



**Australian Government**

**Department of Health and Ageing**

**Office of the Gene Technology Regulator**

# **Licence for dealings involving an intentional release of a GMO into the environment**

**Licence No.: DIR 070/2006**

**Licence holder: BSES Limited**

**Title: Limited and controlled release of GM sugarcane with altered plant architecture, enhanced water or improved nitrogen use efficiency**

Issued: 13 February 2007  
Varied: 18 December 2009  
Varied: 14 May 2010

**More information about the decision to issue this licence is contained in the Risk Assessment and Risk Management Plan prepared in connection with the assessment of the application for the licence. This document can be obtained from the Office of the Gene Technology Regulator website at <<http://www.ogtr.gov.au>>, or by telephoning the Office on 1800 181 030.**

## **Gene Technology Regulation in Australia**

Australia's gene technology regulatory system operates as part of an integrated legislative framework. The *Gene Technology Act 2000* (Cth) and corresponding state and territory legislation form a substantial part of a nationally consistent regulatory system controlling the development and use of genetically modified organisms (GMOs).

The Gene Technology Regulator is required to consult with, and take into account advice from a range of key stakeholders, including regulatory authorities, on risks to human health and safety and to the environment in assessing applications for dealings involving the intentional release of GMOs into the Australian environment.

Other agencies that also regulate GMOs or GM products include Food Standards Australia New Zealand, Australian Pesticides and Veterinary Medicines Authority, Therapeutic Goods Administration, National Industrial Chemicals Notification and Assessment Scheme, National Health and Medical Research Council and Australian Quarantine and Inspection Service. Dealings conducted under any licence issued by the Regulator may also be subject to regulation by one or more of these agencies. It is recommended that the licence holder consult the relevant agency (or agencies) about their regulatory requirements.

Dealings permitted by this licence may also be subject to the operation of State legislation declaring areas to be GM, GM free, or both, for marketing purposes.

### **Note about where dealings with GMOs are being undertaken pursuant to this**

Information about where the GMOs have been planted pursuant to this licence can be found in a separate document entitled 'DIR 070/2006 Site Details'. This document can be viewed by accessing the document on the OGTR website at <http://www.ogtr.gov.au/ir/dir070.htm>.

## **Section 1 Interpretations and Definitions**

In this licence:

- (a) unless defined otherwise in this licence, words and phrases used in this licence have the same meaning as they do in the Act and the Regulations;
- (b) words importing a gender include any other gender;
- (c) words in the singular include the plural and words in the plural include the singular;
- (d) words importing persons include a partnership and a body whether corporate or otherwise;
- (e) references to any statute or other legislation (whether primary or subordinate) are a reference to a statute or other legislation of the Commonwealth of Australia as amended or replaced from time to time and equivalent provisions, if any, in corresponding State law, unless the contrary intention appears;
- (f) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form in respect of that word has a corresponding meaning;
- (g) specific conditions prevail over standard conditions to the extent of any inconsistency.

In this licence:

**‘Act’** means the *Gene Technology Act 2000* (Cth) or the corresponding State legislation under which this licence is issued.

**‘Annual Report’** means a written report provided to the Regulator within ninety (90) days of each anniversary of issue of this licence containing all the information required by this licence to be provided in the Annual Report.

**‘Clean’** (or **‘Cleaned’**), as the case requires, means:

- (a) in relation to a Place specified in this licence as requiring Cleaning, the Destruction of the Plant Material in that Place, to the reasonable satisfaction of the Regulator; or
- (b) in relation to Equipment, the removal and Destruction of the GMOs, Guard Row Plants and Plant Material from the Equipment, to the reasonable satisfaction of the Regulator.

**‘Crush’** (or **‘Crushed’** or **‘Crushing’**) means processing of harvested Sugarcane to extract Sugarcane juice.

**‘Deal With’** in relation to a GMO means one or more of the following, as applicable:

- (a) conduct experiments with the GMO;
- (b) make, develop, produce or manufacture the GMO;
- (c) breed the GMO;
- (d) propagate the GMO;
- (e) use the GMO in the course of manufacture of a thing that is not a GMO;

- (f) grow, raise or culture the GMO;

and includes the possession, supply, use, transport or disposal of the GMO for the purposes of, or in the course of, a dealing mentioned in any of paragraphs (a) to (f).

**‘Destroy’**, (or **‘Destroyed’** or **‘Destruction’**) means, as the case requires, killed by one or more of the following methods:

- (a) uprooting by ploughing;
- (b) rotary hoeing;
- (c) mulching by machine;
- (d) treatment with herbicide;
- (e) slashing;
- (f) crushing;
- (g) autoclaving;
- (h) burning;
- (i) hand weeding, or
- (j) a method approved in writing by the Regulator.

*Note: ‘As the case requires’ has the effect that depending on the circumstances, one or more of these techniques may not be appropriate. For example, used individually, treatment by uprooting by ploughing or slashing would not be sufficient mechanisms to kill the plant material and would require an additional treatment such as herbicide or burning, respectively.*

**‘Equipment’** includes harvesters, seeders, storage equipment, transport equipment (eg bags, containers, trucks), clothing and tools.

**‘GM’** means genetically modified.

**‘GMO’** means the genetically modified organism the subject of the dealings authorised by this licence.

**‘Guard Row’** means at least one (1) row of non-GM Sugarcane located at least one and one half (1.5) metres and not more than three (3) metres from, and entirely surrounding, a Location, and grown in such a way as to reasonably promote growth commensurate with the growth of the GMOs.

**‘Guard Row Plant’** means non-GM Sugarcane.

**‘Isolation Zone’** means an area of land extending at least six (6) metres in all directions from the outer edge of the Guard Row in which no crop of any kind is grown while the GMOs are planted and growing at the Location.

**‘Location’** means an area of land where the GMOs or other plants are planted and grown pursuant to this licence, but does not include the Guard Row.

**‘Natural Waterways’** means waterways other than irrigation channels, holding dams or storage ponds used to collect water runoff from irrigated areas.

**‘OGTR’** means the Office of the Gene Technology Regulator.

**‘Personal information’** means information or an opinion (including information forming part of a database), whether true or not, and whether recorded in a material

form or not, about an individual whose identity is apparent, or can reasonably be ascertained, from the information or opinion.

**‘Place’** means an area required to be Cleaned and/or inspected in respect of that Location.

**‘Plant Material’** means any part of the GM or non-GM Sugarcane plants grown at a location or Guard Row; whether viable or not, including, but not limited to, seed, pollen, stems, stem sections, leaves and plant bases, whether from the plant itself or produced by the plant.

**‘Regulator’** means the Gene Technology Regulator.

**‘Sign-off’** means a notice in writing from the Regulator, in respect of a Place or a Location, whichever applies, that post-harvest inspection conditions no longer apply in respect of that Place or Location.

**‘Site’** means the aggregate of all Places for each Location, as relevant, within the Queensland local government area of either:

- (a) Bundaberg, or,
- (b) Moreton Bay, or,
- (c) Cairns.

**‘Sugarcane’** means plants of the species *Saccharum* spp.

**‘Volunteer Plants’** means progeny of the GMOs or Guard Row Plants, or regrowth of previous GM or non-GM Sugarcane plants.

## **Section 2 General conditions**

### **Duration of Licence**

1. This licence remains in force until it is suspended, cancelled or surrendered. No dealings with GMOs are authorised during any period of suspension.

### **Holder of Licence**

2. The holder of this licence ('the licence holder') is BSES Limited.

### **Project Supervisor**

3. The Project Supervisor in respect of this licence is the person identified in Attachment A.

4. The licence holder must immediately notify the Regulator in writing if any of the contact details of the Project Supervisor change.

### **No dealings with the GMOs except as authorised by this licence**

5. Persons covered by this licence must not deal with the GMOs except as expressly permitted by this licence.

### **Persons covered by this GMO licence**

6. The persons covered by this licence are the licence holder and employees, agents or contractors of the licence holder and other persons who are, or have been, engaged or otherwise authorised by the licence holder to undertake any activity in connection with the Dealings authorised by this licence.

### **Informing people of their obligations**

7. The licence holder must inform any person covered by this licence, to whom a particular condition of this licence applies, of the following:

- (a) the particular condition (including any variations of it);
- (b) the cancellation or suspension of the licence;
- (c) the surrender of the licence.

8. (a) Prior to a person covered by this licence conducting any Dealings, the licence holder must obtain signed statements from those persons that the licence holder has informed those people of the conditions of this licence that apply to them and that they have understood the conditions and agree to be bound by them. The licence holder must provide the Regulator, on the Regulator's written request, with copies of these signed statements from persons covered by this licence.

(b) The immediately preceding condition does not apply to conditions imposed by way of variation to the licence. Where a variation to a licence imposes a new condition, the licence holder must notify persons to whom the condition applies within the time period, and in the manner, stipulated by the Regulator at the time the licence is varied.

9. The licence holder must notify the project supervisor and all persons covered by a licence that Personal Information collected by the licence holder which is relevant to the administration and/or enforcement of the licence may be released to the Regulator.

**Licence holder to notify of circumstances that might affect suitability**

10. The licence holder must immediately, by notice in writing, inform the Regulator of:

- (a) any relevant conviction of the licence holder occurring after the commencement of this licence;
- (b) any revocation or suspension of a licence or permit held by the licence holder under a law of the Australian Government, a State or a foreign country, being a law relating to the health and safety of people or the environment;
- (c) any event or circumstances occurring after the commencement of this licence that would affect the capacity of the holder of this licence to meet the conditions in it.

**Licence holder must provide information on matters related to suitability**

11. The licence holder must provide information related to the licence holder's ongoing suitability to hold a licence when requested to do so in writing by the Regulator and must provide the information within a time period stipulated by the Regulator.

**Additional information to be given to the Regulator**

12. It is a condition of this licence that the licence holder informs the Regulator if the licence holder:

- (a) becomes aware of additional information as to any risks to the health and safety of people, or to the environment, associated with the dealings authorised by the licence; or
- (b) becomes aware of any contraventions of the licence by a person covered by the licence; or
- (c) becomes aware of any unintended effects of the dealings authorised by the licence.

*Note: The Act requires, for the purposes of the above condition that:*

- a. the licence holder will be taken to have become aware of additional information of a kind mentioned in the above condition if he or she was reckless as to whether such information existed; and*
- b. the licence holder will be taken to have become aware of contraventions, or unintended effects, of a kind mentioned in the above condition if he or she was reckless as to whether such contraventions had occurred, or such unintended effects existed.*

13. The licence holder must provide the information required by paragraphs (a), (b) and (c) of condition 12 to the Regulator as soon as practically and reasonably possible, and must also include the information in the Annual Report.

**People dealing with GMOs must allow auditing and monitoring of the dealing**

14. If a person is authorised by this licence to deal with GMOs and a particular condition of this licence applies to the dealing by that person, the person must allow the Regulator, or a person authorised by the Regulator, to enter premises where the dealing is being undertaken, for the purposes of auditing or monitoring the dealing.

15. The licence holder must be able to access and control all Sites to the extent necessary to comply with this licence, for the duration of the life of the licence.

***Remaining an Accredited organisation***

16. The licence holder must, at all times, remain an accredited organisation in accordance with the Act and comply with its instrument of accreditation.

***Notices***

17. The licence holder must provide all notices to the Regulator required to be given by this licence and each notice must be provided in the manner required by Section 6 of this licence.

***Section 3 Growing the GMOs***

***GMOs covered by this licence***

18. The GMOs covered by this licence are described in Attachment B of the licence.

***Permitted dealings***

19. The permitted dealings with the GMOs are to plant, grow, propagate, harvest and conduct experiments with the GMOs, and the possession, supply, use, transport and disposal of the GMOs for the purpose of any of the permitted dealings with the GMOs, or in the course of any of these dealings.

***Non- GM Plants***

20. Non-GM Sugarcane may be planted and grown at a Location, but if planted, must be handled and controlled as if it were the GMOs (ie subject to other applicable conditions elsewhere in this licence).

21. Plant Material from non-GM Sugarcane grown at the same Locations must be handled and controlled as if it were Plant Material from the GMOs (ie subject to other conditions elsewhere in this licence).

***Locations, growing season and size of trial***

22. The permitted dealings with the GMOs may be undertaken between the period of February 2007 and November 2010 within the Queensland local government areas of Bundaberg, Moreton Bay and Cairns.

23. No more than three (3) Locations may be used in any one season. Each of the three Locations used must not exceed two (2) hectares in size.

***Notice of intention to plant and of planting***

24. The licence holder must, in the manner required by condition 59, give advance notice to the Regulator of an intention to plant the GMOs.

25. The licence holder must, in the manner required by condition 60, give notice to the Regulator of the actual date of planting the GMOs.

***Containment Measures***

26. Each Location must be surrounded by a Guard Row, located at least one and one half (1.5) metres and not more than three (3) metres from the outer edge of the GM Sugarcane and an Isolation Zone.

27. The Guard Row must contain only non-GM Sugarcane grown in such a way as to reasonably promote a dense and vigorous growth.
28. The outer edge of the Guard Row must not be within fifty (50) metres of a Natural Waterway.
29. Guard Row Plants must be handled and controlled as if they were the GMOs (ie subject to other applicable conditions elsewhere in this licence) and Plant Material from Guard Row Plants must be handled and controlled as if it were Plant Material from the GMOs (ie subject to other applicable conditions elsewhere in this licence).

#### **Section 4 Use of Plant Material, Cleaning and Disposal of Plant Material**

##### ***Plant Material not to be used as food***

30. GM, non-GM and Guard Row Sugarcane, and Plant Material must not be used, sold or otherwise disposed of for any purpose which would involve or result in their use as food for animals or humans.

##### ***Notice of Harvest and Cleaning following harvest***

31. The licence holder must, in the manner required by condition 61 provide the Regulator with a notice of intention to harvest the GMOs at each Site.
32. The licence holder must, in the manner required by condition 62, provide the actual date or dates of harvesting of the GMOs at each Site.

##### ***Harvest and post-harvest procedures***

33. If the GM, non-GM or Guard Row Plants are harvested, they must be harvested separately from any other crop.
34. If harvested, GM, non-GM and Guard Sugarcane may be Crushed, but if so they must be Crushed separately from any other Sugarcane.

##### ***Use and storage of Plant Material***

35. Plant Material obtained from harvest must be Destroyed as soon as practicable unless:
- (a) used for planting in a subsequent growing season in accordance with this licence; or
  - (b) used in accordance with another relevant authorisation under the Act; or
  - (c) used in the course of destructive experimental analysis; or
  - (d) stored for the purposes of paragraphs (a), (b) or (c) in either:
    - i. a facility certified by the Regulator as a PC2 facility; or
    - ii. a facility approved in writing by the Regulator and signed so as to indicate that GM Plant Material is stored within the facility;or
  - (e) stored for the purposes of Destruction in a Holding Area which is authorised under licence DIR096, provided the Plant Material originates from the same BSES research station as the authorised Holding Area;
  - (f) transported for any of the above purposes.

*Note: For the immediate preceding condition, if a Holding Area authorised under licence DIR 096 is used for the storage and Destruction of Plant Material originating from this licence the Plant Material would be subject to all requirements for inspection, reporting and Sign-off of the Holding Area in accordance with licence DIR 096.*

### **Transportation of Plant Material**

36. Unless occurring within a BSES station, any Plant Material transported must be transported in accordance with the guidelines for the transportation of GM Plant Material found in the Regulator's *Guidelines for the Transport of GMOs* as current at the time of transportation.

37. Within a BSES station, Plant Material may only be transported in accordance with conditions 38 or 39, as applicable, or in accordance with the Regulator's *Guidelines for the Transport of GMOs* as current at the time of transportation.

38. Transportation of GM Sugarcane stalk material within a BSES station for planting or for destructive analysis may be undertaken if:

- (a) the GM sugarcane stalk material is bundled and labelled (eg with a barcode);
- (b) the bundled material is transported in a covered trailer;
- (c) the trailer is followed and observed to ensure that no stalk material is lost during transportation;
- (d) all transported material is accounted for at the destination (eg by scanning barcode labels).

39. Transportation of harvested GM Sugarcane Plant Material within a BSES station may be undertaken if:

- (a) Plant Material is in a truck which is covered securely (eg with a tarpaulin) so as to fully contain the material;
- (b) the truck is followed and observed to ensure that no material is lost during transportation.

*Note: Movement of GM Plant Material within areas required to be inspected and Signed off under this licence is not regarded as transportation or subject to restrictions, provided that it is carried out prior to Cleaning of those areas. For example, prior to Cleaning of a Location, Harvested Plant Material may be moved from the Location, across the associated Guard Row and Isolation Zone to an area immediately adjacent to the Isolation Zone at which the Plant Material will be Destroyed.*

40. For all transport of GM plant material the licence holder must have in place accounting procedures to ensure the same quantity of Plant Material sent is delivered and must document routes, methods and procedures used for transportation of Plant Material.

41. After any experiments with the material from the GMOs are completed, the Plant Material must be Destroyed.

### ***Cleaning – post harvest and generally***

42. Cleaning of Equipment must occur immediately or as soon as practicable after use and before it is used for any other purpose (eg equipment used to Crush GM Sugarcane must be Cleaned before it is used to Crush other Sugarcane).
43. The following Places must be Cleaned within 14 days of their use for any of the indicated purposes:
- (a) any areas used to Clean Equipment;
  - (b) any areas used to process or Crush Plant Material; or
  - (c) any area used to Destroy the GMOs or Plant Material.
44. The following Places must be Cleaned within fourteen (14) days of harvest or Destruction of the GMOs unless the Location is to be replanted or ratooned:
- (a) the Location;
  - (b) Guard Row; and
  - (c) Isolation Zone.
45. The licence holder must, in a manner required by the condition in paragraph 63, give notice to the Regulator of the date on which Cleaning of the Place concluded.

## ***Section 5 Use of Site, Inspection and Sign-off***

### ***General conditions on use of Locations post-harvest***

46. If the GMOs are grown at a Location, no plants may be planted at the Location, or the Guard Row in respect of the Location, until inspection obligations are completed unless the plants are plants agreed to in writing by the Regulator.

### ***Inspection***

47. After Cleaning, the following Places must be inspected for the existence of Volunteer Plants:
- (a) the Location;
  - (b) the Guard Row;
  - (c) the Isolation Zone;
  - (d) any areas used to Clean Equipment;
  - (e) any areas used to Destroy the GMOs or Plant Material.
48. Inspection must be performed by a person who is able to recognise Volunteer Plants.
49. Any Volunteer Plant must be destroyed within one (1) week of being detected.
50. All Places required to be inspected must be inspected at least once every two (2) months commencing on the last day of Cleaning of the Place and continuing until the Regulator has issued a Sign-off for the Place.
51. The results of inspection activities must be recorded in a logbook or paper file. The licence holder must, in the manner required by the condition in paragraph 65, provide the Regulator with the findings of the inspections as recorded in the logbook or paper file.

52. Inspection conditions do not apply in respect of a Place if the licence holder has received a Sign-off for that Place.

**Sign off**

53. For each Place,

- (a) if inspections have been routinely completed for a period of at least twelve (12) months, and,
- (b) if inspection records for that Place show that no Volunteers have been observed in the most recent six (6) month inspection period,

the licence holder may make written application to the Regulator that these inspection conditions no longer apply to the Place.

## **Section 6 Reporting and Documentation Requirements**

### **Compliance Management Plan**

54. Prior to growing the GMOs, a written Compliance Management Plan must be provided to the Regulator. The Compliance Management Plan must describe in detail how the licence holder intends to ensure compliance with each of these conditions and document that compliance and must include:

- (a) A list of the names of all organisations or natural persons who will be persons covered by this licence. Where a name of a person is not known at the time of submitting the Compliance Management Plan the function or position of the person to be covered must be provided.

*Note: Examples of functions or positions are 'Site manager', 'Farm labourer' etc.*

- (b) An explanation of how the licence holder has informed, or proposes to inform, each person intended to be covered by the licence of the conditions of this licence including conditions related to the collection of personal information by the licence holder from the person intended to be covered by the licence.
- (c) A description of the responsibilities of the licence holder and of each person covered by the licence in relation to the requirements of this licence.
- (d) A description of how any contracts, agreements, or other enforceable arrangements between the licence holder and persons covered by the licence will allow the licence holder to access and control a Site to the extent necessary to comply with this licence, for the duration of the life of the licence.
- (e) A description of the licence holder's plans for post harvest use of a Site during the life of this licence.

55. Where any of the details of the compliance management plan change, the Regulator must be notified of the changes within fourteen (14) days of the change occurring.

### **Contingency Plan for unintended presence of Plant Material**

56. Within thirty (30) days of the date of issue of this licence, a written Contingency Plan must be submitted to the Regulator detailing measures to be taken in the event of

the unintended presence of the GMOs, Guard Row Plants or Plant Material, outside an area that must be inspected.

57. The Contingency Plan must include details of procedures to:

- (a) ensure the Regulator is notified immediately if the licence holder becomes aware of the event;
- (b) Destroy any of the GMOs, Guard Row Plants or Plant Material; and
- (c) inspect for and Destroy any Volunteer Plants that may exist as a result of the event.

58. The Contingency Plan must be implemented in the event that the unintended presence of the GMOs, Guard Row Plants and Plant Material is discovered outside an area that must be inspected.

***Notice of intention to plant and of planting***

59. At least seven (7) days prior to the date on which planting of the GMOs is intended to commence, the licence holder must provide a notice in writing to the Regulator which contains:

- (a) the date on which planting of the GMOs is intended to commence;
- (b) the date on which planting of any non-GM Sugarcane at the Site is intended to commence;
- (c) details of the Site where the GMOs will be planted, including the size of the Site, a street address and GPS coordinates for the Site;
- (d) the period during which the licence holder considers the GMOs are likely to be harvested;
- (e) the period during which the licence holder considers the GMOs are likely to be Destroyed;
- (f) a description of how the Site is intended to be used during the first two (2) years following harvest of the GMOs.

60. Within seven (7) days of planting of the GMOs, the licence holder must provide a notice in writing to the Regulator which contains:

- (a) the actual date on which planting of the GMOs occurred;
- (b) details of the Site where the GMOs were planted, including the size of the Site, a street address and GPS coordinates for the Site;
- (c) the period during which the licence holder considers the GMOs are likely to be harvested
- (d) the period during which the licence holder considers the GMOs are likely to be Destroyed; and
- (e) a description of how the Site is intended to be used during the first two (2) years following harvest of the GMOs.

***Notice of harvest and Cleaning following harvest***

61. The licence holder must provide the Regulator with a notice of intention to harvest the GMOs at the Location. This notice must be provided at least seven (7) days, and not more than twenty one (21) days, in advance of the intended date of

harvest set out in the notice. Any change of intention prior to the intended harvest date must be notified to the Regulator as soon as is reasonably and practically possible.

62. The licence holder must provide the actual date or dates of harvesting of the GMOs at the Locations within seven (7) days of completion of harvesting of the GMOs at the Locations.

63. The licence holder must provide a notice in writing to the Regulator when a Place is Cleaned. The notice must be provided to the Regulator within fourteen (14) days of the date on which Cleaning of the Place concluded.

64. On the request of the Regulator, the Regulator must be provided with written documentation of the procedures in place to ensure continuing compliance with the Cleaning conditions in this licence.

### ***Results of inspection activities***

65. The results of inspection activities must be recorded in a logbook or paper file. The findings of the inspections as recorded in the logbook or paper file must be forwarded to the Regulator within fourteen (14) days of inspection taking place and must also be included in the licence holder's Annual Report to the Regulator. The logbook or paper file must contain at least the following:

- (a) details of the areas inspected;
- (b) details of current land use (eg type of crop being grown) and of recent land management practices (eg cultivation or spraying) applied in the areas inspected;
- (c) details of the date of inspection;
- (d) the names of the person or persons who undertook the monitoring and details of the experience, training or qualification that enabled them to recognise Volunteer Plants;
- (e) the means of inspection used;
- (f) the number of Volunteer Plants observed, if any;
- (g) details of the development stages reached by the Volunteer Plants, if any;
- (h) details of methods used to Destroy Volunteer Plants, if any, and the date of destruction, if different from the date of inspection.

66. The licence holder must keep records of the number and type of GM Sugarcane plants grown at the Site as part of the trial, and the number of Sugarcane plants and Plant Material from the Site stored, at the end of the trial.

### ***Annual Report***

67. The licence holder must provide an Annual Report to the Regulator.

*Note: Conditions 13 and 65 specify information to be included in an Annual Report.*

### ***Testing methodology***

68. The licence holder must provide a written instrument to the Regulator describing an experimental method that is capable of reliably detecting the presence of the GMOs and the presence of the genetic modifications described in this licence (for details see Attachment B) in a recipient organism. The instrument must be provided within thirty (30) days of the issuing of this licence.

## ATTACHMENT A

**DIR No:** 070/2006

**\*Full Title:** Limited and controlled release of GM sugarcane with altered plant architecture, enhanced water or improved nitrogen use efficiency

### **Organisation Details**

**Postal address:** \*BSES Limited  
50 Meiers Rd  
Indooroopilly QLD 4068

**Phone No:** 07 3331 3333

**Fax No:** (07) 3871 0383

### **Project Supervisor Details**

**Surname:** *[Personal Information Redacted]*

**First Name:** *[Personal Information Redacted]*

**Title:** *[Personal Information Redacted]*

**Phone No:** *[Personal Information Redacted]*

**Fax:** *[Personal Information Redacted]*

**Email Address:** *[Personal Information Redacted]*

**Position:** *[Personal Information Redacted]*

**Organisation:** BSES Limited

**Postal Address:** BSES Limited  
50 Meiers Rd  
Indooroopilly QLD 4068

### **IBC Details**

**IBC Name:** BSES Limited

**\* Information that must be included in the Record of GM Products and GMO Dealings.**

### GMOs Description

#### **The GMOs covered by this licence:**

*Saccharum* spp. genetically modified by introduction of only the genes, promoters and terminators listed below.

**\*Parent Organism(s) Common Name:** Sugarcane

**\*Parent Organism(s) Scientific Name:** *Saccharum* spp. L.

#### **Modified Trait(s):**

##### **\*Categories:**

Up to 100 lines from each of 19 categories with genetic modifications for altered plant architecture, enhanced water use efficiency (WUE) and improved nitrogen use efficiency (NUE); and up to 100 lines from categories 20 and 21 and up to 400 lines from category 22 genetically modified for marker gene expression (Table 1).

##### **\*Description:**

Sugarcane plants have been genetically modified to show increased sugar yield via altered plant architecture, enhanced WUE or improved NUE. Other lines contain only marker genes to compare transformation protocols.

##### **\*Genes responsible for conferring the modified trait:**

Refer to Table 1 of this attachment.

#### **Purpose of the Dealings with the GMOs:**

BSES applied for a licence to release up to 2500 GM sugarcane lines into the environment under limited and controlled conditions. Up to 1900 of the GM sugarcane lines have been modified to alter plant size and shape, enhance water use efficiency (WUE), or improve nitrogen use efficiency (NUE) which may result in increased sugar yield. The remaining 600 GM sugarcane lines contain only introduced selectable and/or visual marker genes.

The trial includes early stage 'proof of concept' research. The GM sugarcane lines containing only marker genes would be used to compare different genetic modification methods. The agronomic performance of the GM sugarcane lines will be evaluated in the field; some under different irrigation and fertilizer treatments.

#### **\* Information that must be included in the Record of GM Products and GMO Dealings.**

**Table 1: Genes responsible for conferring the modified traits.**

GMO group	Category <sup>1</sup>	Gene(s)	Source organism	Construct function <sup>2</sup>
Altered plant architecture	1	<i>PcGA2ox-1</i>	<i>Phaseolus coccineus</i>	expression
	2	<i>HvGA3ox-2</i>	<i>Hordeum vulgare</i> subsp. <i>vulgare</i>	expression
	3	<i>HvGA20ox-1</i>	<i>Hordeum vulgare</i> subsp. <i>vulgare</i>	expression
	4	<i>HvGA20ox-2</i>	<i>Hordeum vulgare</i> subsp. <i>vulgare</i>	expression
	5	<i>OsMAX3</i>	<i>Oryza sativa</i>	expression
	6	<i>OsMAX4-1</i>	<i>Oryza sativa</i>	expression
	7	<i>OsMAX4-2</i>	<i>Oryza sativa</i>	expression
	8	<i>OsTB1</i>	<i>Oryza sativa</i>	expression
	9	<i>SoTB1</i>	<i>Saccharum</i> spp.	expression
	10	<i>SoMAX3</i>	<i>Saccharum</i> spp.	RNAi
	11	<i>SoTB1</i>	<i>Saccharum</i> spp.	RNAi
	12	<i>HvGA20ox-2</i>	<i>Hordeum vulgare</i> subsp. <i>vulgare</i>	expression
		<i>SoTB1</i>	<i>Saccharum</i> spp.	expression
	13	<i>SoTB1</i>	<i>Saccharum</i> spp.	RNAi
<i>OsMAX3</i> <i>OsMAX4-1</i> <i>OsMAX4-2</i>		<i>Oryza sativa</i>	expression	
14	<i>SoTB1</i>	<i>Saccharum</i> spp.	expression	
	<i>OsMAX3</i> <i>OsMAX4-1</i> <i>OsMAX4-2</i>	<i>Oryza sativa</i>	RNAi	
Enhanced WUE	15	<i>MdS6PDH</i>	<i>Malus x domestica</i>	expression
	16	<i>MdS6PDH</i>	<i>Malus x domestica</i>	expression
	17	<i>EcTPSP</i>	<i>Escherichia coli</i>	expression
	18	<i>AtMYB2</i>	<i>Arabidopsis thaliana</i>	expression
Improved NUE	19	<i>ZmDOF1</i>	<i>Zea mays</i>	expression
Marker gene expression	20	<i>NPTII</i>	<i>Escherichia coli</i>	expression
	21	<i>NPTII</i>	<i>Escherichia coli</i>	expression
	22	<i>NPTII</i> <i>uidA</i>	<i>Escherichia coli</i>	expression

<sup>1</sup> All categories except 15, 20 and 22 also contain the *β-lactamase (bla)* gene from *E. coli* with its native promoter and terminator. All categories contain the *neomycin phosphotransferaseII* gene from *E. coli*. All genes except *bla* are expressed from the *Z. mays ubiquitin1* promoter with the *Agrobacterium tumefaciens nos* transcription termination sequence.

<sup>2</sup> Expression constructs contain the complete coding sequence of the specified gene; RNAi constructs contain forward and reverse orientation copies of a partial gene sequence, separated by the *Pdk* intron from *Flaveria trinervia*.