



**Mine Site Environmental  
Management and  
Sustainable Post-Mining  
Land Use**

**in**

**New South Wales,  
Australia**

**By Greg Unwin  
Senior Environmental Scientist**

# Outline of Presentation

- Introduction
- Role of the Department
- Management and EMS
- Environmental Risk Assessment & Management
- The MREMP System
- Due Diligence
- Sustainable Post-Mining Land Use
- Conclusions

# INTRODUCTION

- All mining results in some degree of environmental disturbance
- Mine disturbance is small compared to agriculture and the urban environments
- Mining can be a point source of potential pollution
- Conditions placed by government on mining projects reflect community concerns for the environment
- Today stakeholders & the community demand consultation

# Introduction continued

- Consultation during project development, operation and closure
- Legislation today reflects stakeholder concerns
- DMR has a statutory role for mine site environmental management & control in NSW
- The DMR is a lead agency in NSW
- But let us not forget companies also place strict environmental safeguards on their own operations.

# The Role of the DMR

- Responsible assessment, development & management of NSW mineral resources.
- The DMR is committed to :-
  - best environmental practices
  - community consultation
  - optimal landuse planning
  - safe work practices
  - encourages exploration
  - equitable resource allocation
  - geoscience & resource data
  - optimal resource utilisation
  - value adding of mineral products and
  - focusing on customer service
- In summary the Department seeks balanced land use decision making through consultation & best practice environmental mangement
- To achieve the Department's role all of the above are managed through a systems approach.

# Management and EM System Challenges

- To encourage ownership, agreement and commitment within EU & Department
- To make management & EM systems simple & flexible to change
- To get people to change their habits
- To effectively communicate the systems in place
- To devote time and resources to implement management & EMS changes and identify positive & negative outcomes
- Question : At what speed should an organisation implement change???

# Key Elements of an EMS

- Organisational commitment
- Corporate environmental policy
- Community consultation & involvement
- Performance targets or tasks
- Environmental management programs
- Document & record keeping
- Planning & operational procedures
- Reporting structure & responsibilities
- Training awareness & competence
- Monitoring & measurement

# EMS continued

- Any EMS system must fit into the existing management structure
- EMS is a management tool
- It make us smarter managers
- Key environmental risk areas can be targeted
- An important part of EMS is Risk Management

# **In Summary the Department's Management & EM Systems are designed to :-**

- be simple
- meets our requirements
- encourage ownership,  
agreement & commitment
- encourage communication and  
feedback
- make us smarter managers
- help target activities requiring  
attention
- reduce environmental risk

# ENVIRONMENTAL RISK ASSESSMENT AND MANAGEMENT

- Unwin (1996) describes in detail:-
  - the environmental risk components required for risk assessment
  - how to measure risks using a Matrix and
  - management of those risks using quality control & quality assurance mechanisms.

# Environmental Auditing a Risk Assessment Tool

- Auditing is an essential business tool
- It's a tool which may be used to avoid prosecution
- Increasingly banks, lenders and government look to a company's performance to judge
  - social impacts
  - economic viability and
  - statutory compliance
- Investors are looking to invest in viable companies committed to social & environmental values



# **ENVIRONMENTAL AUDITING**

**A Vital Part of Mine  
Site Management in  
NSW**

# Department Audits


## ■ Type of Audits

- operational facility audits - MREMP
- compliance audits
- EMS audits
- post incident audits
- environmental risk assessment audits and
- derelict/orphan mine site audits

## ■ Audits & Resource Allocation

- Audits can drain resources
- Audits therefore target:-
  - » poor exploration or mine performers
  - » exploration & mines in sensitive environments and
  - » mines with contaminated ore or mineral processing

## ■ The MREMP audit approach



**The Mining,  
Rehabilitation and  
Environmental  
Management Process  
(MREMP)**

# **MREMP INTRODUCTION**

## **The Mining, Rehabilitation and Environmental Management Process**

- » History & stakeholder  
benefits**
- » Mining Operations Plan**
- » Annual Environmental  
Management Report**

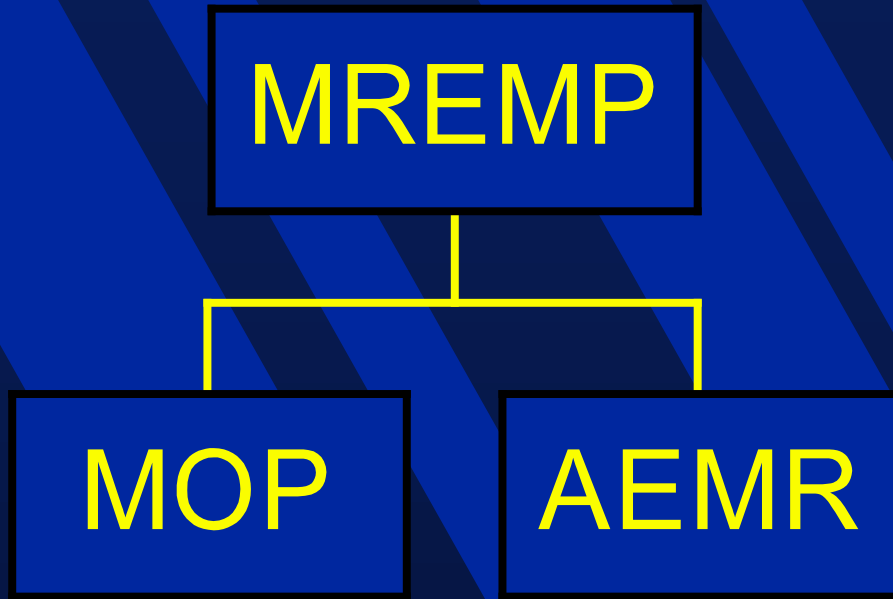
## **The MREMP system and Due Diligence**

# The MREMP

- **The process dates back to the 1970's**
- **In the 1980's the process was extended**
- **In 1996 and 1997 the process underwent further refinement**
- **The MREMP contains a mandatory environmental and compliance audit**
- **The MREMP framework encourages a co-operative and integrated approach**
- **The process reduces government duplication**
- **The process is less bureaucratic**

# The MREMP Continued

- **The process is cost effective**
- **The MREMP allows flexibility in environmental monitoring**
- **It encourages “best practice” technology**
- **The process REWARDS good performers**
- **The MREMP is part of the mine’s decommissioning process**



**Mining Operations Plan (MOP)**

**Annual Environmental Management  
Report (AEMR)**

# **Mining Operations Plan (MOP)**

- **Approvals range from one to several years**
- **Provide close control of mining**
- **The MOP provides the detail the EIS and EIA fail to address in detail because they are prepared at one point in time**
- **The MOP allows for change to better achieve mine site environmental excellence**
- **The MOP is flexible to demands by stakeholders**

# **Annual Environmental Management Report (AEMR)**

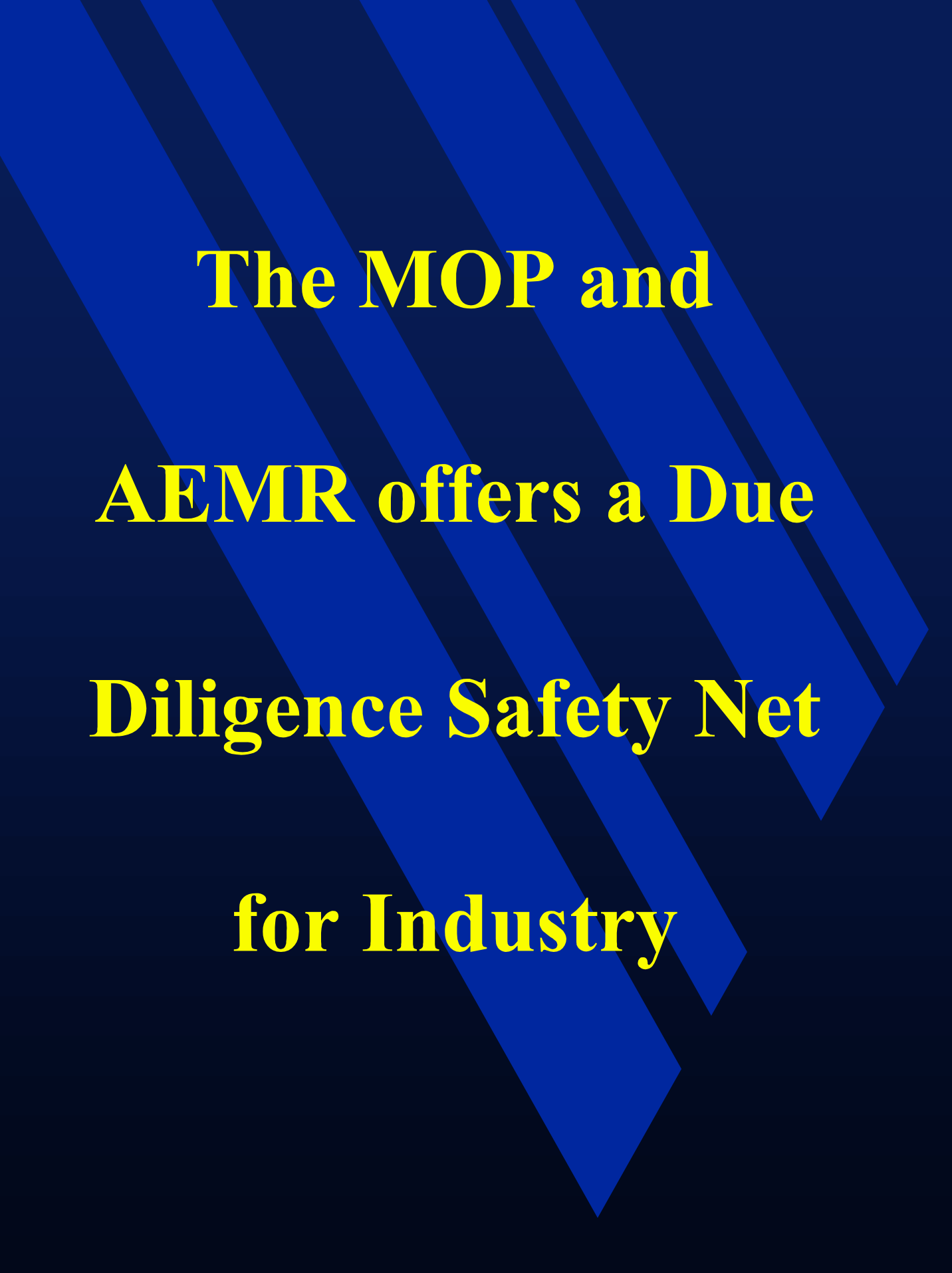
- **Facilitates a single system of reporting for government agencies**
- **AEMR is a management and environmental review tool of the mine's performance**
- **Reports are comprehensive**
- **The process encourages “best practice” environmental management at mine sites**
- **Reduces government duplication and overlapping**

# **The AEMR Review Meeting**

- **Annual reporting by the mine**
- **Membership of the mine site AEMR committee**
- **Yearly mine site inspection**
- **Minuting**
- **‘Action Points’**

# The AEMR Approval

- **AEMR and compliance audit is accepted or modified**
- **Approval or non-approval**
- **Deficiencies in the AEMR**



**The MOP and  
AEMR offers a Due  
Diligence Safety Net  
for Industry**

# Due Diligence

- MREMP is a mechanism by which due diligence requirements and environmental management of mine sites are integrated (Martin & McClure of Allen Allen & Hemsley 1992)
- The process establishes due diligence defence requirements:-
  - » systems approach
  - » the system is supervised and monitored
  - » the system is target and goal orientated and
  - » considers environmental risk assessment principles
- All that I have been discussing in this paper so far leads to one thing:-
  - A Sustainable Post Mining Landuse

# Sustainable Post Mining Land Use

- DMR promotes balanced landuse decision making and
- Viable mining projects which in turn deliver social & sustainable development outcomes
- Mine disturbance to the landscape is small compared to agriculture and urban landuse

# CONCLUSIONS

- **The Department of Mineral Resources has the statutory responsibility for mine site environmental management in NSW, Australia**
- **The Department fulfills this role as a planning, assessment & approval agency**
- **The Department's EMS and MREMP systems meets our requirements and the expectations of the government, industry and community**
- **The MREMP system has lead to a cooperative & intergrated approach by government agencies, industry and the community**
- **Environmental risk assessment and auditing are a vital part of management**
- **The Department's systems meets due diligence requirements**

# Conclusions continued

- The Department's internal and mine site management processes are :-
  - simple and flexible
  - meets stakeholder needs
  - encourage ownership, agreement and commitment
  - encourage communication & feedback
  - provides outcomes for all stakeholders by targeting areas for attention
  - reduces environmental risk and
  - leads to a sustainable post mining land use.