Transporting Biological Materials Procedure

Procedure Owner: Chair Radiation, Biosafety and Hazardous Substances Committee

Keywords: 1) Biological 2) Materials 3) Dangerous Goods 4) Shipping 5) Transport

TABLE OF CONTENTS

1. INTENT .................................................................................................................. 1
2. ORGANISATIONAL SCOPE ............................................................................. 1
3. DEFINITIONS ...................................................................................................... 2
4. GENERAL REQUIREMENTS ........................................................................... 3
4.1 Overview ........................................................................................................... 3
4.2 Biological Materials and Dangerous Goods ................................................... 3
4.2.1 Dangerous Goods Training ........................................................................ 3
4.3 Packing and Shipping Requirements ............................................................... 4
4.4 Packing for Transporting Biological Materials by Post or Plane ............... 5
4.5 Packing for Transporting Biological Materials by Vehicle ........................ 6
4.6 Packing for Transporting Biological Material by Walking or Carrying ....... 7
5. APPENDICES ..................................................................................................... 9
6. RELATED DOCUMENTS .................................................................................. 12
7. CONTACT INFORMATION .............................................................................. 12
8. APPROVAL HISTORY ....................................................................................... 12

1. INTENT
Transporting biological materials is a regulated activity. This procedure provides the minimum requirements to ship and transport biological materials (including biological material that may be considered dangerous goods), between ECU, institutions and countries, by post, plane, vehicle and on foot in compliance with applicable legislation.

2. ORGANISATIONAL SCOPE
ECU students, staff, and contractors
### 3. DEFINITIONS

<table>
<thead>
<tr>
<th>TERM</th>
<th>DEFINITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biohazard</td>
<td>A biological agent that can be a source of harm, including (micro) organisms, viruses and toxins from a biological source.</td>
</tr>
<tr>
<td>Biological</td>
<td>Related to biology or living organisms</td>
</tr>
</tbody>
</table>
| Biological material   | Microbiological, plant, animal or human tissue, body fluids, living or dead biological matter, chemical compound that naturally occurs in living organisms, from living things, material and substances of which cells are composed, derived from living things or containing carbon, capable of living, developing or germinating under favourable conditions. Such as  
  - Diagnostic specimens  
  - Biological products  
  - Infectious substances  
  - Genetically modified organisms and microorganisms and biological material that is not regulated. |
| Dangerous goods       | Substances, mixtures or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment. Types of substances classified as dangerous goods include explosives, flammable liquids and gases, corrosives, chemically reactive or acutely (highly) toxic substances. Such as are defined as:  
  - Things which, by reason of their nature, are liable to endanger the safety of an aircraft or persons on board the aircraft  
  - Things which the regulations declare to be dangerous including but not limited to: infectious substances, radioactive material and dry ice. |
| ECU                   | Edith Cowan University                                                                                                                                                                              |
| Esky                  | A portable insulated container for keeping things cool                                                                                                                                               |
| Material Transfer     | Is a contract that governs the transfer of tangible research materials between two organizations, when the recipient intends to use it for his or her own research purposes. The MTA defines the rights of the provider and the recipient with respect to the materials and any derivatives. |
| Agreement (MTA)       |                                                                                                                                                                                                     |
| Microorganism         | A microorganism or microbe is a microscopic living organism, which may be single-celled or multicellular.                                                                                             |
| Worker(s)             | A person is a worker if the person carries out work in any capacity for ECU, including work as:                                                                                                     |
a) an employee
b) a contractor or subcontractor;
c) an employee of a contractor or subcontractor;
d) an employee of a labour hire company who has been assigned to work in the person's business or undertaking; or
e) an apprentice or trainee;
f) a student gaining work experience;
g) a volunteer.

4. GENERAL REQUIREMENTS

4.1 Overview

The transportation of biological material from one place to another by car, truck, bus, train, post, plane or carrying whilst walking is a regulated activity, to ensure that materials do not:

- become contaminated by the environment
- escape containment to contaminate people or the environment

The regulations that may apply to the transportation of biological materials (including those considered as dangerous goods) are summarised in this document. As such, prior transportation, an assessment of the required licences, permits and/or agreements must be completed and put in place. A Material Transfer Agreement (MTA) may be required prior to an exchange of biological material, please contact research-contracts@ecu.edu.au for further information. The regulations and standards that may apply are listed in section 6 of this procedure.

4.2 Biological Materials and Dangerous Goods

When transporting biological materials, they may be considered Dangerous Goods (DGs). Examples of biological material that may be considered DGs includes but are not limited to biological material that is likely to cause disease in humans or animals, such as:

- infectious substances,
- biological products,
- cultures,
- patient Specimens (human and animal),
- medical or clinical wastes, and
- genetically modified microorganisms.

Further information on the definition of classes of DGs is available from the Australian Dangerous Goods Code (2017) Ed.7.5.

4.2.1 Dangerous Goods Training

When packing DGs for transportation, the task must be overseen and all DGs documentation signed off by a person deemed competent in the following course -
Handle dangerous goods/hazardous substances and maintained the certification by completing a refresher in this course every 2 years. If a specialist courier company (such as World Courier) is being used they will provide all necessary packaging.

Each School/Service Centre with a requirement to transport biological material (which may also be considered a DGs), should nominate a person responsible for providing advice on how this activity conducted, for the respective School/Service Centre. This person shall be known as the Biological Material Transport Co-ordinator and their contact details should be communicated to staff and where necessary students (e.g. Higher Degrees Research (HDR) students) via the local area induction. A register of School/Service centre Biological Material Transport Co-ordinators shall be made available via the Radiation, Biosafety Hazardous Substances (RBHS) webpage.

4.3 General Packing and Shipping Requirements

Appendix B of this document outlines the packing and labelling requirements of AS/NZS 2243.3:2010 Safety in laboratories – Microbiological safety and containment. Depending on the microorganism, they must be either double or triple contained.

Each country and airline has specific requirements for the transport of biological material and DGs, which include strict packing and document requirements for each shipment. **The carrying of biological materials on one’s person onto an aircraft is strictly prohibited.** It is recommended that a contractor specialising in the transport of biological material (that may also be considered DGs) and in particular specimens and temperature-sensitive shipments (i.e. World Courier Service) is engaged to provide this service.

Other packing and shipping considerations include but are not limited to:

- before a biological sample is sent the recipient must be advised to expect it,
- when requesting a biological sample be sent, it is the responsibility of the requestor to let the sender know that the sample must be packed according to the relevant regulations summarised in this procedure,
- biological materials entering Australia will be subject to Biosecurity requirements (i.e. quarantine) – further information about Biosecurity is available by contacting ECU’s Biosafety Officer (BSO) or via the ECU RBHS webpage,
- unpack packages carefully, and in a biosafety cabinet if necessary, in case the containers have broken during transport.

If biological material is to be shipped either nationally or internationally, ECU’s BSO must be contacted, to determine if ECU has valid licences, permits and agreements to receive or send the goods. The BSO can be contacted by email at RBHSC@ecu.edu.au.

If all the correct licences, permits and agreements are in place, the School/Service Centre Biological Material Transport Co-ordinator will assist with organising the shipment of biological sample/s that may also be considered DGs.
The School/Service Centre Biological Material Transport Co-ordinator will provide a specialist courier form to the person requiring the transportation of the biological material. A copy of this form is available in Appendix A of this document and must be completed and returned by the person requiring the transportation. The completed form must be returned to the School/Service Centre Biological Material Transport Co-ordinator. Please note that international transport of biological material (that may also be classified as DGs) may require customs invoices and declarations to be completed before materials can be collected. Getting the relevant customs documents may take in excess of a week. It is critical that the need for these documents is considered in the planning stages and adequate time is allowed to obtain them prior to transport.

The specialist courier will provide all the necessary packing material (including dry ice if necessary) and the provision of these materials will be charged for in addition to the services provided by the courier.

4.3.1 Refrigerants

Freezer bricks are the preferred refrigerant rather than wet ice. Dry ice (carbon dioxide – CO₂) and liquid nitrogen (LN) are classified as DGs and have their own safe handling practices and regulatory requirements not covered in this procedure. It is recommended that the use of these refrigerants be avoided, however should they be required it is the responsibility of the person requiring the transportation to undertake a risk assessment and ensure that the dangerous good requirements for these substances are adhered to.

4.3.2 Higher Containment Considerations

Biological materials such as genetically modified organisms (GMOs), quarantined materials and live animals have their own transport requirements that need to be fulfilled. Transport of these materials requires training specific for these items, and the use of a specialist in the transport of these items is preferred.

4.4 Packing for Transporting Biological Materials by Post or Plane

In Australia, Item 92.120 of the Civil Aviation Safety Regulations specifies required training for packing dangerous goods for transport by air. All persons who pack dangerous goods for transport by air (including enclosing the goods in packaging, marking or labelling the consignment or preparing a shipper’s declaration) are required to successfully complete a course approved by the Civil Aviation Safety Authority, Australia. Carrying biological materials on one’s person onto an aircraft is strictly prohibited.

The International Air Transport Association (IATA) Dangerous Goods Regulations define the requirements for certification, packing instructions, the maximum quantities that can be transported by cargo or passenger aircraft, the external labelling requirements (including the identifying UN number), and the details to be included in the
Dangerous Goods Shippers Declaration (DGD) which can be found via the link IATA DG shippers-declaration.aspx

The Australia Post dangerous and prohibited goods and packaging guide is a source of useful information. When transporting biological materials that do not contain microorganisms infectious to humans or animals, materials can be double contained to withstand the conditions of the journey.

These will include variations in temperature and air pressure, plus the physical rigours of being crushed under other items in the cargo hold of the plane. The pictures in Appendix B of this document demonstrate the features of packaging including multiple layers of sealed and rigid containers, padding, bunding between the layers, and labelling to identify the contents – all of these features will be needed for packaging.

When transporting by post or by plane, the requirements for packaging and labelling are different depending on what biological materials are being transported. Australia Post or a specialist courier company (such as World Courier) can help pack materials to survive the journey. Always use packing materials designed for the purpose. Always fill in all the information that is asked for on the outer labels of the packaging – if you leave any of it blank then your package may seem suspicious and be stopped by the security systems of the post office or airport.

4.5 Packing for Transporting Biological Materials by Vehicle

When transporting biohazards (experiments or waste) from one campus/institution to another by car, truck, bus or train, the biohazards must be either double or triple contain the microorganism, depending on the microorganism.

Where practicable it is recommended that a contractor who is a specialist in the transport of biological material (that may be also be considered DGs) (i.e. World Courier Service) and in particular specimens and temperature sensitive shipments is engaged to provide this service.

Category A - Biological materials are:

- Infectious substances which are capable of causing permanent disability, or a life-threatening or fatal disease to otherwise healthy humans or animals.
- Infectious agents of plants that could cause significant damage to the environment or agriculture are included in this category. (There is a list of examples in AS 4834)

You must package Category A in triple-containment, high integrity packaging such as IATA Packaging Instructions 602 or Packaging Instructions 650 as used for air transport – see the section 4.6 of this procedure for post or plane.

Category B - Biological materials - infectious substances that do not meet the criteria for Category A.

Category C - Biological materials - substances with a low probability of causing disease in humans, animals or plants.
• Materials from healthy plants.
• Materials from healthy humans and animals including excreta, secreta, blood and its components, tissues and tissue fluids.

Category B and C materials need to be double contained as described in Appendix C.

PRIMARY CONTAINER

• Must be sealed.
• Must be surrounded by enough absorbent paper towel to soak up the volume of liquid inside.
• Must be secured inside the secondary container to prevent movement.

SECONDARY CONTAINER

• Must be sealed.
• Must be rigid, solid and durable enough to survive a car accident.
• Must be larger than a 5 centimeter cube.

Note: a polystyrene Esky is not suitable.

LABELS

• A biohazard symbol.
• A brief description of the contents.
• The name and contact phone number of a researcher not accompanying the package, a Facility Manager, or the Biosafety Officer.

4.6 Packing for Transporting Biological Material by Walking or Carrying

To transport biohazards (experiments or waste) by walking and carrying materials between:

• Two laboratories/storage areas in the same building separated by non-laboratory corridors.
• Two laboratories/storage areas in different buildings.

Package and label materials to ensure that, no matter what happens to the package during transport, they will not:

• become contaminated by the environment, or
• escape containment to contaminate people or the environment.

Double contain microorganisms as described in Appendix D.

PRIMARY CONTAINER

• Must be sealed i.e. an Eppendorf tube, a taped petri dish, a taped bag of waste.
SECONDARY CONTAINER

- Must be sealed.
- Must be rigid, solid and durable enough to survive being dropped i.e. a lidded plastic lunchbox, a taped polystyrene Esky.

LABELS

- A biohazard symbol.
- A brief description of the contents (can be on a post-it note).
- The name and contact phone number of a contact not carrying the package, i.e. Laboratory Manager, Biosafety Officer, and Activity Supervisor.
5. APPENDICES

Appendix A - SPECIALIST COURIER REQUEST FORM

This form is to be filled in for all specialised biological and dangerous goods shipments including those requiring specific temperature shipments. For general shipments, please use the ECU procurement system, which is organised through Campus Support Office. Please allow up to five days for shipping. International shipments may take longer due to the paper work required.

| Requestor’s NAME: ___________________________ | PHONE NUMBER: ___________________________ |
| School/Service Centre: ________________________________________________________________ |
| Charge to Cost Centre: ___________________________ |
| LOCAL SHIPMENT | NATIONAL SHIPMENT | INTERNATIONAL SHIPMENT |
| o CUSTOMS INVOICE AND IMPORT PERMIT PROVIDED FOR INTERNATIONAL SHIPMENTS |
| SHIP FROM: |
| CONTACT NAME: ___________________________ |
| PHONE NUMBER: ___________________________ | E-MAIL: ___________________________ |
| ADDRESS: _____________________________________________ |
| _____________________________________________ |
| _____________________________________________ |
| SHIP TO: |
| CONTACT NAME: ___________________________ |
| PHONE NUMBER: ___________________________ | E-MAIL: ___________________________ |
| ADDRESS: _____________________________________________ |
| _____________________________________________ |
| _____________________________________________ |
| ITEMS TO BE SHIPPED: |
| DESCRIPTION: ___________________________ |
| DIMENSIONS: ___________________________ |
| QUANTITY: ___________________________ |
| SHIPPING CONDITIONS: AMBIENT COLD SHIPMENT DRY ICE OTHER ___________________________ |
| Requestors SIGNATURE ___________________________ | DATE ___________________________ |
Appendix B - A/NZS2243.3:2010 packing and labelling requirements

(a) Packing and labelling of Category A infectious substances

(b) Packing and labelling of Category B infectious substances

FIGURE 3 EXAMPLES OF TRIPLE PACKAGING SYSTEMS
Appendix C - Double Containment for Transporting Category B and C materials by Vehicle

**LABELS**

- **PRIMARY CONTAINER**
  - containers secured together and absorbent material present
  - YOUR SAMPLE
  - FREEZER BRICK

- **SECONDARY CONTAINER**

---

Appendix D - Double Containment for Walking and Carrying Biological Material and Micro-organisms

**LABELS**

- **PRIMARY CONTAINER**
  - YOUR SAMPLE
  - FREEZER BRICK

- **SECONDARY CONTAINER**
6. RELATED DOCUMENTS

Australian Standards and Legislation available online via the ECU Library database:

- Australian Code for the Transport of Explosives by Road and Rail
- AS/NZS 2243.3:2010 Safety in laboratories – Microbiological safety and containment
- Biosecurity Act 2015
- AS/NZS 4834 Packaging for surface transport of biological material that may cause disease in humans, animals and plants
- Competent Authority for Dangerous Goods by Air Transport – Civil Aviation Safety Authority
- Competent Authority for Dangerous Goods by Sea Transport - Australian Maritime Safety Authority
- Radiation Protection Series No.2 – Code of Practice for the Safe Transport of Radioactive Material
- State and Territory Dangerous Goods Safety Regulations
- The Australia Post, Dangerous and Prohibited Goods and Packaging Guide
- The Competent Authorities Panel—National Exemptions, Approvals and Determinations
- The IATA Dangerous Goods Regulations
- The International Maritime Organization (IMO), International Maritime Dangerous Goods Code (IMDG Code)
- The Office of the Gene Technology Regulator (OGTR), Guidelines for the transport of Genetically Modified Organisms(GMO’s)

7. CONTACT INFORMATION

For queries relating to this document please contact:

<table>
<thead>
<tr>
<th>Procedure Owner</th>
<th>Chair Radiation, Biosafety, Hazardous Substances Committee (RBHSC)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Enquiries Contact:</td>
<td>RBHSC Executive Officer</td>
</tr>
<tr>
<td>Telephone:</td>
<td>08 6304 5556</td>
</tr>
<tr>
<td>Email address:</td>
<td><a href="mailto:RBHSC@ads.ecu.edu.au">RBHSC@ads.ecu.edu.au</a></td>
</tr>
</tbody>
</table>

8. APPROVAL HISTORY

<table>
<thead>
<tr>
<th>Procedure Approved by:</th>
<th>Chair Radiation, Biosafety, Hazardous Substances Committee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Procedure First Approved:</td>
<td>15.08.2017</td>
</tr>
<tr>
<td>Date last modified:</td>
<td>25.10.2017</td>
</tr>
<tr>
<td>Revision History:</td>
<td>V01.00 First approved document</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td></td>
<td>V01.01 Minor grammar and spelling changes. Change to definition of biological material</td>
</tr>
<tr>
<td>Next Revision Due:</td>
<td>3 years after first approval date</td>
</tr>
<tr>
<td>HPRM File Reference</td>
<td>HSMS/84</td>
</tr>
</tbody>
</table>