

# Tropicana Gold Project: Public Environmental Review

## 5. Environmental Protection and Management



## **5. ENVIRONMENTAL PROTECTION AND MANAGEMENT**

The following chapter describes the principles behind environmental protection and the framework of the Tropicana Gold Project's (the Project) Integrated Management System (IMS), as it relates to environmental and social issues. It describes the management system elements that will guide the Joint Venture to achieve the Project's environmental and social objectives, targets and commitments through the application of mitigation measures described throughout chapter 7, 8, 13, 14 and Appendix Series 3. This chapter briefly describes some of the key external drivers of the IMS, including State and Federal policies and legislation, international agreements, and Project specific approvals and licensing conditions. From an internal perspective, the IMS is driven by the policies and principles of the Joint Venture partners. The intent of these policies permeate to the procedural level of the IMS to guide and support Joint Venture staff and contractors in achieving the environmental and social outcomes of the Project.

### **5.1. PRINCIPLES OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY**

The Joint Venture recognises that the actions of today must not compromise the ability of future generations to satisfy their own needs. Central to the Joint Venture's approach is that the Project meets certain social and economic goals. Responsible development of a project of this scale requires the appropriate consideration of social, environment and economic opportunities, impacts and benefits. In line with this approach the Joint Venture is committed to the International Council of Mining and Metal Sustainable Development Principles, and to the Mineral Council of Australian Enduring Values of Sustainable Development.

In 2003, the EP Act was amended to include a core set of principles that are applied by the EPA in assessments (EPA 2004b). As listed in Section 4a of the EP Act, these environmental protection principles are:

- the precautionary principle;
- the principle of intergenerational equity;
- the principle of the conservation of biological diversity and ecological integrity;
- principles relating to improved valuation, pricing and incentive mechanisms; and,
- principles of waste minimisation.

The Joint Venture has considered these principles in its assessment of the environmental impacts associated with the proposed Project (Table 5.1).

**Table 5.1: Principles of Environmental Protection**

Principle	Consideration Given In Proposal	Addressed in PER
<p><b>1. The Precautionary Principle</b>                      Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by:</p> <ul style="list-style-type: none"> <li>a. careful evaluation to avoid, where practicable, serious or irreversible damage to the environment</li> <li>b. an assessment of the risk-weighted consequences of various options.</li> </ul>	<p>A risk-based approach has been adopted in the development of the Project with the intention of identifying issues early in the process to enable planning for avoidance and/ or mitigation. Part of this process includes undertaking detailed site investigation of the biological and physical environs, including targeted surveys for cryptic species. Where these investigations identified significant environmental issues, the Project design was modified to avoid or reduce potential impacts, where reasonably practicable. If impacts could not be avoided, such as at the Resource Area, offsets have been proposed (Chapter 13).</p>	<p>Refer to risk-based assessment approach outlined in Chapter 9 and a detailed assessment of factors in Chapter 7, 8 and 14.</p>
<p><b>2. Intergenerational Equity</b>                      The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.</p>	<p>The Joint Venture is committed to meeting the International Council of Mining and Metal Sustainable Development Principles and Minerals Council of Australia Enduring Value of Sustainable Development. These sustainability principles are aligned with the requirements of the EP Act.</p> <p>Joint Venture is responsible to ensure that all land impacted within the mining lease is rehabilitated or managed in accordance with agreed closure strategies to ensure the land is preserved for future generations.</p> <p>Where species of conservation significance cannot be avoided offsets are proposed (refer Chapter 13).</p>	<p>Integration of these sustainability principles ensures the environment in which the Joint Venture operates is maintained and, where possible, enhanced for future generations. Refer to Chapters 6, 7, 8, 13 and 14 (Chapter 17 Appendix series 3).</p>
<p><b>3. Conservation of Biological Diversity and Ecological Integrity</b>                      The conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	<p>Conservation of biological diversity and ecological integrity is a major consideration for the Joint Venture. The Joint Venture has sought to reduce its disturbance footprint to avoid disturbance as far as practicable. Project design engineers have developed the Project's layout with the objective of avoiding species of conservation significance as far as practicable.</p> <p>The Joint Venture has undertaken extensive biological studies over a much larger area than is proposed to be disturbed to understand the biological context of impacts.</p> <p>The Joint Venture recognises the Project has the potential for significant impacts on a number of flora species of conservation significance and therefore has proposed a number of offset activities and programs to address these impacts (refer Chapter 13) and is committed to continuing research into these species to ensure that biodiversity impact is minimised.</p> <p>The Joint Venture has developed a Threatened Species and Communities Management Strategy (Appendix 3-E) to minimise the impacts that the Project will have on flora and fauna of conservation significance.</p> <p>The Joint Venture will implement an adaptive approach to environmental management to ensure the continual improvement to environmental management and performance.</p>	<p>Potential effects on terrestrial and subterranean fauna and vegetation / flora will mostly be restricted to the mine foot print. (Chapter 7).</p>

Principle	Consideration Given In Proposal	Addressed in PER
4. Improved Valuation, Pricing and Incentive Mechanisms.	<p>When considering the options for all elements of the Project in the pre-feasibility phase (e.g. layout for key infrastructure such as tailings storage facility), environmental factors were considered and, where necessary, changes to the Project were made.</p> <p>A Conceptual Mine Closure (and Rehabilitation) Strategy (Appendix 3-D) has been included with this PER. The Joint Venture recognises its obligations under the <i>Mining Act 1978</i> to continually update the closure strategy. The costs and requirements for closure have been considered in the design of the project, particularly for major items such as rehabilitation of the waste landforms and the tailings storage facility.</p>	<p>Alternatives Considered by the Joint Venture are summarised in Chapter 3.</p>
<p>5. Waste Minimisation</p> <p>All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</p>	<p>The Joint Venture is committed to developing targets to ensure water, energy and fuel use is optimised. Joint Venture is committed to reducing waste, greenhouse gas emissions, dust, noise, and wastewater. The Project will implement a ‘reduce, re-use and recycle’ approach to waste management across all components and phases of the project. A number of waste minimisation measures are planned to be implemented, including implementing the principles of reduce, reuse and recycle in relation to solid and liquid waste management. In addition to environmental improvements, Incorporating waste minimisation measures results in business advantages including minimising the Project’s exposure to financial commitments under the Carbon Pollution Reduction Scheme.</p>	<p>Strategies for waste minimisation are outlined within the project EMS (Construction and Operational Environmental Management Systems, Appendices 3-B and 3-C respectively, and Conceptual Mine Closure and Rehabilitation Strategy, Appendix 3-D).</p>

## 5.2. PRINCIPLES OF ENDURING VALUE

The Minerals Council of Australia (MCA) has set strategic direction for the mining industry to deliver sustainable performance in development of the policy, Enduring Value – The Australian Minerals Industry Framework for Sustainable Development (MCA 2004).

The enduring value policy is described by MCA as “the centrepiece of industry’s commitment to achieving continual improvement in its environmental, social and economic performance, accountability, and ensuring industry operates in a manner that is attuned to community expectations” (MCA 2004).

The principles of enduring value are in line with principles of sustainability. As such, the principles of enduring value have been incorporated into Joint Venture’s Integrated Management System (IMS), which is detailed in section 5.4.

## 5.3. TROPICANA GOLD PROJECT MANAGEMENT FRAMEWORK

As AngloGold is the majority stakeholder and Manager of the Joint Venture, the framework for management of the Project will be closely modeled on AngloGold’s successful business and management structure. The IMS for the Project will incorporate Environmental, Community, Occupational Health and Safety, Operational and legal compliance requirements. It is intended that the Project IMS will be certified to ISO14001, and, along with high quality environmental management, this certification will be a primary aim for the environmental component of the Project IMS. Likewise, the IMS will attain Occupational Safety and Health Assessment Series 18001 certification.

Figure 5.1 visually demonstrates how the IMS is structured. The framework of management within each component of the IMS will be based on the following structure:

- Values, Business Principles and Policies form the basis of the Company Standards;
- Procedures and Improvement Plans are derived from these Company Standards, which require;
- Monitoring and Data Management, which requires; and,
- Reporting and Review. The results of Reporting and Review are fed back into Procedures and Plans.

Further details of the environmental (and other) values, standards and policies of the Joint Venture partners are available through the following websites:

- The Joint Venture - [www.tropicana-jv.com.au](http://www.tropicana-jv.com.au);
- AngloGold Ashanti Limited- [www.anglogoldashanti.com](http://www.anglogoldashanti.com); and,
- Independence Group NL - [www.igo.com.au](http://www.igo.com.au).

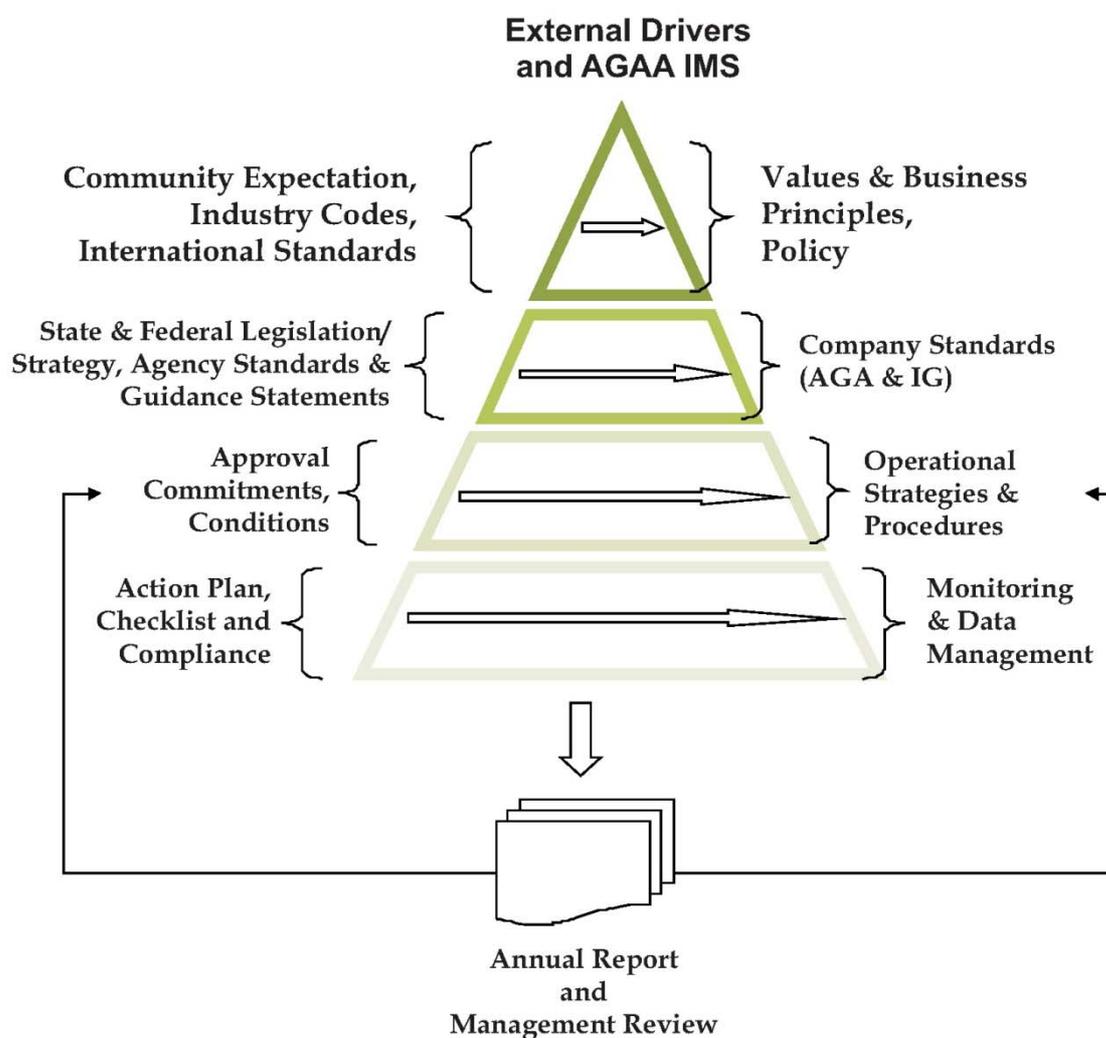


Figure 5.1: External Drivers and the Tropicana Gold Project Integrated Management System

Copies of the key AngloGold and Independence Group policies are provided in Figure 5.2.



## ENVIRONMENTAL POLICY

AngloGold Ashanti Australia is committed to the value that:



**We respect the environment**  
*We are committed to continually improving our processes in order to prevent pollution, minimize waste, increase our carbon efficiency and make use of natural resources. We will develop innovative solutions to mitigate environmental and climate risks.*

To fulfil these commitments, AngloGold Ashanti Australia will:

- comply with all applicable environmental legislation and other requirements to which we subscribe;
- implement and maintain efficient and effective environmental management systems;
- work to maintain the integrity of the natural environment and biodiversity value in the area where we work by protecting natural processes, identifying critical habitats and /or threatened species and limiting our environmental footprint;
- integrate environmental, social and cultural aspects along with economic considerations into all planning activities and decision-making processes;
- manage the environmental and carbon footprint associated with our business from exploration through to mine decommissioning in order to reduce or eliminate their environmental impact and prevention of pollution;
- promote environmental awareness and understanding among our work colleagues to develop an informed and responsible environmental culture;
- provide relevant training and support for all personnel to enable them to fulfil their environmental responsibilities;
- conduct annual environmental audits, set and review performance objectives and targets and measure progress to ensure continuous improvement and responsible industry practice;
- develop and implement innovative approaches to environmental, energy efficiency and carbon management through scientific research and technology transfer;

All employees and contractors are accountable for upholding the company policy and standards on environmental management and will be regularly appraised on their performance.

**Mike Erickson**  
Vice President - Australia

Date: 1 August 2009  
Review: 1 July 2011

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## ENVIRONMENTAL POLICY

The Board and Management of Independence Group NL believe that compliance with environmental standards is an essential responsibility when investing shareholders' funds.

To this end, Independence Group NL commits to the following policy and the values which underpin it:

- Our activities, through mining and exploration, will incorporate the latest environmental standards, as determined by the appropriate Regulatory Authority.

Our guiding principles will be:

- We shall introduce an Environmental Management System to form part of the collection, measurement and interrogation of data which will translate into a better management of our processes while reducing environmental impacts.
- We shall provide all personnel with clear guidelines as to their duties and responsibilities related to this policy and seek periodic external audits to determine our compliance levels.

**R J MARSTON**  
CHAIRMAN

**C M BONWICK**  
MANAGING DIRECTOR

Dated: March 2007

Figure 5.2: Environmental Policies

### 5.4. TROPICANA GOLD PROJECT INTEGRATED MANAGEMENT SYSTEM

As indicated in section 5.3, the IMS will encompass the project’s environmental, health and safety and community management systems (Figure 5.3). The Joint Venture will develop and implement the IMS prior to commencement of its construction activities. Key elements of the IMS will include:

- commitment and policy;
- planning;
- implementation and operation;
- checking and corrective action; and,
- management review.

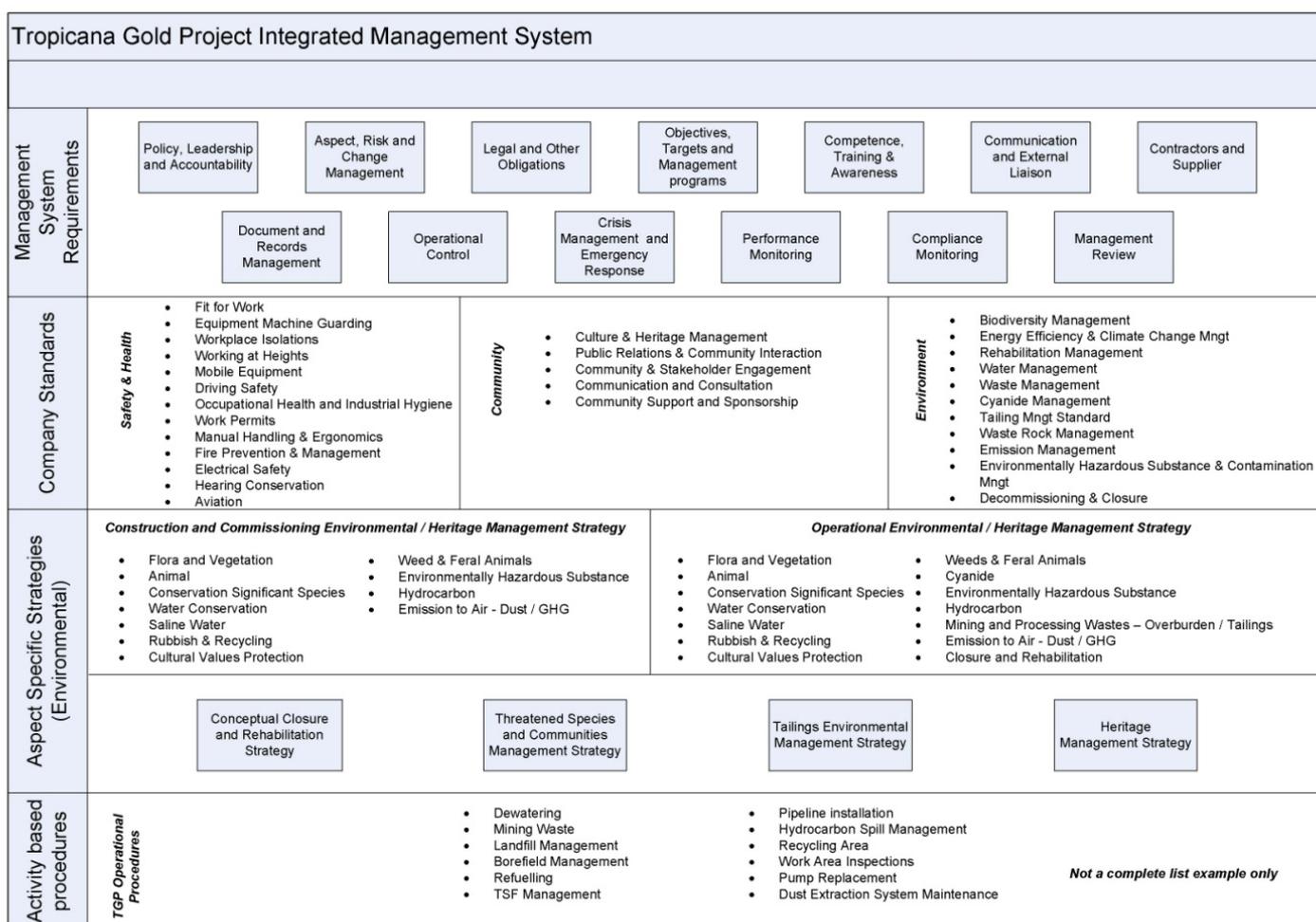


Figure 5.3: Tropicana Gold Project Integrated Management System

External drivers of the IMS will include legislation, EPA Guidance, approval conditions and external audits. A brief description of some of the key legislation and relevant guidance documents, and how they relate to environmental management of the Project is provided in Appendix Series 3.

The Project IMS will operate on an adaptive management or continual improvement philosophy. The principle behind adaptive management is a structured, iterative process of optimal decision making in the face of uncertainty, with the aim of reducing uncertainty over time by monitoring the outcomes of the management

strategy or by adopting procedures. Put simply 'learning by doing'. Like all good management systems, the Project IMS will be expanded and enhanced over the life of the project as new information becomes available or standards and expectations change.

#### **5.4.1. Commitment and Policy**

The Joint Venture is committed to managing its activities in an environmentally and socially responsible manner, as reflected in their respective company policies (Figure 5.2). The Environmental and Social Policies are the pinnacle documents within the IMS and environmental performance is ultimately measured and reported against these policies.

The policies of both Joint Venture partners are based on the principles that sound business practice requires compliance with environmental standards as a minimum and the incorporation of environmental management in the normal business practice ensure that environmental impacts are considered at all stages. As it is not possible to eliminate all impacts, the Joint Venture practice is to engineer and conduct operations with the objective of achieving best practice so that adverse effects on the environment and any surrounding community are either avoided or kept to an acceptable level.

#### **5.4.2. Planning**

##### **Legal and Other Obligations**

The identification and review of relevant legislation, regulations, conditions of approval, Project commitments, policies, industry standards and protocols, and the determination of their implications for environmental and social management, will continue throughout the life of the Project.

Sections 1.5 and 1.6 identified key legislation applicable to the Project. An environmental compliance register will be established for the Project to track compliance with legislation, commitments and procedural requirements.

##### **Objectives and Targets**

Objectives and targets will be set under the IMS. Project specific, measurable environmental objectives and targets will be based on the respective Joint Venture partners' corporate policies, conditions of approvals and Project commitments.

##### **Aspects/ Impacts Register (Risk Register)**

A risk register will be established for the Project documenting all foreseen environmental risks associated with the Project. An environmental risk assessment has been conducted to identify aspects and impacts associated with the Project and to evaluate the likelihood and consequence of environmental impacts occurring as a result of all activities.

### 5.4.3. Implementation and Operation

#### Procedures

Environmental management procedures for the construction and operational stages of the Project will be detailed in the IMS through the Management Strategies (section 5.5).

#### Responsibilities

As the manager, AngloGold is responsible for managing the Project and its associated employees and contractors. The environmental and community management responsibilities that will apply to the various personnel involved in the Project are outlined in Table 5.2.

**Table 5.2: Environmental and Community Responsibilities**

Position	Responsibilities
Joint Venture Companies Senior Representatives	Overall responsibility for the Project and effective management of environmental and social responsibilities.
Project Manager	Overall responsibility for site-specific implementation of environmental and social policies, systems and management measures.
Line Managers	Ensures IMS is prepared, implemented uniformly, revised and maintained. Ensures implementation and regular review of relevant environmental management measures. Liaises with environmental staff as required.
Senior Environmental Specialist	Ensures IMS is prepared, implemented uniformly, revised and maintained. Assesses the suitability and effectiveness of the IMS. Ensures that contractors fulfill their contractual obligations relevant to environment, health and safety (EHS). Implements the EHS component of induction procedures and the appropriate EHS training. Ensures compliance with license conditions and company policy relevant to EHS via the establishment and maintenance of appropriate reporting systems and databases. Participates with personnel to improve work practices on site. Undertakes internal site EHS audits. Provides advice as required to other Project personnel. Liaises with stakeholders. Ensures implementation and regular review of management measures. Contributes to the management of progressive rehabilitation and completion planning.
Employee and Contractors	Fulfills requirements of the IMS and associated contractual obligations where applicable.
Environmental Auditor/ Reviewer	Conducts regular independent environmental audits/ reviews of operations to ensure compliance with the IMS and statutory requirements.

#### Inductions and Training

The Joint Venture will ensure that all personnel have the appropriate knowledge and skills to conduct their activities in accordance with Project policies, objectives and targets. Inductions will be conducted for employees and contractors to inform them of the Project's Environmental and Community Policy, the IMS, conditions of approval, Project commitments, environmental and social values, management strategies and procedural requirements.

An appropriately qualified and experienced person will conduct the inductions. All personnel will be required to undertake and pass a knowledge questionnaire based on the induction presentation, and records will be retained of all persons being inducted. Regular 'toolbox' meetings will identify environmental issues that may arise from time to time.

Additional training will be undertaken on an as-needed basis, and if required, key personnel will be provided with support to explain management procedures to their staff. All personnel will have access to copies of the IMS and associated management strategies.

### **Consultation**

Ongoing stakeholder consultation will be undertaken in accordance with the stakeholder consultation program (Chapter 4).

#### **5.4.4. Checking and Corrective Action**

### **Supervision and Inspection**

Regular supervision and inspections of activities will be undertaken by qualified and experienced personnel to ensure that environmental management procedures are being implemented satisfactorily. The frequency of inspections will depend on the magnitude of risk associated with the particular hazard identified. Outcomes of the inspections will be reported as per the following sections.

### **Recording**

The Joint Venture will maintain a database and repository for storage and retrieval of environmental data, records and other relevant information (e.g. standard operating procedures, audits, Incident Register, complaints received, etc.).

### **Reporting**

The Joint Venture will employ the following environmental and community reporting systems:

- a report dealing specifically with environmental and community issues will be submitted to the Joint Venture Operating Committee on a quarterly basis. This will include a summary of non-compliance reports, corrective actions, and major issues arising from daily supervision and inspections and the compliance audits;
- an Annual Environmental Report will be prepared for submission to relevant agencies such as DMP and the DEC. This report will outline the mining and processing activities that have occurred throughout the year (including extent of disturbance and rehabilitation) and the proposed activities for the coming year, and will address compliance with all environmental commitments and approval conditions. The Annual Environmental Report will also be submitted to the Compliance Monitoring Section of the DEC and other interested parties on request;
- the Department of Water will require annual reporting and/ or auditing as a requirement of a 5C License Operating Strategy under the *Rights in Water and Irrigation Act 1914*;
- incident Reports will be submitted to the DMP and DEC in the event of a significant environmental incident or non-compliance;
- the Project will report greenhouse gas emissions and energy efficiency opportunities in accordance with *National Greenhouse and Energy Reporting Act 2007* and the *Energy Efficiency Opportunity Act 2006*;

- the Project will comply with all reporting requirements associated with the National Pollutant Inventory;
- reporting requirements that are specific to performance indicators and targets are provided within the relevant management strategies and IMS; and,
- an Annual Statement of Compliance will be prepared for submission to the DEC as part of the operating license under Part V of the EP Act.

### **Compliance Audits and Reviews**

Audits and reviews will be undertaken by appropriately qualified and experienced personnel on a regular basis to ensure compliance with the environmental and social management procedures, the conditions of approval and Project commitments. The frequency of auditing will be established in the IMS.

An audit report will be completed shortly after the audit and a corrective action report prepared for all non-conformances identified during the audit. Subsequent audits will review the corrective action reports to ensure they have been adequately addressed.

### **Incidents**

Environmental incidents that cause or threaten serious or material environmental harm will be reported to the relevant personnel and to the regulatory authorities within 24 hours of the event (or as required).

The incident will be recorded in the Project events recording system, investigated, and written up in a report. In addition to statutory reporting requirements, this report will detail any improvements to be made in the IMS or its elements (e.g. the management strategies and environmental procedures), with such improvements resulting in revision of the relevant IMS element and additional training, as required. The Incident Register will be maintained throughout the life of the Project.

#### **5.4.5. Management Review**

Internal review of the IMS by qualified and experienced personnel will help ensure continual improvement in levels of compliance and consistency across the Project. This will include:

- review of performance against objectives and targets;
- summary of inspection, audits, complaints and incidents;
- actions taken to correct or remedy non-conformances;
- an outline of planned activities for the forthcoming three months;
- revision or update to the IMS;
- revision of the corporate Environmental Policies; and,
- revision as a consequence of a change in circumstances of the Project.

These reviews will be conducted at least annually and will also include planned activities for the following year. All personnel will be encouraged to participate in this process.

## **5.5. TROPICANA GOLD PROJECT MANAGEMENT STRATEGIES**

As part of the environmental impact assessment and management process the Joint Venture has identified environmental aspects that will require specific environmental management strategies. Central to the Project IMS are:

- Tropicana Gold Project Integrated Management System Manual (Appendix 3-A);
- Construction Environmental Management Strategy (Appendix 3-B);
- Operational Environmental Management Strategy (Appendix 3-C); and,
- Conceptual Closure and Rehabilitation Strategy (Appendix 3-D).

These strategies provide the framework for identifying and managing environmental issues during the life of the Project. These strategies will be incorporated into the IMS procedures that will be developed and implemented to ensure that all works executed by both Project staff and contractors comply with the Joint Venture's environmental commitments and requirements.

The strategies describe the performance indicators, targets and management actions required to achieve the desired objectives. The implementation process will begin at induction and continue through ongoing training. The environmental objectives, and each employee's obligations for environmental management will be clearly communicated to all staff and contractors.

These strategies demonstrate the Joint Venture's commitment to best practice environmental management and continuous improvement of the Joint Venture environmental performance.