UPDATE ON MANAGEMENT OF LEGACY ENVIRONMENTAL ISSUES IN GHANA

ANGLOGOLDASHANTI

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AngloGold Ashanti acknowledges that there are some legacy environmental concerns to be addressed at both of its operations in Ghana – Obuasi and Iduapriem. Although the majority of these issues resulted from historic operating practices prior to the merger with Ashanti Goldfields Corporation in 2004, the company has not only strived to develop action plans to mitigate these, but also implemented appropriate environmental standards and operating systems. Correcting such legacy environmental issues has taken time, however good progress has been made over the past decade.

Environmental Management Plans (EMPs) are prepared every three years, (and updated when there is a significant change to operations) and submitted to the Ghana Environmental Protection Agency (EPA) for approval that results in the Agency issuing an Environmental Certificate for each mine. These plans contain information pertaining to the key aspects and impacts at each operation and the management commitments to addressing such impacts.

Iduapriem: the 2011-2014 Environmental Certificate expired on 6 October 2014. The 2014-2017 EMP was submitted to the EPA in April 2014, 6 months prior to expiry, in line with the legal requirement. The EPA responded on 10 November 2014 by providing comments on the EMP which the mine addressed and subsequently re-submitted the final document on 9 January 2015. The mine has also paid the required processing and certificate fees to facilitate the issuing of the new permit which is still outstanding as at beginning of October 2015.

Obuasi: the 2011-2014 Environmental Certificate expired on 14 March 2014. The 2014-2017 EMP was submitted to the EPA in September 2013, 6 months prior to expiry, in line with the legal requirement. In early 2014, AGA Ghana announced that there would be a review the future of the Obuasi Operation, based on many years of under-performance. This resulted in the intent to retrench the workforce and suspend underground operations to limit financial losses and by end of 2014 the mine was placed on a limited operation phase whilst work continues on the Feasibility Study into the mine's redevelopment. In response, the EPA requested an EMP that reflected the proposed future direction of the mine.

In July 2014, AGA Ghana submitted an Amendment to the Programme of Mining Operations (APMO) to the Ministry of Lands and Natural Resources to cover the period October 2014 to December 2015. The Minister for Lands and Natural Resources subsequently approved the APMO in November 2014, which allowed AGA Ghana to complete the retrenchment of the entire workforce and to transition the operation into a Limited Operating Phase (LOP). The EPA has yet to approve this EMP and it has now been superseded by a 2016-2018 EMP which reflects the resultant Feasibility Study project. EPA approval of the most recent EMP submitted in July 2015 is pending.

From July 2014 to June 2015 a Feasibility Study was conducted to outline the redevelopment requirements and future potential of the Obuasi Gold Mine. The draft study was reviewed internally by AGA Corporate and presented to the AGA Executive and Board and to the Government of Ghana and key Stakeholders in June 2015. The optimisation of this Feasibility Study and further discussions in relation to project funding, development and approvals is ongoing with the intent to complete in Q1 2016.

Numerous engagements have been held with the EPA during 2015 on the status of the programme to address the legacy environmental issues. AGA Ghana has focussed on a number of initiatives including:

- Reducing the lease area from 474km^2 to 201km^2: well underway and sitting with the Minerals Commission to make a final submission to the Minister for approval
- Fencing the operational area: now complete with a 21km fence enclosing the bulk of the open pits and waste dumps, plus all required infrastructure. Housing estates fall outside this area, as does the operating South TSF and pipeline. Numerous legacy TSFs, open pits and waste dumps are also outside the fenced area. Detailed plans to address these have been prepared in the Feasibility Study
- Reduction of the mine infrastructure: this includes the demolition of Shaft infrastructure such as at Sansu in the far South of the 8km orebody strike length and Eton Turner Shaft (ETS) in the far North, plus the Pompora Treatment Plant (PTP) and other redundant or unusable infrastructure
- Undertaking test work on how best to treat and dispose of the stockpiled Arsenic Trioxide: this programme has been underway for 12 months and is nearing completion, with both a viable option and a viable alternative option identified
- Developing an integrated plan for tailings, backfill and water management: this is a key consideration in the Feasibility Study and there has been good progress on the operation in the past 12 months to understand the water balance and to ensure that the closed water system functions properly, with all water discharged to the environment (due to the positive water balance) meeting EPA guidelines

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1	**ENVIRONMENTAL STRUCTURE & STAFFING**: Given the complexity of environmental issues at Obuasi and Iduapriem, the company should ensure that the Environmental Management Plan is supported by the appropriate structure and qualified staff.	Develop the appropriate operational strategy and organisational structure, then staff with competent personnel.	There have been no major changes with the environmental team at Iduapriem. At Obuasi, with the onset of the Limited Operating Phase (LOP) the Environmental function has been consolidated under the EHS Manager. There is a strong linkage between this team and the Feasibility Study team to ensure current activities align with the planned redevelopment work. The smaller team is working well and the Environmental management framework has been under constant review and refinement. Technical support to both operations is provided from the corporate office.
2	**WATER MANAGEMENT:** In the past, water management has been a significant risk for the business at both Obuasi and Iduapriem. Both	**Water Treatment Facilities:** Develop water balance models, redesign the overall site water management infrastructure and install sufficient water treatment	The water-positive environment at Obuasi continues to be catered for through the use of three water treatment plants which discharge compliant water to the environment. These plants have a combined maximum capacity to treat 890m^3/hr.

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mines have positive water balances.	plant capacity at both operations.	The water treatment plant at Iduapriem continues to operate optimally, even during the wet season.
	Underground water at Obuasi: Install flexibility to pump to either the water treatment plants or to the processing plant where it is used as process water or treated and discharged.	The underground water system has been integrated into the site-wide water balance. Further test work is underway to identify water ingress points to underground with a view to minimising ingress where possible and to allow clean surface water to flow through the lease without being polluted.
	Return Water Dam at Obuasi: A new return water dam or process water dam is planned to provide water holding capacity.	The Feasibility Study design has been completed to utilize Ponds 1 and 2 for the future Process Water and Return Water ponds respectively. The construction of these facilities will form part of the broader Implementation Phase following Project approval.
	Water Balance at Obuasi: Develop a predictive mine-wide water balance model which can cater for different stages in the operation including opening and closing TSFs and changes to water storage facilities.	At Obuasi a mine wide water balance model (OPSIM) has been updated and calibrated to simulate the proposed operational periods through the life of mine. A suite of 24 flow meters were installed in 2014 to aid with the calibration. The same OPSIM model was used to develop and manage the Iduapriem water balance.
	Water Storage at Obuasi: Construct an additional pond for storage and re-use of process water. Ultimately decommission the existing ponds by treating the water and removing the silted material to enable ultimate use as a fresh water pond.	In the updated water management strategy Ponds 1 & 2 will be utilised for process water containment. Pond 3 has now been isolated from the operational water circuit through the construction of a diversion channel. This Pond will provide make-up water to the operational requirement and will ultimately be remediated. The design and construction for all ponds has been included in the current Obuasi Mine Feasibility Study requiring Board approval for implementation
3 WASTE MANAGEMENT: Domestic and general waste in Obuasi town is	In compliance with a 2010 directive from the Environmental Protection	The mine continues to operate the landfill facility at a designated and permitted area. The EPA is yet to

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managed by the municipality. The municipal waste disposal facility was poorly managed and had a significant environmental impact.	Agency, Obuasi mine stopped using the municipal refuse facility for its domestic and general waste. The mine has an approved landfill facility.	respond to an application for the extension of the use of the temporary landfill facility as the permanent landfill facility. Despite this not being a material risk given the reduction of waste volumes generated as a result of reduction in staff numbers, we continue to pursue the application for a permanent landfill facility.
4 TAILINGS MANAGEMENT: Operations at Iduapriem mine were suspended by the Environmental Protection Agency in February 2010 due to a lack of tailings storage deposition capacity. The previous environmental certificate at Obuasi (2011) was conditional on the decommissioning of the current tailings storage facility and commissioning of a new facility by December 2014. This deadline was extended by the EPA by one year to December 2015.	**Iduapriem**: A new facility (Greenfields TSF) was built and deposition started in 2011.	The facility has received all of the progressive subsidiary permits from the EPA and is fully operational.
	Obuasi: A new tailings management strategy is being developed at Obuasi, which will separate tailings into two streams: the BIOX® stream (contain cyanide) which will be deposited within a new high-density polyethylene plastic lined facility and the floatation stream (does not contain cyanide) which will be utilised in underground backfill and deposited within either a clay-lined facility, on top of the South TSF to create the closure landform or in disused pits.	During the Limited Operating Phase, legacy tailings are being cleaned up and processed, with tailings residue being deposited on the South TSF. This programme will finish by the end of 2015 to enable normal deposition to cease in accordance with the current EPA directive. As part of the Feasibility Study, AGA Ghana has designed a new double-lined facility immediately to the North of the South TSF which will be utilised for the BIOX® stream. Though a separate Floatation Compartment has been designed, AGA Ghana is proposing to utilise relatively benign floatation tailings to deposit on the South TSF to create the closure landform (rather than truck up the equivalent volume from borrow pits). Furthermore AGA Ghana is now studying the merits of depositing this product into disused open pits which is a practice that has been used at both Obuasi and Iduapriem in the past. The Feasibility Study also proposes the use of Pastefill rather than Hydrafill for underground stope void filling which takes both the full floatation stream particle range and a higher percentage than the previous method, requiring less storage space on surface.
5 REHABILITATION: There are a significant number of pits and waste rock dumps, from	**Obuasi:** There is an on-going rehabilitation plan as per the submitted EMP which is being implemented.	Obuasi: revegetation of Coral Snake waste rock dump is complete. Revegetation of Diawuoso Tailings is ongoing.

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previous surface mining at Obuasi that should be rehabilitated to safe, stable and sustainable conditions which are approved by the Environmental Protection Agency. There are three decommissioned tailings facilities at Iduapriem that must be rehabilitated in the short term.		T2 pit, Adubirem pit and Sansu Waste Dump have been remediated. All are in care and maintenance. AGA is engaging the EPA towards relinquishment of pits and waste rock dumps which have been encroached on, and are being used by, the communities. The scope of the feasibility study includes optimisation of the rehabilitation plan for the mine.
	Iduapriem: Rehabilitation plan includes the old pits that were backfilled using tailings (Blocks 1, 2 and 3) as well as the interim tailings storage facility.	Rehabilitation of the Block 1 tailings storage facility was completed in 2012. Rehabilitation of Block 2 and the Interim tailings storage facility was completed in 2014. The western corner of Block 3 pit is being utilised for additional water storage as part of optimising the mine-wide water management.
6 POLLUTION RISKS AND IMPACTS: There is need to ensure that pollution risks at Obuasi mine are mitigated going forward, and that the legacy pollution impacts and sites are remediated.	**Effluent water discharge:** The commissioning of new water treatment plants, clean-dirty water separation (diversion trenches), cyanide code compliance and building of a new process water dam are all projects being implemented to ensure that effluent water discharge is compliant with Environmental Protection Agency standards.	See water treatment facilities response above. International Cyanide Management Institute (ICMI) compliance certificate for Obuasi remains valid. Iduapriem has achieved compliance with ICMI requirements at the TSF due to interventions in the slurry thickening process through the operation of the leach at a more suitable pH, and using a coagulant to settle fines (as opposed to settling through additional lime 'dosing'). Iduapriem has begun preparations for their first ICMI Certification Audit scheduled for the end of 2015.
	Ground water seepage (mainly from TSFs): Historically unlined tailings storage facilities have been identified as a potential source of groundwater seepage. At Obuasi the Feasibility Study addresses these risks.	The final phase of the Diawuoso tailings re-mining is planned for completion by the end of 2015. Rehabilitation of the first phases has commenced. Planning for the closure of the South, Pompora and Kokoteasua TSFs is part of the Feasibility Study. The Environmental Impact Statement and design of the new Dokyiwa TSF

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		lined facility has been submitted to the EPA. Additional boreholes were drilled around these TSFs and monitoring has commenced.
	Polluted Land: Obuasi TSF footprints: Geochemical studies will be done to delineate polluted areas. Optimal clean up techniques are being studied.	Geochemical studies on the TSF footprints have been completed and the immediate planned action is to fence off identified areas. Agreed closure options are to be implemented during next phase.
	Stream Sediments: Complete the stream sediments de-silting.	Dredging of the Jimi Water Dam has been completed. A total volume of 100,000m^3 of silt was dredged from the dam and the EPA notified.