GILMOUR SPACE

Bowen Orbital Spaceport

Hazardous and Dangerous Good Management Plan

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Table of Contents

List of Tables

List of Figures

1 Introduction

Gilmour Space is committed to achieving sovereign orbital launch capabilities for Australia. The Australian space sector represents a small but significant sector of the Australian economy with significant growth potential. The establishment of an operational orbital launch facility will enable greater market participation for Australian space companies in both domestic and international markets.

1.1 Purpose

This Hazardous and Dangerous Goods Management Plan (HDGMP) seeks to demonstrate the framework used for the transport, receipt, storage, use and handling, as well as disposal of hazardous and dangerous goods at the Bowen Orbital Spaceport (BOS).

The HDGMP aims to minimise the potential impacts on human health, property, and the natural environment, while also complying with the objectives within various legislation, standards, and codes of practice.

1.2 Scope

This document will address operations specifically related to the construction and operation of the Bowen Orbital Spaceport.

1.3 Legislation, Standards and Guidelines

International Codes and Standards:

- **International Maritime Organization**
  - The International Maritime Dangerous Goods Code (IMDGC)
- **International Air Transport Association**
  - International Air Transport Association (IATA) Dangerous Goods Regulations (DGR)

Commonwealth Legislation:

- **National Transport Commission**
  - Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)

State Legislation:

- **Worksafe Queensland**
  - Work Health and Safety Act 2011
  - Work Health and Safety Regulation 2011
  - Managing risks of hazardous chemicals in the workplace code of practice 2021
  - Labelling of workplace hazardous chemicals code of practice 2021
  - Preparation of safety data sheets for hazardous chemicals code of practice 2021

Australian Standards:

- **Standards Australia**
  - AS ISO 31000:2018 Risk Management Principals and Guidelines
  - AS/NZS 1940:2017 The storage and handling of flammable and combustible liquids
  - AS 1894:1997 The storage and handling of non-flammable cryogenic and refrigerated liquids
  - AS 2444:2001 Portable Fire Extinguishers and Fire Blankets – Selection and Location
  - AS/NZS 3833:2007 Storage and Handling of Mixed Classes of Dangerous Goods in Packages and Bulk Containers

- AS/NZS 4326:2008 Storage and Handling of Oxidisers
- AS 2030.1:2009 the verification, filling, inspection, testing and maintenance of cylinders for the storage and transport of compressed gases
- AS 3780:2008 The storage and handling of corrosive substances

2 Roles and Responsibilities

All employees and contract staff are responsible for the safe handling of hazardous and dangerous goods at the BOS. This includes complying with relevant approval / permit requirements and ensuring that all reasonable and practical measures to prevent or minimise harm are taken for all activities.

Contractors and Employees – All Phases

- Assess the workplace and work activities for hazardous substances before commencing any work.
- Ensure that for any hazardous substances identified, that the relevant SDS for the substance has been reviewed by the work party.
- Ensure that the risks of using hazardous substances are assessed and that appropriate controls are in place for risks prior to initiating work.

Launch Site Supervisor – All Phases

- Ensure employees and contractors have sufficient knowledge and training in the handling of hazardous substances that will be encountered.
- Ensure that the SDS register is updated and that SDS are available to all workers and work parties.
- Ensure that all hazardous substances brought to site are approved and are registered in the hazardous substance register.
- Maintain an Emergency Response Plan for the Launch Site incorporating responses to incidents involving hazardous or dangerous goods.

Workplace Health and Safety Officer – All Phases

- Provide guidance and facilitation for assessment of the risks relating to hazardous substances, and that appropriate controls for those risks are implemented.
- Supervise audits and verifications on the storage and use of hazardous substances.
- Own and maintain hazardous substances and SDS storage registers.

3 Hazardous Substances Management

3.1 Risk Assessments

A documented risk assessment shall be conducted prior to working with hazardous substances. Documented risk assessments are to be kept available and should be updated whenever the scope of the work activity involving a hazardous substance or the environmental conditions for which the risk assessment was conducted changes.

Risk assessments are to be conducted in line with the Gilmour Space risk management procedure, which follows a 5-step process of:

- **Identifying the Risk** – Identify hazards presented by project, task, or activity.
- **Assessing the Risk** – Qualify or quantify the consequence and likelihood.
- **Making Risk Decisions** – Determine controls or actions from hierarchy of controls.
- **Implementing Controls** – Assign ownership and timing to controls or actions.
- **Supervision** – Risk acceptance and review.

The hierarchy of controls shown in figure 1 below should be used when determining controls or actions.

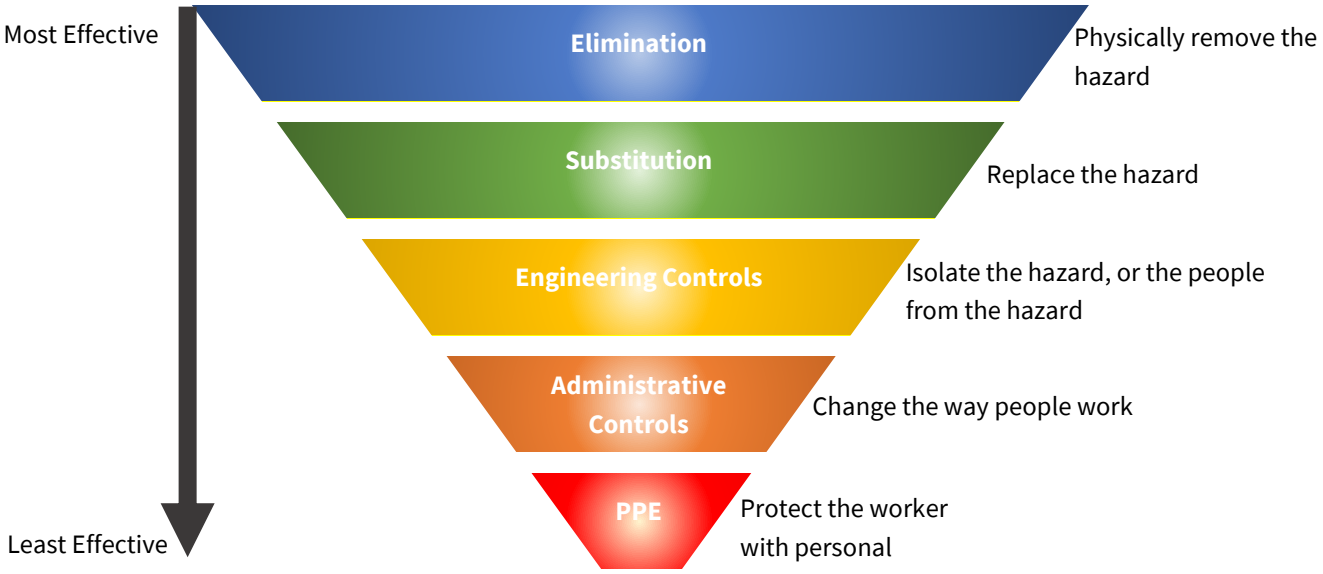

Figure 1 - Hierarchy of Controls

3.2 Receipt of Hazardous Substances

The receipt of hazardous substances at the BOS requires persons receiving to ensure that:

- All deliveries are labelled in accordance with labelling requirements in this HDGMP.
- Any damages or concerns are immediately identified via receiving an inspection and reported to Site Supervisor.
- Risks associated with the transport and handling of the hazardous substances or dangerous goods are known.

- Receiving personnel are trained and knowledgeable about the handling and storage of the hazardous substance or dangerous goods to be received.
- Receiving personnel are trained and knowledgeable in how to respond to incidents involving the hazardous substance or dangerous goods to be received.
- All equipment for loading and unloading, required power and utilities, necessary storage and ullage area, and PPE is available for receipt.
- Spillages or leaks are immediately responded to and reported to the Site Supervisor and Environment Health and Safety Coordinator.

3.3 Hazardous Substances Register and SDS

The hazardous substances register will be utilised at the site throughout construction and operations. The hazardous substances register will include the following information:

- Substance Name
- Chemical Composition
- Storage Method (Package, IBC, Self-bunded Tank, ISO Tank)
- Storage Safe Fill Level (L, m^3, %, kg)
- Storage Max capacity (L, m^3, %, kg)
- Storage Quantity (L, kg, m^3)
- State (solid, liquid, gas)
- Hazardous Substance / Dangerous Goods Classification

The hazardous substances register is required to be updated whenever receipt of an existing hazardous substance is received or whenever a new substance is to be added.

All substances added to the register must also be accompanied with a corresponding SDS. Copies of SDSs must be maintained at the location of storage and in the Gilmour SDS register.

3.4 Storage of Hazardous Substances

Storage facilities shall comply with the managing risks of hazardous chemicals in the workplace code of practice 2021.

Wherever required, storage areas and compounds shall be adequately compounded and bunded to ensure containment of any hazardous substance. Separation and segregation and bund construction shall comply with AS/NZS 1940:2017 Flammable Liquids Storage and Handling, or AS/NZS 4326:2008 Oxidizing Agents Storage and Handling, AS 1894:1997 Storage and Handling of Non-flammable Cryogenic and Refrigerated Liquids or any other code or standard applicable.

3.5 Labelling

Hazardous substances will be labelled in accordance with the labelling of workplace hazardous chemicals code of practice 2021 published by Workplace Health and Safety Queensland.

Below are the requirements that a hazardous chemical label must include as per the code (written in English):

- The product identifier.
- The name, Australian address, and business telephone number of either the manufacturer or importer.
- The identity and proportion disclosed, in accordance with Schedule 8 of the WHS Regulation, for each chemical ingredient.

- Any hazard pictogram(s) consistent with the correct classification(s) of the chemical.
- Any hazard statement(s), signal word and precautionary statement(s) that is consistent with the correct classification(s) of the chemical.
- Any information about the hazards, first aid and emergency procedures relevant to the chemical, which are not otherwise included in the hazard statement or precautionary statement.
- The expiry date of the chemical, if applicable. As a person conducting a business or undertaking (PCBU), you may include any information on the label that does not contradict or cast doubt on any other information that is required on the label.

The following additional information should also be included on the label, where available:

- An emergency phone number for specific poisons or treatment advice.
- The overseas name, address and telephone number of the manufacturer or supplier.
- A valid website or internet address.
- Reference to the safety data sheet (SDS), for example a statement on the label that says: 'Additional information is listed in the safety data sheet'.

If an emergency information service or Poisons Information Centre phone number is provided on the label, this arrangement should be confirmed with the service beforehand and copies of the SDS should be provided to them.

3.6 Hazard Pictograms and ADG Code Class Labels

Signage and labelling of dangerous goods storage and use areas should where feasible, align with the Globally Harmonized System of Classification and Labelling of Chemicals.

3.7 Inventory Management

A system for the inspection of bunding and the monitoring of storage levels of hazardous substances is to be implemented to facilitate the identification of loss or leakage.

3.8 Fire Protection

The BOS facility shall have fire extinguishers of suitable types and quantities at locations where the risk of fire is present. The selection and location of fire extinguishers shall be consistent with AS/NZS 2444:2001 Portable Fire Extinguishers and Fire Blankets.

Requirements of AS/NZS 1940:2017 Storage and Handling of Flammable and Combustible Liquids and AS/NZS 4326:2008 Storage and Handling of Oxidisers relating to fire safety shall be observed.

Specialist systems shall be available for the potential for experimental battery fires within the launch vehicle body (N2 / CO2 flood systems) when launch vehicles are being assembled.

3.9 Removing and Disposing of Hazardous Substances

All waste or unused hazardous substances must be removed from site in line with legislative and code of practice requirements , as well as the BOS Waste Management Plan.

Documented details of any disposal or removal of waste of unused hazardous substances shall be approved by the Site Supervisor prior to disposal or removal. All documentation must be kept.

4 Emergency Response

4.1 Emergency Response Plan

The Site Supervisor shall maintain an emergency response plan for the BOS facility in order to minimise damage to people, property and the environment as a result of any emergency involving the launch site. The plan will ensure appropriate responses to emergencies or incidents that that may arise from launch site activities or other incidents that may impact the integrity or safety of the launch site.

The emergency response plan shall dictate the procedures for responding to Medical, Fire and Dangerous Goods incidents, will specify notification and reporting procedures for incidents and shall include provisions for appointment of incident investigation teams.

The Emergency Response Plan will be made available to personnel through site induction and copies will be available in all work areas. The plan will be reviewed annually or when any changes are made that may materially affect the plan.

5 Launch Site Hazardous Substances

The hazardous and non-hazardous materials expected to be used during the construction phase of the BOS are shown below in Table 1.

Table 1 - Construction Materials

Product	Use	Proposed Storage Location	Quantity
Cement	Launch pad and vehicle assembly building construction.	At point of use.	TBC
Diesel 	Fuel for machinery and power generation.	Self-bunded storage tanks. Power Generation & Launch Pad.	TBC
Unleaded Petrol 	Fuel for machinery and vehicles.	Self-bunded storage tanks. Power Generation Pad.	TBC
Lubricants (transmission fluid, engine 	Maintenance of heavy civil machinery.	TBC	TBC
Miscellaneous Cleaning Products	Site maintenance	TBC	TBC

The Hazardous and non-hazardous materials expected to be used during the operational phase of the BOS are shown below in Table 2 and the layout of hazardous materials storage and signage areas are show below in Figure 2.

Table 2 - Operational Materials

Product	Use	Proposed Storage Location	Quantity
Diesel 	Power Generator	Self-bunded storage tanks. Power Generation & Launch Pad.	5,000 L
Lubricants 	Power Generator and launch erector maintenance.	Material store in Vehicle Assembly Building.	TBC

Miscellaneous Cleaning Products	Site Maintenance	Material store in Vehicle Assembly Building.	As required.
Miscellaneous Cleaning Products	Rocket Instrumentation cleaning and assembly	Material store in Vehicle Assembly Building.	As required.
Nitrogen Compressed UN1066 	Cryogenic Proof	Compressed and cryogenic liquid storage pad	
Helium Compressed UN1046 	Rocket pressurisation	Compressed and cryogenic liquid storage pad	
Hydrogen Peroxide – UN2014 UN2015 	Rocket Oxidiser (1st and 2nd Stages)	Oxidiser Storage Pad (AS/NZS 4326)	18m^3 per launch
D60(Kerosene) – UN1223 	Rocket Fuel (3rd Stage)	Fuel Storage Pad (AS/NZS 1940)	0.3m^3 per launch
Liquid Oxygen – UN1073 	Rocket Oxidiser (3rd Stage)	Oxidiser Storage Pad (AS/NZS 4326)	5 m^3 per launch

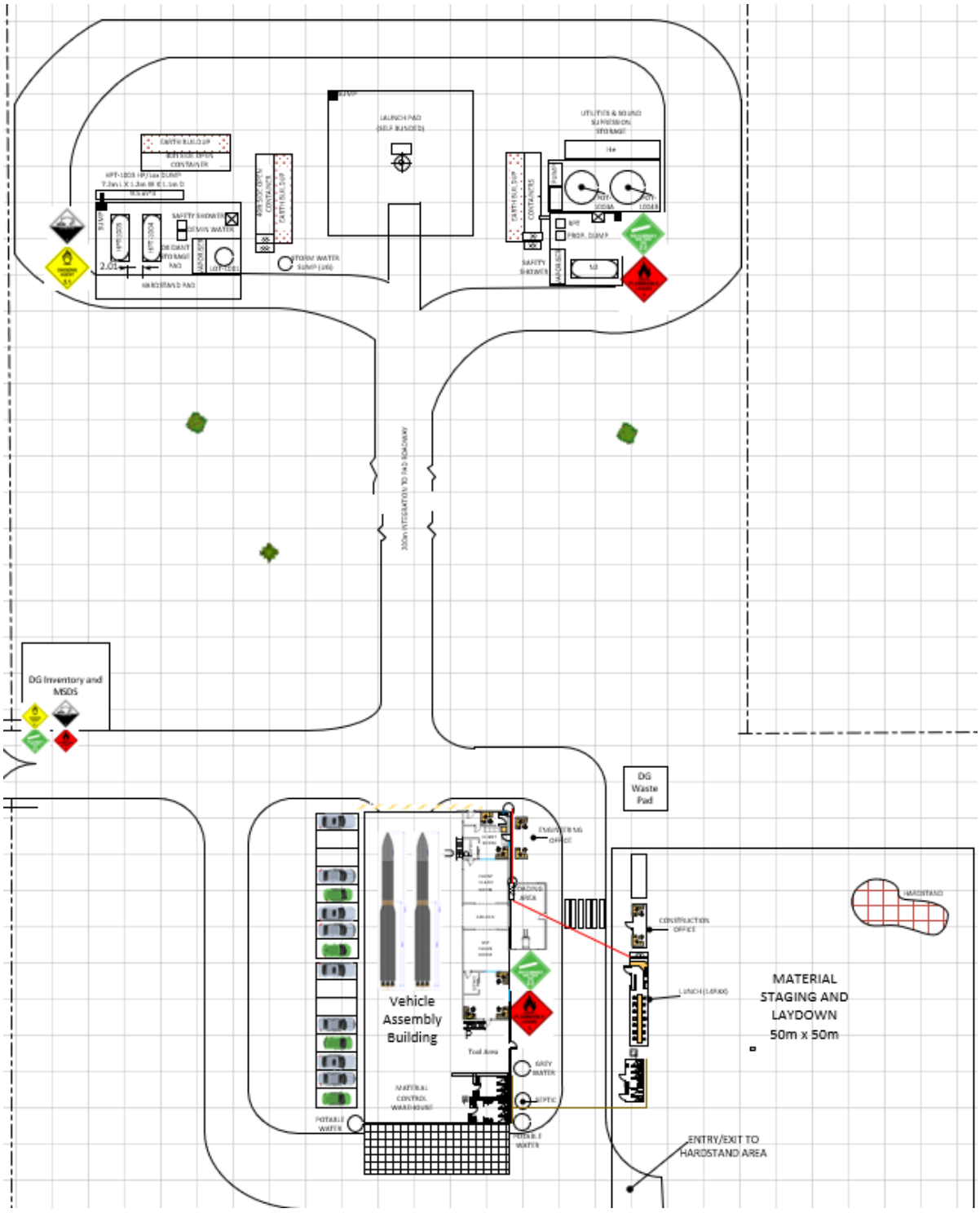

Figure 2 - Hazardous and Dangerous Goods Storage Areas Layout

6 Training

All personnel working with hazardous substances shall have suitable training and be assessed as competent by the Site Supervisor and the Workplace Health and Safety Officer. Training shall include elements in the identification, safe use, storage, and handling of hazardous substances in accordance with the relevant SDS for each hazardous substance.

Successful training to enable work with hazardous substances must be recorded by a verification of competency or training assessment record. Training records must be approved by a competent person. Records of training must be obtained and stored by the Workplace Health and Safety Officer prior to a person undertaking work activities.

Abbreviations

Abbreviation	Definition
1080	Sodium Fluoroacetate
ACH	Aboriginal Cultural Heritage
ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
APSDA	Abbot Point State Development Area
ASA	Australian Space Agency
BOS	Bowen Orbital Spaceport
CSMP	Coral Sea Marine Park
DA	Development Application
DFO	Distant Focusing Overpressure
DGR	Dangerous Goods Regulations
ECSS	European Cooperation for Space Standardization
EDQ	Economic Development Queensland
EMP	Environmental Management Plan
EP Act	Environmental Protection Act
ERA	Environmentally Relevant Activity
ESC	Erosion and Sediment Control
ESCP	Erosion and Sediment Management Plan
FMECA	Failure Modes, Effects, and Criticality Analysis
FMP	Facilities Management Plan
FSS	Flight Safety System
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GP	General Public
GST	Gilmour Space Technologies
H_2O	Water
H_2O_2	Hydrogen Peroxide
HDGMP	Hazardous and Dangerous Goods Management Plan
IAASS	International Association for the Advancement of Space Safety
IATA	International Air Transport Association
IMDGC	International Maritime Dangerous Goods Code
Kero	Kerosene
LCC	Launch Control Centre
LEO	Low Earth Orbit
LMP	Land Management Plan
LOx	Liquid Oxygen
LPAD	Launch Pad
MCU	Material Change of Use
MEDQ	Minister for Economic Development of Queensland
NASA	National Aeronautics and Space Administration
NEW	Net Explosive Weight

NQBP	North Queensland Bulk Ports
O_2	Oxygen
PCBU	Person Conducting a Business or Undertaking
PPE	Personal Protective Equipment
RHD	Rabbit Haemorrhagic Disease
SDA	State Development Area
SDS	Safety Data Sheet
SPP	State Planning Policy
SSP	Site Security Plan
TAP	Transport and Access Plan
TBC	To be Confirmed
TNT	Trinitrotoluene
UN	United Nations
VAB	Vehicle Assembly Building
WHS	Workplace Health and Safety
WMP	Waste Management Plan
WRC	Whitsunday Regional Council