**The Legislative Assembly for the Australian Capital Territory**

Explanatory Statement

# GENE TECHNOLOGY AMENDMENT REGULATION 2008 (No 1)

**SL2008-17**

Distributed by Authority of the Minister for Health and
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**Explanatory Statement for the Gene Technology Regulation (ACT) 2008**

OVERVIEW

The *Gene Technology Regulation (ACT) 2008* (the regulation) is a component of the national framework for the regulation of gene technology.

The regulation will be an important component of the proposed national legislative scheme. The regulation will underpin the *Gene Technology Legislation Amendment Act 2008* (the Act) and will describe certain aspects of the operation of the legislation in detail. In particular, the regulation will contain many of the administrative details of the legislation and will determine the way the legislation will operate on a day-to-day basis.

The purpose of this Explanatory Statement is to:

- explain the overall intention of the regulation; and
- explain the effect of each of the amendments to the regulation.

The regulation mirrors the Commonwealth *Gene Technology Regulations 2007*. A Regulatory Impact Statement (RIS) was prepared by the Commonwealth as part of the development of the Commonwealth regulations. Consequently, in accordance with Section 36(1)g of the *Legislation Act 2001* a separate RIS for the regulation is not required.

The purpose of the Act was to amend the *Gene Technology Act 2003* in order to improve its operation without changing the underlying policy intent or overall legislative framework of the regulatory scheme.

The Act is the ACT Government's component of the nationally consistent regulatory scheme for gene technology. Under the Gene Technology Agreement 2001, all States and Territories have committed to maintaining corresponding legislation. The object of the Commonwealth *Gene Technology Act 2000* (the Commonwealth Act) is to protect the health and safety of people, and to protect the environment, by identifying risks posed by or as a result of gene technology, and by managing those risks through regulating certain dealings with genetically modified organisms (GMOs).

In 2005-06, an independent statutory review of the Commonwealth Act and the intergovernmental Gene Technology Agreement 2001 (the Review) was conducted. The Review found that the Commonwealth Act and the national regulatory scheme had worked well in the five years following introduction, and that no major changes were required. However, it suggested a number of minor changes, aimed at improving the operation of the Commonwealth Act at the margin.

On 27 October 2006, the Gene Technology Ministerial Council (GTMC), an intergovernmental body comprised of State, Territory and Australian Government Ministers, agreed to proposals to implement the recommendations of the Review. The

Commonwealth Act and the Act implemented the recommendations requiring legislative change, which included:

- introducing emergency powers, giving the Commonwealth Minister the ability to expedite the approval of a dealing with a GMO in an emergency;
- improving the mechanism for providing advice to the Gene Technology Regulator (the Regulator) and the GTMC on ethics and community consultations;
- streamlining the process for the initial consideration of licences;
- reducing the regulatory burden for low risk dealings;
- providing clarification on the circumstances in which licence variations can be made;
- clarifying the circumstances under which the Regulator can direct a person to comply with the Act;
- providing the Regulator with the power to issue a licence to persons who find themselves inadvertently dealing with an unlicensed GMO, for the purpose of disposing of that organism; and
- making technical amendments to improve the operation of the Act.

FINANCIAL IMPACT STATEMENT

The amendments to the Commonwealth Act and the Act have no financial impact.

GENE TECHNOLOGY AMENDMENT REGULATION 2008 (No 1)

NOTES ON CLAUSES

**Clause 1: Name of regulation**
This clause provides that the regulation may be cited as the *Gene Technology Amendment Regulation 2008 (No 1).*

**Clause 2: Commencement**
This clause provides that the regulation commences on the commencement of Section 3 of the *Gene Technology Amendment Act 2008.*

**Clause 3: Legislation amended**
This clause provides that this regulation amends the *Gene Technology Regulation 2004*.

**Clause 4: Substitution in Section 4**
Omit "somatic cell nuclear transfer if the transfer does not involve genetically modified material" in Section 4 Part 2 and substitute "a technique in Schedule 1A." This amendment reflects the fact that Schedule 1A has been inserted to list techniques not constituting gene technology for the purpose of the Act.

The inclusion of Schedule 1A in addition to Schedule 1 ("Organisms that are not genetically modified organisms") will provide for a clearer distinction between "techniques" and "organisms" that are not regulated under the Act. The techniques to be listed are those mentioned in regulation 4 or Schedule 1. These are techniques which have a long history of safe use and which do not involve the direct manipulation of genetic material. Refer also to the explanatory statement for clause 23.

**Clause 5: Omit Section 6(1)(c) from "Dealings exempt from licensing"**
This amendment omits a reference to Australian Standard AS/NZS 2243.3:1995 (Safety in laboratories: microbiology) in paragraph 6(1)(c), in connection with containment requirements for exempt dealings, in accordance with recommendation 6.1 of the Review that there be no legislative requirements on exempt dealings beyond listing in the regulation.

**Clause 6: Substitute section 6(1)(d) insert new section 6(1)(e) in "Dealings exempt from licensing"**
This amendment will substitute section 6(1)(d) to replace "." with "; and" to allow for the addition of the new section 6(1)(c) and will add a new paragraph (e) to subsection 6(1), excluding dealings with retroviral vectors able to transduce human cells (i.e. enter an intact human cell by interaction of the viral particle with the cell membrane) from exempt dealings. This will clarify an ambiguous reference to these higher-risk vectors in Schedule 2, Part 2 (Host/vector systems for exempt dealings), which was intended to exclude them from exempt dealings.

**Clause 7: Omit section 6(3)**
This is a consequential amendment arising from the omission of 6(1)(C) in clause 5.

**Clause 8: Substitute section 7**
This item will amend regulation 7 to refer to a prescribed fee in relation to an application for licence, for the purpose of subsection 40(6) of the Act, with a note to indicate that at commencement of the regulation no fee is prescribed.

This item will also remove from regulation 7 reference to prescribed information in relation to an application for licence, for the purpose of paragraph 40(2)(a) of the Act. Clause 23 of the regulation will remove the details of prescribed information requirements by deleting Schedule 4 ("Prescribed information – application for a licence"). Paragraph 40(2)(b) of the Act requires an application to contain such information as is specified in writing by the Regulator. The application form will specify this information. This will allow the Regulator to update the information requirements quickly in response to advances in the knowledge and practice of gene technology, thus enhancing the effectiveness and efficiency of the regulatory system.

**Clause 9: Substitute section 8(1)(b)**
Amendments to section 8 change the timeframes in which the Regulator must issue, or refuse to issue, a licence for intentional release applications under s 43 of the Act. The amendments implement recommendations 5.7, 5.8 and 5.9 of the Review. The new timeframes are:

- 150 days for limited and controlled release applications not posing significant risks;
- 170 days for limited and controlled release applications posing significant risks; and
- 255 days for applications for intentional releases that are not limited and controlled.

**Clauses 10 and 11: Omit "gene technology ethics committee" from section 8(2)(e) and section 8(3) and substitute "ethics and community committee"**
Clauses 10 and 11 would repeal references to the Gene Technology Ethics Committee and replace them with references to the Gene Technology Ethics and Community Committee in line with changes to the Act which proposed the amalgamation of the Gene Technology Ethics Committee and the Gene Technology Community Consultative Committee into one advisory committee. The combined committee will be known as the Gene Technology Ethics and Community Consultative Committee (the Ethics and Community Committee) and will carry out the combined functions of both committees as well as providing advice on risk communication and community consultation in relation to intentional release licence applications.

**Clause 12: New section 8(4)**
Clause 12 is a consequential amendment arising from the insertion of a new section 50A into the Act. This proposed section would create a new category of licence application, to be known as "limited and controlled release" applications.

**Clause 13: Omit section 9(c)**
In accordance with recommendation 5.4 of the Review, clause 13 removes the National Health and Medical Research Council (NHMRC) from the list of prescribed authorities within s 50(3)(c) and s 52(5)(c) of the Act. This reflects the fact that the role changed from a prescribed agency to one where the Gene Technology Regulator (the Regulator) can seek advice as appropriate.

**Clause 14: Substitute section 9(d) and (e)**
Clause 14 will amend section 9 to refer to the current names of authorities and agencies prescribed by the regulation for the purposes of s 50(3)(c) and s 52(5)(c) of the Act.

**Clause 15: Insert new section 9A**
Paragraph 51(1)(a) was amended to provide that the regulation may prescribe matters that the Regulator must have regard to in preparing a risk assessment and risk management plan (RARMP). Clause 15 inserts a new section for this purpose.

S 49 of the Act, which lists matters that the Regulator must have regard to in satisfying itself as to whether a dealing may pose significant risk, and which must also be considered in preparing the RARMP, was amended to clarify processes for initial consideration of licences. Clause 15 makes the consequential change that ensures these matters are referred to by the regulation. This change is necessitated by changes to the Act required to implement recommendation 5.5 of the Review.

**Clause 16: Substitute section 10(1)(a)**
Clause 16 will amend paragraph 10(1)(a) to refer to "any previous assessment *by a regulatory authority*", rather than simply to "any previous assessment", and to make this paragraph subject to s 45 of the Act (which restricts consideration of confidential commercial information). This will mean that the Regulator will not be required to take into account previous assessments which do not have regulatory authority, or information that is restricted under the Act.

**Clause 17: Omit section "selective advantage" in subsection 10(1)(b)(v) and substitute "an advantage".**
Clause 17 will amend subparagraph 10(1)(b)(v) to refer simply to an "advantage", which will be defined by the regulation, rather than to "selective advantage", to provide consistent use of the defined term.

**Clause 18: New section 11A**

Clause 18 inserts a new section that introduces a timeframe of 90 days within which the Regulator must notify of its decision to either vary or refuse to vary a licence made under s 72(7) of the Act. This change implements recommendation 5.9 of the Review.

**Clause 19: Substitute section 13 and insert new section 13A**

This item will amend section 13 to:

1. remove the timeframe within which an Institutional Biosafety Committee (IBC) must, after completing an assessment of a proposed notifiable low risk dealing (NLRD), notify the Regulator of the proposed dealing (leaving this detail of IBC and organisational administration to their members);

2. require that the above mentioned notification be in the form approved by the Regulator, rather than referring to information specified in Schedule 3, Part 3

(Prescribed information – notification of proposed notifiable low risk dealing) (noting that clause 23 of the regulation will remove Schedule 3, Part 3);

3. require that a person not undertake a NLRD unless the written notice which the IBC must provide to the person and to the project supervisor for the proposed dealing indicates that the IBC considers that the proposed dealing is a NLRD and that the personnel to be involved in the dealing have adequate training and experience;

4. remove the requirement for the dealing to be properly supervised and details of the dealing recorded and kept (noting that NLRDs must only be conducted in facilities certified by the Regulator, which attaches certain conditions such as training and work practice requirements, and that there is no guidance on what constitutes proper supervision or what details of the dealing should be recorded, or on how compliance with this clause might be assessed);

5. remove the requirement that dealings with human pathogens only be conducted in accordance with recommendations for vaccination given in Australian Standard AS/NZS 2243.3:1995 (noting that the Standard provides only recommendations regarding vaccination, while subsection 13(2)(c) may be interpreted as making such vaccinations mandatory, and that the appropriateness of vaccination is a medical issue which should be assessed based on individual circumstances);

6. remove the current text of subsection 13(3) relating to the circumstances in which a dealing is taken to have been assessed by an IBC (noting that the notification of the dealing will be in a form approved by the Regulator, as described in point 2 above, which will require provision of relevant information on the dealing and on the IBC assessment); and

7. insert a new requirement at subsection 13(3) for a notifying an IBC, or a person or organisation involved in the conduct of a dealing, to provide, within a period specified by the Regulator, further information requested by the Regulator in order to be satisfied that the dealing is a NLRD (allowing the Regulator to perform the function of independent oversight of the consideration of dealings by IBCs).

The new section 13 of this item removes the requirement to notify NLRDs to the Regulator before commencing the dealing. This item also inserts a new section (section 13A) that introduces a requirement to include a report of all NLRDs assessed in the last financial year in the accredited organisation's annual report, and to maintain an up-to-date list of dealings which have been conducted, for inspection and auditing purposes. These changes are necessary to implement recommendation 6.2 of the Review.

**Clause 20: Substitute Part 5 for Parts 5 and 6**

Clause 20 is a consequential amendment which would repeal references to the establishment and operation of Gene Technology Community Consultative Committee (Part 5) and the Gene Technology Ethics Committee (Part 6) and replace

them with references to the Gene Technology Ethics and Community Committee in line with changes to the Act as per the amalgamation of committees described at clauses 10 and 11.

**Clause 21: Omit "in the GM product; and" in section 39(2)(c)(ii) and substitute "in the GMO from which the GM product is derived; and"**

This clause will amend paragraph 39(2)(c) to refer to the "GMO from which the GM product is derived" rather than to the "GM product" itself, since genetically modified (GM) products in the Record of GMO and GM product dealings generally do not themselves have introduced traits. Rather, it is the GMO from which the GM product is derived that has an introduced trait.

**Clause 22: Omit Part 8**

This clause will omit Part 8, which is now redundant as it relates to the transitional arrangements from the former voluntary scheme, overseen by the Genetic Manipulation Advisory Committee (GMAC), to the current regulatory scheme under the Act.

**Clause 23: Substitute revised schedules 1 to 3, including new schedule 1A, for schedules 1 to 4.**

This amendment will substitute current Schedules 1, 2, 3 and 4 with a new Schedule 1A and revised Schedules 1, 2 and 3, as detailed below.

A new Schedule 1A ("Techniques that are not gene technology") will be inserted by this item to support amended section 4. The inclusion of Schedule 1A in addition to Schedule 1 ("Organisms that are not genetically modified organisms") will provide for a clearer distinction between "techniques" and "organisms" that are not regulated under the Act. The techniques to be listed are those mentioned in regulation 4 or Schedule 1, or in the Explanatory Statement in relation to Schedule 1 items. These are techniques which have a long history of safe use and which do not involve the direct manipulation of genetic material.

This item will also substitute a new list at Schedule 1 ("Organisms that are not genetically modified organisms") in place of the current Schedule 1, Part 1 ("Organisms") and Part 2 ("Species known to exchange DNA by a known physiological process"). The items in Schedule 1 and in the new Schedule 1 (apart from items 2 and 3, see below) describe organisms which exchange nucleic acid in nature, are commonly used in biological research and have a long history of safe use in Australia and overseas. One common element of these organisms is that it can be difficult or impossible to distinguish between naturally occurring mutant organisms and those which have been subject to some directed genetic alteration. Thus these organisms do not present a unique biosafety risk. The items and the rationale for their listing are as follows:

1. A mutant organism in which the mutational event did not involve the introduction of any foreign nucleic acid (that is, non-homologous DNA, usually from another species).

This item is unchanged from that of Schedule 1, Part 1.

2. A whole animal, or a human being, modified by the introduction of naked recombinant nucleic acid (such as a DNA vaccine) into its somatic cells, if the introduced nucleic acid is incapable of giving rise to infectious agents.

   This is listed because the introduction of naked nucleic acid into somatic cells of an animal or human is most unlikely to lead to modification of the genome of the cells, and any modification could not be passed onto the progeny of the animal. An example of this is the use of strands of DNA as a vaccine to vaccinate animals against disease. This technique has the potential to be safer than current non-GM vaccines which use live, weakened strains of an organism (e.g. polio vaccine or influenza vaccines).

3. Naked plasmid DNA that is incapable of giving rise to infectious agents when introduced into a host cell.

   This item makes explicit the current understanding that plasmids, not being organisms, are not themselves GMOs for the purpose of the Act. However, an organism into which a genetically modified plasmid has been introduced will be a GMO, unless it meets the criteria in other items of this schedule.

6. An organism that results from an exchange of DNA if:

   (a) the donor species is also the host species; and
   (b) the vector DNA does not contain any heterologous DNA.

   This item is unchanged from that of Schedule 1, Part 1.

7. An organism that results from an exchange of DNA between the donor species and the host species if:

   (a) such exchange can occur by naturally occurring processes; and

   (b) the donor species and the host species are micro-organisms that:

      (i) satisfy the criteria in AS/NZS 2243.3:2002 (Safety in laboratories, Part 3: Microbiological aspects and containment facilities) jointly published by Standards Australia and Standards New Zealand, for classification as Risk Group 1; and

      (ii) are known to exchange nucleic acid by a natural physiological process; and

   (c) the vector used in the exchange does not contain heterologous DNA from any organism other than an organism that is involved in the exchange.

This item is modified from item 7 of Schedule 1, Part 1. Transfer of genes between different bacterial species occurs commonly in nature. Part 2 of Schedule 1 lists groups of species that are known to exchange genetic information under natural conditions. In order to be exempt, the exchange of DNA must only occur between members of any one group and the vector used must not contain DNA from species outside the same group. Schedule 1, Part 2 lists groups of organisms (bacteria) that

are known to exchange DNA and which present only limited risk to human health and the environment. However, such a list may quickly become outdated due to increasing scientific knowledge about microbial gene transfer. To avoid a need for frequent updating of such a list, the amended item 7 refers instead to micro-organisms known to the scientific community to exchange nucleic acid and which meet the criteria for classification as Risk Group 1 ("low risk to people and the environment") in the relevant Australian/New Zealand Standard. To meet the conditions of this item, the exchange must either be naturally occurring or mimic a natural exchange.

Items 2, 3, 4 and 5 of Schedule 1 will be removed by this amendment but are reflected in the new Schedule 1A ("Techniques which are not gene technology"), as described above.

Clause 23 of the regulation will also replace Schedule 2, Part 1 ("Exempt dealings") with an amended list of exempt dealings. Exempt dealings are dealings with GMOs that have been assessed over many years as presenting negligible biosafety risks to human health and safety and the environment. To be exempt the dealings must only be undertaken within appropriate containment facilities, as specified in regulation 6 and as amended by clause 6 above (equivalent to physical containment level 1). The following kinds of dealings will be described in the amended Part:

1. dealings with a genetically modified laboratory mouse or a genetically modified laboratory rat (unless an advantage is conferred on the animal, or the animal is capable of secreting an infectious agent, as a result of the genetic modification).

   The regulation listed dealings with 'gene-knockout mice', that is, mice whose genetic modification involves deletion or inactivation of a specific gene, as exempt dealings, provided that no advantage is conferred on the animal. This item will extend that exemption to all GM laboratory mice and laboratory rats, provided that they also do not secrete infectious agents as a result of the modification. This recognises the long history of use of laboratory mice and rats, their inherent low risk to people and the environment due to extensive selection and inbreeding, and their ability to be contained in the type of facilities required for exempt dealings.

2. dealings with a genetically modified *Caenorhabditis elegans* (unless an advantage is conferred on the animal, or the animal is capable of secreting an infectious agent, as a result of the genetic modification).

   As for item 1 above, this item recognises the long history of use of *C. elegans* (a commonly studied species of free-living nematode or round worm), their inherent low risk to people and the environment, and their ability to be contained in the type of facilities required for exempt dealings.

3. dealings with an animal into which genetically modified somatic cells have been introduced (unless the somatic cells are capable of giving rise to an infectious agent as a result of the genetic modification, or the animal is infected with a virus which is capable of recombining with the genetically

modified nucleic acid in the somatic cells).

This is very similar to item 3 of Schedule 2, Part 1, modified to clarify that the conditions which must be met in order to be classified as an exempt dealing relate to the genetic modification in the somatic cells. The risks posed by dealings with animals into which genetically modified somatic cells are introduced are minimal because the modification does not involve any changes to the genome of the animal. However the exemption does not apply if the somatic cells are capable of giving rise to infectious agents *as a result of the genetic modification*, or if the animal is infected with a virus which is capable of recombining with the *genetically modified nucleic acid* in the somatic cells, as these circumstances may increase risk and necessitate higher level containment conditions.

4. dealings involving approved host/vector systems (as listed in Part 2 of Schedule 2) and producing no more than 10 litres of GMO culture in a single vessel, provided that the donor nucleic acid presents a low risk (for example, it must not be uncharacterised nucleic acid from a pathogenic organism, or code for a toxin).

   This is very similar to item 4 of Schedule 2, Part 1. A host/vector system is a system facilitating introduction of a foreign gene or nucleic acid sequence into the host organism. Part 2 of Schedule 2 (Host/vector systems for exempt dealings) contains a list of hosts and corresponding vectors that have been studied and are considered to offer a high level of biological containment. This means that it is very difficult for the foreign nucleic acid to spread outside the host/vector system or the resulting GMO (the host with foreign nucleic acid in it), and unlikely that the GMO could survive outside a laboratory.

   While the use of such host/vector systems minimises risks, other criteria must be met in order for the dealing to be exempt. For example, in addition to using an approved host/vector system, the dealing must not use uncharacterised donor nucleic acid that is derived from an organism that is toxic or is implicated in disease in humans, animals, plants or fungi, or code for a product toxic to vertebrates. If the donor nucleic acid includes viral sequences, these must not be capable of leading to the production of replication competent virus particles, either on their own or through correcting a defect in the approved host/vector system. If the vector is able to transduce human cells (i.e. enter an intact human cell by interaction of the viral particle with the cell membrane), the donor nucleic acid must also not confer an oncogenic modification, as this has the potential to increase risk to the person undertaking the dealing.

5. dealings involving shot-gun cloning, or the preparation of a cDNA library, in approved host/vector systems (as listed in item 1 of Part 2 of Schedule 2) provided that the donor nucleic acid is not from a pathogen or a toxin-producing organism.

   This is similar to item 5 of Schedule 2, Part 1 but additionally encompasses cloning of nucleic acid from organisms other than mammals, including cDNA. This item recognises that nucleic acid from non-pathogenic and non-toxin-

producing organisms pose negligible biosafety risks in approved bacterial host/vector systems, and that shot-gun cloning and cDNA library construction (which produce large random collections of cloned nucleic acid fragments) have been occurring for many years in laboratories world-wide without any safety problems.

Clause 23 will also amend the list of approved host/vector systems at Schedule 2, Part 2 ("Host/vector systems for exempt dealings"). A host/vector system is a system facilitating introduction of a foreign gene or nucleic acid sequence into the host organism. Part 2 of Schedule 2 contains a list of hosts and corresponding vectors that have been studied and are considered to offer a high level of biological containment. This means that it is very difficult for the foreign nucleic acid to spread outside the host/vector system or the resulting GMO (the host with foreign nucleic acid in it), and unlikely that the GMO could survive outside a laboratory. Some additional hosts and vectors meeting these criteria will be added to the list by this amendment. An error in the numbering within this Part will also be corrected.

Further, item 5 of this Part (any host listed in items 1 - 4 with a "non-biological vector") will be replaced by the listing of "none (non-vector systems)" as a vector option for each listed host, as item 5 has caused some confusion within the regulated community. "Non-vector system" will be defined in Schedule 2, Part 2.3 (Definitions) as a system by which donor nucleic acid is introduced into a host in the absence of a nucleic acid-based vector. These amendments will thus specify a system facilitating introduction of nucleic acid into a listed host organism without a nucleic acid vector. Such a system offers a level of biological containment at least as high as a system involving a vector.

Clause 23 of the regulation will also amend Schedule 2, Part 3 (Definitions) by removing terms which are to be added to regulation 3 (Clause 5) or will no longer be used in the regulation, and by adding new definitions relevant to the amended Schedule 2 ("Dealings exempt from licensing").

Clause 23 of the regulation will also replace Schedule 3, Part 1 ("Dealings that are notifiable low risk dealings") with an amended list of dealings, and will correct a reference to a subsection in the note in this Part. NLRDs are dealings with GMOs that present minimal biosafety risks to human health and safety and the environment due to their pathogen, pest and biological containment properties. NLRDs must only be undertaken within appropriate, certified containment facilities, as specified in subsection 13(2) of the regulation (physical containment level 2 or other level considered suitable by the Regulator). Twelve kinds of dealings will be described as NLRDs in the amended Part (subject to them <u>not</u> also falling within Schedule 3, Part 2 – "Dealings that are not notifiable low risk dealings"):

(a) dealings involving modification of the genome of a whole animal to produce a novel whole organism, other than a laboratory mouse, laboratory rat or *Caenorhabditis elegans*.

This is very similar to paragraph (a) of Schedule 3, Part 1. The amended paragraph will not encompass dealings with GM mice, rats and *C. elegans*, as some dealings with these organisms are to be listed as exempt dealings by

amendment to items 1 and 2 of Schedule 2, Part 1 (Exempt dealings), as described above.

(aa) dealings involving genetically modified laboratory mice or rats if an advantage is conferred on the animal by the genetic modification, provided that the animal is not capable of secreting an infectious agent as a result of the genetic modification;

(ab) dealings involving genetically modified *Caenorhabditis elegans* if an advantage is conferred on the animal by the genetic modification, provided that the animal is not capable of secreting an infectious agent as a result of the genetic modification.

These two paragraphs will classify as NLRDs dealings with genetically modified mice, rats and *C. elegans*, which have an advantage (an increased ability to survive or reproduce) relative to the unmodified animal, as physical containment level 2 is appropriate to the risk posed by such GMOs.

(b) dealings involving a genetically modified plant if the dealing occurs in a facility designed to contain pollen, seed, spores and other propagules, and the invertebrate vectors of these;

(ba) dealings involving a genetically modified flowering plant if, before flowering, all inflorescences (groups or clusters of flowers) are enclosed so as to prevent escape of viable pollen and seed.

Paragraphs (b) and (ba) are similar to paragraph (b) of Schedule 3, Part 1. The amended paragraphs will additionally cover plants other than flowering plants. Dealings involving genetically modified plants being grown in physical containment level 2 facilities under conditions able to contain their reproductive material will be classified as NLRDs.

(c) dealings involving a host and vector that are not mentioned as a host/vector system in Schedule 2, Part 2 (Host/vector systems for exempt dealings), provided that the host and vector are not pathogenic organisms.

This is very similar to paragraph (c) of Schedule 3, Part 1. The amended wording is not intended to change the meaning but to improve clarity of this paragraph. Non-pathogenic organisms can be used as hosts and vectors in a NLRD.

(d) dealings involving a host and vector that are not mentioned as a host/vector system in Schedule 2, Part 2 (“Host/vector systems for exempt dealings”) if, while the host or vector is a pathogenic organism, the donor nucleic acid is characterised and will not alter the host range or mode of transmission, or increase the virulence, pathogenicity or transmissibility of the host or vector.

This is very similar to paragraph (d) of Schedule 3, Part 1. The amended wording is intended to improve clarity of this paragraph and ensure that potentially higher risk dealings are not included in NLRDs. Pathogenic

organisms can only be used as hosts and vectors in a NLRD if the introduced nucleic acid is known not to lead to new or increased disease risk from the host or vector.

(e) dealings involving a host/vector system mentioned in Schedule 2, Part 2 ("Host/vector systems for exempt dealings"), if the donor nucleic acid encodes a pathogenic determinant, is uncharacterised nucleic acid derived from a pathogen or, if the vector is able to transduce human cells, confers an oncogenic modification.

This is very similar to paragraph (e) of Schedule 3, Part 1. The amended wording is intended to improve clarity of this paragraph. Dealings involving particular types of inserted nucleic acid in approved host/vector systems merit higher containment than is required for exempt dealings, and are therefore classified as NLRDs. Thus dealings with nucleic acid which may increase the disease risk from the host or vector are classified as NLRDs. If the vector being used is able to transduce human cells (i.e. enter an intact human cell by interaction of the viral particle with the cell membrane), then a dealing involving an oncogenic modification will be classified as a NLRD, as this combination of factors has the potential to increase risk posed by the vector to the person undertaking the dealing.

(f) dealings involving a host/vector system mentioned in Schedule 2, Part 2 ("Host/vector systems for exempt dealings") and producing more than 10 litres of GMO culture in a single vessel, provided that the donor nucleic acid presents a low risk (for example, it must not be uncharacterised nucleic acid from a pathogenic organism, or code for a toxin) and that the dealing is conducted in a facility that is certified by the Regulator as a large scale facility to at least physical containment level 2.

This paragraph will classify as NLRDs those dealings which will be exempt dealings (under Schedule 2, Part 1 item 4) except for the fact that they involve large-volume cultures. These dealings are of low risk but the large culture volumes warrant higher containment conditions than are normally required for exempt dealings. Risk management conditions required by physical containment level 2 guidelines, which is the default for NLRDs, are appropriate.

(g) dealings involving complementation of knocked-out genes, if the complementation does not alter the host range or mode of transmission, or increase the virulence, pathogenicity, or transmissibility of the host above that of the parent organism before the genes were knocked-out.

This paragraph will classify as NLRDs those dealings where an organism (which may be a pathogen), which has previously had gene(s) deleted (or "knocked-out"), has the same or equivalent gene(s) reintroduced, as long as this does not lead to new or increased disease risk relative to the organism *before* the genes were knocked-out. This recognises that dealing with the GMO will not be more risky than dealing with the original, un-modified organism.

(h) dealings involving shot-gun cloning, or the preparation of a cDNA library, in a host/vector system mentioned in item 1 of Schedule 2, Part 2 ("Host/vector systems for exempt dealings"), if the donor nucleic acid is derived from either a pathogen or a toxin producing organism.

This paragraph will classify as NLRDs those dealings involving shot-gun cloning and cDNA library construction (which produce large random collections of cloned nucleic acid fragments), in approved bacterial host/vector systems, that are excluded from being exempt dealings due to the origin of the donor nucleic acid. This recognises that shot-gun cloning and cDNA library construction has been occurring for many years in laboratories world-wide without any safety problems but provides for higher containment conditions (physical containment level 2, the default for NLRDs) than is required for exempt dealings, due to potential risks associated with source of the donor nucleic acid.

(i) dealings involving introduction of a replication defective retroviral vector able to transduce human cells into a host mentioned in Schedule 2, Part 2 ("Host/vector systems for exempt dealings") if the donor nucleic acid is incapable of correcting a defect in the vector leading to production of replication competent virions.

This paragraph will classify as NLRDs those dealings in approved hosts involving retroviral vectors which are only excluded from being exempt vectors due to their ability to transduce human cells (i.e. enter an intact human cell by interaction of the viral particle with the cell membrane). Risk management conditions required by physical containment level 2 guidelines, which is the default for NLRDs, are appropriate for such dealings with replication defective retroviruses.

Clause 23 of the regulation will also delete clause 1.2 (Definitions) of Schedule 3, Part 1 as there will no longer be any definitions specific to this part.

Clause 23 of the regulation will also replace Schedule 3, Part 2 ("Dealings that are not notifiable low risk dealings") with an amended list of dealings. This Part qualifies Part 1, describing higher risk dealings that must be licensed before being conducted. Under subsection 47(1) of the Act, the Regulator must prepare a risk assessment and risk management plan before issuing a licence. If the Regulator decides to issue a licence, the Regulator may, under paragraph 55(b) of the Act, impose risk management conditions on the licence. Fourteen kinds of dealings are described as not NLRDs in the amended Schedule 3, Part 2, as detailed below:

(a) dealings involving cloning of nucleic acid encoding a toxin having an $LD_{50}$ of less than 100 µg/kg, except for shot-gun cloning or cDNA library preparation;

(b) dealings involving high level expression of toxin genes, even if the $LD_{50}$ is 100 µg/kg or more;

(c) dealings involving cloning of uncharacterised nucleic acid from toxin-producing organisms, except for shot-gun cloning or cDNA library preparation.

These paragraphs are very similar to paragraphs (a), (b) and (c) of Schedule 3, Part 2, which require licensing for most dealings involving cloning and expression of toxin genes, due to potential risks posed by the toxins. However the amended wording in paragraphs (a) and (c) will provide that a dealing mentioned in new paragraph 1.1(h) of Schedule 3, Part 1 ("Dealings that are notifiable low risk dealings"), relating to shot gun cloning and construction of cDNA libraries, will not be excluded from being a NLRD by these provisions.

(d) dealings involving viral vectors with nucleic acid encoding oncogenic modifications, immunomodulatory molecules, cytokines or growth factors/signalling molecules that may lead to cell proliferation, unless the host/vector systems is listed in Schedule 2, Part 2 ("Host/vector systems for exempt dealings") or in new paragraph 1.1(i) of Schedule 3, Part 1 ("Dealings that are notifiable low risk dealings").

This paragraph is similar to paragraph (d) of Schedule 3, Part 2. The amended wording is intended to improve clarity and specificity with respect to the types of nucleic acid that are of particular concern when used in viral vectors other than as part of an approved host vector system, and which will therefore require licensing. For example, nucleic acid which may lead to unregulated cell growth or interfere with the function of the immune system. For this paragraph, approved host/vector systems include those listed in Schedule 2, Part 2 and those described in new paragraph 1.1(i) of Schedule 3, Part 1 (relating to certain replication defective retroviral vectors in hosts listed in Schedule 2, Part 2).

(e) dealings involving a pathogenic micro-organism as host or vector, except where: (i) the host/vector system is a system mentioned in Schedule 2, Part 2 ("Host/vector systems for exempt dealings"); or (ii) the donor nucleic acid is characterised and is not known to lead to new or increased disease risk from the host or vector; or (iii) the dealing is mentioned in paragraph 1.1(g) of Schedule 3, Part 1 ("Dealings that are notifiable low risk dealings").

This paragraph is similar to paragraph (e) of Schedule 3, Part 2. The amended wording is intended to improve clarity of this paragraph with respect to what characteristics of a host or vector may be associated with new or increased disease risk, and therefore which dealings are required to be licensed. The amendment will also provide that a dealing mentioned in paragraph 1.1(g) of Schedule 3, Part 1, relating to complementation of knocked-out genes, will not be excluded from being a NLRD by this provision.

(f) dealings involving the introduction, into a micro-organism, of nucleic acid encoding a pathogenic determinant, unless the micro-organism is a host mentioned in Schedule 2, Part 2 ("Host/vector systems for exempt

dealings"), or the dealing is mentioned in paragraph 1.1(g) of Schedule 3, Part 1 ("Dealings that are notifiable low risk dealings").

This paragraph is very similar to paragraph (f) of Schedule 3, Part 2. The amended wording will improve clarity with respect to what nucleic acid is of concern for pathogenicity of host micro-organisms, other than approved hosts, and therefore which dealings are required to be licensed. The amendment will also provide that a dealing mentioned in paragraph 1.1(g) of Schedule 3, Part 1, relating to complementation of knocked-out genes, will not be excluded from being a NLRD by this provision.

(g) dealings involving the introduction into a micro-organism, other than a host mentioned in Schedule 2, Part 2 ("Host/vector systems for exempt dealings"), of genes whose expressed products have a heightened risk of inducing an autoimmune response.

This paragraph is unaltered from paragraph (g) of Schedule 3, Part 2. It requires dealings to be licensed if the GMO may pose a high risk, to an individual who is accidentally exposed to the GMO, due to its potential to induce an autoimmune response.

(h) dealings involving use of part(s) of viral or viroid genomes to produce a novel replication competent virus with altered host range or mode of transmission, or increased virulence, pathogenicity or transmissibility relative to any parent or donor organism.

This paragraph combines paragraphs (h) and (i) of Schedule 3, Part 2. The paragraph will improve clarity regarding the types of risks which must be considered in relation to genetically modifying viruses and viroids, requiring licensing where there is new or increased disease risk from a GM replication competent virus or viroid, relative to the unmodified virus or viroid.

(i) dealings involving a lentiviral vector able to transduce human cells unless the vector and packaging cell line have been specifically developed to reduce the risk of formation of replication competent viral particles.

This is a new paragraph which will require licensing of certain dealings with vectors derived from lentiviruses, a subfamily of retroviruses. Lentiviral gene delivery vectors, based on the human or animal immunodeficiency viruses, are being explored for gene therapy and for the production of genetically modified animals. Recombination between these vectors and endogenous viral sequences has the potential to generate replication competent lentivirus, presenting a risk to the people involved in the dealing. However, characteristics incorporated into recently developed lentiviral vector systems (removal of certain genes and regulatory sequences) greatly reduce the possibility of this happening. This new paragraph will require licensing for dealings with lentiviruses able to transduce human cells if they do not have these safety features. Lentiviral vector systems having these safety features will be regulated in the same manner as other defective retroviral vectors.

(j) dealings involving a genetically modified animal, plant or fungus that is capable of secreting or producing infectious agents as a result of the genetic modification.

This paragraph is very similar to paragraph (j) of Schedule 3, Part 2. The amended wording will improve clarity. Dealings where the genetic modification of an animal, plant or fungus leads to production of an infectious agent are required to be licensed.

(k) dealings producing more than 10 litres of GMO culture in a single vessel, other than a dealing mentioned in paragraph 1.1 (f) of Part 1 ("Dealings that are notifiable low risk dealings") of this Schedule.

This paragraph is very similar to paragraph (k). It requires licensing for dealings involving large-volume GMO cultures. The amended paragraph will provide that dealings in which the donor nucleic acid presents a low risk (for example, it must not be uncharacterised nucleic acid from a pathogenic organism, or code for a toxin), are not excluded from being NLRDs by this paragraph.

(l) dealings that are inconsistent with a policy principle issued by the Ministerial Council.

This paragraph is unaltered from paragraph (l) of Schedule 3, Part 2. It requires licensing for dealings that are inconsistent with a policy principle issued by the Ministerial Council, so that these dealings will be individually assessed by the Regulator.

(m) dealings involving the intentional introduction of a GMO into a human being.

This is a new paragraph which will require dealings involving intentional introduction of a GMO into a human (e.g. a clinical trial of a live GMO vaccine) be licensed. Risks to human health associated with such dealing warrant individual assessment by the Regulator.

(n) dealings involving a genetically modified pathogenic organism, if the practical treatment of any disease or abnormality caused by the organism will be impaired by the genetic modification.

This is a new paragraph which will require licensing for dealings involving a genetically modified pathogenic organism, where the genetic modification could make the disease more difficult to treat. Risks to human health and the environment associated with possible impairment of treatment of disease warrant assessment by the Regulator.

Clause 23 of the regulation will also omit Schedule 3, Part 3 ("Prescribed information – notification of proposed notifiable low risk dealing"). Clause 19 will require the notification be in the form approved by the Regulator, rather than providing the information specified in Schedule 3, Part 3, allowing the form to specify the

information requirements related to the notification. This will allow the Regulator to update the information requirements quickly in response to advances in the knowledge and practice of gene technology, thus enhancing the effectiveness and efficiency of the regulatory system.

Clause 23 of the regulation will also omit Schedule 4 ("Prescribed information – application for a licence"). Clause 4 of the regulation will omit reference to Schedule 4. Subsection 40(2) of the Act requires an application for licence to contain such information as is: (a) prescribed in the regulation; and (b) specified in writing by the Regulator. The application form will specify the information required by the Regulator under paragraph 40(2)(b) of the Act. This will allow the Regulator to update the information requirements quickly in response to advances in the knowledge and practice of gene technology, thus enhancing the effectiveness and efficiency of the regulatory system.

**Clause 24: Insert "ethics and community committee" in Dictionary, note 3**
Clause 24 is a consequential amendment with the insertion required due to the amalgamation of committees discussed in clauses 10 and 11 resulting in the formation of the ethics and community committee.

**Clause 25: Substitute a modified definition of "advantage" in Dictionary in Dictionary, note 3**
The definition of "advantage" has been modified to reflect its specific meaning in the regulation (to refer to "organism" rather than to "adult animal").

**Clause 26: Substitute a modified definition of "characterised" in Dictionary**
The definition of "characterised" has been modified to reflect its specific meaning in the regulation (to refer to "nucleic acid" rather than to "DNA").

**Clause 27: Omit definitions of "division 5.3 application" and "division 5.4 application"**
The definitions of "division 5.3 application" and "division 5.4 application" will be deleted as a consequential amendment required by the omission of schedule 4 as described in clause 23.

**Clause 28: Substitute a modified definition of "expert adviser" in Dictionary**
This clause makes a consequential amendment so that the definition of expert advisers in the regulation refers to the new section of the proposed Act relating to the creation of the new Gene Technology Ethics and Community Consultative Committee (GTECCC) that mentions expert advisers.

**Clause 29: Omit definition of "gene-knockout mice"**
The definition of "gene-knockout mice" will be deleted, as its use will be removed by other items in the regulation, namely the fact that exempt dealings will extend to all GM laboratory mice and laboratory rats, provided that they also do not secrete infectious agents as a result of the modification. This is a consequential amendment (refer clause 23).

**Clause 30: Omit definition of "genetic manipulation advisory committee"**
The definition of "genetic manipulation advisory committee" will be deleted as it is now redundant. References to this committee related to the transitional arrangements from the former voluntary scheme, overseen by the Genetic Manipulation Advisory Committee (GMAC), to the current regulatory scheme under the Act.

**Clause 31: New definitions of "genetically modified laboratory mouse" and "genetically modified laboratory rat"**
The use of these terms will be introduced by the regulation, and will be defined in this item (refer to clauses 23 and 28).

**Clause 32: Omit definition of "inclusion-negative"**
This is a consequential amendment. The term "inclusion-negative" is no longer used in the regulation as a result of amendments in clause 23 to schedule 2.

**Clauses 33 and 34: Insert new dictionary definitions for "infectious agent"; "known"; "non-conjugative plasmid"; "nucleic acid"; "pathogenic"; "plasmid"; "non-vector system"; "oncogenic modification"; "packaging cell line"; and "pathogenic determinant".**
The following terms are used but not defined in the regulation, and will be defined in this clause: *infectious agent*; *known*; *non-conjugative plasmid*; *nucleic acid*; *pathogenic*; and *plasmid*. The definitions will increase clarity of clauses where these terms are used.

The use of the following terms will be introduced by the regulation and will be defined in this clause: *non-vector system*; *oncogenic modification*; *packaging cell line*; and *pathogenic determinant*.

**Clause 35: Omit definition of "recombinant"**
This is a consequential amendment required due to amendments proposed in clause 23 as this term is no longer used in the context previously referred to in the regulation.

**Clause 36: Substitute definition of "shot-gun cloning"**
The definition of this term will be amended by this clause (to remove reference to "mammalian DNA", thus making the definition more general).

**Clause 37: Insert new dictionary definitions for "toxin", "toxin producing organism" and "transducer"**
The use of these terms will be introduced by the regulation and will be defined by this clause.