



HAZMAT Annex B Space Re-entry Debris (SPRED)

STATE HAZARD PLAN

RESPONSIBLE AGENCY

Western Australia Police Force

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Amendments Table

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July 2014	Update of hazard history and titles of Australian Government agencies as advised by EMA	87406
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The SEMC acknowledges the Aboriginal peoples throughout the state of Western Australia as the Traditional Custodians of the lands where we live, work and volunteer. We recognise Aboriginal peoples' continued connection to land, waters and community, and pay our respects to Elders both past and present.

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All of the State emergency management legislation and documents can be accessed via the [State Emergency Management Framework](#) page of the [State Emergency Management Committee website](#).

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Part One:

Introduction

This Annex B Space Re-entry Debris (the annex) provides an overview of arrangements for the management of space re-entry debris (SPRED) emergencies in Western Australia, in accordance with the Australian Government Space Re-entry Debris Plan (AUSSPREDPLAN). It contains information on prevention, preparedness, response and initial recovery.

The annex refers to a range of existing plans and documents relating to SPRED but does not duplicate the information contained in these, instead providing directions to websites or other sources where further information can be obtained if required.

The Commissioner of Police is the Hazard Management Agency (HMA) for SPRED emergencies.

1.1 Scope

SPRED presents a particular problem as many of the specific resources and skills required in responding to an impact are limited or do not exist in WA. As such, the annex provides for significant Australian Government involvement in monitoring before impact, tracking/locating SPRED immediately after impact, and other Commonwealth assistance in support of the State response. Additionally, the Australian Government has an obligation under international agreement to return SPRED to the launching nation.

1.2 Hazard Definition

A SPRED emergency is defined as the orbital decay and subsequent re-entry of man-made space objects, including space vehicles and satellites (see glossary) as space debris. This is closely monitored by the United States Strategic Command (STRATCOM), Japanese Aerospace Exploration Agency (JAXA) and other monitoring agencies around the world.

Most of these re-entries are scheduled and controlled, including booster rockets, shielding and returning payloads. Smaller objects tend to be destroyed during the re-entry process, due to extremes of heat and dynamic forces, but with larger objects, 10-40% of the structure will survive re-

entry and impact on Earth. For planning purposes, a SPRED footprint may be approximately 1000 kilometres long and 40 kilometres wide.

No satellites containing radioactive fuel and meant for Earth's orbit have been launched since 1988; however, there remain a number of radio-isotopic thermoelectric generators, nuclear reactor fuel cores and nuclear reactors known to be in orbit. Most other satellites and space objects in orbit contain other toxic, non-nuclear hazardous materials such as Hydrazine and Beryllium, with a high probability of surviving re-entry and thus posing a risk on the ground.

1.3 Organisational Roles and Responsibilities

The Commissioner of Police is the HMA for SPRED emergencies.

Information regarding the response roles and responsibilities of relevant agencies under this annex are detailed in Appendix C.

It is recommended that each agency with a role or responsibility under this annex has appropriate operational procedures detailing their response arrangements in accordance with this annex. These arrangements should be complementary to the agency's operational procedures detailing their roles and responsibilities under the State EM Plan.

Organisation	Prime Function
WA Police Force	Controlling Agency on behalf of the Commissioner of Police as HMA. Overall control, including the WA Space Debris Emergency Response Team (WASDERT) which has a leading role in the response phase.
Emergency Management Australia (EMA)	Coordinates Australian Government actions in accordance with AUSSPREDPLAN. Central point of communication between relevant Australian Government agencies and states and territories.
Australian Defence Force (ADF)	Liaison with STRATCOM, JAXA and other SPRED monitoring agencies regarding likely re-entry paths and risks to Australian interests. Communicates to EMA via the Australian Government National Situation Room (NSR).
Department of Water and Environmental Regulation (DWER)	Provision of Environment Protection Advisor to the WASDERT and specialist environmental impact/clean up advice and environmental monitoring as required.
Department of Fire and Emergency Services (DFES)	Provision of Special Operations Advisor to the WASDERT and provision of firefighting response, rescue of victims and Urban Search and Rescue operations as required.
Department of Health	Provision of Radiation Health Advisors to the WASDERT and coordination of the health response to a SPRED emergency, including the provision of advice and radiation monitoring services where appropriate.

1.3.1 Australian Government Planning Group (AGPG)

The AGPG, chaired by EMA, is made up of representatives from relevant Australian Government agencies, jurisdictions and other organisations as required. Its role is to evaluate, forward plan and provide advice on any operational and technical issues related to AUSSPREDPLAN activation and, if required, contribute to the development a SPRED incident action plan.

1.3.2 Legislation

The *Space (Launches and Returns) Act 2018* includes a number of responsibilities for emergencies associated with space activities authorised under the Act. These include obligations on a launching agency associated with custody of objects (and possible compensation) relating to accidents and incidents, including SPRED.

1.4 Related Documents and Legislation

This annex is to be read in conjunction with the following documents:

- The Australian Contingency Plan for SPRED (AUSSPREDPLAN)
- Plans from South Australia and the Northern Territory (as the footprint of SPRED could cross State borders).

Legislation and codes relevant to this plan include but are not limited to:

- *Space (Launches and Returns) Act 2018*.

The background is a dark blue, monochromatic photograph of a rocky canyon. A waterfall is visible in the upper right, cascading down a rock face. The rock layers are clearly visible, showing horizontal and diagonal striations. The overall tone is somber and dramatic.

Part Two:

Prevention and Mitigation

2.1 Responsibility for Prevention and/or Mitigation

Due to the nature of this hazard, there are no relevant activities for prevention and/or mitigation able to be conducted from a State or HMA perspective. However, the potential for SPRED incidents is closely monitored by STRATCOM, JAXA and other monitoring organisations around the world, who will provide advice to Australia's Department of Defence on likely re-entry paths and risks to Australian interests.



Part Three:

Preparedness

3.1 Responsibility for Preparedness

The Commissioner of Police, as HMA, has overall responsibility for State preparedness in relation to SPRED within WA. In order to ensure that this responsibility is met, the WA Police Force preparedness activities focus on essential emergency management capabilities through the development of plans, procedures, organisation and management of resources and training. This includes:

- Preparation of Annex B – SPRED, on behalf of the SEMC
- Managing the plan at State level and activating its response arrangements, as required.

The focus of this preparation is to enable any such incident to be responded to promptly and efficiently, to facilitate the use of all available resources and to ensure timely liaison with Australian Government agencies.

EMA is responsible for the preparation and maintenance of the Australian Plan for SPRED (AUSSPREDPLAN). AUSSPREDPLAN outlines the Australian Government communication and information flow arrangements to manage the risk posed by SPRED which may impact Australia, and how Australian Government support to any SPRED impact will be provided and managed.

3.2 Planning and Arrangements

Some general planning for response may occur before re-entry; however, the lack of precise information, particularly on timing and location of possible re-entry of an uncontrolled object over Australia, will mean detailed planning of response activities for specific locations will not normally be possible until after re-entry and impact occurs.

The location of the SPRED impact area (footprint), the availability of agencies and the time required to reach the footprint complicate the manner in which most eventualities can be dealt with. For example, there could be multiple locations requiring activation of this plan for a single space vehicle. In other circumstances, a space vehicle may encounter difficulties during the initial

launch and subsequently not reach its planned orbit. In this case the space vehicle may re-enter within a relatively short period of time from hours to days.

The concept of this plan is to coordinate the activities of State and Commonwealth agencies and organisations for a SPRED emergency. This concept is based on:

- The designation of the Commissioner of Police as the HMA responsible for the management of a SPRED emergency in WA
- The availability of a 24-hour State level contact facility for receipt of initial incident reports by the HMA, i.e. the Police Operations Centre (POC)
- The deployment of additional resources from State and Australian Government to support the WA Police Force.

3.3 Local and District Hazard Emergency Management Plans

Due to the nature of this hazard requiring a State level response, it is not expected that each local area will have a local SPRED plan; the principles contained in this document apply to any local area where a SPRED emergency occurs.

Each LEMC should consider whether their local planning arrangements would enable an appropriate response to such an emergency within their area of responsibility and identify resources which may be utilised at a higher level, ensuring, as far as practicable, that local contacts and resource lists are up to date.

The specific location of SPRED within a local area is likely to require the implementation of arrangements set out in Local Hazard Plans for search and rescue and perhaps also local Hazmat and Health Plans. These plans should be prepared by the relevant HMA/lead agency in consultation with the LEMC, and include the following:

- The manner in which the response to a SPRED emergency is to be conducted
- The responsibilities of personnel/agencies
- Details of available resources and usage priorities
- Personnel contact details
- Communications with public authority, or other person, including frequencies, call signs, radio watches, etc, where appropriate
- A list of services that may be utilised
- A regular review process to keep the plan current and up to date.

Local Hazard Plans for Search and Rescue Plans for areas without a permanent Search and Rescue facility, should detail arrangements for the establishment of temporary facilities.

3.4 Assistance Arrangements with Other Jurisdictions

3.4.1 Australian Government Assistance

The provision of Australian Government physical assistance is dependent upon established criteria and requesting arrangements as per State EM Policy section 5.10, State EM Plan section 5.6 and State EM Response Procedure 20. All such requests are to be made via COMDISPLAN.

EMA will coordinate Australian Government agency activities from the time that tracking data indicates a possibility that a SPRED impact will occur in Australian territory within seven days, including:

- maintenance of the flow of information to affected authorities within Australia
- maintenance of communications with relevant overseas authorities
- conduct of normal disaster operations support, as required.

Following initial impact, the Australian Government may, on request, carry out actions to search for, detect and retrieve space debris in support of the State. Requests for assistance from the State will be coordinated by EMA.

3.4.2 Assistance from Overseas

Overseas assistance (and the process involved) will need to be determined at the time of the incident, and will be coordinated by EMA.



Part Four:

Response

4.1 Responsibility for Response

EMA's Australian Government National Situation Room (NSR) connects relevant Australia Government, state and territory agencies to centralise Australian Government actions during complex national crises in order to develop a single, timely and consistent picture or understanding of a crisis incident, its implications and the national capacity to respond.

The Commissioner of Police, as the HMA, is responsible for the response to SPRED incidents within WA. The WA Police Force will appoint a Police Commander to assume overall control of the emergency. Given the nature and possible magnitude of the incident, involving multi-agency response and interaction with Australian Government agencies for specialist support, overall control of a SPRED emergency will be at State level on notification by EMA. Response at the incident site(s), once known, will follow the principle of a graduated approach as set out in State EM Policy section 5 and State EM Plan section 5.

4.2 Response Arrangements

The response arrangements of this annex are automatically activated on advice from EMA to the POC of the possibility of SPRED (either directly or via the Department of Fire and Emergency Services). They are designed to be initiated in incremental stages to allow sufficient time for agencies, both State and Australian Government, to mobilise resources, thereby permitting a rapid commencement of response activities once the SPRED footprint area has been determined.

The amount of warning received by the NSR will influence the rate at which the arrangements will be implemented. Normally, several days warning of a possible SPRED impact would be received; however, in exceptional circumstances, the warning time may be reduced to only a period of hours. In this case, a rapid response may be required by specific State and Commonwealth agencies.

Phases of activity associated with the response to SPRED incidents are applicable to pre-impact, post impact and at stand-down.

4.2.1 Pre-Impact

The actions taken on receipt of a notification from the EMA of a possible SPRED emergency.

Watching Phase

The Watching phase will be initiated by EMA who, through the NSR, will advise relevant states and territories, as well as Australian Government agencies, of the first notification of possible SPRED and the associated risk (e.g. re-entry of a space vehicle containing an Radio-Isotopic Thermoelectric Generator RTG/reactor or other hazardous materials likely to pose a risk to Australian interests).

EMA, through the NSR, will notify States and Territories through the agreed single point of contacts for emergency notification. The progress of the space object will be monitored, and policy and planning aspects considered.

Warning Phase

EMA, through the NSR, will notify States and Territories and relevant Australian Government agencies of a possible or confirmed SPRED incident. The declaration of the Warning phase will signify that:

- Tracking data on the forecast re-entry of a space object indicates a possibility of impact of known or suspected SPRED on Australian territory with the predicted commencement of the re-entry window within a timely manner
- There should be a change of emphasis from policy and planning to response
- Activation of a police command team at the Maylands Incident Command Centre (MICC) during normal hours (0700 to 1800 hours WST Monday - Friday).

Any reports of SPRED impact sightings to be reported to EMA.

Thereafter

Tracking data on the forecast re-entry of a space object indicates a probability of impact of known or suspected SPRED on Australian territory with the commencement of the re-entry window being within two days:

- The Assistant Commissioner Specialist and Support Services (or for 'out of hours, short notice incidents, the Duty Commander) is to be contactable by telephone at all times, via the State Operations Command Centre (SOCC)
- Other emergency management agencies may be requested to provide Liaison Officers to attend the MICC
- Where an area of likely impact is known, local government/s may assist with consideration to at risk communities and infrastructure.

Declaration of the Warning phase or notification from EMA will normally provide 48 hours' notice of the initial impact. However, the immediate declaration of this 'thereafter' phase without implementation of the Watching and Warning phases may be necessary where very little notice is received from EMA. In these circumstances, actions carried out during the Watching and Warning phases will need to be condensed and may take place in an abridged form.

4.2.2 Post Impact

Initial Impact Phase

EMA will notify relevant Australian Government agencies of the impact site(s), the situation and coordinate likely requests for assistance under COMDISPLAN. The initial impact phase will signify that:

- The impact or suspected impact of SPRED within Western Australia has occurred
- WASDERT will deploy as advised by the Police Commander with incident control if the area of impact is known.

Upon declaration of the initial impact, efforts will concentrate on:

- Determination of the footprint
- Cordoning and containment of the area to protect the public
- Search for and retrieval and/or storage of SPRED
- Decontamination of personnel and facilities contaminated by radioactive and/or other hazardous materials (HAZMAT) debris.

All debris impact sites should be treated as potentially a serious Hazmat situation, with possible activation of response arrangements in the State Hazard Plan – Hazardous Materials (HAZMAT) until expert advice recommends otherwise. All confirmed or suspected impact sites are to be reported to EMA through the NSR.

Note: COMDISPLAN may be activated if the impact of space debris is significant enough to warrant an official request for Australian Government assistance.

Search Phase

Based on information provided by the NSR, including the type of any radioactive hazard (e.g. Radio-Isotopic Thermoelectric Generator (RTG) or nuclear reactor), other likely hazardous materials, the estimated impact date and orbital track, arrangements will be made for the conduct of search operations to locate SPRED. On advice that SPRED has impacted or may have impacted in WA, detection aircraft (tasked and dispatched by the Police Commander with incident control), will search the area located within the predicted footprint to confirm that impact has actually occurred.

For search planning purposes, the footprint is assumed to be a corridor measuring 1,000 kilometres by 40 kilometres. Although it is reasonable to assume that this footprint will occur along (or at least near) the final orbit track, confirmed footprint data from STRATCOM may not be available until 72 hours after the impact. Where possible, aircraft will normally be used to conduct the initial search to define the footprint and locate areas of high threat.

The type of power generation will influence the method of search to be conducted. RTGs are difficult to detect using aerial ionising radiation detection methods; however, they do give off a degree of heat that may be identified by infra-red detection devices. Nuclear reactors generally can be detected by aerial methods using gamma spectrometer devices. Some space vehicles have on-board safety mechanisms designed to separate some of the component parts before re-entry. If this occurs, the behaviour of these component parts may differ from the forecast behaviour of the whole vehicle and multiple re-entry events could occur and be separated by days or even weeks.

As certain types of HAZMAT are difficult to detect by aerial survey, detailed ground search may also be required to determine their precise location and facilitate their removal. In the worst-case scenario of small particle contamination of a populated area, high-rise buildings and flying restrictions may seriously degrade aerial search performance and so ground search techniques may have to be conducted.

Concurrently, the Australian Government may, on request by and in consultation with the State, task and dispatch aircraft and conduct atmospheric air sampling using unmanned aerial vehicles and ground-based air sampling devices. Populated areas within the foot print area will be surveyed early to determine if they have been subjected to contamination.

Response Phase

Initial action will be to isolate the site and contain and manage it due to potential HAZMAT. Radioactive and other HAZMAT debris found will need to be collected and removed safely. Areas that may have been contaminated will require detailed surveying to establish level of risk (e.g. to health and/or the environment) and possible decontamination. The impacts of a SPRED emergency could extend over a number of months. Initial actions taken can be vitally important in determining the final outcome of the incident and may include such actions as:

- retrieval and storage of radioactive and/or other HAZMAT SPRED

- decontamination of personnel, facilities and equipment contaminated by SPRED
- declaration and evacuation of restricted areas
- checking and declaring 'safe' populated areas within the footprint to alleviate community and political concerns
- immediate welfare of uninjured survivors (including possible decontamination)
- triage, treatment (including possible decontamination) and evacuation of any casualties to hospital
- removal of any deceased
- preservation of evidence (in support of Australian Government's obligation under international agreement to return SPRED to the launching nation)
- provision of security to areas that have been evacuated.

Recovery Phase

Recovery activities will commence and be undertaken at the same time as the immediate response activities and continue into the recovery phase. Initial recovery considerations include, but are not restricted to, such actions as:

- ongoing treatment and rehabilitation of injured
- clothing, food, shelter for evacuees
- potential quarantine and/or health surveillance
- information on what is available to help people resume a "normal" life
- location of family members and tracing missing persons
- information on the emergency site (e.g. impact on homes, clean up/decontamination requirements and environmental monitoring).

Long term recovery will be carried out in accordance with State EM Policy section 6, State EM Plan section 6 and State EM Recovery Procedures 1-4, and

will involve relevant local governments, with possible escalation to the State Recovery Coordinator should state support be required.

4.2.3 Stand-Down

The Police Commander with incident control, in consultation with EMA, will issue authority to cancel activation of the response arrangements of this annex. Consideration should subsequently be given to:

- Debrief
- review of annex.

Note: The Australian Government is responsible for the return of AUSSPREDPLAN to its default Standby Phase status.

4.2.4 Activation at District and Local Level

As a SPRED emergency notification occurs at the State level, via EMA, activation and ensuing duties at District and Local levels will be informed by State direction. There may additionally be locally notified incidents through 000 calls and via a number of agencies attending incidents initially not linked to SPRED.

Appendix F – On Site Emergency Response provides guidelines for police officers and others potentially first on scene and is included in the appendices to support the District and Local response.

4.3 Notifications

Advice that SPRED impact has occurred, or will possibly occur, in Western Australia will be received by, or directed to, the WA Police Force POC Duty Inspector, who will notify the Duty Assistant Commissioner/Commander via the WA Police Force State Operations Command Centre (SOCC).

The SOCC will advise the Assistant Commissioner Specialist and Support Services (or for 'out of hours' short notice incidents via the SOCC) who will assess the situation, and if necessary, activate the response arrangements

of this annex and direct key personnel of participating agencies to be notified (see Appendix C).

4.4 Alerts

During the Watching Phase, Australian Government messaging will be coordinated by EMA via the NSR.

During the Warning Phase, the NSR is responsible for the distribution of all information about known or suspected SPRED to the State.

The WA Police Force, through the Police Media Section, will issue public information and public warnings, and will provide a copy of all releases being issued to EMA. (Media representatives should not be referred to the Defence Intelligence Organisation or any other organisation for information.)

4.5 Operational Sequence Guide

An operational sequence guide detailing agency responsibilities in each of the operational stages are detailed in Appendix I and may be used as an aide-memoire.

4.6 Public Warnings/Information

WA Police Force, as Controlling Agency, is responsible for the provision of media management and public information. Participating organisations and support agencies should only release information which specifically relates to the functions of that organisation.

WA Police Force at all times retains the responsibility for the control of the release of information regarding victim identities.

The broadcasting of information must be appropriate for the severity and timing of the predicted emergency. Further information can be found in the State Support Plan - Emergency Public Information.

4.7 Evacuation Arrangements During Response

The decision to evacuate residents from certain areas impacted by a SPRED impact shall be the responsibility of the Police Commander with incident control.

The WA Police Force will undertake operational evacuation planning as practicable to the circumstances and initiate actions necessary for an evacuation of the community. In such a situation, the WA Police Force will address issues such as community safety and welfare, security of properties and community services.

Directed evacuation under the *Emergency Management Act 2005* would normally require a declaration of an Emergency Situation by the Commissioner of Police or a State of Emergency by the Minister, unless other legislative provisions are applicable.

4.8 Telecommunications

Provision of communications for emergency response measures under this annex is based on the use of normal communication facilities required for the day to day activities of participating organisations.

Telephone, email and facsimile (fax) are the normal means of communication between State, Australian Government and Liaison Officers. All telephone requests are to be confirmed by email/fax as soon as practicable.

Messages from EMA initiating this annex or altering the degrees of warning will commence with the codeword AUSSPREDPLAN indicating the phase in effect.

4.9 Financial Arrangements For Response

Generally, to ensure accountability for expenditure incurred, the organisation with operational control of any resource shall be responsible for payment of

all related expenses associated with its operation during emergencies unless other arrangements are established. Detailed information in relation to the financial responsibilities of participating organisations is outlined in State EM Policy section 5.12, State EM Plan sections 5.4 and 6.10, State EM Recovery Procedure 2 and AUSSPREDPLAN.

Assistance provided under Annex B – SPRED is funded from agency/departmental budgets. Where these resources are inadequate, either because of insufficient funds or a lack of a suitable/appropriate item on which to call, no financial commitments can be entered into or expenditure incurred unless authorised by the Assistant Commissioner Specialist and Support Services (or the Duty Assistant Commissioner/Commander for 'out of hours', short notice incidents).

Agencies and Departments are requested to maintain a record of all costs incurred in providing assistance.

Agencies should not presume they will be provided with net budget supplementation; however, the State through Commonwealth can seek reimbursement from the launching authority.

The Australian Government does not normally seek reimbursement from the State for the cost of assistance provided under AUSSPREDPLAN or the COMDISPLAN. The exception to this may be for tasks not directly related to the safety of life or property or that could be handled by jurisdiction resources, such as clean up teams.



Part Five:

Recovery

Recovery is the coordinated process of supporting emergency affected communities in the reconstruction and restoration of physical infrastructure, the environment and community, psychosocial, and economic wellbeing.

5.1 Local Government

Under the *Emergency Management Act 2005*, it is a function of local government to manage recovery following an emergency affecting the community within its boundary.

The extent of recovery activity will, however, depend on the nature and magnitude of the emergency. In some circumstances, it may be necessary for the State Government to assume responsibility for coordinating the recovery process at a whole-of-government level.

5.2 WA Police Force

The WA Police Force, as the Controlling Agency for a SPRED emergency, must initiate recovery activity during the response to that emergency. The WA Police Force is to:

- ensure timely notification of the emergency, liaison and appropriate inclusion of those with recovery responsibilities in the incident management arrangements
- ensure that in combating the effects of the emergency, activities have regard for the need to facilitate recovery
- coordinate completion of the Impact Statement prior to the transfer of responsibility for management of recovery to the affected local government(s)
- other responsibilities described in State EM Plan section 64.

A dark, blue-toned photograph of a rocky cave interior. A small waterfall flows from a rock overhang into a pool of water. The rock walls are textured and layered. The word "Appendices" is written in white, bold, sans-serif font, centered horizontally and partially underlined by a white horizontal line.

Appendices

Appendix A: Distribution List

This Annex B - SPRED is available on the [SEMC website](#). The agencies below will be notified by the HMA (unless otherwise specified) when an updated version is published on this website.

- All agencies and organisations with responsibilities under this plan, including:
 - Department of Water and Environmental Regulation
 - Department of Fire and Emergency Services
 - Department of Health
 - Department of Communities
 - Local Governments (SEMC Business Unit to notify via WALGA)
- Emergency Management Australia (SEMC Business Unit to notify)
- Minister for Emergency Services (SEMC Business Unit to notify)
- Minister for Police
- National Library of Australia, Legal Deposits Unit (SEMC Business Unit to notify)
- State Emergency Management Committee (SEMC), SEMC subcommittee and SEMC reference group members (SEMC Business Unit to notify)
- State Library of Western Australia (SEMC Business Unit to notify).

Appendix B: Glossary of Terms/Acronyms

Terminology used throughout this document has the meaning prescribed in section 3 of the *Emergency Management Act 2005* or as defined in the State Emergency Management Glossary. In addition, the following hazard-specific definitions apply.

B1 Glossary of Terms

Term	Definition
Beryllium	a metal used as an aerospace material for space vehicles and satellites which, if inhaled as a dust can cause a chronic, life threatening disease in some people.
Hydrazine	a highly toxic inorganic compound which can be dangerously unstable unless handled in solution, used in various rocket fuels.
Satellites	In the context of this annex, an artificial object which has intentionally been placed in orbit, for military and civilian purposes including communications, navigation, weather and research.
Space Debris	Also known as orbital debris, space junk and space waste, refers to defunct objects in orbit around Earth, including spent rocket stages, old satellites and fragments from disintegration, erosion and collision.
Space Vehicle	A rocket powered vehicle used to transport unmanned satellites or humans between the Earth's surface and outer space.

B2 Acronyms

Acronym	Meaning
AGPG	Australian Government Planning Group
AUSSPREDPLAN	Australian Government Space Re-entry Debris Plan
COMDISPLAN	Commonwealth Government Disaster Response Plan
DFES	Department of Fire and Emergency Services
DPC	Department of the Premier and Cabinet
DWER	Department of Water Environmental Regulation
EMA	Department of Home Affairs Emergency Management Australia
EOU	Emergency Operations Unit (WA Police Force)
HAZMAT	Hazardous materials
HEAT	Hazmat Emergency Advisory Team
JAXA	Japanese Aerospace Exploration Agency
MICC	Maylands Incident Command Centre

Acronym	Meaning
NSR	Australian Government National Situation Room
POC	Police Operations Centre
RHA	Radiation Health Advisor (DoH)
RTG	Radio-Isotopic Thermoelectric Generator
SOA	Special Operations Advisor (DFES)
SOCC	State Operations Command Centre
STRATCOM	United States Strategic Command
WASDERT	Western Australia Space Debris Emergency Response Team

Appendix C: Response Roles and Responsibilities

The WA Police Force has the primary role of coordinating the response to SPRED emergencies.

The following are the response roles and responsibilities of agencies under this plan. Brief all-hazards information is also provided for agencies who may have a role under this annex – full details of these roles and responsibilities can be found in the State Emergency Management Plan, Appendix E.

All agencies should maintain appropriate internal plans and procedures in relation to their specific responsibilities.

Organisation	Response Responsibilities
Department of Communities	<ul style="list-style-type: none"> a. Coordinate emergency relief and support services for those impacted by the incident including operating evacuation centres and providing crisis support services (emergency accommodation, emergency clothing and personal requisites, personal support services, financial assistance, emergency food), as required. b. Coordinate and facilitate registration and reunification, including arranging for Register.Find.Reunite. to be activated via the Australian Red Cross, as required.
Department of Water and Environmental Regulation	<p>Role: To provide expert advice and air, water and soil monitoring for hazardous emissions</p> <p>Responsibilities to:</p> <ul style="list-style-type: none"> a. Be contactable and available 24/7 and provide a Liaison Officer to the MICC from initiation of Warning Phase b. Provide Environmental Protection Advisor to the WASDERT when activated c. Provide a mobile response for the detection and monitoring of chemicals and particulates escaping into the environment during a SPRED emergency d. Provide environmental monitoring during the Response phase for off-site impacts in air and water and advice on impacts to the Police Commander with incident control e. Provide advice on minimization of impacts on the environment, including containment, confinement and clean up, decontamination, minimisation of wastes, and waste disposal. f. Coordinate post-incident environmental sampling and provide interpretation of environmental monitoring data and results where required.

Organisation	Response Responsibilities
Department of Fire and Emergency Services	<p>Role: Provision of expert advice and support for hazardous materials during initial response phase, firefighting suppression and attending to the rescue of victims</p> <p>Responsibilities to:</p> <ul style="list-style-type: none"> g. Provide a DFES Commander and/or Liaison Officer on call from initiation of Warning phase h. Provide Special Operations Advisor (SOA) to the WAsDERT when activated i. Provide rescue and fire-fighting suppression response capabilities j. Assist with the rescue of trapped victims k. Provide HAZMAT response (in accordance with State Hazard Plan – Hazardous Materials (HAZMAT)) l. Provide manpower and resources.
Department of Health	<p>Role: To coordinate the overall Health response to a radioactive or other health related contaminant in SPRED (e.g. Hydrazine), or mass casualty situation.</p> <p>Responsibilities to:</p> <ul style="list-style-type: none"> a. Provide a liaison officer on call from initiation of Warning phase b. Coordinate the health response to emergencies including medical, first aid, ambulance and public health resources, as needed c. Monitor public health aspects of the emergency response d. Coordinate the public health response to minimise ongoing environmental and public health risks e. Assist partner agencies in crisis counselling and critical stress management.

Organisation	Response Responsibilities
Department of Health (continued)	<p>Examples of Specific Health Agency Functions:</p> <ul style="list-style-type: none"> a. Radiation Health: <ul style="list-style-type: none"> - Provide expert advice and radiation monitoring services in relation to radiation hazards (including Radiation Health Advisors to the WASDERT). b. St John Ambulance: <ul style="list-style-type: none"> - Provide a liaison officer on call from initiation of Warning phase - Provide and coordinate road ambulance responses to emergencies - Coordinate the triage of injured persons and the medical evacuation of severely injured persons. c. Royal Flying Doctor Service: <ul style="list-style-type: none"> - Provide and coordinate air ambulance responses to emergencies. d. Australian Red Cross Blood Service: <ul style="list-style-type: none"> - Provide blood and blood products - Provide specialist consultation on transfusion medicine. e. Public Health Officers/Environmental Health Officers: <ul style="list-style-type: none"> - Provide advice and direction on: <ul style="list-style-type: none"> · food and water safety · sanitation and refuse disposal · infection control · vermin control. <p>Note: It should be noted that while the <i>Public Health Act 2016</i> provides the enabling powers for Environmental Health Officers, most are employed by their respective Local Government Authority, and not by the Department of Health.</p>

Appendix D: WA Space Debris Emergency Response Team (WASDERT)

Organisation

Minimum personnel requirements for the WASDERT are:

- a) **WA Police Force:** 2 Emergency Operations Unit (EOU) Officers
- b) **Health:** 2 Radiation Health Advisors (RHAs)
- c) **DFES:** 1 Special Operations Advisor (SOA)
- d) **DWER:** 1 Environmental Protection Advisor

Depending on the deployment location, the composition of the WASDERT may be adjusted by the Police Commander with incident control. Additional advisors may be included according to the nature of the SPRED, e.g. via the Department of Health's Disaster Preparedness and Management Unit.

The WASDERT may be deployed to the impact site or other locations by the Police Commander with incident control on receipt of positive information of the footprint area location. IMT personnel are to be identified and in readiness to move from the time Warning phase is notified from EMA.

The involvement of the Hazmat Emergency Advisory Team (HEAT) and activation of response arrangements of State Hazard Plan – HAZMAT will be considered, where appropriate, at the request of the Police Commander with incident control.

Appendix E: Notification (Warning Phase)

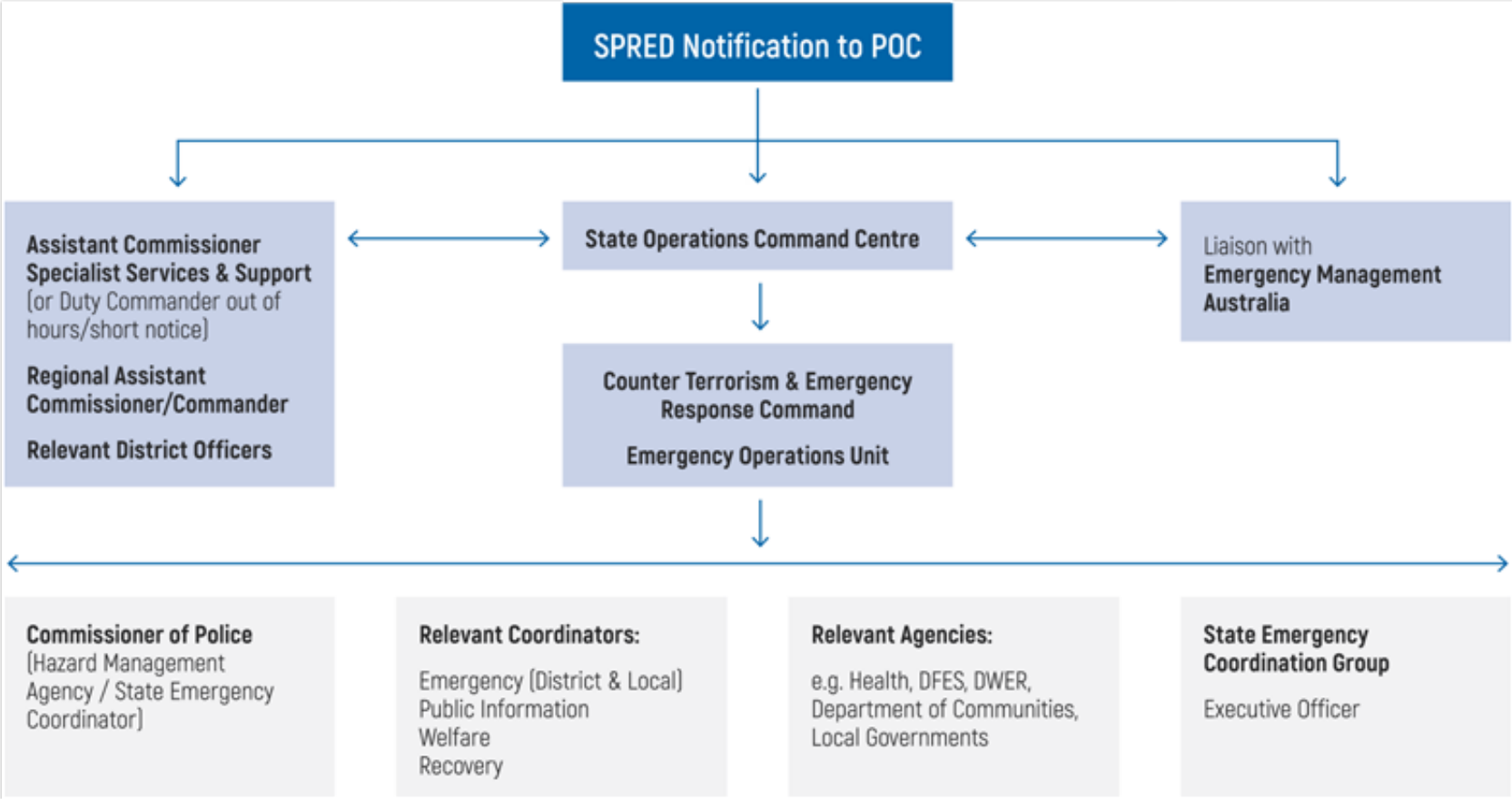


Figure 1: Notification to POC during Warning Phase

Appendix F: Sequence Guide

Responsible Authority	Watching	Warning (1)	Warning (2)	Initial Impact
Western Australia Police Force (WA Police Force) <i>Role</i> Hazard Management Agency <i>Responsibilities</i> Provide Police Commander with incident control Provide personnel for WAsDERT and Incident Management Team Control/Coordination of any emergency response Dissemination of warnings, public announcements and advice to the public	Activate to the necessary level of readiness and alert all involved agencies.	Increase the activation level of emergency management arrangements. Maintain close liaison with appropriate agencies (including EMA). Confirm arrangements for the coordination of Australian Government agencies that will be operating in support, should the State be affected. Implement a public information process through Police Media. Nominate staff for WAsDERT and IMT. Collect/pass reports to EMA from emergency services and the public on re-entry sightings and suspicious objects.	Increase the activation level of emergency management arrangements. Ensure twenty-four (24) hour contact arrangements are established with EMA. Collect and pass reports to EMA from emergency services and the public on re-entry sightings and suspicious objects. Provide regular Sitreps to appropriate agencies and Police Media. Where necessary establish liaison with appropriate Australian Government agencies providing assistance to the state. Staff and equip the MICC (if practicable). Assemble and brief WAsDERT and IMT. Confirm Assistant Commissioner Specialist and Support Services or delegate is available for MICC attendance as required via the SOCC.	Control and coordinate operations. Staff and equip the MICC (if not already in place). Cause suspicious objects reported by emergency services and the public to be checked for radioactivity and cordon/isolate those which are radioactive where practicable. Immediately cause decontamination procedures of public areas where radioactivity or other contaminant is confirmed. Provide personnel to assist in the supervision and security of decontamination centre(s). Collect and pass reports to EMA from emergency services and the public on re-entry sightings and suspicious objects. Declare restricted (e.g. potentially radioactive) areas if required. Evacuate restricted areas if required. Registration of personal details of evacuees. Determine the requirement for Australian Government assistance in consultation with EMA. Request Australian Government assistance if required, and provide and maintain liaison with Australian Government supporting agencies. Cause surveys of those locations where radioactive debris may have fallen on inhabited areas. Provide temporary radioactive material storage facility and security as necessary. Deploy WAsDERT and IMT as required. Crowd and traffic control.

Responsible Authority	Watching	Warning (1)	Warning (2)	Initial Impact
<p>Department of Health (Radiation Health and/or others as required) <i>Role</i> To provide advice and radiation and/or other health monitoring services <i>Responsibilities</i> Provision of advice on public health matters, and emergency medical services as required Distribution of prophylactic tablets and dosage Implementation of controls and restrictions of food stuffs Provide a monitoring team (normally 2 persons) to IMT</p>	<p>Receive and distribute internally operational information on the situation.</p> <p>Check the availability of relevant equipment.</p>	<p>Advise as per watching phase.</p> <p>Nominate staff for pre-positioning at selected population centres.</p> <p>Nominate staff for WASDERT and possibly ISG/OASG.</p> <p>Place Liaison Officer On Call at the MICC.</p>	<p>Advise as per watching phase.</p> <p>Locate monitoring personnel at threatened populated centres.</p> <p>Check suspicious objects reported by emergency services and the public for radioactivity.</p> <p>Assemble Radiation Health Section representatives (or other specialists as required) to WASDERT at MICC for briefing.</p>	<p>Advise as per watching phase.</p> <p>Check suspicious objects reported by emergency services and the public for radioactivity.</p> <p>Conduct surveys of those locations where radioactive debris may have fallen on inhabited areas.</p> <p>As an immediate response measure, commence decontamination procedures of public areas where radioactivity is confirmed.</p> <p>Provide advice to the Police Commander with incident control and Assistant Commissioner Specialist and Support Services or delegate regarding radiological risks and protective countermeasures.</p> <p>Establish appropriate health surveillance measures.</p>

Responsible Authority	Watching	Warning (1)	Warning (2)	Initial Impact
<p>WASDERT</p> <p><i>Role</i></p> <p>To provide a Forward Control Point at the impact area.</p> <p><i>Responsibilities</i></p> <p>Establishment of security projected footprint area</p> <p>Provide advice to the Police Commander with incident control on all matters relating to the space debris operation</p>	<p>Maintain an awareness of the situation.</p> <p>Ensure personnel preparation.</p>	<p>As per monitoring phase.</p>	<p>Assemble at MICC for briefing.</p> <p>Remain at 2 hours notice for deployment.</p>	<p>Deploy as instructed.</p> <p>Establish Forward Control Point.</p> <p>Arrange with MICC for security of projected footprint.</p> <p>Assist Police Commander with incident control as required.</p>

Table Notes: Sequence Guide Key

Watching : First notification of possible re-entry of radioactive space debris

Warning (1): 7 days before estimated re-entry window

Warning (2): 2 days before estimated re-entry window

Initial Impact: On impact of debris

