Sub-Series 1.4 Integrated Environmental Management Framework

Purpose

- Establish statutory requirements.
- Review environmental assessment and management tools.
- Incorporate IEMF into DWA’s business process (impacting and management functions)

Note:

- Extends beyond development projects

Description

Aligns DWA Water Sector business process with IEM principles and environmental assessment and management to ensure due consideration of the environment.

R&R

<table>
<thead>
<tr>
<th>Development:</th>
<th>E&amp;R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation:</td>
<td>Organisation-wide - all functional areas to adopt IEM principles and</td>
</tr>
<tr>
<td>Review:</td>
<td>Facilitated by E&amp;R; feedback from line functions</td>
</tr>
<tr>
<td>Training:</td>
<td>E&amp;R</td>
</tr>
</tbody>
</table>

Status

1st draft – 2007; 2nd draft – 2008
Aligns DWA Water Sector business process with IEM principles and environmental assessment and management to ensure due consideration of the environment.

**Purpose**
• Establish statutory requirements.
• Review environmental assessment and management tools.
• Incorporate IEMF into DWA’s business process (impacting and management functions)
• **Note:**
  > Extends beyond development projects

**Description**
Let’s consider IEM:

1. Development: E&R
2. Implementation: Organisation-wide - all functional areas to adopt IEM principles and
3. Review: Facilitated by E&R; feedback from line functions
4. Training: E&R

**Status**
1st draft – 2007; 2nd draft – 2008
Aligns DWA Water Sector business process with IEM principles and environmental assessment and management to ensure due consideration of the environment.

**Purpose**
- Establish statutory requirements.
- Review environmental assessment and management tools.
- Incorporate IEM into DWA’s business process (impacting and management functions).

**Note**:
- Extends beyond development projects.

**1st draft – 2007; 2nd draft – 2008**

<table>
<thead>
<tr>
<th>Development</th>
<th>Implementation</th>
<th>Review</th>
<th>Training</th>
</tr>
</thead>
<tbody>
<tr>
<td>E&amp;R</td>
<td>Organisation-wide - all functional areas to adopt IEM principles and management practices</td>
<td>Facilitated by E&amp;R; feedback from line functions</td>
<td>E&amp;R</td>
</tr>
</tbody>
</table>

1. Understand the DWA Business process
2. Identify appropriate tools and practices

Let’s consider IEM:
- Development:
- Implementation:
- Organisation-wide - all functional areas to adopt IEM principles and management practices
- Review:
- Facilitated by E&R; feedback from line functions
- Training:
- E&R
What does DWA’s Business Process look like?
Understanding DWA’s “Business Process”

- DWA’s implementation and management functions and activities.

**Developer / Operator**

**Direct Legislation**
- National Water Act (No. 36 of 1998)
- Water Services Act (No. 108 of 1997)

**Indirect Legislation**
- NEMA
- NHRA
- CARA
- MPRDA
- Other…

**Regulator**
- National Water Act (No. 36 of 1998)
- Water Services Act (No. 108 of 1997)
Understanding DWA’s “Business Process”

- Progressive change of DWA’s functions and roles:

**INITIAL FUNCTION AND ROLE**

Water Resource Management & Services Provision

(Infrastructure development, implementation, operation and institutional arrangements – EIP)

**INTERIM FUNCTION**

Support / create an enabling environment and processes

(Formulating and maintaining of policies, strategies, guidelines and tools - EMP)

**LONG-TERM FUNCTION & ROLE**

Regulation & Intervention

(Auditing, monitoring, penalties, incentives, information management systems, strategic plans, etc. – EMP)

Empowering and building capacity
Understanding DWA’s “Business Process”

- Evolution of incorporating IEM into DWA business
<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978</td>
<td>Guidelines - rehabilitate landscapes during planning, design, construction &amp; implementation</td>
</tr>
<tr>
<td>1989</td>
<td>Departmental procedures for applying the IEM process</td>
</tr>
<tr>
<td>1990</td>
<td>Manual for applying the IEM process</td>
</tr>
<tr>
<td>1992</td>
<td>Amending 1989 departmental IEM procedures to comply with national IEM guideline series</td>
</tr>
<tr>
<td>1995</td>
<td>Amending and documenting the DWAF IEM procedure</td>
</tr>
<tr>
<td>2001</td>
<td>Translation of DWAF’s IEM procedures into the English language in 2001;</td>
</tr>
<tr>
<td>2002</td>
<td>Environmental legal register</td>
</tr>
<tr>
<td>2002</td>
<td>Guideline for Environmental Management Plans (EMPs) for WRM</td>
</tr>
<tr>
<td>2002</td>
<td>Guideline for ESM&amp;RS for construction sites</td>
</tr>
<tr>
<td>2002</td>
<td>Environmental Impact Management System (EIMS) for water services related projects</td>
</tr>
<tr>
<td>2004</td>
<td>Guideline EMP for Limpopo regions for Community Water Sanitation and Supply Projects</td>
</tr>
<tr>
<td>2004</td>
<td>Update of legal register and development of Environmental Legal Guide</td>
</tr>
<tr>
<td>2004</td>
<td>Environmental Decision Support System (E-DSS) and associated tools</td>
</tr>
<tr>
<td>2004</td>
<td>Development of environmental monitoring and auditing protocol</td>
</tr>
<tr>
<td>2004</td>
<td>Development of environmental best practices guideline and specifications</td>
</tr>
<tr>
<td>2004</td>
<td>Revision of the DWAF-IEM procedures &amp; commencing with IEMF (strategic - water sector)</td>
</tr>
<tr>
<td>2005</td>
<td>Environmental Impact Guidelines for Water Services</td>
</tr>
<tr>
<td>2005</td>
<td>Environmental Management Framework</td>
</tr>
<tr>
<td>2006</td>
<td>Environmental Reporting</td>
</tr>
<tr>
<td>2006</td>
<td>Sustainable Development Management System</td>
</tr>
<tr>
<td>2007</td>
<td>Integrated Environmental Management Framework</td>
</tr>
<tr>
<td>2008</td>
<td>CEIMP 2nd Edition</td>
</tr>
<tr>
<td>2009</td>
<td>DWA Environmental Policy</td>
</tr>
<tr>
<td>2009</td>
<td>DWA Statement of Intent</td>
</tr>
<tr>
<td>2009</td>
<td>DWA Environmental Policy Reference Document</td>
</tr>
</tbody>
</table>
Evolution of incorporating IEM into DWA business

1978 - Guidelines - rehabilitate landscapes during planning, design, construction & implementation
1989 - Departmental procedures for applying the IEM process
1990 - Manual for applying the IEM process
1992 - Amending 1989 departmental IEM procedures to comply with national IEM guideline series
1995 - Amending and documenting the DWAF IEM procedure
2001 - Relevant Environmental Impact Prognosis (ROIP) Manual
2001 - Translation of DWAF’s IEM procedures into the English language in 2001;
2002 - Environmental legal register
2002 - Guideline for Environmental Management Plans (EMPs) for WRM
2004 - Guideline for ESM&RS for construction sites
2004 - Environmental Impact Management System (EIMS) for water services related projects
2004 - Guideline EMP for Limpopo regions for Community Water Sanitation and Supply Projects
2004 - Update of legal register and development of Environmental Legal Guide
2004 - Environmental Decision Support System (E-DSS) and associated tools
2004 - Development of environmental monitoring and auditing protocol
2004 - Development of environmental best practices guideline and specifications
2004 - Revision of the DWAF-IEM procedures & commencing with IEMF (strategic - water sector)
2004 - Environmental Impact Guidelines for Water Services
2005 - Environmental Management Framework
2006 - Environmental Reporting
2006 - Sustainable Development Management System
2007 - Integrated Environmental Management Framework
2008 - CEIMP 2nd Edition
2008 - DWA Environmental Policy
2009 - DWA Statement of Intent
2009 - DWA Environmental Policy Reference Document
Summary of Pre-2000 DWA IEM procedure & associated engineering phases

**DWAF IEM PHASES**

**PHASE 1: RECONNAISSANCE**  
Catchment / system basis

- Identify possible developments taking all info into account

**PHASE 2: PRE-FEASIBILITY**  
Possible development options

- Select one or more options / scheme for further investigation

Option not feasible

**PHASE 3: FEASIBILITY**  
Detail investigations for one option

- Recommend implementation of option based on feasibility

Option Feasible

**PHASE 4: DESIGN**
Table Management Plan

**PHASE 5: CONSTRUCTION**
Implement Management Plan continuously

**PHASE 6: OPERATION**
Monitor and produce audit report
What does your Business Process look like?
Understanding DWA’s “Business Process”

Generic DWA Project Life Cycle

Note:
Applies to roles as –
• Implementor
• Developer
• Regulator
What does DWA's Business Process look like?

How can “IEM Integration” be achieved?
How to achieve “Integration”? 

Environmental considerations are taken into account during all the stages of the life cycle of water related business processes…

Integrating DWA IEM Series tools into the Plan-Do-Check-Act cycle
Tiered approach to Environmental Management
(Top Down / Bottom Up Approach)

**STAGES IN THE DEVELOPMENT CYCLE**

- Plans, Programmes and Strategies
  - Strategic / sectoral / regional level
- Projects
  - Planning & Conceptualize level
- Implementation and Monitoring
  - Operational level

**COMPONENTS OF IEM**

- Environmental Management Plans & Work instructions
- Project Tools
- Strategic Tools
- Policies & Strategies

Increased levels of strategic input

16
How to achieve “Integration”?*

<table>
<thead>
<tr>
<th>PLAN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic</strong></td>
<td></td>
</tr>
<tr>
<td>• CEIMP</td>
<td></td>
</tr>
<tr>
<td>• Environmental Policy &amp; Strategy</td>
<td></td>
</tr>
<tr>
<td>• SDMS</td>
<td></td>
</tr>
<tr>
<td>• Risk Assessment</td>
<td></td>
</tr>
<tr>
<td>• Environmental Legal Guide Booklet &amp; Database</td>
<td></td>
</tr>
<tr>
<td>• IEMF</td>
<td></td>
</tr>
<tr>
<td>• Strategic Environmental Assessment</td>
<td></td>
</tr>
<tr>
<td><strong>Project Specific</strong></td>
<td></td>
</tr>
<tr>
<td>• Impact &amp; Aspect Register</td>
<td></td>
</tr>
<tr>
<td>• EIA Checklist</td>
<td></td>
</tr>
<tr>
<td>• EMP Checklist</td>
<td></td>
</tr>
<tr>
<td>• EMPR Checklist</td>
<td></td>
</tr>
<tr>
<td>• Risk Assessment</td>
<td></td>
</tr>
<tr>
<td>• EBPG&amp;S</td>
<td></td>
</tr>
<tr>
<td>• Life Cycle Assessment</td>
<td></td>
</tr>
<tr>
<td>• Social Impact Assessment</td>
<td></td>
</tr>
<tr>
<td>• Heritage Impact Assessment</td>
<td></td>
</tr>
<tr>
<td>• EIA</td>
<td></td>
</tr>
<tr>
<td>• EMPR</td>
<td></td>
</tr>
</tbody>
</table>

*Red font = IEM Series Tools*
How to achieve “Integration”?  

<table>
<thead>
<tr>
<th>PLAN</th>
<th>DO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strategic</strong></td>
<td></td>
</tr>
<tr>
<td>• CEIMP</td>
<td></td>
</tr>
<tr>
<td>• Environmental Policy &amp; Strategy</td>
<td></td>
</tr>
<tr>
<td>• SDMS</td>
<td></td>
</tr>
<tr>
<td>• Risk Assessment</td>
<td></td>
</tr>
<tr>
<td>• Environmental Legal Guide Booklet &amp; Database</td>
<td></td>
</tr>
<tr>
<td>• IEMF</td>
<td></td>
</tr>
<tr>
<td>• Strategic Environmental Assessment</td>
<td></td>
</tr>
<tr>
<td><strong>Project Specific</strong></td>
<td></td>
</tr>
<tr>
<td>• Impact &amp; Aspect Register</td>
<td></td>
</tr>
<tr>
<td>• EIA Checklist</td>
<td></td>
</tr>
<tr>
<td>• EMP Checklist</td>
<td></td>
</tr>
<tr>
<td>• EMPR Checklist</td>
<td></td>
</tr>
<tr>
<td>• Risk Assessment</td>
<td></td>
</tr>
<tr>
<td>• EBPG&amp;S</td>
<td></td>
</tr>
<tr>
<td>• Life Cycle Assessment</td>
<td></td>
</tr>
<tr>
<td>• Social Impact Assessment</td>
<td></td>
</tr>
<tr>
<td>• Heritage Impact Assessment</td>
<td></td>
</tr>
<tr>
<td>• EIA</td>
<td></td>
</tr>
<tr>
<td>• EMP</td>
<td></td>
</tr>
</tbody>
</table>

*Red font = IEM Series Tools*
How to achieve “Integration”? 

<table>
<thead>
<tr>
<th>PLAN</th>
<th>DO</th>
<th>CHECK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEIMP</td>
<td>SDMS</td>
<td>SDMS</td>
</tr>
<tr>
<td>Environmental Policy &amp; Strategy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SDMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Legal Guide Booklet &amp; Database</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEMF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Environmental Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Specific</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impact &amp; Aspect Register</td>
<td>E-DSS</td>
<td>EBPG&amp;S</td>
</tr>
<tr>
<td>EIA Checklist</td>
<td></td>
<td>EMP</td>
</tr>
<tr>
<td>EMP Checklist</td>
<td></td>
<td>EMPR</td>
</tr>
<tr>
<td>EMPR Checklist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EBPG&amp;S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Cycle Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Impact Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heritage Impact Assessment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EIA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EMPR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Red font = IEM Series Tools*
How to achieve “Integration”?

<table>
<thead>
<tr>
<th>Strategic</th>
<th>Project Specific</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CEIMP</td>
<td>• Impact &amp; Aspect Register</td>
</tr>
<tr>
<td>• Environmental Policy &amp; Strategy</td>
<td>• EIA Checklist</td>
</tr>
<tr>
<td>• SDMS</td>
<td>• EMP Checklist</td>
</tr>
<tr>
<td>• Risk Assessment</td>
<td>• EMPR Checklist</td>
</tr>
<tr>
<td>• Environmental Legal Guide Booklet &amp; Database</td>
<td>• Risk Assessment</td>
</tr>
<tr>
<td>• IEMF</td>
<td>• EBPG&amp;S</td>
</tr>
<tr>
<td>• Strategic Environmental Assessment</td>
<td>• Life Cycle Assessment</td>
</tr>
<tr>
<td></td>
<td>• Social Impact Assessment</td>
</tr>
<tr>
<td></td>
<td>• Heritage Impact Assessment</td>
</tr>
<tr>
<td></td>
<td>• EIA</td>
</tr>
<tr>
<td></td>
<td>• EMPR</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PLAN</th>
<th>DO</th>
<th>CHECK</th>
<th>ACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• SDMS</td>
<td>• SDMS</td>
<td>• SDMS</td>
<td>• SDMS</td>
</tr>
<tr>
<td>• Environmental Monitoring &amp; Auditing Guidelines</td>
<td>• Environmental Monitoring &amp; Auditing Guidelines</td>
<td>• Environmental Reporting Framework</td>
<td></td>
</tr>
<tr>
<td>• Strategic Environmental Assessment</td>
<td>• Environmental Reporting Framework</td>
<td>• Environmental (CEIMP) Annual Report</td>
<td></td>
</tr>
</tbody>
</table>

- Red font = IEM Series Tools
Integrating TQM in Environmental Management

Continual improvement

- Environmental aspects
- Legal requirements
- Objectives and targets
- Environmental management programme
- Monitoring and measurement
- Non-conformance and corrective action
- Records
- EMS audits
- Structure and responsibility
- Training awareness and competence
- EMS documentation
- Document control
- Operation control
- Emergency preparedness and response

Management Review

EMS

Planning

Checking & Corrective action

Implementation & Operation
Integrating IEM Series into EMS Framework

- CORE ELEMENTS
  - Legal and other requirements
- Policy
- Environmental Aspects
- Objectives and Targets
- Environmental Programmes
  - Operational control
  - Emergency preparedness
- Monitoring & Measurement
- Management Review
- DWA Environmental Policy
- SUPPORTING ELEMENTS
  - Structure and Responsibility
  - Training and Competence
  - System documentation
  - Document control
  - Non-conformance and Corrective Action
  - System Audits
  - Communication

DWA legal guide booklet

Environmental Policy

IEMF / SDMS / E-DSS

CEIMP

Enviro Reporting
Positioning Environmental Assessment & Management Tools in Project Life-Cycle

**PDCA cycle**

**PLAN**
- **EMS Principles and Elements**
  - Management Commitment
    - Initial review
    - Create strategic plan
  - Planning
    - Customer requirements
    - Identify aspects and evaluate impacts / risks
    - Legal requirements
    - Establish internal performance criteria
    - Set objectives and targets
    - Develop management programme
    - Communication
  - Implementation
    - Resources
    - Accountability and responsibility
    - Operational control
    - Procedures and instructions
    - Emergency preparedness and response
    - Communication and reporting
    - Training and competence
    - Information management

**DO**
- **EMS Principles and Elements**
  - Measurement and Evaluation
    - Measure and monitor
    - Corrective and preventive action
    - Audit
  - Review and Improvement
    - Review
    - Continual improvement

**CHECK**
- **Documentation & Environmental Tools**
  - Policy
  - Impact register
  - Legal, I&AP and standards register
  - Construction and Operational EMP, ESM&RS, EMS
  - Monitoring register and site inspection reports
  - Audit plan
  - Audit report
  - Management Review

**ACT**
- **Corrective actions**
  - Continual improvement

**EMS Principles and Elements**
- SEA
- EIA
- SIA
- HIA
- ERA
- LCA
- EMPR
- PIP
Environmental Management and Governance Instruments for DWA-related functions

MARKET BASED
- IWRM
- Pricing Strategies: Waste Discharge Charge System; Water Resource Management Charge; Raw water tariffs

CO-REGULATION
- ISO 14001 Delegation of management functions to Regions, CMA’s and Local Government

COMMAND & CONTROL
- Environmental Law Inspections
- Audits
- Prosecutions
- Authorisation, license penalties
- Environmental standard

CIVIL INSTRUMENTS
- Consultative and Participative management; 2020 Water Vision Education Programme

IWRM
- Incentives and awards
- Environmental charges
- Pricing policies
- Subsidies
- Resource charges
- Green purchasing
- Tradable licenses
- Disincentives

Education
- Public awareness
- Access to info
- Public participation
- Green rights
- Eco-labelling
Positioning IEMF in context with DWA’s strategic framework (Impacting & Management Functions)
Scenario:
DWA proposes to build a dam (wall higher than 5m) to provide for the water requirements of a local municipality. The project will also require borrow pits. The land use in the inundation area includes residential and agricultural. Graves will also be affected by the dam’s footprint.

Question:
Complete DWA Project Business Process from a WRM perspective.
Question:
Complete DWA Project Business Process from a WRM perspective

WRM business stages for development projects
(DWA as Regulator and Developer / Operator)
End – Module 5
ANSWER
Relevant EM tools for Stages 1 – 3 of the DWA Project Life Cycle

- SEA
- E-DSS Checklists
- Environmental Policy (subseries 1.2)
- SDMS (subseries 1.9)
- Environmental Legal Guide Booklet and database (subseries 1.12)
- IEMF (subseries 1.4)
- Environmental Management Framework (GN R385)
- EIA
- Aspect & Impact Register
- EBPG&S (subseries 1.6)
Relevant EM tools for Stages 4 – 5 of the DWA Project Life Cycle

- EIA
- EMP
- EMPR
- SIA
- HIA
- ERA
- LCA
- Aspect & Impact Register
- E-DSS (subseries 1.5)
- EBPG&S (subseries 1.6)
- SDMS (subseries 1.9)
- IEMF (subseries 1.4)
- Environmental Management Framework (GN R385)
Relevant EM tools for Stages 6 – 9 of the DWA Project Life Cycle

- Cleaner Technology
- Integrated waste management
- Pollution prevention
- Emergency detection and response plans
- EMP
- EMPR
- Rehabilitation Plans
- Environmental communication
- CEIMP (subseries 1.3)
- IEMF (subseries 1.4)
- E-DSS (subseries 1.5)
- EBPG&S (subseries 1.6)
- Environmental Monitoring and Auditing Guidelines (subseries 1.7)
- Environmental Reporting Framework (subseries 1.8)
- SDMS (subseries 1.9)
- State of the Environment Reports
- Public Participation
- Improvement plans
- Environmental accounting

Initiate EIA Planning Process
Relevant EIM tools for all stages of the DWA Implementation Project Life Cycle

- **Feasibility**
  - Pre-feasibility
  - Preparation / reconnaissance

- **Identification**
  - SEA/EIA commences

- **Preparation / reconnaissance**
  - SEA/EIA commences

- **Planning and design**
  - Decision to Proceed Authorisation
  - Conceptual Design
  - Appraisal and Changes

- **Implementation**
  - Detail Design
  - Tender specifications
  - Contractor / supplier selection
  - Conditions (ROD/EMP) and environmental penalties

- **Operational**
  - Monitoring/post implementation phases

- **Control changes**
  - Stage gates throughout

**Control changes**
- **Stage gates throughout**

**SDMS = THE DRIVER (PLAN-DO-CHECK-ACT)**