District Council forthwith.
- 5.18 No person shall erect a structure or building within 5 metres of either an existing well, or a closed well.
- 5.19 (a) **Where in the opinion of an authorised officer, an abandoned or disused well presents a potential safety hazard, that abandoned or disused well shall be grouted shut by an approved contractor and the Rotorua District Council shall be notified in writing within 14 days of completion of that grouting by the owner or occupier of the land on which the well is located.**
- (b) All abandoned or disused soak holes shall be made safe by filling with clean fill or to a standard approved by the Rotorua District Council District Engineer.
- 5.20 In the event that any authorised officer is satisfied that through lack of proper maintenance or for whatever other reason, the headworks of any bore, extraction and or delivery pipelines, heat exchangers or geothermal baths and pools located on any property, present a potential threat to the safety of any person entering onto the property, that authorised officer may serve notice on the owner or occupier of the property in question, requiring the undertaking of specified remedial works forthwith. Evidence that the specified work has been carried out to a satisfactory standard is to be produced to an authorised officer within 14 days of completion.
- 5.21 The owner or occupier of any property on which there exists a disused bore or abandoned well which the owner/occupier has grouted close, shall advise the Council in writing within 14 days of such grouting having been completed.

6. BUILDINGS

- 6.1 Where in the opinion of an authorised officer of Council there exists on any land or premises any natural or artificially created geothermal feature or activity which is or is likely to be dangerous or injurious to health, the authorised officer may by written Notice require the owner and/or the occupier of such land or premises to take such steps, including adequate fencing of land or closing of any premises so as to protect any person from any associated danger/threat.
- 6.2 Any land or premises in respect of which a notice in terms of Clause 6.1 has been issued, shall remain fenced off or closed, until the said officer is satisfied the danger/threat to the premises or land, owner, occupiers or member of the public has been made safe.

7. WORK SITES

- 7.1 No person shall, except with the express written approval of the Council, and subject to any conditions it may impose, either generally or in any specific case make any well within 5 metres of any building or boundary or subterranean public service including drains, cables, service pipes, water mains or sewers.
- 7.2 No person shall engage in any occupation, trade, manufacture or other undertaking or be employed or occupy, or require any person to be employed, in any office, shop, warehouse, factory, workshop or other enclosed premises, or permit any member of the public to enter any such premises where:
- (a) At any time the Short-Term Exposure Limit value over a 15 minute period of the atmospheric concentration of hydrogen sulphide (**H₂S**) gas at any point within the office, shop, warehouse, factory, workshop or enclosed premises exceeds a level of fifteen (15) parts per million, or
- (b) Over an eight (8) hour period the Time-Weighted Average value of the atmospheric concentration of hydrogen sulphide (**H₂S**) gas exceeds ten (10) parts per million.
- 7.3 The developer, owner or occupier of every building shall take all reasonable practical steps to incorporate acceptable barriers to the ingress or egress of hydrogen sulphide, into or from, new or upgraded building developments.

- 7.4 Where a defect occurs in a building which permits or is likely to permit the ingress or egress of hydrogen sulphide gas, in such concentrations as to be injurious or likely to be injurious or dangerous to the health of any person, the owner or occupier shall take all reasonably practical steps to remedy that defect.
- 7.5 Where an Authorised Officer is of the opinion that any building, is in such a state or condition or has any defect, as to permit the ingress or egress of hydrogen sulphide gas in such concentrations as to be injurious or likely to be injurious or dangerous to the health of any person, he may require the owner and/or occupier to cause all proper steps to be taken, to secure the removal of, or otherwise remedy, such state, condition or defect.

8. FEES AND CHARGES

Council reserves the right to determine by Council Resolution, following the Special Consultative procedure provided for in Section 83 of the Local Government Act 2002, reasonable fees and charges for undertaking any inspection in terms discharging its responsibilities under and in terms of the Bylaw.

9. OFFENCES

9.1 Every person commits a breach of this Bylaw who:

- (a) Commits, or causes to be committed, any act contrary to this Bylaw, or
- (b) Omits, or knowingly permits to remain undone, any act required by this Bylaw, or
- (c) Refuses or neglects to comply with any notice, or any condition in any such notice, whether public or private, given pursuant to this Bylaw, or
- (d) Obstructs or hinders any officer of the Council in the performance of any power, or duty conferred upon him or her by his Bylaw.

10. PENALTY

Every person who commits a breach of this Bylaw is liable on summary conviction to a fine not exceeding \$20,000.00.

THE COMMON SEAL of the
ROTORUA DISTRICT COUNCIL
was hereto affixed in the presence of:

.....
MAYOR

.....
CHIEF EXECUTIVE