AngloGold Ashanti Limited \ Reg. No.1944/017354/06
76 Jeppe Street \ Johannesburg \ 2001 \ PO Box 62117 \ Marshalltown \ 2107 \ South Africa
Tel +27 (0)11 637 6000 \ Fax +27 (0)11 637 6624 \ Website: www.AngloGoldAshanti.com

MANAGEMENT STANDARD		
WATER		
POLICY CUSTODIAN	Corporate Office Environment and Community Affairs Department	
AUTHORISED BY	AngloGold Ashanti Executive Committee	**DATE:** 23 June 2009
BRIEF DESCRIPTION OF CHANGES		
Second Revision: Condensing the requirements of Revision 1; removal of performance assessment framework; title change (replacement of "Guideline" with "Standard'). Modification of document identification nomenclature.		

Table of Contents

1. INTRODUCTION

Managing water responsibly and ensuring that adverse impacts on local and regional water resources are avoided, is a major consideration for all AngloGold Ashanti (AGA) sites. Water management parameters are easily quantified and therefore are the subject of frequent scrutiny by governments, NGOs and communities. This standard sets common requirements for managing water resources, broadly in terms of water quality and consumptive use.

2. OBJECTIVE

The objectives of this document are as follows:

2.1 To ensure that reliable information regarding potential and actual water quality impacts on local and regional water resources is generated, analysed and acted upon at an appropriate spatial scale that allows for effective water quality management[1] by AGA sites.

2.2 To ensure that operations are able to optimise their consumptive water use[2] and achieve their water quality objectives via a robust water balance model that also permits forecasting the potential water management impacts of design changes on local and regional water resources.

2.3 To ensure that actual and potential impacts arising from water resource use are avoided where possible, or managed according to mandatory host government requirements, reasonable community expectations and the AngloGold Ashanti's values, which state: "We respect the environment" and "We are committed to continually improving our processes in order to prevent pollution…"

3. ACCOUNTABILITY AND RESPONSIBILITY

Overall accountability for implementing this standard lies with the Manager in direct control of the site. Responsibility for its implementation can be delegated to a designated person(s) who should clearly understand their role(s) and responsibilities.

[1] Including the maintenance of legal compliance.
[2] Through for example, site water use minimisation strategies.

4. SCOPE

4.1 This standard defines a common approach to the management of water[3], including its quality and consumptive use at AGA managed operations. It is applicable to all phases of the mining project lifecycle.

4.2 Where AGA has no operational responsibility but a significant equity stake, and an equivalent standard is not in place, this standard must be made available to the operator for application.

4.3 Onsite contractors and subcontractors are required to adopt this standard unless they have an alternative water management standard, approved in writing by AGA.

5. REQUIREMENTS

5.1 LEGISLATIVE AND OTHER REQUIREMENTS

The management of water at AngloGold Ashanti sites must be in compliance with applicable international treaties, national laws and regulations, environmental licence conditions and any other binding obligations.

5.2 WATER QUALITY MANAGEMENT

5.2.1 Risk Assessment

5.2.1.1 A baseline[4] water quality risk assessment must be conducted as early as possible in the site's life, to identify actual and potential impacts on background water quality and neighbouring communities, arising from AGA activities. For exploration projects, this assessment should form part of the baseline environmental assessment for the project, and be appropriately updated when the project progresses from the detailed design stage to the commissioning and operational phases.

5.2.1.2 The water quality parameters assessed during this process must include an appropriate[5] suite of physical, chemical and biological constituents.

5.2.1.3 The identified local and regional water quality risks, in particular, potential non-compliance to host country usage requirements and regulatory or adopted[6] effluent

[3] Meaning surface and groundwater water, including that which drains into underground and open pit mines.

[4] In this context, ***baseline*** assessment refers to the initial thorough assessment conducted at the site and may be conducted during any phase of the project. It establishes the status quo with respect to impacts generated from site operations.

[5] Appropriate to the local geological and topographical setting, prevailing human population activities, the probable mine design and in conformance with host country expectations.

standards, must be clearly documented in the baseline assessment. Water quality management objectives must be developed in response to the potential risks identified in the baseline assessment, and appropriate[7] preventive and/or corrective actions must be developed and implemented.

5.2.1.4 Where effluent quality standards are not specified by host governments, the effluent guideline values referred to in section 1.1 (Water Use and Quality subsection) of the IFC Environmental, Health, and Safety Guidelines: MINING[8] and/or in section 1.3 of the IFC Environmental, Health, and Safety Guidelines: GENERAL EHS GUIDELINES[9] must be adopted as effluent quality targets.

5.2.1.5 The baseline assessment must, as a minimum, be reviewed every 3 years, or more frequently as significant changes in site activities occur, or as statutory requirements dictate.

5.2.2 Water Quality Monitoring Programme

5.2.2.1 Sites must establish a surface and ground water monitoring programme in response to the identified local and regional water quality risks including the legal and/or adopted effluent standards. The water quality monitoring programmes must detail:

i. responsibilities for execution of the monitoring programme
ii. locations of where routine samples to should be taken,
iii. required sampling and preservation protocols,
iv. analytical parameters required per sample,
v. frequency of sampling; and
vi. sample quality/custody controls.

---

[6] See section 5.1.1.4.

[7] Depending on whether the risk relates to an already producing mine or new project, this could take the form of implementing a new water effluent treatment process or redesigning future production processes to avoid water resource impacts.

[8] These Guidelines can be obtained at the following URL: http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_Mining/$FILE/Final+-+Mining.pdf

[9] These Guidelines can be obtained at the following URL, http://www.ifc.org/ifcext/sustainability.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_GeneralEHS/$FILE/Final+-+General+EHS+Guidelines.pdf

5.2.2.2 The appropriateness of the water quality monitoring programme must be evaluated and maintained either through the periodic review of the baseline assessment, or as statutory requirements dictate.

5.2.2.3 Analyses of collected samples must be undertaken as required by country regulatory authorities, or alternatively at laboratories providing defendable analytical results through the use of recognised quality control measures, e.g. ion balances and/or third party verification.

5.2.2.4 The results of surface and groundwater analyses must be maintained in a protected electronic format, suitable for ease of communication to internal and external parties. The original (physical or electronic) certificates of analysis from laboratories must be safely stored.

5.2.3 Analysis and Response

5.2.3.1 Results and trends in water quality must be analysed regularly against water quality management objectives and the prevailing effluent standards.

5.2.3.2 The frequency of analysis must be as regulatory requirements dictate or, if there are none, at intervals appropriate to the attainment and assurance of site water quality management objectives.

5.2.3.3 Groundwater plume modelling:

i. Groundwater plumes should be monitored with the aid of an appropriate groundwater model which allows for tracking of solute transport and modelling the evolution of groundwater plumes over time.

ii. The construction of this model must be preceded by a good understanding of geological conditions on site (i.e. a conceptual site model).

iii. All data used during modelling must be validated, and of good quality[10].

5.2.3.4 Corrective and preventive actions[11] must be implemented to ensure achievement of water quality management objectives. An emphasis should be placed on proactive responses rather than reactive responses.

[10] Good quality data is obtained by practising sample collection, preservation and analytical methods that are best suited to determining the groundwater constituents of interest. Various methods can be used to assure (validate) confidence in the data collected. These include the taking of duplicate samples, analysis by accredited laboratories, field water quality checks during sampling and the using analytical confidence tools such as cation and anion balances.

5.2.4 Reporting

5.2.4.1 Reporting on water quality results must be in accordance with regulatory and AGA corporate office reporting requirements that includes incident notification and reporting and GRI environmental Indicators.

5.3 WATER USE MANAGEMENT

5.3.1 Water Balance Model

5.3.1.1 Operations must develop and maintain a water balance model[12] that includes the following three design components;

I. New Inflows (**I**)[13],

II. Inventory Storage (**S**)[14]

III. Outflows (**O**)[15].

The mathematical relationship between the three components is: [**I + ΔS - O = 0**]

5.3.1.2 The following considerations must be incorporated into the design and operation of water balance models;

i. Where relevant, compliance against regulatory withdrawal and discharge limits must be shown in water balance model reports. Internal water use objectives, such as consumption optimisation targets should also be shown.

ii. The resolution[16] of water balance models should be appropriate to the nature and scale of operations and must allow for effective water management decisions.

---

[11] Corrective and preventive actions may but are not limited to include: up-gradient storm water deflection structures, lining of contaminated water dams, silt collection structures, erosion controls and groundwater interception bores.

[12] A basic water balance model is a numerical representation of an operation's water flow system, including piped reticulation and external factors such as rainfall and evaporation. A series of periodically captured records of inflows, outflows and inventory changes constitute a water balance database that permits an analysis of trends and facilitates water management planning decisions.

[13] New water inflow sources should at least be classified into at least four types; surface water withdrawals, groundwater withdrawals and inflows to mine workings, captured precipitation, and supply from water utilities or third parties.

[14] Meaningful changes in water inventory should be measured. Water storage facilities include water reservoirs and dams as well as water contained in processing circuits such as leach tanks and heap leach pads, thickeners, tailings facilities and mine workings.

[15] Outflows include accidental and planned surface water discharges to the environment, transfers to third parties, evaporation - including ventilation system moisture losses; seepage losses to groundwater and other non-recoverable water uses such as irrigation and dust suppression

iii. The target water balance model accuracy[17] must be ±10%. Continued imbalances outside of this tolerance range must trigger a review and update if necessary.

iv. The water balance model architecture should reflect the key activities on the entire site, e.g. process plant, the mine, tailings facilities, water dams, office areas and where relevant, mine accommodation.

v. Water balance model data must be updated at least monthly intervals as a minimum.

vi. Where required for operational purposes, forecasting capacity must be built into water balance models e.g. to forecast the long term water consumption requirements or inventory changes[18], as a result of changing water use patterns.

5.3.1.3 Major internally recycled water streams should be identified[19] and quantified[20] in the water balance model.

5.3.1.4 Appropriate methods of water volume measurement, in keeping with the performance requirements of the water balance model, or as may be directed by regulators, must be used. These may include mechanical or automatic flow and totalisation devices, calculation (volume differences), slurry density calculations, or estimates[21].

---

16 A water balance model of a very high resolution where virtually all flows and inventories are monitored may be impractical to maintain and may provide no more management value than a water balance model of lesser resolution. Host country requirements may specify particular flows that need to be accounted for in the model.

17 The accuracy of water balance models is dependant on both the accuracy of routine volume measurements and the resolution of the model.

18 See: The AngloGold Ashanti Limited, Tailings Management Framework, Standard of Practice section 3.6, relating to water balance requirements when water is accumulated on a TSF.

19 Potential sources of recyclable water streams in the water balance can include; process water streams (e.g. refrigeration or cooling water circuits); drainage water from leach pads, process ponds and decant from tailings storage facilities; washdown water; and treated effluent from water treatment plants.

20 According to the G3 Technical Protocols, the calculation of the volume of water recycled or reused is based on the volume of water demand satisfied by recycled or reused water, in the place of further withdrawals .Site water balances should state the total volume of water recycled in cubic meters per relevant time period (m3/month or m3/year) and also as a percentage of total water withdrawals

21 The quality of estimation methods used must stand up to external scrutiny.

5.3.2 Analysis and Response

5.3.2.1 Analysis of results of actual water use patterns against host country regulatory, and internal water use objectives, must be undertaken as per regulatory requirements or at an interval appropriate to achieve water use management objectives.

5.3.2.2 Remedial and preventative actions must be initiated to correct deviations from regulatory requirements and site water use objectives.

5.3.3 Reporting

5.3.3.1 Reporting on water use performance against regulatory and AGA requirements[22] must be performed undertaken as required.

6 GLOSSARY

6.1 **Waste storage facilities** refers to all constructed facilities for the storage of waste, including waste rock dumps, tailings storage facilities, spent heap leach pads and landfill sites.

6.2 **Operation** refers to a producing mine.

6.3 **Project** refers to an exploration project or a new mine expansion.

6.4 **Site** is used when referring collectively to gold producing operations and to exploration and expansion projects.

6.5 **Mining lifecycle** encapsulates all stages of a mine project, from exploration to operation and closure.

6.6 **Permit** is used to denote any environmental approval, authorisation or license issued by host government departments and containing legally binding performance requirements.

[22] Including incident reporting requirements and the relevant G3 GRI Environmental Indicators.