Australian Government

Department of Defence
Estate and Infrastructure Group

CULTANA ENVIRONMENTAL MANAGEMENT SYSTEM:
(1) SYSTEM DESCRIPTION

Australian Government

Department of Defence
Estate and Infrastructure Group

Cultana Environmental Management System: (1) System Description

Prepared by:
Dr Frederick Ford, Acting Assistant Director – Biodiversity and Landscape Management
Angelene McCracken, Biodiversity Policy Officer
Directorate of Environment and Heritage Policy Directorate
Environment and Engineering Branch
Infrastructure Division
Estate and Infrastructure Group

Date: 8 January 2016

Contents

Figures

Tables

List of Acronyms

ADF	Australian Defence Force
BI	Business Intelligence
BMP	Bushfire Management Plan
BONS	Biodiversity and Overabundant Native Species
BORIS	Budget and Output Reporting Information System
BSM	Base Support Manager
CEA	Cultana Expansion Area
CO	Commanding Officer
CSP	Contracted Service Provider
CUTA	Cultana Training Area
DACC	Defence Assistance to the Civil Community
DDOTAM-SA/NT	Deputy Director of Operations and Training Area Management – South Australia / Northern Territory
DEPA	Director of Environment Protection and Assessments
DEPA	Directorate of Environment Protection and Assessments
DEQMS	Defence Estate Quality Management System
DFR	Defence Force Regulations
DHA	Density per Hectare
DI	Defence Instruction
DOTAM	Directorate of Operations and Training Area Management
DotE	Department of the Environment
DPA	Defence Practice Area
DTARP	Director of Training Area Regulation and Policy
DSEWP&C	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
DSO	Defence Support Operations (now ESD)
DSRG	Defence Support and Reform Group (now EIG)
DSTO	Defence Science and Technology Organisation
DTAMM	Defence Training Area Management Manual
DTARP	Directorate of Training Area Regulation and Policy
E&E	Environment and Engineering Branch
EAC	Environmental Advisory Committee
EC	Environmental Compliance (monitoring)
ECC	Environmental Clearance Certificate
EF	Environmental Factor
EFR	Environmental Factor Record
EHSM	Environmental Health and Safety Management
EIG	Estate and Infrastructure Group (formerly DSRG)
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMOS	Estate Maintenance and Operation Services
EMS	Environmental Management System
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPIT	Environmental Planning Information Tool
ERAT	Environmental Risk Assessment Tool
ESD	Estate Services Division (formerly Defence Support Operations)
FASES	First Assistant Secretary Estate Services

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

1

GEMS	Garrison and Estate Management System
GIS	Geographical Information System
GRC	Governance Risk and Compliance
IAW	In Accordance With
ID	Infrastructure Division
ILUA	Indigenous Land Use Agreement
LOCR	Legal and Other Compliance Register
LWP	Land Warfare Procedures
MARS	Metropolitan Adelaide and Regional Sites
MLDP	Miscellaneous Lease for Defence Purposes
MNES	Matters of National Environmental Significance
MOU	Memorandum of Understanding
NDTA	Non-Defence Training Area
NOTAM	Notice to Airmen
NOTMAR	Notice to Mariners
OC	Officer Commanding
PDS	Product Delivery Service
PEP	Property Environmental Profile
PRAP	Project Review and Approval Process
PM	Plant Maintenance
PPM	Project and Program Management
RAAF	Royal Australian Air Force
RCO	Range Control Officer
REO	Regional Environment Officer (now RESO)
RESO	Regional Environment and Sustainability Officer
RI	Range Inspector
ROMAN	Resource and Output Management Accounting Network
RSO	Range Standing Orders
RTAM-SA	Range Training Area Management – South Australia
SADFO	Senior Australian Defence Force Officer
SAP	Systems, Applications & Products in Data Processing (software designed to manage business operations and customer relations)
SCARF	Soil Constraints Analysis Risk Framework
SMARP	Sustainability Monitoring and Reporting Program
SO	Standing Orders
SOW	Statement of Works
SSB	Site Selection Board
STARSN	Standard Training Area Range Safety Network
TA	Training Area
TAMA	Training Area Management Authority
TAOA	Training Area Operation Authority
TARM	Training Area and Range Management
TASCS	Triaxial Alignment Set Calibration System
TASMIS	Training Area Safety Management Information System
UOM	Unit of Measurement
UXO	Unexploded Ordnance
WHS	Work, Health and Safety

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR-
Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment
Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

2

1.0   Introduction

1.1   Background

Cultana Training Area (CUTA) is located approximately 300 km northwest of Adelaide. It occupies an area between the Spencer Gulf to the east and Iron Knob to the west. Port Augusta, Whyalla and Iron Knob are the nearest settlements. For more than a decade Defence has been progressing the expansion of CUTA westward to overcome significant limitations for large-scale manoeuvre training on the 50,250 ha freehold portion of CUTA. The acquisition of all or part of the pastoral leases of Lincoln Park, Pandurra (part), Corruna (part), Roopena, Middleback and Katunga (part) have increased the total size of CUTA to approximately 209,300 ha.

The process of expansion involved a referral (EPBC 2010/5316) to the Minister for the Environment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in 2009. In February 2010, it was determined that the project was a controlled action and was to be assessed through the preparation of a Public Environment Report (PER) (AECOM 2012). This report was completed and submitted in 2012 and approval for the action was finalised in late 2013. In concert with Commonwealth approval processes, negotiations with the South Australian government resulted in the conversion of the majority of the leased areas from pastoral leasehold to a Miscellaneous Lease For Defence Purposes (MLDP) which was signed in June 2013.

The PER (AECOM 2012) identified the following reasons for acquiring the leasehold areas of CUTA.

> *"The current size and shape of CUTA can support only limited military training activities. The site is not large enough to allow large mechanised and motorised combined arms (tanks, infantry and artillery) live fire practices, joint Army and RAAF exercises, or battle group activities. It therefore does not adequately support the training needs of Defence. Weapons systems development has resulted in increases in the range of weapons, which consequently require a larger area in which to train. The limitations of the existing CUTA have therefore become more severe over time and this is expected to worsen further into the future.*
>
> *The size, shape and topography of the existing CUTA offers little or no flexibility to vary training activities, further limiting training value and preventing Defence from using the land sustainably at the tempo needed to fulfil operational requirements. The expanded training area would enable variations in battle group training scenarios and, importantly, it would also allow any areas intensively used for manoeuvring and targeting to be closed until they have recovered sufficiently to be re-opened without impacting on Defence training needs.*
>
> *The Cultana Training Area Expansion is critical to maintaining Defence's training requirements both now and into the future. Without adequate training facilities, Defence's capability to defend Australia and its national interests is reduced. The consequences of not proceeding with the action are as follows:*

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR-Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

3

- *No suitable area for the development of foundation warfighting skills, necessary for delivery of Force 2030, will be available in southern Australia*

- *Training at the existing CUTA at the necessary intensity required to fulfil Defence training needs will not be able to be carried out sustainably*

- *Live firing of planned future weapons capabilities will not be able to be fully integrated into Defence training*

- *Intensive, large scale 1st Brigade and combined arms training will be restricted to the northern dry season which is insufficient to meet training requirements."*

In the PER submitted to the Commonwealth Minister for Environment, Defence proposed that environmental management of CUTA would be effected in the same way as management elsewhere on the Defence Estate; through an Environment Management System (EMS) supported by a number of sub-plans detailing specific environmental matters. The use of an EMS to provide a robust management framework was supported by the South Australian and Commonwealth Governments when assessing the purchase of leases in the Cultana Expansion Area (CEA). This lead to requirements for an Environmental Management Framework (EMF) under the MLDP, and an EMS under the EPBC Act conditions of approval (EPBC 2010/5316). The terminology of EMS has been adopted for consistency with the rest of the Defence estate.

1.2 Environmental Management System concept and structure

Management of the environment is not a stand-alone process. The best environmental management model is one where environmental matters are routinely taken into consideration as part of the management process of any other business interest (assets, equipment etc). This largely removes the need for a new or separate process that controls actions or outcomes that might impact the environment. Defence has been developing and implementing this model of management for many years under the overarching umbrella of various iterations of the Defence Environmental Strategic Plan, which was most recently updated and reviewed in 2015. These processes are robust, and have not been changed or altered for the management of CUTA. They do form many of the key components of the EMS, and substantial elements of this document describe or summarise generic management processes that have not been altered in any way. Should management of CUTA ever highlight required changes to those processes there are formal processes in place to achieve those changes.

While controls and impact assessment through the integration of environment into other business processes is an important part of environmental management, the direct management of environmental matters, such as pests and vegetation, requires consideration under specific processes designed for environmental management. The CUTA EMS is the first Defence EMS designed to take advantage of the new estate management system, the Garrison and Estate Management System (GEMS), due for roll-out in 2016. Once complete, the CUTA EMS will form a flagship project to demonstrate the future management model for environment at all Defence sites. Environmental management components in GEMS were specifically designed to reflect the core requirements currently provided in management plans. Current management plans often contain large quantities of repetition, such as property descriptions and descriptions of legislation, which are common to all plans for the site. This material is generally held elsewhere in readily accessible form, and in the case of legislation, the legal drivers for a plan, or action prescribed in a plan, are generally implicit in its

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

4

recommendations, or are explicitly listed in the Defence Legal and Other Compliance Register (LOCR). The LOCR is updated quarterly with respect to environmental matters, unlike plans that tend to have a five-year life.

A key goal of the CUTA EMS is to recognise the core components of a plan that are required for Defence managers to manage the site, and to minimise repetition and extraneous information that dilutes that core information. Generally this means that a section of the Environmental Management Plan (CUTA EMS (2) Environmental Management Plan) dealing with a particular environmental matter emphasises the "what", "where" and "how", rather than the "why" of a matter. "What" generally takes the form of a risk, organism or feature requiring management. Each of these has an on-system identity within GEMS that describes the nature of the value or risk. The "where" is self-explanatory, and also has an on-system identity through description and direct geospatial referencing of the records describing the matter. This includes the capacity to view risks and environmental factors on a map-viewing interface within GEMS. "How" is the management recommendations for treatments, risk management and monitoring.

The "why" elements that are not dealt with in the same detail as in most current plans are things like descriptions of the internal policy requirements to have a plan for that environmental issue. Usually, the plan exists because other elements of the EMS indicate that it is necessary. GEMS provides a simple, integrated way for such references to be linked and accessed without the need to re-iterate that information. Essentially, plans need not be stand-alone documents if they are properly integrated within an EMS. Elements of "why" that are still required in plans are specific decision-making processes leading to a particular management recommendation. This is especially true for decisions that may have significant ramifications, like those in a Bushfire Management Plan.

Goals of the EMS:

1) Provide an adaptive management framework that ensures a sustainable training area that can support Defence training activities until the end of Defence ownership
2) Fulfil legal requirements of the MLDP and EPBC approval
3) Support integrated management of the environment across freehold and leasehold portions of CUTA
4) Facilitate a transition towards on-system data recording, decision-making and recording, by providing a model for sourcing and implementing core management data into an integrated environment that accounts for general site management requirements
5) Ensure that actions and information arising from planning and operations are generated in a form that is available to relevant personnel and processes
6) Empower training area and environment managers to make environmentally justified risk-management decisions regarding conduct of training serials with the potential to impact the environment

The following section details the over-arching components of the EMS and its broader context. Subsequent sections expand on each key sub-process that contributes to the management of the environment; Environmental Factor Record (EFR) management, monitoring, risk identification and management, hazard and incident management and impact assessment.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

5

2.0   Core Components of Environmental Management

2.1   Policy
Policy provides the documentation of an organisation's motivations, goals, procedures and practices for environmental management. Defence has an extensive suite of policy documentation that implements legal requirements, broader Commonwealth policy, and where possible adopts best practice approaches to a specific subject matter. Extensive guidelines and business process documentation accompany these policies to ensure that personnel conducting Defence business are able to understand their obligations, and identify where environmental policies and procedures integrate into their own business process. The Defence Estate Quality Management System (DEQMS) is a network-based quality assurance system certified under ISO 9001 that houses all estate-related policies and provides task-based and subject matter based guidance on how to manage all aspects of the Defence estate from purchase, disposal and leasing of land to major capital re-development and works program. Other key policies and procedures stem from service doctrine and policies regarding conduct of activities, movements and logistics. A Land Activities Environmental Management Plan that is currently under review provides generalised procedures for environmental management procedures (such as vehicle washdown) that are common across sites.

2.2   Survey
The type and location of environmental values on a site should be largely known before effective management of those values can be achieved. Some exceptions are high risk biosecurity threats are not known to occur, but that still pose a significant risk to the site, and very rare or cryptic species that may reasonably be suspected to occur but have not been detected. CUTA has been the subject of extensive survey effort primarily targeted at vegetation, heritage, threatened flora and fauna, and weeds (Kellogg, Brown and Root 2005; Rural Solutions SA 2011; AECOM 2012; Jacobs 2015). Survey methods have included desktop database searches, direct field investigation, remote sensing and interviews with previous pastoral landholders. Surveys are fundamental to understanding the site, but the return on investment gained through survey rapidly diminishes once baseline site surveys have been conducted. In other words, most information that will ever be learned about a site will be learned from the initial surveys, and subsequent surveys, although they may cost similar amounts, will yield significantly less information. CUTA survey effort has reached this point and a sufficient baseline of information is available to allow successful management of the site. Although large sums of money could be dedicated to general surveys, the net benefit of that effort is likely to be limited. This means that future surveys need to target specific matters of interest, such as rare and cryptic species or emerging issues not currently considered management priorities. Opportunities for general survey are provided by ongoing monitoring and incidental recording of any values of interest encountered during routine management activities.

2.3   Planning and Impact Assessment
Given that a sufficient baseline is available describing the environment of CUTA, this allows for the responsible placement of facilities and infrastructure to support Defence use of the site, and designation of areas that are capable of supporting particular land uses. Planning is a key step in management of the site. Defence business processes that support the responsible location of facilities include the range sighting board and site selection board (SSB). Boards convened under these processes examine proposed options for the location of facilities. SSBs

are required to consider an array of environmental aspects of a development, including bushfire risk and the impacts of any vegetation clearing.

Once sites have been chosen (either before or after a SSB has been convened), then an impact assessment process will be implemented. The review process for projects occurs through submission of planning and design documents into the Project Review and Approval Process (PRAP). Impact assessment requirements for Defence are prescribed under the EPBC Act and in Defence Instruction General 40-3. This requires targeted surveys of the development footprint to establish the presence of any environmental values, and consideration of any matters relevant to the development and its direct and indirect impacts. Developments with small-scale impacts can be assessed and approved at a local level using an Environmental Compliance Certificate (ECC). Any developments with the potential to have a significant impact on matters of national environmental significance (MNES) under the EPBC Act, or on the whole of environment (including heritage), must be considered and approved by the Director of Directorate Environmental Protection and Assessments (DEPA). If a referral to the Minster for the Environment is required under the EPBC Act, DEPA is responsible for the approval process and interactions with the Minister.

2.4 Activity Management

The management of Defence activities falls into several streams. Development activities are discussed above. However, many other activities may cause impacts to the environment. In general, Defence training activities and management actions have well understood impacts, and often have limited requirement for specific management. The potential impacts of routine activities are managed at the site level through control and mitigation measures prescribed in Range Standing Orders (RSOs), e.g., the restriction of vehicle access to a site with sensitive vegetation. Routine activities listed in RSOs do not require any specific management beyond compliance with RSOs. Monitoring is still required to ensure cumulative impacts that could result from routine use over time are identified and managed (section 2.6). When proposed activities fall outside the known impact parameters that permit management as a routine activity, then assessment and approval via an ECC is required, or potentially an even higher level of impact assessment for large scale activities.

2.5 Incident Management

Incidents that impact the environment may result from a variety of sources including Defence activities. Environmental incident management is currently achieved under the Defence National Environmental Standard for Environmental Incident Management by reporting incidents on an AE444 report form. Subsequent investigation and management review may result in corrective action, disciplinary action, or notification of relevant authorities. In GEMS, the AE444 form will be replaced by equivalent processes including an incident report form and review processes as detailed in section 4.3.2.

2.6 Environmental Management Works

Many aspects of the environment require ongoing, scheduled management actions. For example some aspects of weed and pest animal management are required to be conducted each year or seasonally. These works are likely to be conducted by contracted service providers under the Base Services Contracts. The main site contractor for CUTA is Broadspectrum who provide non-Defence range management staff and land management services under the Estate Maintenance and Operations (EMOS) Contract. Because of inherent environmental variability and the unpredictable nature of Defence use of CUTA, many

situations may arise that require responsive management actions. These range from repairing damage resulting from a bogged vehicle to site-wide campaigns to control outbreaks of a pests or weeds during favourable environmental conditions. Depending on the scale or nature of the solution required, Broadspectrum may provide those services, or a separate one-off project may be commissioned through the Product Delivery Service (PDS).

2.7   Monitoring and Improvement

Monitoring is central to an EMS. Monitoring provides feedback to site managers about the impacts of Defence activities, and can identify the requirement for reactive management actions should a prescribed threshold be exceeded (e.g. a pest species increases in abundance to a damaging level). In its simplest form monitoring may involve tracking the number of complaints received about a particular matter (e.g. noise), but more often will involve repeated field measurement of sensitive values that require management of informative parameters that indicate a management action is required. Like surveys, monitoring can be very costly, and every parameter that is monitored potentially reduces Defence's capacity to manage other aspects of the environment. This means that the CUTA monitoring program has been strategically designed to ensure that, in general, 1) the condition of parameters being monitored are plausibly linked to Defence management, 2) the monitoring method yields an interpretable result with a pre-defined management outcome or trigger for further action, 3) monitoring for a number of values can be achieved in the same place at the same time. It would be impossible to monitor a site as large as CUTA through intensive transect or plot measurement. However, informed site users can be encouraged to report readily identified species or features across large areas of the property that might not otherwise be accessed. It is only through such approaches that a practical, cost effective, and informative monitoring program can be implemented. Likewise, post-activity inspections allow relatively random inspections to occur across the site.

2.8   Reporting

Monitoring and the immediate feedback it can provide to management represents a short-term feedback process within an EMS. Over longer time periods it is necessary to consider larger data sets and combinations of factors that may affect site management or demonstrate compliance with environmental regulations. There are a number of prescribed reports required under the MLDP and EPBC approval conditions and these can be semi-automated within GEMS.

2.9   Management of Training Areas

Management of the Defence estate is a collaborative effort by many parts of the Defence organisation. Due to the nature of their use, training areas (TAs) have a distinct management structure compared to the rest of the estate. This includes two dedicated training area management directorates, the Directorate of Training Area Management (DOTAM), and the Directorate of Training Area Regulation and Policy (DTARP). From an environmental perspective, Engineering and Environment Branch (E&E) are the designated technical authority for development of Defence environmental policies and for impact assessment. The key organisational roles and responsibilities for operational management of CUTA are set out in chapter 2 of the RSOs and are included in full below as they describe key roles that cut across most aspects of range management described in the EMS.

CHAPTER 2 MANAGEMENT STRUCTURE AND RESPONSIBILITIES

Management Structure

2.1   The Deputy Secretary Estate and Infrastructure Group (DEPSEC E&IG) is the sole Training Area Management Authority (TAMA) for Defence.

2.2   The Capability Advisor for CUTA is Vice Chief of the Defence Force, through Head Joint Capability Coordination.

2.3   The Training Area Operational Authority (TAOA) for CUTA is First Assistant Secretary Estate Services (FASES), Estate and Infrastructure Group (E&IG).

2.4   The TAOA has delegated the management and operational responsibilities to the Director Operations and Training Area Management (DOTAM) who exercises control through the Deputy Director of Operations and Training Area Management – SA/NT (DDOTAM SA/NT), the Regional Training Area Manager South Australia (RTAM-SA) and the RCO located at CUTA.

2.5   Technical authority over all RTAM-SA managed TA is exercised by Director Training Area Regulation and Policy (DTARP) who provides policy guidance and advice as required.

2.6   For further detail on management responsibilities see DI(G) Admin 59-1 Management of Defence Training Areas (reference D) and Defence Training Area Management Manual (reference E).

2.7   **Doctrine/Range Standing Orders**. Range safety, command and control are to be effected through the hierarchy of Range Safety Doctrine contained in chapter 1 of LWP(G) 7-3-1 Australian Defence Force Range Orders (Land) (reference F).

Estate and Infrastructure Group (E&IG) Responsibilities

2.8   IAW chapter 2, reference E, E&IG, through Infrastructure Division (ID) has portfolio responsibility for strategic estate planning, corporate management policy, including environmental protection related to Defence TA, and TA infrastructure asset development including selection, siting and development of Defence TA to meet Defence capability requirements. ID is also the design authority for range construction.

Estate Services Division (ESD) Responsibilities

2.9   E&IG, through ESD staff are responsible for the delivery of TA estate management services. The provision of user requirements by the Capability Advisors support and assist E&IG in meeting its responsibilities.

2.10 ESD is responsible for

   a.   The conduct of facility or capability Siting Boards to meet strategic estate development plans;

   b.   initial assessment and preparation of Defence practice area declarations for TA;

   c.   estate management of training areas; including:

      (1) property management;

      (2) environment and heritage management, including implementation of TA Environmental Management Plans (EMP), or Environmental Management Systems (EMS) and environmental assessment approvals of proposed activities to ensure use of TA is sustainable; and

      (3) facilities maintenance and garrison support through the suite of Defence contracts, including Estate Upkeep, Land Management and Waste Management, established through ESD.

   d.   The establishment and maintenance of corporate information on the operation of the TA asset; and

   e.   Coordination of defence use of non-defence training areas (NDTA).

TAOA/DOTAM Responsibilities

2.11 The TAOA responsibilities delegated to DOTAM in respect to CUTA include:

   a.   Producing and promulgating instructions, orders, publications, manuals or TA Standing Orders;

   b.   implementing emergency management,

   c.   ensuring the safe and secure operation of the TA;

   d.   support to preparing proposals for processing DPA declarations through DTARP;

   e.   managing airspace requirements;

   f.   approving access for the conduct of activities on the TA;

   g.   ensuring that appropriate environmental impact assessments are conducted for authorised training activities and that an ECC has been issued if the activity is not covered by routine environmental approvals contained in TA standing orders;

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

9

h. *controlling access to the TA including response to trespass;*

i. *developing and implementing assigned responsibilities under approved TAR environmental management plans and environmental management systems, and relevant environmental conditio ns;*

j. *authorising the conduct of activities on the TA under approved EMP;*

k. *ensuring that a regular inspection regime is implemented for all live fire range facilities and demolition ranges;*

l. *providing input to ID for TA development plans;*

m. *convening and approving Range Siting and Safety Boards;*

n. *implementing UXO management on the TA;*

o. *coordinating access and egress of bushfire fighting agencies and user units on the TA as required;*

p. *processing and scheduling of TA bookings and pla cing notices regarding the TA activities (Notice to Airmen, Notice to Mariners and public notices/liaison);*

q. *coordinating users on the TA;*

r. *managing TA safety communication;*

s. *monitoring the conduct of activities of all TA users for compliance with Standing Orders and ECC both during and after the activity, and investigating non -compliance; and*

t. *the training of TA management staff.*

RTAM-SA Responsibilities

2.12 The RTAM-SA is responsible to the TAOA, DOTAM and DDOTAM for the management of C UTA to meet paragraph 2.11.

2.13 RTAM-SA is responsible for authorising all use and access to the CUTA IAW DFR 57BA and chapter 4 of the DTAMM.

2.14 All requests for non-Defence use and access to the TA are to be forwarded to RTAM-SA.

2.15 Request for visitors to access the TA are to be directed to RTAM-SA for authorisation prior to the activity.

RCO CUTA Responsibilities

2.16 The RCO CUTA is the immediate point of contact located at CUTA for all safety matters.

2.17 Day-to-day management including the safe and effective coordination of training activities is the responsibility of the RCO and Range Control. Once an activity/booking has been approved, Range Control will facilitate access to, and coordinate activities within the CUTA for:

a. *ADF organisations and duly authorised individuals (military and non -military);*

b. *non-Defence organisations or contractors authorised via contractual engagement by Defence, for the purposes of carrying out activities on CUTA;*

c. *non-Defence organisations or contractors sponsored by a unit, authorised by RTAM-SA to support the unit for the purposes of carrying out activities on the CUTA, and*

d. *licensees authorised by Indigenous Land Use Agreements, Deeds of Access, MOU, Defence Property Leases, and/or DACC tasks approved by SADFO Metropolitan Adelaide and Regional Sites (MARS), Base Services Manager - MARS, and/or RTAM-SA.*

2.18 The RCO CUTA responsibilities include:

a. *Iimplementing assigned responsibilities under approved TA EMP,*

b. *assist in the conduct of Range Siting and Safety Boards,*

c. *conducting safety inspections of live fire range facilities assisted by Range Inspectors (RI) for all ground weapon and demolition ranges,*

d. *implementing emergency management plans,,*

e. *in conjunction with the RTAM-SA, producing and promulgating TA Standing Orders,*

f. *ensuring the safe and secure operation of the TA,*

g. *controlling access to the TA, including response to trespass,*

h. *monitoring compliance of all TA users with ECC conditions and investigating non-compliance,*

i. *processing and scheduling of TA bookings (in conjunction with the Contracted Service Provider (CSP) staff and Notices to Airmen (NOTAM), Notice to Mariners (NOTMAR) and public notices/liaison),*

j. *coordinating users on TA,*

k. *monitoring the conduct of activities for compliance with TA Standing Orders,*

l. *implementing UXO management on the TA,*

m. *liaising with civilian authorities, and*

n. *monitoring the service provided by CSP.*

Range Control Responsibilities

2.19 *Training Areas and Range Management (TARM) CSP support daily operations for TA management.*

2.20 *The Range Control Staff are the RTAM-SA representatives after hours and on weekends/public holidays and when the RCO is not present.*

2.21 *Range Control Staff report to the RCO for all safety and security issues and for day-to-day operational issues.*

2.22 *Range Control Staff are authorised to act within their Description and Deliverables statements when monitoring all activities on CUTA. Range Control Staff may be contacted on telephone number (08) 8641 5830 or on call sign 'RANGE SAFETY' on the STARSN (TASCS) network.*

2.23 *The Range Control CSP (IAW Description and Deliverables) are responsible for, but not limited to providing the following support:*

a. **Bookings**. *Provide TA booking and allocation of services for permanent ranges, training areas and facilities using TASMIS.*

b. **Range Preparation**. *Preparing live firing ranges for user units.*

c. **March-in and March-out.** *Providing a march-in and march-out brief to all TA users.*

d. **Maintenance.** *Maintenance of buildings, facilities and property.*

e. **Safety.** *Ensuring the safe conduct and coordination of training by units on CUTA.*

f. **Security.** *Ensure controls are in place for a secure training environment including facilities, equipment and the boundary to prevent illegal access or theft.*

g. **Response.** *Coordination of all fire fighting and emergency response resources on CUTA.*

h. **Supervision.** *Supervision of contracted range staff and sub-contractors on CUTA.*

i. **Reporting**. *Reporting incidents and accidents to the RCO, RTAM-SA and relevant emergency services.*

j. **Communications.** *Maintaining, controlling and operating TA safety communications networks (STARSN).*

k. **Post Activity Inspections.** *Conducting post activity inspections of all those areas used by user units prior to their departure from the TA.*

Check Fire and Suspension of Practice

2.24 *Range Control Staff are to order all live firing to cease whenever an unsafe situation occurs, and will not allow a resumption of firing until it is safe to do so. All radio traffic including "CHECK FIRING" is to be logged.*

2.25 *Range Control Staff are to order a live firing user unit to suspend its practice to allow for an administrative move on CUTA. Range Control Staff are the sole authority for cancelling the suspensions issued by their authority.*

Unit Responsibilities

2.26 *User unit commanders, officers and non-commissioned officers are responsible to comply with and enforce Australian Defence Force Range Orders (Land) (reference F) and Range Standing Orders to ensure the safe conduct of their unit activities on CUTA.*

2.27 *All users of CUTA are responsible for the following:*

a. *Submitting TASMIS bookings to Range Control within the period specified in chapter 5 of these Orders;*

b. *ensuring that suitable, qualified and competent personnel are appointed to conduct range practices or dangerous activities in accordance with Australian Defence Force Range Orders (Land) (reference F), any applicable formation and unit specific orders and these Orders;*

c. *the conduct of staff checks and obtaining CO/OC approval of firing details for all live firing activities in accordance with Australian Defence Force Range Orders (Land) (reference F), any applicable formation and unit specific orders, and these Orders;*

d. *conducting pre and post activity inspections in conjunction with Range Control;*

e. *ensuring reliable communications exist for the safe conduct of any activity;*

f. *stopping or modifying range practices or dangerous activities when there are insufficient safety staff available;*

g. *reporting and investigating all incidents which occur as a consequence of activities in CUTA to Range Control;*

h. *providing the Investigating Officers Report/Quick Assessment to Range Control within 14 days of the incident;*

i. *complying with the provisions of these Standing Orders and all directions given by RTAM-SA, RCO and Range Control;*

j. *the safety and security of all personnel, facilities, equipment and material;*

k. *ensuring troops or personnel under their command or control do not trespass into danger areas, restricted areas or buildings that are out of bounds;*

l. *ensuring all unit/contractor/group personnel remain within the area allocated;*

m. *reporting all damage which occurs as a result of activities conducted on CUTA to Range Control;*

n. *repairing any damage that is within the unit's, organisation or individuals capabilities;*

o. *removal of any target/material that they have introduced to the TA to support their activity;*

p. *ensuring that all personnel under their command are conscious of potential trespass by unauthorised persons;*

q. *advising Range Control as soon as practicable after the discovery of any trespasser;*

r. *providing all administrative and logistic support requirements for activities conducted at CUTA;*

s. *advising Range Control of suggested amendments to the CUTA Standing Orders; and*

t. *completing the Exit Report on TASMIS within 14 days of the completion of the activity (inclusive of filling out an incident report, if required).*

Key Defence-wide documents that guide the development and ongoing management of training area and environmental matters are listed in Table 1. This is not an exhaustive list and does not seek to capture the full scope of documents from Defence white papers down to RSOs. The documents in the list are the mid-tier documents that seek to distil high-level strategies and legislation into training area specific or environmentally specific outcomes. The CUTA EMS (2) lists specific policies and key references against environmental management issues for the site.

Table 1: Key Policies and Documents

Document	Subject matter
Training Area Strategic Plan	High level visionary document
Defence Environmental Strategic Plan	High level visionary document
Policy for Training Area Sustainability Monitoring and Reporting	A response to an identified need to demonstrate a sustainable approach to management of TAs and provide a tool kit of management thresholds
Defence Instruction General 40-2	General environmental management arrangements in Defence
Defence Instruction General 40-3	Impact assessment processes and environmental management under the EPBC Act
Defence Instruction General 59-1	Management of Defence Training Areas
CUTA Training Area Capability Board report	Assessment of the potential uses and infrastructure requirement for CUTA
Environment Policies	*Including* Contamination Management, Bushfire Management, Biosecurity and Overabundant Native Species Management, Waste Management, Pollution prevention

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

12

3.0 Overview of System Components

3.1 Garrison and Estate Management System (GEMS)

During 2015, Defence has been finalising the design and testing of GEMS. GEMS is a SAP-based database and business intelligence system that is designed to integrate management of information about estate assets with transactional and financial data relating to those assets. Unlike previous computer-based Defence estate management systems, GEMS explicitly takes account of environmental values. GEMS records the location and details of environmental values relevant to management, and supports monitoring and reporting against those matters. Works and projects relevant to the environment can be tracked against specific environmental values, and on-line incident management and other related processes are integrated within a single framework. The design of environmental management in GEMS was modelled against an EMS following the principles of ISO 14001. Figure 1 illustrates how GEMS in interaction with other system elements fulfils the requirements of an EMS, and each of the key modules contributing directly to the EMS is outlined below. GEMS will replace two interim systems; Predict, which is a risk management database, and IBIS (the Interim Business Information System), which holds estate and transactional data relating to estate management. Throughout the EMS document where such functions are described within GEMS, the functionality is partly or wholly mirrored by these systems. Neither system records environmental factors in the way that GEMS does.
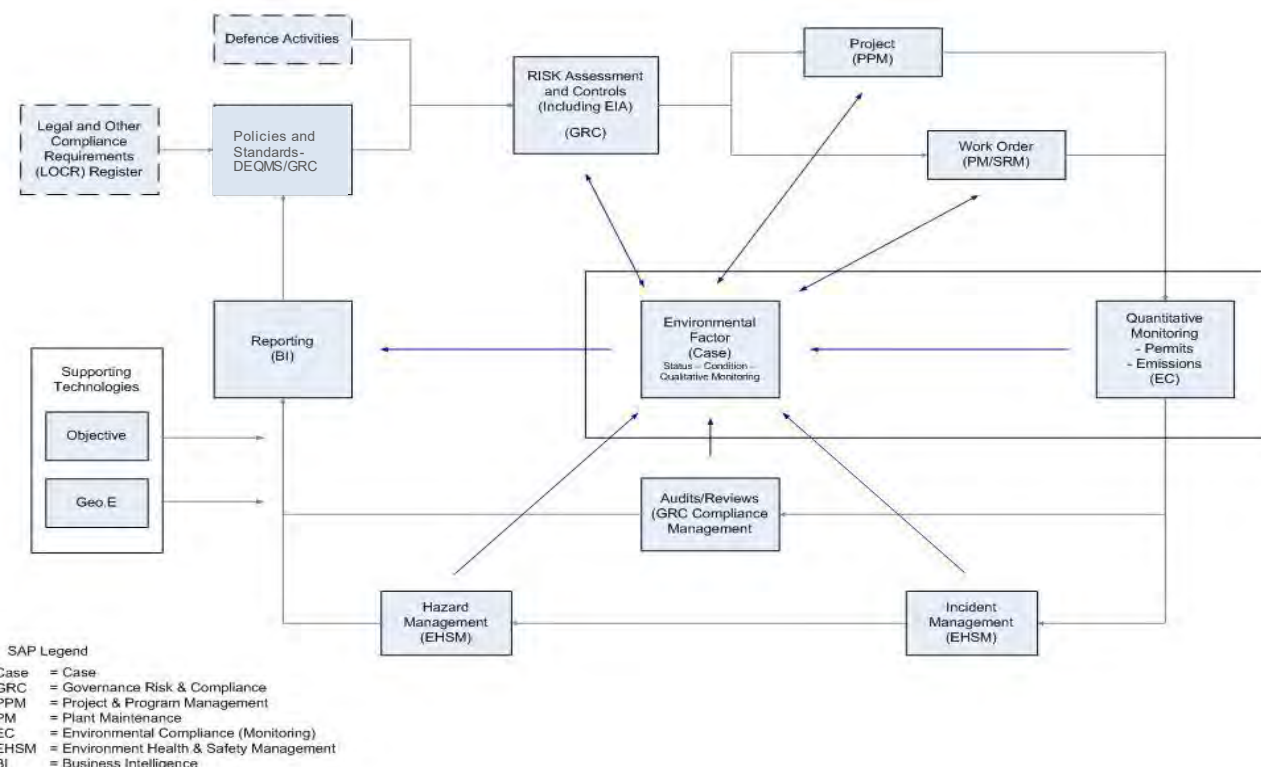

Figure 1. How GEMS supports the Defence EMS.
Dashed lines are off-system elements and solid lines represent modules within GEMS. Supporting technologies are non-SAP programs that are fully integrated within the GEMS systems architecture.

3.1.1   Environmental Factor (EF) Management (Case)

Environmental Factors are the key element of the "what" component of the EMS. The functionality for EF management has been built in the Case module of GEMS. Environmental Factors describe nine currently defined categories of environmental matter; Asbestos, Biodiversity, Biosecurity and Overabundant Native Species (BONS), Bushfire, Contaminated Sites, Heritage, Resource Management, and Soil and Waste. A further category, Monitoring Point, is under development. Post go-live other EFs can potentially be designed based on emerging requirements. Environmental Factor Records (EFRs) describe the location of environmental values or issues using a set of fixed criteria for each type or sub-type of EFR. These are described in more detail in section 4.3.

3.1.2   Environmental Compliance (EC)

Quantitative monitoring against EFRs or other environmental matters and risks is achieved in EC. This module allows almost any conceivable environmental 'material' to be monitored in a relevant unit of measure. 'Material' may be a threatened species, water or air quality, or any other aspect of the environment. Thresholds can be defined within EC such that automatic notifications are sent to relevant individuals when a threshold is breached. Real-time dashboard and other reporting options are available that give at-a-glance condition monitoring for a given area whether it be property, region, Base Support Area or entire country.

3.1.3   Governance Risk and Compliance (GRC)

While EFRs record the presence and location of an environmental value or matter, GRC is used to assess the significance of that value to management and to record the management interests in that EFR. The presence of a particular environmental value may be of no particular management importance, but a risk associated with that value may render it of interest to site managers. For example, a particular vegetation community may be unremarkable, but becomes a key management item when it is designated a bushfire prone area. The exact risk management framework for implementation within GEMS is still being refined but will build on the current Defence Support Operation Risk Management Framework. System functionality to manage that framework is fully designed.

3.1.4   Environmental Health and Safety Management (EHSM)

Incident and hazard reports are completed and managed within EHSM. Both provide management feedback triggers for on-system planning, review and reactive works.

3.1.5   Plant Maintenance (PM) and Project and Program Management (PPM)

Works orders (or service requests) are a common method used to request management works. Within GEMS this process takes place within PM. The start of the process can be an off-system request form (AE547) that is semi-automatically entered into the system. PPM provides management functionality for delivery of more complex programs of work such as infrastructure projects. Both PM and PPM can represent delivery of environmental works, but equally may require environmental controls. GEMS project templates include specific review points for environmental impact assessment and consultation with environmental subject matter experts.

3.1.6   Business Intelligence (BI)

Reporting within the modules of GEMS is generally restricted to the content of that module. It is necessary to use BI to generate integrated reporting that compares data from different modules, e.g., a comparison of works requests raised for weed control against the presence of threatened species impacted by those weeds. Pre-defined reports are available within BI, and

it is also possible to build reports through a drag-and-drop interface. Although not yet defined, it is intended that a generic Sustainability Monitoring and Reporting Program (SMRP) report will be designed within BI which can be attached to additional site-specific reporting. The development of a richer suite of reports is a standard business process after implementation of large business management systems such as GEMS, and a period of testing the systems prior to finalising reporting should lead to better standardised reports for environmental managers.

3.1.7   Interactive forms

Several forms were described above as forming part of the GEMS management solution. These provide basic information in pre-defined fields that match the equivalent fields within GEMS. One of the greatest benefits of GEMS is that once the system is operational much of the information that is required to manage EFs will be importable directly from reports and interactive forms. For environmental management this means that future survey information will be recorded in GEMS format, and the data will be automatically loaded into the system. Assessment forms for heritage management plans and more complex processes can just as easily be translated into on-system EFRs with minimal effort from Defence management. This will transform the way in which management plans are commissioned in the future.

3.1.8   Other IT systems

The CUTA EMS is centred on the integration of on and off-system processes and information, in particular effective use of GEMS as the backbone of the EMS. However, the on-system components of the EMS do not consist solely of GEMS. The Training Area Safety and Management Information System (TASMIS) is central to the management of Australian Defence Force (ADF) activities including range bookings, review of proposed bookings, environmental approval of activities and post-activity reporting. Where possible to do so, report forms in TASMIS will be transitioned to interactive forms that automatically import into GEMS to ensure a central point of truth and repository for environmental management information. For example, the bushfire report form on TASMIS has already been updated to replicate the data fields required for GEMS. TASMIS is fundamental to training area management because although property managers have access to GEMS, user units are unlikely to use systems other than TASMIS. Range Standing Orders (RSOs) and most other relevant information about the site are accessible to user units through TASMIS. This means that access restrictions and other environmental controls must be clearly defined for inclusion in RSOs and implementation through TASMIS.

GEMS integrates with two other SAP systems, the Resource and Output Management and Accounting Network (ROMAN) and the Budget and Output Reporting Information System (BORIS), which form the financial management systems for Defence. From a business management perspective this is highly advantageous and may allow better auditing of environmental management spending, but is not directly relevant to the management of environmental information.

The Defence records management system, Objective, is a key component of the EMS. Objective is where all documents and reports are stored, as well as most other documentary evidence of how CUTA is being managed. Currently the Environmental Performance and Reporting Tool (EPIT) provides a Microsoft® Excel-based reference library to access environmental documents stored in Objective. GEMS will replace this functionality as it directly links to files stored in Objective and makes them available to users viewing the EFRs through the documents tab.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

15

ESRI® ArcGIS™ is the Defence Geographical Information System (GIS) platform. An ArcGIS system will be integrated and rolled out in concert with GEMS. Much of the data needed to support contextual interpretation of site-based GEMS data will be available as web-served maps and queries. Full GIS functionality will be available to users that require access to more advanced analytical processes related to site management. A geodatabase specifically for CUTA underpins all mapping presented in the EMS, and this data will be included within the corporate GIS.

3.2 Off-system processes, controls and services

GEMS will integrate elements of management that are currently off-system, or functionally off-system and bring them together in a consolidated IT framework. However, many important components of environmental management will necessarily remain outside of GEMS or other IT systems except as documents. The primary repository of environmental policies and business processes is the Defence Estate Quality Management System (DEQMS). DEQMS is an ISO 9001 certified quality management system that houses all Defence environmental policies, environmental standards, guidelines and fact sheets. End-to-end business processes including environmental impact assessment procedures, project approval requirements and other guidance for proponents undertaking actions that may cause environmental harm are all detailed on DEQMS.

GEMS manages transactions related to the Base Services Contracts that deliver the majority of environmental management actions, including many elements of day-to-day site environmental management. However, many elements of management of the contracts, including works packaging, approvals and other decisions about delivery of specific environmental programs may occur outside of GEMS but form a key part of the EMS. However, projects, works and impacts arising from those off-system processes should be visible and reportable through GEMS.

A number of committees and decision-making bodies may influence environmental management of CUTA through changes in policy, or through approving infrastructure or other action that may impact on the TA. Most of these are too distant from the immediate management of the TA to be considered as part of the EMS. However, the CUTA Environmental Advisory Committee (EAC) forms an integral part of the EMS. The EAC is convened under the MLDP and consists of self-nominated representatives from across the local community who have an interest in the management of CUTA. The EAC can provide advice on any aspect of site environmental management and priorities, including the EMS.
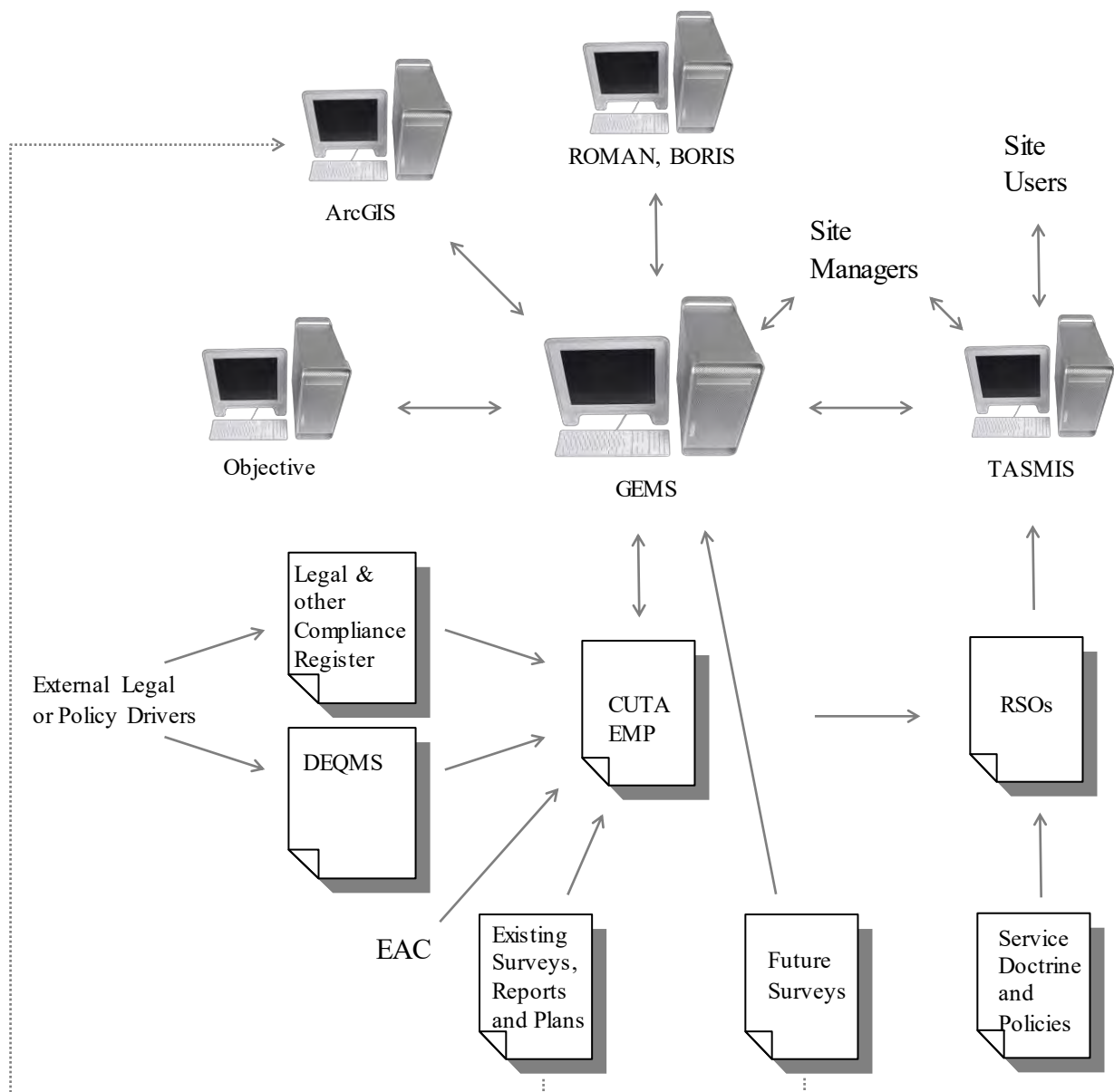
Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

Figure 2. Simplified information management in the CUTA EMS.
Note that future survey data and management information will often be entered directly into GEMS, from where it is directly linked to other relevant parts of the EMS, rather than filtered through a plan document or report. Reporting and planning can largely be conducted or recorded directly in GEMS.

3.3 Legal Compliance

Defence is subject to most of the same legislation as any other landholder. However, as a Commonwealth agency, Defence's primary environmental obligations are detailed in the EPBC Act 1999. This legislation controls both actions by a Commonwealth agency and actions on Commonwealth land (including all freehold and leasehold portions of CUTA). The Defence Legal and Other Compliance Register (LOCR) provides a repository of legal requirements relating to environmental management under State and Commonwealth Laws, as well as other compliance requirements such as EPBC Act recovery plans and Threat Abatement Plans. The register is updated quarterly and is accessible to all Defence personnel through DEQMS. While Defence seeks to comply with State legislation where possible and

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

17

practical to do so, Defence actions at CUTA are explicitly exempt from the *Natural Resources Management (General) Regulations 2005, Development Regulations 2008, Environment Protection Regulations 2009 and Native Vegetation Regulations 2003* on leasehold portions of the site under the *Development (Cultana Training Area) Variation Regulations 2014*. Many of Defence's compliance obligations on the leasehold portion of CUTA are therefore derived not from State law, but through the lease conditions of the MLDP. Further legal conditions arise from the EPBC referral for the purchase of the CUTA leasehold area. This EMS documentation fulfils MLDP and EPBC conditions for an EMS/EMF, and for constituent plans as shown in Table 2.

Table 2: MLDP and EPBC conditions for an EMS/EMF and constituent plans.

MLDP Plan Name	EMS Plan Name	Section	Associated Section(s)
Flora and fauna	CUTA EMS (2) Management Plan	Biodiversity	
Feral Animal	CUTA EMS (2) Management Plan	Biosecurity and Overabundant Native Species	
Weeds	CUTA EMS (2) Management Plan	Biosecurity and Overabundant Native Species	
Fire	CUTA EMS (2) Management Plan	Bushfire	
European Heritage	CUTA EMS (2) Management Plan	Heritage	
Air Pollution and Dust	CUTA EMS (2) Management Plan	Contamination and Pollution Prevention	
Noise and Vibration	CUTA EMS (2) Management Plan	Contamination and Pollution Prevention	
Land Rehabilitation and Degradation	CUTA EMS (2) Management Plan	Whole-of-site programs, Soil	Biodiversity, Contamination and Pollution Prevention
Sustainability, Monitoring and Reporting	CUTA EMS (2) Management Plan	Sustainability, Monitoring and Reporting	
Water Conservation and Water Pollution Management Plan	CUTA EMS (2) Management Plan	Water	
EPBC Plan Name	EMS Plan Name	Section	Associated Section(s)
Threatened Species	CUTA EMS (2) Management Plan	Biodiversity	
Biosecurity and Overabundant Native Species	CUTA EMS (2) Management Plan	Biosecurity and Overabundant Native Species	
Pollution Prevention and Contamination Management	CUTA EMS (2) Management Plan	Contamination and Pollution Prevention	
Sustainability, Monitoring and Reporting	CUTA EMS (2) Management Plan	Sustainability, Monitoring and Reporting	

3.4 Matters not covered by the EMS

There are a large number of business processes that interact directly with environmental management. One of the advantages of GEMS is that although the descriptions of its functionality in this document are focussed on the environmental components, most of the relevant processes that may have a bearing on environmental management are also integrated

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR-Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

18

within GEMS and associated systems. Project management within PPM and the estate upkeep process conducted by contractors and facilitated within the Plant Maintenance (PM) module of GEMS both deal with infrastructure through development of new infrastructure (PPM), or modification or repair of existing infrastructure (PM). These processes are subject to environmental impact assessment and approval where required (e.g. excavation, vegetation clearance, works to a heritage building) and the impact assessment process within PRAP is a core part of the EMS. However, some aspects of estate upkeep also result in environmentally beneficial outcomes, for example, maintenance of road networks and drainage to prevent erosion or other associated problems. In some instances these works may be conducted due to an environmental driver, but in most cases maintenance of infrastructure will primarily occur for the maintenance of the infrastructure itself. Clear cases where such activities do represent both a maintenance and environmental matter are recognised through the provision of EFR subtypes, such as asset protection zones within the bushfire module. Where a matter such as road maintenance may have a bearing on an environmental issue such as erosion, this becomes part of the EMS through recognition of a risk in GRC, or through the realisation of that risk and the need to create an EFR relating to an erosion event and monitoring of the progression or remediation of that erosion.

Workplace Health and Safety (WHS) requirements also sometimes relate to the same matters or events as environmental management. Examples include bushfire hazards, fire events or weeds that are notable for causing allergic reactions and wildlife strike. Where a hazard, such as a bushfire prone area represents an environmental and WHS risk then the assessment of risk within GRC will take those separate parameters into account. Where an event leads to an environmental incident report being generated through GEMS, there are clear steps within the process to determine when and how any associated WHS issues should be reported. WHS incidents such as injuries are reported through Sentinel. This is not considered part of the EMS as environmental aspects are reported within GEMS. However, the close interaction of GEMS and Sentinel for incident reporting must be recognised and the interaction is detailed in sections 4.3.2.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

4.0 Detailed Environmental Management Processes

4.1 EMS

The Defence EMS has been described above in terms of components, information flow and roles and responsibilities as they relate to CUTA. Figure 3 presents a consolidated view of the business processes contributing to the EMS, most of which have been mentioned above. Each of the sub-processes directly relevant to the CUTA EMS is broken down into its constituent parts in subsequent sections; Manage Environmental Factors, Identify and Analyse Risk, Incident and Hazard Management, Monitoring, Sustainability Monitoring and Reporting.
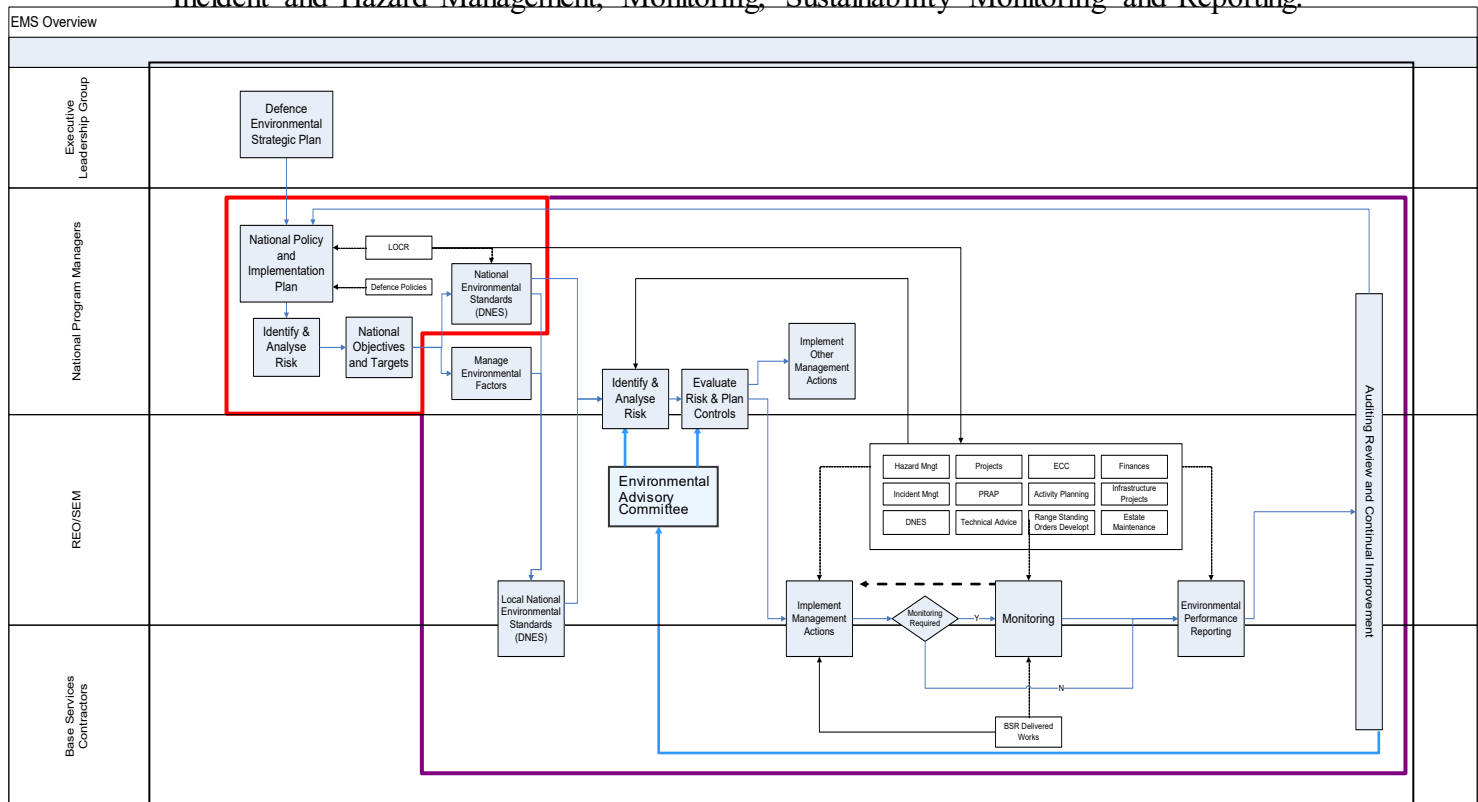
Figure 3. Defence Environmental Management System Processes.
The CUTA EMS is part of the broader Defence EMS and shares many processes. Predominantly site-based processes are shown in the larger purple box and national level processes that feed in to the CUTA EMS in the smaller red box.

4.2 Environmental Factor Management

Environmental Factors (EFs) are overarching categories of environmental values or issues. Environmental Factor Records (EFRs) are specific instances of that type of EF and describe the location and attributes of an individual occurrence of an EF. Within GEMS there are two main levels at which to view EF information; the Property Environmental Profile (PEP), and EFRs.

4.2.1 Property Environmental Profile (PEP)

The PEP provides an overarching summary of environmental matters at a site (Figure 4). Property information is automatically drawn from real estate master data and is not editable within the PEP. Tabs within the PEP allow more specific oversight of specific EFs, with limited management of property-level data (Figs 5-11). Every EF overview tab includes a list of all EFRs representing that EF on the property. A summary statement about the EF is

provided, and in the first instance, the text should be derived directly from the CUTA EMP sections dealing with that EF type, but is editable for those with appropriate permissions. Other tabs link to monitoring results, works, projects, management documents and incidents relating to the EF. A compliance tab is present, and is used for contaminated sites to indicate specific legal requirements relating to an EFR. This functionality will be expanded in the future to potentially link matters such as MLDP conditions with EFRS they relate to. In addition to the above standard features, some overview tabs have additional functionality as shown in the example screenshots taken from the test environment of GEMS. Note that data included in the screenshots is not real data, it is testing data used to ensure system functionality and in no way relates to the CUTA EMS.

Figure 4. Property Environmental Profile overview.
Basic summary information about the property. Blue backgrounds indicate data populated automatically by the system.

Figure 5. BONS overview tab.

Identical to the biodiversity tab except that the date of a management plan is indicated. These are the simplest PEP tabs with only a free-text description of issues on the site and a list of EFRs. New EFRs can also be created directly from the PEP tab, although this is only a practical approach for small numbers of records. Most relevant management information that has been linked to an EF (monitoring, incidents, documents etc) can be directly accessed through the PEP tabs.

Figure 6. Bushfire tab.

Several key attributes can be reportable at the property level for bushfire, particularly bushfire proneness, risk level of property and currency of the Bushfire Management Plan (BMP). Implementation status of the BMP is also achieved at the property level through the checklist tab below.

Figure 7. Outdated version of the Annual Bushfire Plan Implementation Checklist tab.

Due to a recent revision of the Defence bushfire policy wording of these questions has been changed to reflect policy changes. The GEMS report will be altered to reflect those changes. This is a key tab for bushfire. It provides a reportable series of questions that addresses high-level assessment of the readiness of a property for the fire season. Questions can be answered at any time following completion of works and can be changed until an authorised individual accepts the report, at which time it becomes read-only. The form is reset on 31 September each year and the previous year's version archived.

Figure 8. Contaminated Sites Register.

Implements the same functionality as the current Defence Contaminated Sites Register.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR-Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

23

Figure 9. Heritage tab.

Similar to BONS, but with additional derived information indicating the highest ranking heritage listings on the site based on the hierarchy presented for individual heritage EFRs (Fig. 20). Heritage sites, particularly indigenous heritage, are more likely to be managed through no-go zones or access restrictions, and EFRs are more likely to require suppression of sensitive information. This status is shown in the EFR list, and those records that are sensitive are only accessible to authorised personnel.

Figure 10. Resource management tab.

A simple list of EFRs.

Figure 11. Soil tab.
A simple summary that includes the date of soil management plan (if prepared) and soil constraints map (if prepared). Six key soil constraints that may be relevant to EFRs are shown in the EFR list

.

4.2.2   Environmental Factor Records

The purpose of EFRs is to provide a location for environmental matters that require management. EFRs contain some qualitative monitoring information, but their main goal is to provide a system record describing an environmental item that can be linked to monitoring, estate maintenance works, incidents or other relevant on-system information and transactions for planning and reporting purposes. EFR templates are pre-defined within GEMS and take a consistent form across the Defence estate. As far as possible, the data entered into each record has been pre-defined in drop-down menus to minimise transcription errors and ensure accurate, consistent reporting. This includes information, such as species names. These are derived from a centrally maintained database of all known threatened species and BONS across the Defence estate. This allows key information, such as conservation status, to be automatically attributed to a record based on location and species name without the need for user input. It also ensures accurate reporting over time if taxonomic reviews change species names, or when conservation status changes, as all species EFRs are automatically updated to reflect current parameters. Each record also has a GEOe™ spatial representation so that it is viewable through a geospatial portal within GEMS. The different types of factor records are listed below and the following pages detail some of the specific information contained in the different types of factor records.

a. Asbestos
b. Biodiversity
  i. Plant, Algae, Fungus
  ii. Animal
  iii. Ecological Communities
  iv. Environmental Offset
c. BONS (Biosecurity and Overabundant Native Species)
  i. Disease
  ii. Pest
  iii. Weed
  iv. Overabundant native species
  v. Management zone
  vi. Exclusion zone
d. Bushfire
  i. Fire management zone
      i. Asset protection zone
      ii. Strategic fire-fighting advantage zone
      iii. Land management zone – Environmental
      iv. Land management zone – operational
  ii. Fire event record
  iii. Bushfire prone area
  iv. Fire management infrastructure
      i. Water point
      ii. Fire Break
      iii. Refuge of last resort
      iv. Fire trail
      v. Fire escape route
      vi. Fire sensitive asset
      vii. Photographic monitoring point
e. Contaminated sites
f. Heritage
  i. Listing

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

26

        ii. Precinct

       iii. Value

g. Resource management

h. Soil

i. Waste

Figure 12. Animal Environmental Factor Record.

Environmental Offset:EVO – 903456 – no vehicles – and exclusion of all other military activities xxxx

EFR ID: BIO_QLD_000003

Save | Close

Functional Location: Shoalwater Bay Training Area

Functional Location ID: PR 200219

Status: Active

EFR General | Objects | Projects/Work Order | Compliance | Monitoring | Risk | Hazards | Incidents | Notes

EFR Title: * EVO - 903456 - no vehicles - and exclusion of all other military activities xxxx

Category: Environmental Offset

Operational Status: * Operational

Access Restriction: Non-management vehicle

Environmental Offset Type
- Exclusion fence
- Reintroduced species
- Other

[Red callout box] Users can choose from pre-determine types of offset. Offsets can be additive over time

Created By: 060276AF   Andre Flament   Date Created: 23.07.2014

Last Changed By: 060276AF   Andre Flament   Date Changed: 23.07.2014

Accepted By: Jill Bihiti-Kiribilli   Accepted Date: 04.03.2014

Prescribed By: * Fred Ford-Bookland-Fraightford   Prescribed Date: * 19.03.2014

Description: * As part of the National Environment Law Reform agenda, this policy provides upfront guidance on the role of offsets in environmental impact assessments, and how the department considers the suitability of a proposed offset. It aims to improve environmental outcomes through the consistent application of best practice offset principles, provide more

Location: The Shoalwater Bay Military Training Area encompasses 454,500 hectares (4,545 km²), which includes the Warginburra Peninsula, the Torilla Peninsula east of the Stanage Bay Road, Townshend and Leicester Islands, and a sizable chunk of the Shoalwater Bay hinterland north of the village of Byfield.

Figure 13. Environmental Offsets Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

Weed:UT-32-01-03-04 – EFM Forms – BONS – 20150121 – Paterson's curse – very wide spre

EFR ID: BON_QLD_000006   Functional Location: Shoalwater Bay Training Area   Functional Location ID: PR 200219   Status: Active

Save   Close

EFR General | Objects | Projects/Work Order | Compliance | Monitoring | Risk | Hazards | Incidents | Notes

EFR Title: * UT-32-01-03-04 - EFM Forms - BONS - 20150121 - Paterson's curse - very wide spre

Category: Weed

Taxonomy
Species
Taxonomy Type: * Vine/creeper ▼
Echium plantagineum
Paterson's curse

Management Plan Date: * 01.01.2015
Presence: * Potential ▼   Priority: * Moderate ▼   Infestation Age: Short term ▼   Spread: * Decreasing ▼   key Threatening Processes? * ● Yes ○ No
Plant Age: Reproductive ▼

Description: d.#

Weed and pest records contain far more information that threatened species records. All information in drop-down and checkbox format can be reported in consistent and more flexible ways than free text

Transmission Method
☑ Seed   + than 5000 seeds/plant/year   text--------end
☑ Animals   text--------end
☑ Water   text--------end
☑ Plant Material   text--------end
☑ Human Movement/Activity   text--------end
☑ Wind   text--------end
☑ Others   text--------end

Created By: 060276AF   Andre Flament   Date Created: 22.01.2015
Last Changed By: 060276AF   Andre Flament   Date Changed: 22.01.2015
Recorded By: * Hongsth Tudor-Noo-Gah   Date Recorded: 20.03.2014

Identification Category: * Field: Survey ID- secondary evidence   Identification Confidence: Definite ▼

Management Methology: * educe farm and forest productivity. Australia spends considerable time and money each year in combating weed problems and protecting ecosystems and primary production on private and public land.#

Figure 14. Weed Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

Figure 15. Bushfire Management Zone Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

Fire Escape Route:FER - UT-32-01-03-05 - EFM Forms - BUS - TC-32-01-03-05-01 - EFM Upload xxx xxx#

EFR ID: BUS_VIC_000004   Functional Location: Dutson Bombing Range - East Sale   Functional Location ID: PR 2009916   Status: Active

Tabs: EFR General | Objects | Projects/Work Order | Compliance | Monitoring | Risk | Hazards | Incidents | Notes

EFR Title: * FER - UT-32-01-03-05 - EFM Forms - BUS - TC-32-01-03-05-01 - EFM Upload xxx xxx#

Category: Fire Management Infrastructure   Sub-Category: Fire Escape Route

Maintenance Type: Reactive

Surface: Gravel   Traffic Type: 2WD

Trafficable Weight (t): 10.00   Travel Speed (km/hr): 50.00

Operational Status: * Operational

Description: Desrc UT-32-01-03-05 - UPDATE 20150216
Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia

Access: ACCESS UT-32-01-03-05 - UPDATE 20150216
Sed ut perspiciatis unde omnis iste natus error sit voluptatem accusantium doloremque laudantium, totam rem aperiam, eaque ipsa quae ab illo inventore veritatis et quasi architecto beatae vitae dicta sunt explicabo. Nemo enim ipsam voluptatem quia voluptas sit aspernatur aut odit aut fugit, sed quia

Created By: 060276AF Andre Filament   Date Created: 20.03.2014
Last Changed By: 060276AF Andre Filament   Date Changed: 16.02.2015
Recorded By: * hector manchez-sanchez   Date Recorded: * 20.03.2014
Last Inspected By: * Sole Soulful   Last Inspected Date: * 14.05.2014

Desrc UT-32-01-03-05 - UPDATE 20150216
natus error sit voluptatem accusantium aperiam, eaque ipsa quae ab illo inventore vitae dicta sunt explicabo o. Nemo enim aspernatur aut odit aut fugit, sed quia

GEMS allows these relationships to be explicitly defined, and matters can be related back to the EFR.

Objects like fire escape routes are designating an additional purpose over existing assets or structures. maintenance spend and other

Figure 16. Bushfire Escape Route Environmental Factor Record.

Figure 17. Bushfire Asset Protection Zone Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

33

Figure 18. Bushfire Event Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

Figure 19. Bushfire Event Environmental Factor Record.

Figure 20. Heritage Listing Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

36

Value:test ZXP_EF_MNT_PEP_EFR_NON_ASB

🖫 Save   ❌ Close

EFR ID: HER_NSW_000003   Functional Location: Defence Plaza - Sydney   Functional Location ID: PR 203174   Status: Active

| EFR General | Objects | Projects/Work Order | Compliance | Monitoring | Risk | Hazards | Incidents | Notes |

EFR Title: * test ZXP_EF_MNT_PEP_EFR_NON_ASB

Category:

Security & Access: * Public Access ▼

Importance to Listed Place: * High ▼   Importance to Precinct: * High ▼

☑ Sensitive Site   ☑ No-Go Zone

Primary Listing Status: * NHL   Other Listing: State ▼

Heritage Type	Heritage Value
Natural	Inwards Vista
Indigenous	Scar Tree
Indigenous	Sacred Site
Indigenous	Rock Art Site

Key Stakeholders: * ZXP_EF_MNT_PEP_EFR_NON_ASB

Created By: 06027BAF   Andre Flament   Date Created: 17.11.2014
Last Changed By: 060276AF   Andre Flament   Date Changed: 17.11.2014
Recorded By: * Andre Flament   Date Recorded: * 14.05.2014

Location: * test ZXP_EF_MNT_PEP_EFR_NON_ASB It is her

Stakeholder Access: * ZXP_EF_MNT_PEP_EFR_NON_ASB

Any values within a listing can be associated with it for easy audit of the attribution of heritage values to individual assets within and outside formal listings. Specific aspects of the asset that confer heritage value can be listed in the values table. This is especially helpful for building maintenance, but does have a broader application.

Figure 21. Heritage Value Environmental Factor Record.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

4.3 Management Processes

4.3.1 GRC

Once environmental baseline information is transformed into EFRs, the decision-making process can formally begin. In reality, this is not a linear process, and management risks can drive survey and EFR creation, but logically, the discovery of values is the first step. The next step is to determine what obligations or risks are caused by the presence of values, and to understand how important that risk is compared to other management issues on the site. The GRC module of GEMS provides the core functionality to perform the risk assessment and to define controls for risks. Controls are the actual actions that will be taken to reduce the likelihood of the risk being realised. Potential control process within GRC include the requirement to create and manage EFRs and, where necessary, define the monitoring program that allows the state of the risk and outcomes of management options to be assessed and reported on.

It is not only the presence of a value that may trigger the realisation that a management requirement exists. An incident may highlight the need to examine a potential activity, geographical area or management process if it has the potential to cause environmental harm or if it reveals an unknown risk, such as a previously unrecognised contaminated site. Equally, the creation of a new legal obligation can trigger a risk assessment process or the need to management a particular issue. A simple example is the listing of a new species that then requires a new control process that would involve creating EFR records for that species, assessing the risks associated with that species and determining management and monitoring options to assess the effectiveness of the control being applied. Fig 22 shows the inter-relationship between compliance obligations, risk assessment, and outcomes of incident and hazard investigations. These processes apply across many aspects of Defence business, and environment is only one element within the risk and control processes.
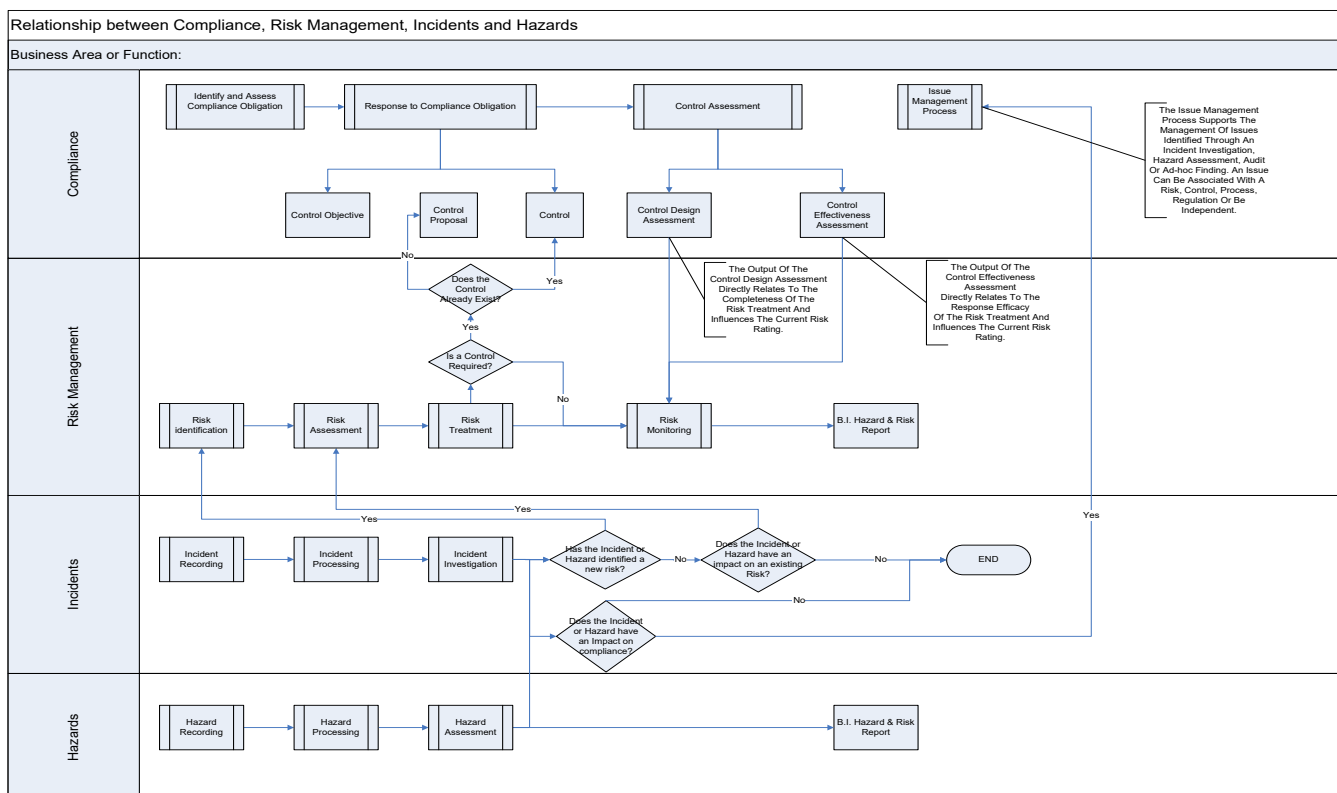
Figure 22. Relationships between compliance, risk, incidents and hazards.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

There are currently many different risk assessment tools used in Defence. All are based on the likelihood and consequence of the risk, but each has been modified to reflect the specific area being investigated. An example set of risk criterion from the Soil Constraints Analysis Risk Framework (SCARF) (GHD 2011) is presented below, but similar ratings are embedded in the generic Environmental Risk Assessment Tool (ERAT) (Department of Defence 2006), Contaminated Site Risk Assessment Tool (Department of Defence 2012) and many others. Risk management in Defence is currently undergoing major reform, although this will not alter the standard consideration of likelihood and consequence in determining risk, nor descriptions of environmental risk already defined in environmental policy. A Joint Directive issued in June 2015 by the Chief of Defence Force and the Secretary of the Department of Defence includes key guidance for Defence personnel on managing risks:

Accepting and treating risks
    a. To be confident that Defence will achieve the best outcomes for Government and the Australian community, we must be deliberate in our decisions about what risks can be accepted, what risks need to be treated and managed, and what level of management activity is required.
    b. The following principles are to apply to all decisions to accept and treat individual risks.
        i. Evidence-based. We actively take risks when we have assessed the potential causes and consequences; we are confident that the benefits of action outweigh the costs; and it is ethical to take these risks.
        ii. Realistic and affordable. Risks are an unavoidable part of day-to-day activities. Actions are to be put in place to reduce the likelihood of negative consequences and maximise the beneficial consequences of risk as far as reasonably practical. These actions must be realistic and achievable within available resources.
        iii. Active and regular review. Risk management must not be a 'one-off activity'. Risks, and the approach to managing each risk, are to be actively monitored to take account of changing circumstances and new information. This may mean re-evaluating earlier decisions or amending and refining management strategies.

Prior to the Joint Directive being issued the Defence Estate Services Division (ESD) undertook a major rationalisation of risk treatment and implemented the ESD Risk Management Framework in order to provide consistency for how risk was being treated within estate management operations. The framework is currently implemented through the program Predict!, and GRC will implement an expanded ESD risk framework.

Table 3. Example risk consequence criteria for assessing impacts on soil.

	Severe	Major	Moderate	Minor	Negligible
	Consequence if soil issue is not managed OR consequence of undertaking particular management actions				
Capability	All activities cease AND unable to conduct missions or training activities OR All activities cease AND major unacceptable delays in delivery of capability. AND For CF1 (major) assets 1 resumption not possible within 24 hours. For CF2 (important) assets resumption not possible within 7 days. For CF3 (support) assets resumption not possible within 28 days. *E.g. Operating heavy vehicles at high frequency immediately after significant rain, on Soil Landscapes that cannot tolerate such activity. The resulting soil damage can include deep wheel ruts that in turn will erode into deep gullies that are likely to prevent vehicle training activities from being conducted for significant periods of time. Eroded gullies may be so large that it will take many months, or even years to secure funding to remediate.*	Some activities curtailed AND missions or training activities can be conducted however in a significantly degraded state. AND For CF1 (major) assets 1 resumption not possible within 24 hours. For CF2 (important) assets resumption not possible within 7 days. For CF3 (support) assets resumption not possible within 28 days. *E.g. Mowing, or slashing open areas too short, will reduce the ground cover required to limit the flows of stormwater and prevent erosion. The resultant rill or gully erosion will significantly restrict the areas available for training for significant periods of time. Access could be limited for many weeks or months until earthworks are completed to remediate the site.*	Some activities curtailed AND missions, training or Cadet activities can be conducted however one or more of the significant requirements of the mission or training would not be met. AND For CF1 (major) assets 1 resumption not possible within 24 hours. For CF2 (important) assets resumption not possible within 7 days. For CF3 (support) assets resumption not possible within 28 days. *E.g. Failure to maintain drainage structures on vehicle trail network (E.g. such as routine periodic maintenance to clear mitre drains or blocked pipes) will result in access being restricted in sections due to erosion of trail surface. Access could be limited for days or weeks until damage is repaired.*	Minimal activities curtailed AND missions, training or Cadet activities can be conducted with minor degradation to several mission or training requirements. OR Minor delays or minor performance degradation. *E.g. Failure to implement and/or maintain simple erosion control measures prior, during and after activities results in ground disturbance that will lessen the quality of training experience for subsequent military personnel. Future training activities may experience time delays in having to take detours around rehabilitation works.*	Minimal activities curtailed AND missions, training or Cadet activities can be conducted with minor degradation to one mission or training requirement. AND Negligible performance impact. *E.g. Failure to manage a soils issue does not curtail Defence activities, or reduce the quality of the experience associated with the activity.*
	Severe	Major	Moderate	Minor	Negligible
Environment	Adverse impact on the Management Objectives and Targets for a site with heritage values, or a heritage asset on a site that is likely to either: ▪ permanently destroy the heritage values OR ▪ substantially alter in a way that is inconsistent with the heritage values, any one of the following: – physical nature of a site or asset – setting of the site or asset – value of the site or asset for a community or group for which it is significant – use of a site as a cultural or ceremonial site. AND / OR Significant negative impact on the Management Objectives and Targets for Valued Environmental Components identified for the site, especially those components described in the EPBC Act definition of the "environment", that is likely to: • impact on areas outside of the area Defence is directly responsible for or • have an impact that meets any two of the following criteria: 1. permanent or irreversible. 2. medium - large scale. 3. moderate - high intensity *E.g. Failure to maintain required ground cover and biomass results in erosion that destroys a Commonwealth Heritage listed Aboriginal midden, thereby having permanent adverse impact on the heritage values of a site.*	Adverse impact on the Management Objectives and Targets for a site with heritage values, or a heritage asset on a site that is likely to either: ▪ require an emergency commitment of substantial resources (time and /or money) to remediate, or would take more than 10 years to recover through natural processes OR ▪ substantially alter in a way that is inconsistent with the heritage values, any one of the following: – physical nature of a site or asset – setting of the site or asset – value of the site or asset for a community or group for which it is significant – use of a site as a cultural or ceremonial site. AND / OR Significant impact on the Management Objectives and Targets for Valued Environmental Components identified for the site, especially those components described in the EPBC Act definition of the "environment", that is likely to meet any two of the following criteria: 1. Would require an emergency commitment of substantial resources (time and/or money) to remediate, or will take more than 10 years for the viability of ecosystems or their constituent parts to recover through natural processes. 2. Medium - large scale. 3. Moderate - high intensity. *E.g. Failure to mitigate soil erosion risks during major earthworks results high sediment loads in stormwater deposited in a World Heritage listed site (E.g. Great Barrier Reef) and having a high intensity long term impact.*	Impact on the Management Objectives and Targets for either a site with heritage values, or a heritage asset on a site, or Valued Environmental Components on a site, which is reversible and meets any two of the following criteria: 1. Would require a programmed commitment of substantial resources (time and /or money) to remediate, or will take between 2-10 years for the viability of ecosystems, or their constituent parts to recover. 2. Small to Medium scale and contained on-site. 3. Moderate intensity. *E.g. Failure to provide controls for the management of acid sulphate soils results in medium scale and moderate intensity impact on the fish population in a section of river flowing through a Defence site that could take up to 10 years to recover.* *E.g. Failure to manage site soil salinity issues leads to moderate impacts on a vegetation community within a site with secondary impacts on habitat for protected bird species. Could take up to 10 years to recover.*	Impact on the Management Objectives and Targets for either a site with heritage values, or a heritage asset on a site, or Valued Environmental Components on a site, which is reversible and meets any two of the following criteria: 1. Would require a programmed commitment of resources (time and/or money) to remediate, or will take less than 2 years for the viability of the ecosystems, or their constituent parts to recover. 2. Small scale and contained on site. 3. Low intensity. *E.g. Failure to manage site soil salinity issues leads to moderate impacts on a vegetation community within a site with secondary impacts on habitat for protected bird species. Could take up to 10 years to recover.*	Impact on the Management Objectives and Targets for either a site with heritage values, or a heritage asset on a site, or Valued Environmental Components on a site, which is reversible and meets any two of the following criteria: 1. Would require minor repair that will be rectified during routine maintenance, or will take less then 6 months for the viability of the ecosystems, or their constituent parts to recover. 2. Small scale on site and localised. 3. Low intensity. *E.g. Failure to prevent soil erosion leads to a loss of landscape amenity.*

Processes for identifying and entering a risk into GEMS are presented below. One of the key elements of the framework to be implemented is the identification of the risk owner. That person assumes management of the risk (Fig. 23). Higher level risk managers can then audit and assess effectiveness of controls against that risk (Fig. 24). The process of monitoring and review of risk controls is generic but applies directly to management of environmental risks within the EMS. The key linking feature is associating the Risk to the EFR it applies to.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group
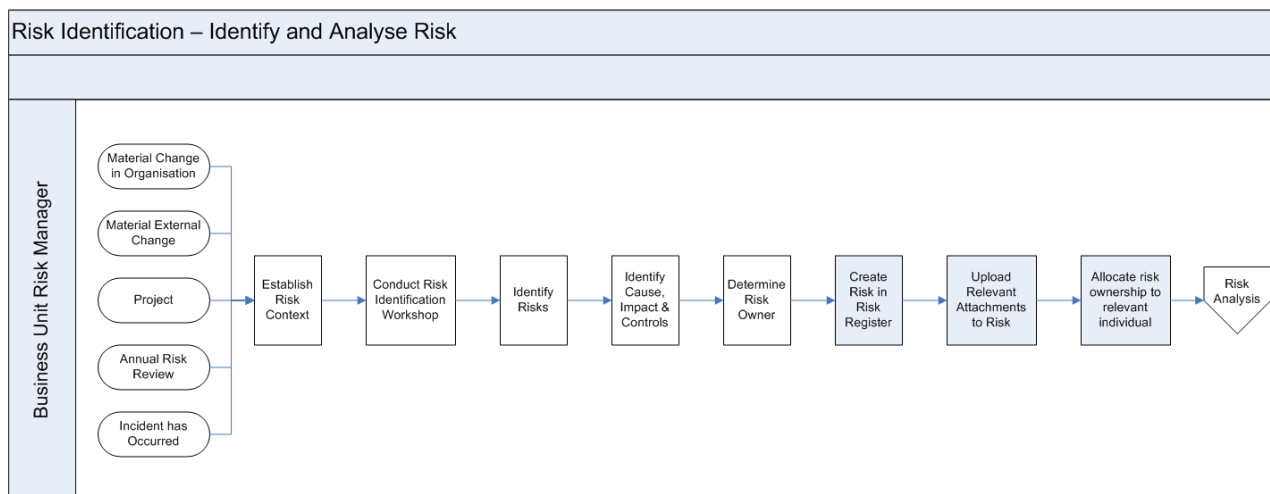
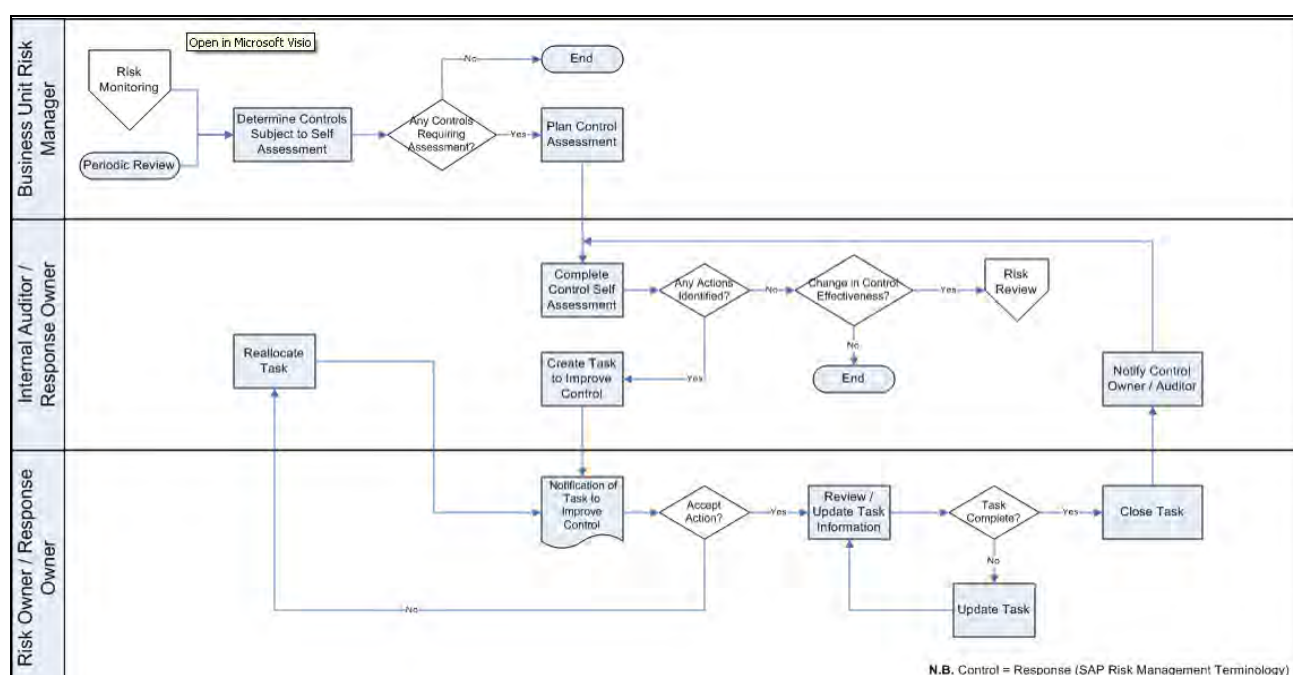**Figure 23. Identifying and analysing risk in GEMS - Risk manager.**

Figure 24. Identifying and analysing risk in GEMS.

4.3.2   Incident Management

Incident management within the EHSM module of GEMS is an important part of the adaptive management process under the CUTA EMS. The main steps in the incident management process are the recording of the incident, processing to determine if further action is required, investigation if required, and any ongoing management and monitoring arising from the incident (Fig 25). Recording of the incident utilises a straightforward form or on-system notification that records basic information about the incident. This will replace the AE444 environmental incident form currently in use across the estate and in TASMIS. The GEMS incident report form automatically populates incident details into the EHSM incident management process once it has been loaded. Notification of incidents on CUTA will be automatically sent to the RCO, RESO, EMOS contractor and Base Support Manager (BSM) (these roles have not yet been finalised). At the point of notification of an incident, any WHS elements are also reported on Sentinel (or vice-versa depending on the main impact of the incident) and the respective reporting processes and cross-referencing are shown in Fig 25. An incident manager (most likely the RCO or range contractor) will be appointed to

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

41

determine whether further action is required. If an investigation is required the process in Figure 26 is followed by an incident investigator. For environmental incidents the criteria and thresholds to assist the incident manager in making these decisions about proceeding to investigation or a management action are documented in the CUTA EMP against matters likely to be affected by an incident. It is only incidents where this process is undertaken that are likely to have management implications in terms of revision of management processes or ongoing management actions and monitoring of the incident location.

4.3.3 Integrated Management of Estate Risk in GEMS

The combination of risk, hazard and incident management within GEMS builds the key decision making processes that filters the information generated by environmental surveys to identify matters likely to be impacted by risks (EFRs) into the actual conduct of management works to protect or remediate damage to those matters. The interaction of the decision-making elements of GEMS in response to an incident, or knowledge about the presence of a hazard or EFR that generate risks is shown in Figure 27. This process map alone constitutes a significant component of a functional EMS.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

42

Figure 25. Detailed process overview for incident management.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC-Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group
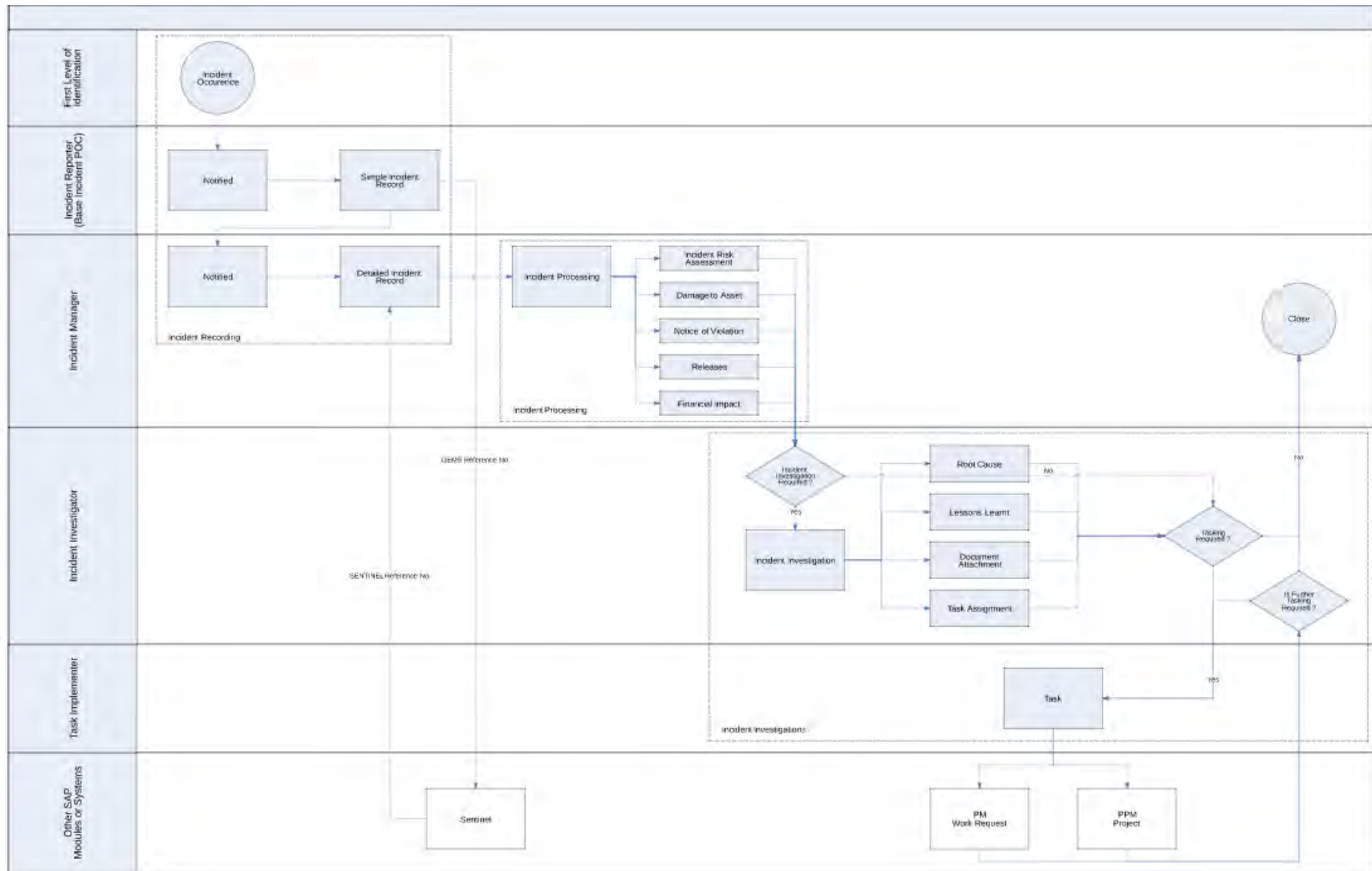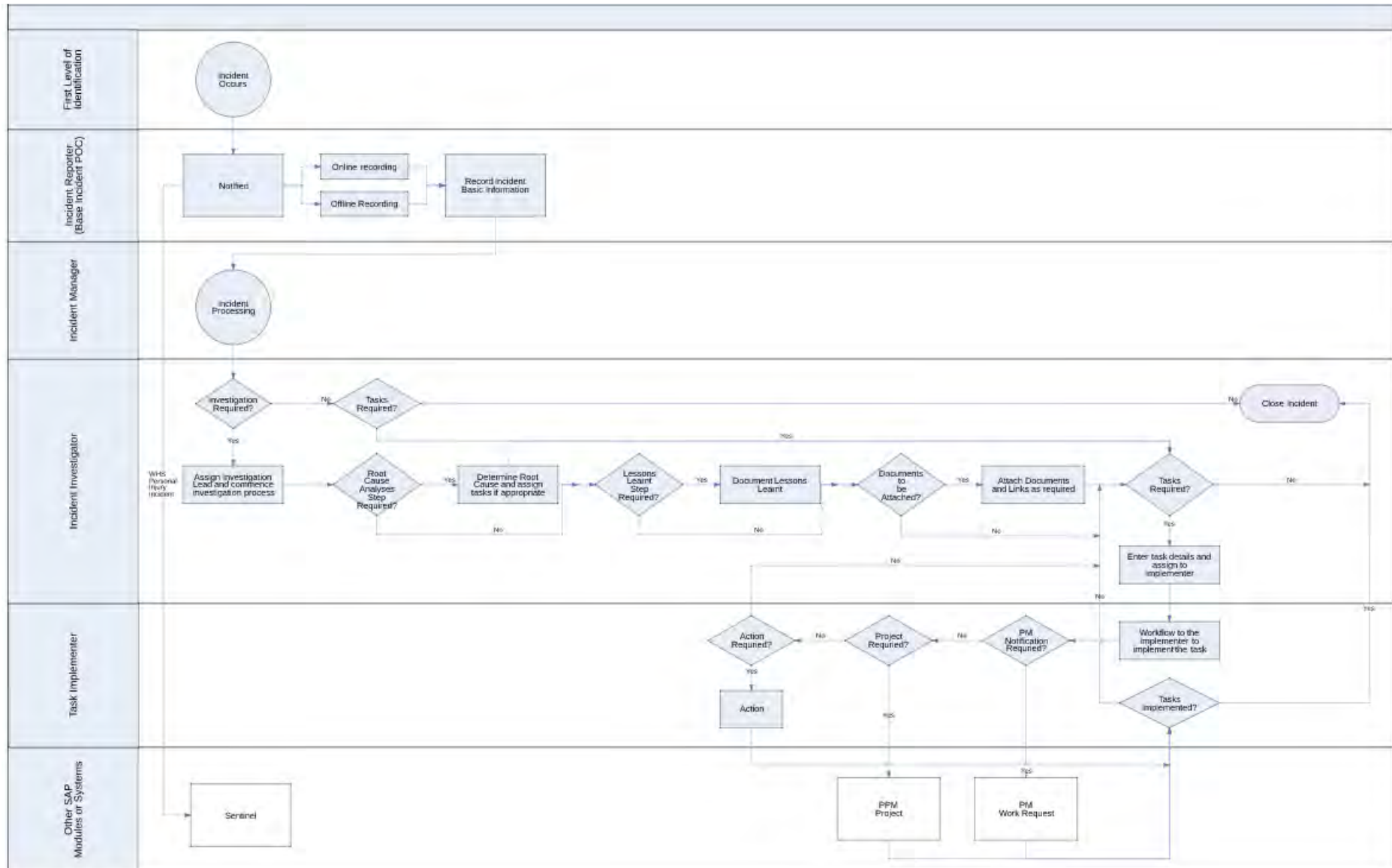
Figure 26. Detailed sub-process for incident investigation.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC-Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

44

Figure 27. Overall process for managing realised risks (incidents) and potential risks (risks and hazards) in GEMS.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group
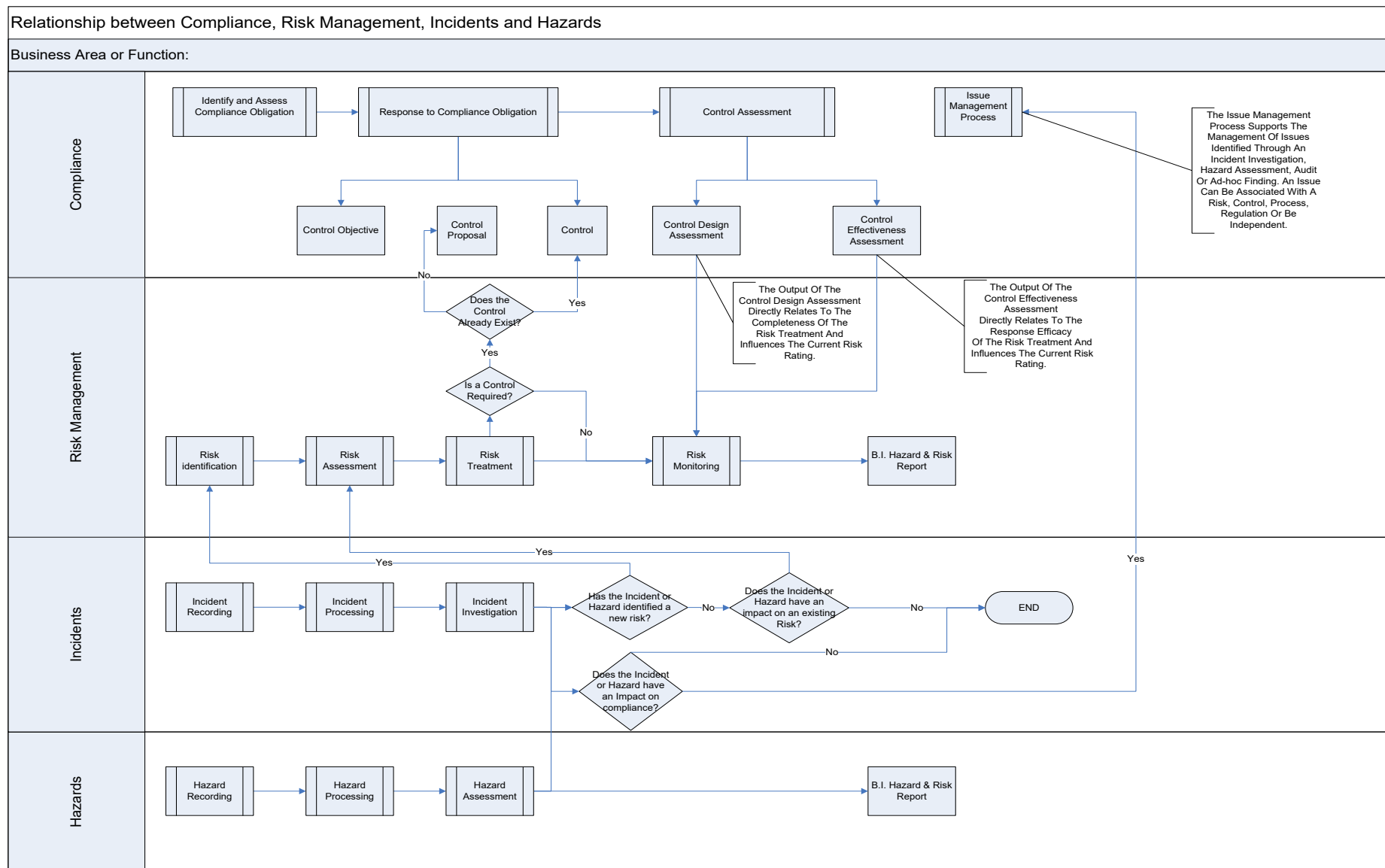
4.3.4 Impact Assessment

Impact Assessment processes are a routine part of Defence business. They form a key associated business process that supports the operation of the EMS and proper implementation of a risk-managed approach to doing business (essentially impact assessment is identification and mitigation of risk). Environmental impact assessment provides a safety net for environmental protection when a proposed activity outstrips the capacity of routine management processes to manage the risks associated with the activity. The process for impact assessment of activities at CUTA, aside from major capital facilities developments, is likely to follow that shown in Figure 28.
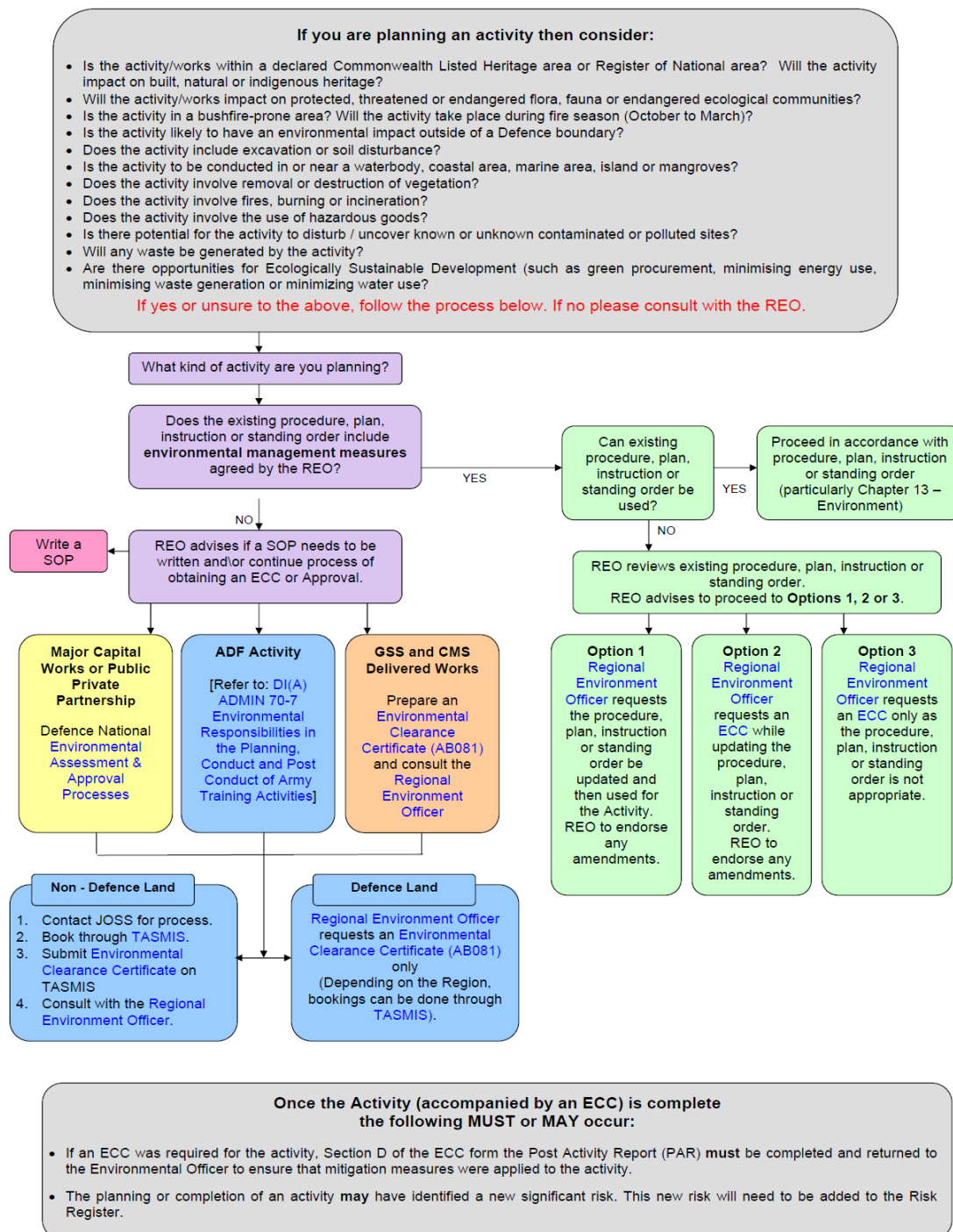

Figure 28. Defence environmental impact assessment processes.

Note that organisational names and the names of roles have changed since this figure was developed. GSS and CMS contractors are now Base service contractors, REOs are RESOs.

A key step in mitigating impacts of developments is to properly convene a Site Selection Board (SSB). When proposing or comparing different locations to a site selection board the proponent must consider and document the answers to the following environment and heritage questions. The SSB has at least one environmental representative. The questions below essentially represent a logical set of questions to ensure the impacts of any activity are considered during the planning phase.

Environment & heritage considerations for the considerations matrix taken to a site selection board:
- Has any stage of the planning and design of the facility/activity been reviewed by the Regional Environment and Sustainability Officer (RESO) or by any of the Directorates from the E&E Branch?
- Consultation with the RESO or E&E Branch?
- Will the proposed facility result in disturbance of listed/threatened species?
- Will the proposed location of the facility/activity result in the disturbance of listed threatened species and / or ecological communities (protected by Commonwealth and/or State legislation)?
- Will the proposal cause disturbance to the built, natural or indigenous heritage?
- Will the proposed location of the facility/activity result in the destruction of, or cause disturbance to, built, natural or Indigenous Heritage?
- Will the disturbance caused by this proposal generate a need for compensatory planting and/or the need for a landscaping plan/schedule
- Does the site have any known or existing contamination issues?
- Does the siting option have existing contamination or pollution that could be disturbed by the proposed facility/activity?
- Will the proposed activity cause or create contamination issues?
- Does the proposed facility/activity have the potential to contaminate the site and/or surrounding land?
- Does the proposed facility/activity have the potential to create pollution?
- Will the proposed site be located within a high bush fire risk area or exacerbate the existing risk in the area?
- Will the location of the facility/activity be in a high bushfire risk area or result in, or exacerbate the risk of bushfire to an existing area?
- Will the proposal minimise the demand for natural resources?
- Will the proposed location of the facility/activity minimise the demand for natural resources or fuel resources, such as electricity, oil, fuel, water or natural gas?
- Will the proposal result in unfavourable community impacts?
- Will the proposed location of the facility/activity result in negative or unfavourable community perception and social impacts?
- Will the proposal cause or be affected by subsidence, flooding, tidal inundation, sedimentation or the like
- Will the proposed location of the facility/activity result in or be affected by land subsidence (sink holes), tidal inundation, flooding, sedimentation to waterways and erosion?

Environmental Compliance Certificates (ECCs)
Defence environmental approvals take the form ECCs. These are essentially licences constituted under Defence Instruction General 40-3 *Assessment and Approval of Defence Actions Under the Environment Protection and Biodiversity Conservation Act 1999*. They detail the required mitigations and management of activities and provide for post-activity compliance auditing. ECC templates are available on DEQMS and are reviewed periodically to ensure they align with current

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

47

business practices and organisational names etc. ECCs are a key management document for many activities conducted on CUTA. RSOs clearly describe those activities and locations that require ECCs before they can proceed. An ECC allows the RESO and Range Control staff to make risk management decisions on the practical protection of environmental components during activities, rather than applying blanket area restrictions or other measures that may unnecessarily limit the use of the training area for it primary purpose of supporting Defence training.

4.3.5 Monitoring in Environmental Compliance (EC)

The implementation of monitoring within GEMS is simple. The eight fields in Table 4 capture the required definition of the monitoring program. The first fields need not contain legal requirements. "Authority" could be the owner of the risk being monitored and "Permit" could be an internal Defence management plan that prescribed the requirement, or a standard prescribing a method. The key field from the perspective of a site manager is the threshold. This provides the trigger point that if it is exceeded (an "exception" occurs) can be set to automatically notify the RESO, RCO or other relevant person. Thresholds can be upper and lower bounds and other relational parameters, not just a single threshold. The simplicity of the EC module confers real power in conveying the condition of the estate. The vast body of work lies in defining and justifying the thresholds placed into the module. These thresholds are defined in the EMP.

Table 4: Monitoring program characteristics with example data.

Authority	Permit	Requirement	Monitoring Facility	Monitoring Material	Monitoring Unit of Measure (UOM)	Monitoring Threshold	Monitoring period
SAAL NRMB	Classified weed	Sector J carrion flower monitoring program	CUTA	Carrion flower Population Density	DHA (Density Per Hectare)	10	1/1/2015 to 30/06/2015

4.3.6 Sustainability Monitoring and Reporting Program (SMRP)

SMRPs are a requirement of the Policy for Training Area Sustainability Monitoring and Reporting (Department of Defence 2010). This policy "directs the establishment of a framework for the environmentally sustainable use and management of Defence Training Areas (TAs) in order to support the delivery of capability for the Australian Defence Force (ADF)". The centrepiece of the SMRP concept is site-specific limits of acceptable change that trigger management action. This is implemented through the EC threshold feature above. Reporting is also a key element. Individual monitoring indicators are flagged throughout the EMS that directly address a management issue leading to a sustainability outcome. However, annual reporting of SMRP outcomes has always been a requirement that was difficult for site managers to meet. EC offers real-time dashboard reporting of any exceptions (breach of monitoring thresholds), the risk profile of the property and other related information. This capacity should negate the requirement for prescribed annual reporting, as any system user can immediately access the state of the SMRP indicators. However, the MLDP requires an internal review of the EMS operation every second and fourth year of the MLDP's five-year periods. This report should summarise all accumulated data in the system and analyse any trends that are apparent. The second/fourth year SMRP reports should be sent to all relevant site managers and to the Assistant Director - Training Area Sustainability in DOTAM. This SMRP reporting should directly inform the five-yearly external report required by the MLDP. Under the CUTA EMS the five-yearly report is tied to specific long-term monitoring events. The combination of the shorter-term trends encapsulated in the SMRP against longer-term trends should provide an external reviewer with an accurate understanding of the long-term sustainability of the site under Defence management.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

References

AECOM 2009, S*ustainability Monitoring and Reporting Plan – Cultana Training Area,* Final. Unpublished report prepared for the Department of Defence.

AECOM 2012, *Cultana Training Area Expansion – Public Environment Report*, unpublished, prepared for the Department of Defence.

AECOM 2012a, *Cultana Training Area Expansion – Public Environment Report Appendix*, unpublished, prepared for the Department of Defence.

Department of Defence 2006, *Environmental Risk Assessment Tool,* unpublished.

Department of Defence 2010, *Policy for Training Area Sustainability Monitoring and Reporting,* unpublished.

Department of Defence 2012, *Contamination Risk Assessment Tool,* unpublished.

GHD 2011, *Assessing and Prioritising Soil Constraints on the Defence Estate – Soil Constraints Analysis Risk Framework,* unpublished, prepared for the Department of Defence.

Jacobs 2015a, *Cultana Expansion Area – State of the Environment Report*, unpublished, prepared for the Department of Defence.

Kellogg, Brown and Root 2004, *Cultana Training Area Flora and Fauna Assessment,* Resolve FM PTY LTD, Salisbury SA.

Rural Solutions SA 2011, *Regional Pest Management Plan- Cultana Training Area (CUTA),* Rural Solutions, South Australia.

Useful acronyms: MLDP- Miscellaneous Lease for Defence Purposes, GEMS- Garrison and Estate Management System, EFR- Environmental Factor Record, GRC- Governance Risk and Compliance, EC- Environmental Compliance (monitoring), EHSM- Environment Health and Safety, RSOs- Range Standing Orders, ESD- Estate Services Division, E&IG- Estate and Infrastructure Group

49