

REPORT OF THE:



EXTERNAL COMPLIANCE MONITORING GROUP (ECMG)



EIGHTH SITE VISIT JANUARY 2012

AHAFO SOUTH PROJECT, GHANA

Prepared for

International Finance Corporation - IFC
Newmont Ghana Gold Limited - NGGL

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FREQUENTLY USED ACRONYMS

ABMMP	Ahafo Biodiversity and Monitoring Plan
AFMP	Ahafo Fluid Management Plan
APELL	Awareness and Preparedness for Emergencies at Local Level
BOD	Biological Oxygen Demand
CA	Conservation Alliance
CAPA	Corrective and Preventative Action
CI	Conservation International
COD	Chemical Oxygen Demand
DO	Dissolved Oxygen
ECD	Environmental Control Dams
ECMG	External Compliance Monitoring Group
EHS	Environmental Health and Safety
ESIA	Environmental and Social Impact Assessment
EPA	Environmental Protection Agency
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
EWP	Employee Wellbeing Program
GPS	Geographic Positioning System
GWC	Ground Water Compliance (well)
HSLP	Health, Safety and Loss Prevention
ICMC	International Cyanide Management Code
IFC	International Finance Corporation
IMS	Integrated Management System
ISO	International Organization for Standardization
LCRS	Leachate Collection and Recovery System
KP	Knight Piésold Pty Ltd
MDE	Maximum Design Earthquake
NGGL	Newmont Ghana Gold Limited
NGO	Non-Governmental Organization
OHSAS	Occupational Health and Safety Assessment Series
OP	Operational Policy
SCS	Sediment Control Structure
SOP	Standard Operating Procedure
STP	Sewage Treatment Plant
TRAFR	Total recordable Accident Frequency Ratio
TSF	Tailings Storage Facility
TSS	Total Suspended Solids

USEPA United States Environmental Protection Agency
VRA Volta River Authority
WAD Weak Acid Dissociable
WRI Water Research Institute
WSF Water Storage Facility

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INTRODUCTION AND EXECUTIVE SUMMARY

This report summarizes observations made during the eighth site visit (January 9 – 13, 2012) by D'Appolonia S.p.A., Italy (D'Appolonia), serving as the External/Independent Environmental, Health and Safety (EHS) Compliance Monitoring Consultant (referred to as the External Compliance Monitoring Group – ECMG) for the Ahafo South Mining Project, Ghana (“the Project”). Compliance is based on the requirements of NGGL’s Integrated Management System (IMS) which was determined to comply with the requirements of the International Finance Corporation on the basis of the ECMG sixth site visit (completion audit) undertaken in December 2009.

This Eighth External Compliance Report is the first audit which also considers compliance with IFC requirements with respect to the 2012 Performance Standards that became operational on January 1, 2012 and the 2007 EHS General and Mining Guidelines. Previous audits were based on the pre-2006 IFC Safeguard Policies and Guidelines. NGGL undertook a voluntary decision to upgrade to the 2012 Performance Standards. Consistent with the TOR this audit has focused on the following:

- Confirm NGGL’s IMS and its defined standards conform to 2012 IFC Performance Standards and the EHS General and Mining Guidelines;
- Provide practical guidance and advice to the Projects’ internal field teams on how to solve any remaining problems identified;
- Identify areas and degrees of conformance or non-of conformance with the applicable IFC Performance Standards and Guidelines as presented above; and
- Identify specific issues and/or conduct follow-up and closure of issues identified in previous regular compliance monitoring visits.

At the time of this audit, the Subika Underground Project was still in the exploration phase and not yet formally part of the Ahafo South extracting operations. Nevertheless, as this project has the possibility of becoming operational before the next annual audit, an initial review of their operations was conducted during this field visit.

D'Appolonia observations that require actions and will be reviewed in subsequent sections within this report have been collated in Table 1-1 – Follow-up Issues. Table 1-1 is updated by the auditing team following each site assessment. D'Appolonia has also provided recommendations for improvement based on the collective experience and expertise of the team members. These recommendations are not considered compliance requirements and there is no onus on the operation for implementation. D'Appolonia, however, encourages the Project to consider the usefulness of the recommendations and incorporate them, as appropriate, into management activities.

The review of NGGL’s IMS in terms of its compliance with the newly-adopted 2012 Performance Standards and associated EHS General and Mining Guidelines is presented in terms of a gap analysis whereby the contents of the IMS are reviewed in the context of the Performance Standards. This evaluation is presented in Table 1-2. It is emphasized that although changes to the IMS to comply with the Performance Standards are presented in terms of “*no action required*” or “*action required*” the Performance Standards are associated with guidelines that represent current good practice, but are not absolute requirements. An “*action required*” may be discretionary if it is presented within the context of a guideline.

Newmont Ghana Gold Limited (NGGL), a wholly owned Ghanaian subsidiary of Newmont Mining Corporation (Newmont), is developing gold reserves with mining and milling operations located along a mineralized zone that extends approximately 70 kilometers (km) in the Brong Ahafo Region of Ghana, West Africa. The Project is an open cast gold mine and associated facilities. Construction initiated in April 2004 and mining started in January 2006 with the pouring of first gold in July 2006. Ahafo produced 545,000 ounces in 2010 and NGGL estimates 2011 gold production at Ahafo to be between 560,000 and 590,000 ounces, final production not yet reported. This increased production reflects the mining of higher grade ore and also productions from the Amoma pit, which started operations on October 1, 2010.

Mining is currently conducted in four areas, the Subika, Apensu, Awonsu, and Amoma pits. Underground exploration from the base of the Subika pit, a separate project from the open pit mining (Subika Underground Project), is ongoing. The Ahafo South Mining Project is expected to add about an additional 5 million ounces to Ghana's overall export of gold during the life of the mine based on the current mining plan, but the Subika Underground Project has the potential to add up to the equivalent of the current reserves over the next decade, should underground mining become operational. The blasting/drilling of an underground portal started in January 2010 and at the time of this visit had advanced approximately seven kilometers. This work has been undertaken on the basis of an exploration permit from the Inspectorate Division of the Minerals Commission. This permit has now been regularized through the surface operations through a "Yearly Operating Plan". NGGL does not have a permit for production mining underground, but the Exploration permit allows for test stoping and test campaign milling of the test stope ore.

The current total workforce, including both NGGL and contractors, is approximately 5,100 of which about 1,700 are from NGGL. Only about 2% of the NGGL employees are expatriates and approximately a third of the national workforce is recruited locally. About 9 percent of Ahafo's work force is women, primarily working in clerical, technical, and operation-related positions. However, 35 percent of mobile truck operators are female.

IFC involvement and financing required both pre-finance project due diligence and post-finance project assurance related to the various social, environmental, and health and safety IFC Safeguard Policies relevant to the Project, as presented in the Environmental and Social Impact Assessment (ESIA), which was disclosed on August 29, 2005. NGGL achieved full IFC compliance with the development of their IMS, as confirmed by the 6th ECMG audit in December 2009. NGGL has expanded upon this initial commitment to now include compliance with IFC Performance Standards and related EHS General and Mining Guidelines that post-date the ESIA. This 8th Audit represents NGGL's ongoing commitment to external/independent social, environmental, and health and safety compliance monitoring to provide an additional level of transparency to the implementation of its social, environmental and health and safety management programs. Social compliance is independently evaluated and reported by other external assessors¹ outside of the D'Appolonia organization. Public disclosure documents, including the independent ECMG reports are available on the Newmont Ahafo web site at <http://www.newmont.com/africa/ahafo-ghana/public-disclosure-documents>.

Specific activities conducted during this site visit included the following:

- evaluation of the current NGGL Environmental and Health, Safety and Loss Prevention (HSLP) Management System documents with a focus on identifying issues associated with the adoption of the IFC Performance Standards and the General Environmental and Mining Guidelines;
- visit to the sites of the Project operating facilities (including the Subika, Apensu, and Awonsu pits, Processing Plant and associated infrastructure, including the Water Storage Facility (WSF) and Tailings Storage Facility - TSF);
- visit to the Subika Underground Project;
- meeting with the Project teams responsible for EHS compliance monitoring, biodiversity and ecological management, and review relevant plans, procedures and monitoring records;
- review of documentation provided by NGGL specifically related to the Volta River Authority's (VRA) Kumasi-Sunyani Transmission Line; and
- conducting a closeout meeting with NGGL EHS and management personnel focusing on key findings, correction of any factual inaccuracies and possible corrective/upgrade actions.

The closeout meeting was conducted at the Ahafo South Mining Project on January 13, 2012 and the information presented in this meeting has formed the basis for this report. The information, observations, and opinions presented in this report are those of D'Appolonia and are independent of those of NGGL and the IFC. The most significant findings and observations made during this site visit are summarized below and in Table 1-1. The full description of findings and observations is provided in the text of this report.

¹ The Independent External Social Compliance Monitoring Reports are publicly available at <http://www.newmontghana.com/>

Environmental and HSLP Management System

The adoption of the IFC Performances Standards and associated EHS General and Mining Guidelines represents a significant commitment by NGGL to follow good practice for their environmental and social management. From an EHS point of view, NGGL has worked to develop a management system under International Organization for Standardization (ISO) 14001:2004 and Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 that comply with the pre-Performance Standard requirements, but also go a long way towards compliance with the new requirements. Over the past five years, D'Appolonia has worked with NGGL to develop good-practice programs such that, for the most part, the newer standards and guidelines do not represent major changes from the EHS policies and procedures already set for the Ahafo South Project. The new requirements are more comprehensive in the areas of stakeholder engagement and labor management, which are not the subject of this audit, except where there may be linkages with EHS topics. One such linkage is part of the EHS Guidelines for Mining, which state that Awareness and Preparedness for Emergencies at Local Level (APELL) procedures published by the United Nations Environment Programme should be followed for developing and implementing Emergency Action Plans for emergency response. Significant community involvement is required for emergency planning. Table 1-2 provides a gap analysis of the existing IMS with respect to the 2012 Performance Standards and the associated EHS General and Mining Guidelines for the Ahafo South Project. At this stage, the plans and procedures associated with the Subika Underground Project should be incorporated in the IMS before the start of underground production mining.

Pollution Prevention

Pollution prevention encompasses compliance with standards for air emissions, noise and vibrations, surface water contamination, groundwater contamination and the associated systems and processes in place to prevent pollution, in particular for cyanide management. Monitoring is thorough and NGGL demonstrates a continuing commitment to minimize environmental impacts. Surface water contamination has been the main environmental issue, in particular flow into the Environmental Control Dams (ECDs) and the discharge of pit dewatering into the WSF, the latter being of particular concern.

At the time of the D'Appolonia field visit in December 2010, dewatering of the pits into the WSF had reached the point where the actual water quality of this large body of water was starting to be impacted (ammonia). Unfortunately, this situation worsened and on January 2, 2012 a fish kill took place, as reported to the press by NGGL on January 4. High levels of ammonia coupled with low levels of dissolved oxygen were recorded at the time of the fish kill and either parameter could have triggered the event. Although it is recognized that natural sources of ammonia could have contributed to the situation and the dry Harmattan conditions may have also exacerbated the problem, pumping contaminated mine water into the WSF may have been a significant factor. NGGL has stopped pumping mine water into the WSF, but needs to develop solutions to recover this reservoir.

A second environmental issue identified from the December 2010 ECMG field visit is that the TSF was at the time showing signs of leakage (cyanide and cobalt). It is emphasized that the leakage is minor and that cyanide is detected only in the leakage detection zone beneath the liner and is not being detected in groundwater. Over the past year, NGGL has improved its management of supernatant fluid such that conditions do not appear to have worsened and is continuing to monitor this situation. NGGL may also wish to consider increasing the number of monitoring wells and the frequency of monitoring to better characterize the nature of seepage from the TSF. Should this situation worsen actions such as pump-back wells could be considered.

Sulfate and nitrate are also appearing to represent a problem that needs to be investigated and managed. At the beginning of 2010, sulfate and nitrate started to appear in anomalous concentrations in monitoring wells at the western edge of the TSF and in surface water also flowing along the western edge of the TSF a short distance upstream of ECD4. In 2011, the concentrations increased and both nitrate and sulfate were encountered in concentrations exceeding Ghana EPA general environmental quality standards within the Subri River downstream of ECD4. NGGL needs to identify the source of this nitrate and sulfate and identify solutions to contain or otherwise remediate the situation.

Biodiversity and Ecological Management

NGGL continues to progress in its biodiversity management activities with a local Non-Governmental Organization (NGO), Conservation Alliance (CA). At the time of the ECMG December 2010 visit, the Ahafo Biodiversity Management and Monitoring Plan (ABMMP) with an associated Action Plan had already been completed (2009) and implementation was pending CA/NGGL development of a Field Implementation Plan. NGGL has approved a CA proposal to start a biodiversity monitoring program representing the start of field implementation of the ABMMP in the first Quarter of 2012.

The most significant issue with respect to ecological management is the one mentioned under the topic of "Pollution Prevention" for the WSF. Although a modified habitat created for the mine, effort should be made to ensure that it is healthy such that the biodiversity values of the reservoir surroundings are not impacted. Several potential improvements were discussed with NGGL personnel at the time of the visit, including: modification of blast procedures to reduce the amount of residual ammonia left over after blasting; expediting construction of a zeolite-based treatment plant; plan any future discharges to go to the bottom of the reservoir to improve the distribution of oxygen; and aerate the reservoir by pumping in air through an engineered aeration system. At the time of the visit, plans were being made at the request of the Ghanaian Government to reduce the size of WSF, so the main recommendation is to not deliberately discharge water into the local river system until it is safe to do so.

An inspection of the Volta River Authority (VRA) transmission line corridor was undertaken in May 2011 by a joint NGGL/VRA team. Their observations reveal that new logging routes previously identified along the transmission line right-of-way were actually created by the Forest Services Division of the Forestry Commission of Ghana and not by illegal loggers. Farming still represents a risk of encroachment, as farms were encountered at the base of the transmission line pylons. Although no major issues were identified, the Inspection Report is inadequate to effectively assess any biodiversity impacts along the transmission line route. As this is a biannual survey intended to document any potential impact to a nearby designated Forest Reserve (a Globally Significant Biodiversity Area), the scope and reporting requirements of these surveys needs to significantly improve.

At the time of the December 2010 ECMG site visit, NGGL was able to demonstrate successful reinstatement of approximately 3.5 Ha at the Apensu Waste Dump. However, this area represented only about 10% of the area projected to be reclaimed by this time from the Reclamation Security Agreement between NGGL and the Ghana EPA made in 2008. At the time of this field visit the situation had not improved and in fact was slightly worse, because new mining activities extended into areas previously reclaimed. This situation is being resolved by subcontracting out earthmoving to a third-party, such that it is expected that the reclamation previously planned for 2011 will be added to the scope of work for 2012. Again, it is noted that the delay in reclamation does not constitute any urgency from an environmental point of view, but could be a reputational risk if progress is not made in 2012.

Waste and Wastewater Management

In general, NGGL has demonstrated that it has developed systems and procedures to appropriately manage the solid waste streams generated by the Ahafo South Project. On the positive side, the project has successfully developed composting as a solution to most of the organic waste generated at the site. Nevertheless, improvements are still needed and there have also been some setbacks in terms of previous accomplishments. In particular, at the time of the last ECMG field visit in December 2010, NGGL had achieved a major milestone with the inauguration of a high temperature incinerator designed for the combustion of oily materials that eliminated the need to send this waste to Kumasi. Unfortunately, this incinerator did not function as anticipated and NGGL again resumed sending oily rags, a hazardous waste stream, to the Kumasi municipal landfill. Based on D'Appolonia's past inspection, this facility is not properly operated to prevent the spread of contamination and it is therefore not an appropriate disposal site. It is understood that NGGL is again stopping the use of this facility and is in the process of refurbishing another incinerator for management of this waste stream. Improvements are still needed in the management of putrescible (biodegradable) food waste at the on-site waste pits to make sure that waste is covered with soil and not accessible to birds and other vectors that can potentially transmit disease. Wastewater plants continue to represent a positive contribution to waste management and, in any case, its treated effluent does not enter the surface water regime, but goes to the Process plant where it is mixed with the tailings stream.

Health and Safety

Outside-the-fence safety has previously been identified as a significant issue by the ECMG. NGGL has made significant inroads towards traffic control such that there has been an 80% reduction in accidents related to speeding through the first three quarters of 2011, although there was one fatal accident recorded in 2011 involving a contractor with a private vehicle. Each Department Manager now receives daily reports on vehicle movements based on Geographic Positioning System (GPS) controls and NGGL has continued with extensive awareness training. An issue previously identified was drowning, where several incidents had occurred from the startup of mining, but it should be noted that these incidents involved community people who were trespassing into the mine area and deliberately going there to fish in a restricted area and no drowning took place in 2011. NGGL has a comprehensive community safety awareness program that also includes a strong focus on road safety.

NGGL actively monitors the workplace from the standpoint of occupational health. On this basis, some issues have appeared with respect to insufficient hearing protection, high silicon levels, and one individual working in NGGL's metal laboratory was found to have a high level of lead in his bloodstream. In all cases, NGGL has reacted to take care of the affected workers and to make changes in the workplace (improved dust masks; better hearing protection) to prevent similar occurrences in the future. NGGL's programs for HIV/AIDs, tuberculosis and malaria continue to demonstrate results indicating their effectiveness and workers are encouraged to enter an Employee Wellbeing Program (EWP) whereby they are voluntarily tested for HIV, TB, Malaria, Cancer, Diabetes, Hypertension, and Hepatitis B. NGGL's senior management is encouraged to lead by example to make sure this worthwhile health initiative is successful with the general workforce.

WSF/TSF Management

The main issue with respect to WSF/TSF Management encountered during this field visit has been the consequences of pumping mine water into the WSF, as discussed under the topics of "Pollution Prevention" and "Ecological Management". Current plans are to lower the level of the WSF by 1.7 meters, representing approximately a one-third reduction in the volume of this facility. As noted above, NGGL will need to take care to ensure that the water from this facility is discharged safely such that the downstream river system is not adversely impacted.

NGGL is certified by the International Cyanide Management Code (Cyanide Code) and with respect to the management of cyanide entering the TSF, 2011 has been the best performance to date, with the average decant water concentration of Weak Acid Dissociable (WAD) cyanide being only 0.04 mg/L and the highest reading only 1.65 mg/L (the standard is 50 mg/L). NGGL has responded to the third-party independent audit of the TSF undertaken in October 2010 by Golder Associates and has reviewed the impact of future tailings loadings on liner integrity and determined that this is not an issue. The volume of supernatant liquid currently being stored in the TSF has also been reduced, although further reduction is still needed to achieve Golder Associates' recommendations.

As noted in the discussion of Environmental and HSLP Management System above, the adoption of the IFC Performances Standards and associated EHS General and Mining Guidelines does have some implications for the management of the TSF. In addition to the requirements for managing the Emergency Preparedness Plan consistent with the requirements of APELL, the IFC EHS Mining Guidelines cite the management strategy of zero discharge from the TSF and maintenance of freeboard for the Probable Maximum Flood, which is consistent with other industry standards for impoundments of this hazard classification during the life of the facility. The Guidelines also flag that a liquefaction analysis under the Maximum Design Earthquake (MDE) should also be undertaken.

The following table summarizes issues raised in this report. To facilitate an understanding of the seriousness of these issues, levels of severity were assigned to some of them where a break in a Project commitment has been observed. For all issues raised, a priority level (high, medium, low) is assigned, as well as a reference to the document that contains the Project commitment (e.g., IFC Performance Standards and associated Guidelines; Management Plans; Procedures, etc.). The nomenclature of the color-coded priority level categorizations is assigned based on levels of severity similar to the high, medium, and low priority items identified in NGGL's Management System Procedure for Corrective and Preventative Action and/or on the significance of environmental, health and safety, and/or reputational risk in terms of its magnitude and/or on time frame in which an impending risk might occur (short-term, medium-term, long-term). Observations regarding EHS Management in terms of compliance with the Performance Standards

and associated EHS General and Mining Guidelines are not included as this subject is addressed in the gap analysis presented in Table 1.2.

The following descriptions are provided:

- **Critical action required** - Level III critical situation, typically including observed damage to or a reasonable expectation of impending damage or irreversible impact to an identified resource or community and/or a major breach to a commitment as defined in Project documents or an applicable IFC requirement. A Level III situation can also be based on repeated Level II findings or intentional disregard of specific prohibitions or Project standards;
- **Immediate Action Required** - Level II – representing a situation that has not yet resulted in clearly identified damage or irreversible impact to a sensitive or important resource or community, but requires expeditious corrective action and site-specific attention to prevent such effects. A Level II situation can also represent a significant breach of a commitment, or a risk of a significant breach if not expeditiously addressed, requiring corrective action as defined in Project documents or applicable IFC requirement. A Level II situation can also be based on repeated Level I findings;
- **Action Required** - Level I situation not consistent with stated commitments as defined in Project documents, but not believed to represent an immediate threat or impact to an identified important resource or community. A Level I situation can also represent a minor breach of a commitment requiring corrective action as defined in Applicable Lender Environmental and Social Standards; and
- **Observation:** A finding not considered serious, but where improvement is recommended or a caution is warranted. An observation may also be associated with a recommendation.

Issues will be tracked in terms of their future status in subsequent audits. Observations do not constitute requirements for action, but can simply be recommendations that NGGL may or may not wish to follow. They are not assigned a mission number or an opening date/closing date and will not be repeated in subsequent reports, unless changed circumstances still allow for making the same observation.

Table 1: Follow-up Issues

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
<i>EHS Management</i>						
M7.1	Integrated Management System (IMS) – compliance with IFC General Environmental Guidelines	Dec-10	Closed	The IMS contains commitments to follow IFC requirements, but some of the details are missing, specifically with respect to some environmental standards. The standards for blast vibrations, air overpressure, or noise are not stated in any of the environmental Plans, Procedures, or SOPs, but are referenced only from the old Environmental Management Plan, the contents of which are not reflected in the IMS. Water emissions standards are provided in a document entitled Ahafo Fluid Management Plan (AFMP), but this is a draft, not a final, document. In particular, the AFMP indicates that “Bacterial analysis and BOD & COD will not apply to NGGL discharges due to background levels”, which is contrary to IFC requirements. The AFMP standards differ from the NGGL standards reported by Knight-Piésold in their TSF inspection reports (e.g., total cyanide; cobalt).	Closed	NGGL has adopted the current Performance Standards and associated Guidelines. The old General Environmental Guidelines are no longer applicable. This becomes an issue for action as discussed in Table 1.2.
	Integrated Management System (IMS) – compliance with IFC OP 4.04 - Natural Habitats	Dec-10	Jan-12	Biodiversity issues are not addressed in the NGGL IMS, except in terms of the Environmental Standard - Closure and Reclamation Planning. Similarly, the Implementation Plan for Noxious Weeds is not part of the IMS and the Vegetation Monitoring for Newmont Ghana SOP does not even mention monitoring the presence of invasive species should they be encountered.	Closed	NGGL has adopted the current Performance Standards and associated Guidelines. The old General Environmental Guidelines are no longer applicable. This becomes an issue for action as discussed in Table 1.2
	Integrated Management System (IMS)	Dec-10		Organization and staffing are currently sufficient to implement the current management system, but an issue that has frequently been flagged as significant to the implementation of the IMS is staff turnover.	Observation	Turnover is still a significant issue and staffing in many key positions has changed over the past year. Organization and staffing appear to be barely sufficient to implement the current management system, and some positions still need to be filled. As the IMS requires revision, this could be an additional drain on the time of the EHS staff.

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
	Integrated Management System (IMS)	Dec-10		Incorporating the Subika Underground Project into the IMS will require some substantial revisions.	Observation	Substantial changes are required, but, according to Project information, the management plans for the Subika Underground project are being prepared under the auspices of the Performance Standards and associated EHS General and Mining Guidelines. Assuming that is the case, the actual integration should not be difficult, even though there is a lot to incorporate. Based on our initial visit to the Subika Underground project, the procedures being followed appear to be consistent with the requirements of the 2007 Environmental, Health and Safety Guidelines for Mining.
Pollution Prevention						
	Noise Monitoring SOP; Blast Monitoring SOP	Dec-10	Jan-12	Although blasting parameters have been compliant at the Awonsu pit, the local community of Akorekrom on the north side of the pit has been the source of complaints associated with mining activities and noise. Nighttime ambient noise levels at this community have been higher than the 45 dBA IFC standard.	Closed	A study by Heilig and Partners from Australia has verified, consistent with ECMG recommendations to distinguish mine noise from natural background, that the high nighttime noise levels are not from NGGL activities, although mine noise is audible. In any case, NGGL is actively working to resolve community complaints by stopping mining or rock tipping on the north side of the pit at night.
M7.4	Water Management	Dec-10	Jan-12	An ongoing issue with respect to surface water has been sediment loading from runoff associated as reflected in some high total suspended solid (TSS) readings, especially at ECD 2. NGGL is currently using a device to flocculate the suspended particles in the ECDs, but measured values are still high, especially in ECD 2. ECD 2 was the main source of community complaints from an overflow that took place during heavy rains at the beginning of July 2010.	Closed	Monitoring of TSS from the ECDs in 2011 did not identify any non-compliances with respect to TSS at the ECDs.

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
M7.5	Water Management	Dec-10 (modified Jan-12)		Sulfate and nitrate are appearing to represent a problem that needs to be investigated and managed. At the beginning of 2010, sulfate and nitrate started to appear in anomalous concentrations in monitoring wells at the western edge of the TSF and in surface water also flowing along the western edge of the TSF a short distance upstream of ECD4. In 2011 the concentrations increased and in 2011 both nitrate and sulfate were encountered in concentrations exceeding Ghana EPA general environmental quality standards within the Subri River downstream of ECD4.	I	NGGL should evaluate the source of sulfate and decline in pH observed in the TSF monitoring wells and determine if any actions need to be taken, such as adding additional monitoring points and/or establishing control measures. In particular, determine the source of nitrate and sulfate, as it appears to possibly be the source of surface water contamination that is affecting the Subri River with nitrate and sulfate. The non-compliance is assigned only a Level I, because the presence of sulfate and nitrate is not a serious health threat at the measured concentrations.
M7.5	Water Management	Dec-10 (modified Jan-12)		At the time of the D'Appolonia field visit in December 2010, dewatering of the pits into the WSF had reached the point where the actual water quality of this large body of water was starting to be impacted (ammonia). This situation reached the point that this dewatering may have contributed to a fish kill, but NGGL has stopped discharging mine water into the WSF.	Observation	This issue is an observation as discharge from the WSF is under Government supervision and the request for lowering the water level is a Government request. Nevertheless, NGGL needs to better manage this ecosystem and undertake the discharge of reservoir water in a manner that does not cause adverse downstream impact.
M8.2	Water Management	Jan-12		The TSF is showing signs of minor chemical leakage (cyanide and cobalt). Both cyanide and cobalt have been detected in the underdrain beneath the liner. Cobalt is also being detected from one monitoring well at the northern end of the TSF near the spillway to the WSF and this might indicate environmental leakage. Cyanide has not been detected from the TSF monitoring wells.	Observation	NGGL may also wish to consider increasing the number of monitoring wells and the frequency of monitoring to better characterize the nature of seepage from the TSF. Should this situation worsen actions such as pump-back wells could be considered.
Biodiversity and Ecological Management						
	Biodiversity Management Plan	Dec-10		NGGL continues to progress in its biodiversity management activities, but the partnership with Conservation International (CI) has significantly changed with CI's modifying their organization such that the CI office in Accra has closed and their activities are currently administered from Liberia. Key CI staff members in Accra now work with a different organization, Conservation Alliance (CA), an NGO with their main offices in Accra and NGGL plans to continue biodiversity management with CA.	Observation	This observation from December 2010 is still essentially valid. NGGL will need to be very transparent in their work with CA and may want to consider seeking additional support from an international conservation organization depending on CA's performance. It is understood that NGGL plans to bring in a senior external advisor to assist implementing the biodiversity management program.

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
M8.3	Biodiversity Management Plan	Jan-12		The inspection of the VRA transmission line corridor was undertaken in June 2011 by a joint NGGL/VRA team. Although no major issues were identified, the Inspection Report is inadequate to be able to effectively assess any biodiversity impacts along the transmission line route. As this is a biannual survey where the main goal is to identify potential impacts to a nearby designated Forest Reserve (a Globally Significant Biodiversity Area), the scope and reporting requirements of these surveys needs to significantly improve.	I	Currently the level of observations from the Inspection Reports is inadequate to verify that no encroachment to the Tano-Offin forest has taken place. A recommended improvement would be that observations be recorded systematically and logged into a GIS layer to allow any changes in frequency or density of human encroachment (or use of the forest) to be more easily recorded, presented, and analyzed over time. If the Inspection recommendation on twice-yearly weeding be taken up by NGGL, ensure this ties in with the NGGL Ahafo weeds control management plan and the NGGL Ahafo invasive species management plan. This should include data recording and appropriate management actions.
	Environmental Standard - Closure and Reclamation Planning	Dec-10		NGGL was able to demonstrate successful reinstatement at the toe of the Apensu stockpile west of the Apensu pit covering approximately 3.5 Ha, but this area is only about 10% of the area projected to be reclaimed by this time from the Reclamation Security Agreement between NGGL and the Ghana EPA made two years ago. It is emphasized that NGGL is working to achieve reclamation and that the lack of progress does not constitute any environmental emergency, but there could be financial consequences to NGGL if performance is not improved.	Observation	The observation from December 2010 is still essentially valid. During 2011 reclamation did not progress. Current plans are to bring in third-party equipment such that the reclamation team is not dependent on using equipment that needs to be dedicated to mining and catch up with the reclamation schedule in 2012.
Waste and Wastewater Management						
	Waste Management Plan			NGGL achieved a major milestone in terms of the goals of the Waste Management Plan with the inauguration immediately before the ECMG site visit of a high temperature incinerator designed for the combustion of oily materials (a portable SMART ASH incinerator manufactured by Elastec/American Marine in the U.S.) that has eliminated the need to send this waste to Kumasi.	Closed	The note from the December 2010 report was that care will need to be taken to make sure that there are no setbacks to current practice due to equipment problems, in particular for the incinerator as it is a very small unit. The issue is closed as an observation as this concern unfortunately proved true.
M8.4	(NEM-ENV-S.046, sections 3.2.11 and 3.2.13) IFC standards (General EHS Guidelines, section 1.6)	Jan-12		The SMART ASH incinerator unit was plagued by repeated technical problems and since August 2011 the Project resumed the practice to dispose of oily rags, about 6 to 7 1m ³ containers per month, at the Kumasi Landfill	I	The Project should immediately discontinue the practice of sending oily rags to the Kumasi Municipal Landfill, store this waste stream on-site until the new incinerator unit is commissioned.

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
M7.7	Management System Procedure for Contractor Selection and Management	Dec-10	Jan-12	Newly installed filter crushers at the IFAC, MANTRC and WBHO workshops significantly reduce the volume of waste filters, allowing for the recovery of the waste oil that is sent to an accredited contractor for use as a fuel at a Tema refinery. The waste scrap metal from this operation is being recycled by the same contractor who is also accepting waste wet cell batteries for the recovery of lead. Although the procedures being followed by this contractor appear to be acceptable based on what has been described to NGGL, their recycling facility has not been audited by NGGL for the recycling of the crushed filters and wet cell batteries.	Closed	On January 28th 2011, the Project conducted an audit of the Presank facility, located in Kumasi, the company used to recycle used wet batteries, crushed filters, and used hydraulic hoses. Overall, Presank facility was found suitable for the handling of these waste streams with a few H&S corrective actions needed that NGGL could help them with.
	Management System Procedure for Contractor Selection and Management	Jan-12		NGGL has identified companies audited to be suitable for recycling some specific waste streams from the Ahafo South Project as long as the companies undertake some corrective actions, especially with respect to their health and safety procedures. The issue is that NGGL has not conducted follow-up audits to verify that these companies have followed up with the required corrective actions.	Observation	Verify that these recycling companies are working according to expectations.
M8.5	NEM-ENV-S.046, sections 3.3.13 and 3.3.16) IFC standards (EHS – Waste Management Facilities, sections 1.1.3 and 1.2)	Jan-12		A problem that was highlighted in several previous Audits is the lack of regular coverage of the inert pit on-site pit. Prompt coverage of the waste, in particular since it contains a good amount of food waste, should be performed quickly so to prevent pathogens and vectors to be spread by the bird population.	I	The Project should consider providing the on-site inert landfill facility with a bobcat, or similar small earthmover, for immediate coverage and relying on mining equipment for trench overall maintenance only (e.g. spreading and compaction of waste layers)
	Waste Management Plan	Jan-12		Sludge production from the STPs is reported to fill about 2-3 small trucks every 3 days while the composting process takes an average of 90 days to mature.	Observation	It is possible that sludge production may outpace composting and therefore requiring temporary storage room before it is used in the composting process.

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
Health and Safety						
	Light Vehicle Operation and Control Policy and related Standards involving community safety	Dec-10	Jan-12	Outside-the-fence safety has previously been identified as a significant issue by the ECMG. The main safety issue with Ahafo South, as is also the case with most major development projects, is traffic safety. Ahafo South has also been associated with drowning incidents, which occurred (two in 2005; one in 2009; and one in 2010). It is recognized that only one fatal traffic accident was actually associated with a Newmont vehicle and that Newmont vehicles have GPS controls to identify speeding and discipline drivers. The drowning incidents took place in spite of warnings, relevant safety signs, and community awareness-raising programs.	Closed	Although there was a traffic fatality in 2011, the HSLP Department did demonstrate that traffic safety is a special focus. Community awareness programs and signage at the ECDs appears to be working to prevent drownings, as no incidents were recorded in 2011.
	Technical Standard for Medical Programs and Malaria Management Plan	Dec-10	Jan-12	From the standpoint of health, special recognition has been given to NGGL by the Global Business Coalition on HIV/AIDs, Tuberculosis and Malaria for their workplace program for HIV/AIDs and malaria, which was awarded best in category for initiatives in disease prevention and control.	Closed	The program is ongoing.
	Medical Program	Jan-12		The Project has launched a new Employee Wellbeing Program for which a baseline was completed in June 2011. The program involves voluntary testing of all workers, and their families, for HIV, TB, malaria, cancer, diabetes, hypertension, and hepatitis B.	Observation	The Ahafo workforce is now well receptive of new initiatives; however, the Employee Wellbeing Program should get the full support of all Division Managers for the program to succeed
WSF/TSF Management						
	Tailing Management Standard – IFC OP 4.37	Dec-10	Jan-12	The last remaining issue for IFC compliance still pending at the time of the 6th ECMG site visit in December 2009 was an independent review of the investigation, design, and construction of the WSF/TSF. This issue was addressed with by means of a third-party independent audit in October 2010 by Golder Associates. The draft report for this inspection dated November 2010 was reviewed by ECMG and found to be competently undertaken, with the note that we expected to see a review of the design basis for the dams, rather than just a review of how the construction and operation of these impoundments complies with design.	Closed	OP 4.37 is no longer the applicable standard

Mission/ Issue No.	NGGL Document/ Commitment	Opening Date	Closing Date	Description	Level	Comments
	Tailing Management Standard – IFC OP 4.37			The independent audit conducted by Golder did encounter some aspects of WSF/TSF management that do require significant improvement.	Closed	This issue is closed if for no other reason than IFC OP 4.37 is no longer the applicable guideline, but over 2011 NGGL did respond to the issues identified in the Golder audit. NGGL has reviewed the impact of sediment loadings on liner integrity and determined that this is not an issue. The volume of supernatant liquid currently being stored in the TSF has also been reduced, although further reduction is still needed. As noted in the above observation, NGGL does have some additional requirements for managing the TSF beyond the requirements of OP 4.37.

1 EHS MANAGEMENT

1.1 PLANS AND PROCEDURES

Project Strategy:

The basic NGGL EHS and social commitments are contained in publicly disclosed documents: ESIA, the Resettlement Action Plan and the Public Consultation and Disclosure Plan. The Environmental and Social Action Plan (ESAP) that is part of the ESIA identifies the Project management programs and specific mitigation measures expected to reduce potentially adverse impacts to acceptable levels. At the time the ESIA was written, the Newmont Mining's Five Star Management System, a global management system developed in-house by Newmont, was the applicable System. This system has been phased out and replaced by an IMS based on certification under ISO 14001/OHSAS 18001 since June 2010.

The goals of Newmont Ahafo's IMS are as follows:

- ensuring that Ahafo management, employees, contractors and stakeholders are aware of safety, health, environmental and social issues so that all parties can effectively carry out their responsibilities in managing these issues with a goal of reducing the impact of our activities;
- facilitating the formation of the cross-functional and multidisciplinary teams necessary to meet safety, health, environmental and social challenges successfully, to ensure they are effectively communicating and monitoring their performance;
- improving risk management by identifying and addressing as early as possible potential safety, health, environmental and social liabilities identified from risk assessments, incident and accident reports, inspections, audits and observations; and
- managing change, so that safety, health, environmental and social issues associated with routine or non-routine changes in operational processes, significant process volume, facility design, and equipment modifications are identified and dealt with early enough in the planning process to avoid delays and other impediments to business goals.

An important part of NGGL's IMS is also to be certified under the International Cyanide Management Code (ICMC), a voluntary industry program for companies involved in the manufacture and transport of cyanide and the production of gold. The ICMC covers the lifecycle of cyanide management and defines a series of principles and objectives that cover production of cyanide, transportation, handling and storage, operations, decommissioning of facilities, worker safety, emergency response, training and communications with the public.

A change in project strategy from the last ECMG field visit in December 2010 is NGGL's commitment to upgrade their IMS to be compliant with new IFC requirements by incorporating the 2012 Performance Standards that became operational on January 1, 2012 and the 2007 EHS General and Mining Guidelines.

Observations:

The development of the Newmont Ahafo Environmental and Social Management System (ESMS) was completed in June 2010 by means of certifications from the International Organization for Standardization (ISO) 14001:2004 and Occupational Health and Safety Assessment Series (OHSAS) 18001:2007. The terminology of the certifications refers to the ESMS as an Integrated Management System (IMS) whereby IMS Procedures are framed in an overarching document entitled "*Integrated Management System (IMS) Manual Newmont Ahafo Operations*". This Manual defines the principal elements of the IMS in terms of Health, Safety, Loss Prevention, Environmental and Social Responsibility (HSLP and ESR), and a Statement of Commitment (policy) organized as follows:

Planning

- HSLP & ESR Risks;
- Legal and other requirements; and
- Objectives, targets, and programs.

Implementation and Operation

- Resources, roles, responsibilities and authority;
- Competence, training and awareness;
- Communication;

- Documentation and Document control;
- Operational control; and
- Emergency preparedness and response.

Checking

- Monitoring and measurement;
- Evaluation of compliance;
- Nonconformity, corrective action and preventive action;
- Control of records; and
- Internal audit.

Management Review

The supporting documents consist of Plans, Procedures and SOPs designed to fulfill the requirements of the basis policies as defined in the Manual and are organized as follows:

Environmental Standards:

- Hydrocarbon Management
 - SOP – Desilting of washing bay Interceptors procedure;
 - SOP – Volatilization pad operations procedure; and
 - SOP – Emergency environmental monitoring
- Chemical Management
 - HSLP Technical Standard – Hazard Material Management;
 - Related Document: Environmental Protection Agency-Ghana, Guidelines for the Safe Transport of Hazardous Chemicals in Ghana
- Cyanide Management;
- Tailings Management;
 - Emergency Preparedness Plan for Water and Tailings Disposal Facilities
- Waste Rock Management;
 - SOP – Pit Sampling For Carbon Sulphur & Mercury Analysis
- Waste Management
 - Waste Management Plan – Ahafo Operation
 - Management Plan – Hazardous Waste Management Procedure
 - Waste Management Handbook
 - SOP – Medical Waste Procedure
 - SOP – Management of Used Household Batteries
 - SOP – Compost Preparation
 - SOP – Compost Monitoring
 - SOP – Non-Hazardous Waste and Trench Procedure
 - SOP – Management and Disposal of Aerosol Cans
 - SOP – Petroleum Hydrocarbon Spill Management Procedure
 - SOP – Environmental Call-in Duty Procedure
 - SOP – Management of Secondary Containments
 - SOP – Composting
 - SOP – Sewage Treatment Plant
 - SOP – Operation and Inspection of leach field at MKV
 - STP – Incineration of Oily Rags
- Water Management

- SOP – Surface Water Sampling (Grab)
- SOP – Pump Hoist Rig
- SOP – ECDs Operations Procedure
- SOP – Turbidity – Calibration, Measurement And Maintenance
- SOP – Determination Of Instrument Detection Limit
- SOP – E-Coli Analysis
- SOP – Procedure For Laboratory Logbooks Management
- SOP – Calibration, Measurement and Maintenance Of Conductivity Meter
- SOP – COD Analysis Procedure
- SOP – Procedure For Testing For Free Chlorine
- SOP – Data Verification Procedure
- SOP – Enterococci coliforms Analysis Procedure
- SOP – Ph Calibration, Measurement And Maintenance
- SOP – Procedure For Retesting Of Samples
- SOP – Total Coliforms Analysis Procedure
- SOP – Total Suspended Solids Measurement By Meter/Gravimetric Means
- SOP – Emergency Environmental Monitoring
- SOP – Groundwater Sampling
- Management Plan – Water Storage Facility
- Management Plan – Ahafo Fluid Management Plan
- Air Quality Management
 - SOP – Blast Monitoring
 - SOP – Meteorological Monitoring Procedure
 - SOP – Noise Monitoring
 - SOP – PM10 / TSP Monitoring
- Closure and Reclamation Planning
 - SOP – Topsoil Management
 - SOP – Weeding Requisition
 - SOP – Operate Brushcutter Machine
 - SOP – Weeding
 - SOP – Energy Bridge Installation
 - SOP – Hand Broadcast of Seeds
 - SOP – Fish Transfer
 - SOP – Vegetation Monitoring for Newmont Ghana
 - SOP – Final Reclamation Cost Centre Management
 - Reclamation and Closure Plan Update
 - Management Plan – Cultural Resource Management
 - SOP – Cultural Resource Management

Health & Safety Standards:

- Occupational Health & Hygiene
 - SOP – Hearing Conservation Plan/Procedure
 - SOP – Dust Sampling Procedure
 - SOP – Sampling of Mercury Vapor
 - SOP – Mercury Biological Monitoring Procedure

- SOP – Biological Monitoring of Lead
- SOP – Respiratory Protection
- SOP – Food Handlers and Kitchen Hygiene Standard
- SOP – Hood Face Velocity
- Surface Ground Control
- Surface Fire Protection
- Energy Isolation
 - SOP – Lockout Tag-out
- Mobile Equipment
 - Site Traffic Rules and Vehicle Operating Guideline
- Electrical Safety
- Work Permit Systems
 - SOP – Confined Space
 - SOP – Hot Work Procedure
 - SOP – Excavation Procedure
 - SOP – Overhead Power Line Vicinity Procedure
 - SOP – Tree Felling Procedure
- Machine Guarding and Conveyors
- Explosives
- Light Vehicles and Road Safety
 - Light Vehicle Operation and Control Policy
- Working at Heights
 - Technical Standard – Scaffolding and Scaffold Tagging
- Pressurized Systems
- Cranes and Lifting Equipment
- Medical Programs
 - Management Plan – Malaria Management Plan
 - SOP – Thermal Fogging
 - SOP – Indoor Residual Spraying
 - SOP – Mosquito Larviciding
 - SOP – Drug and Alcohol Policy and Procedure
 - SOP – Medical Surveillance of Pesticide Workers
 - SOP – Malaria case Management
 - SOP – Malaria Diagnosis
- Hazardous Materials Management

Social Standards:

- Social Baseline Studies
- Social Impact Assessment
- Stakeholder Mapping
- External Stakeholder Engagement
- Expectation and Commitment Management
- Complaint/Grievance Management and Resolution
- Monitoring and Evaluation
- Local Community Investment

- Security and Human Rights
- Land Access, Acquisition and Resettlement
- Management of Cultural and Heritage Sites

There are some management plans that are currently outside of the IMS, related to biodiversity and ecological management, including Biodiversity Management Plan (BMP), Biodiversity Implementation Plan (BIP), Biodiversity Impact Monitoring Plan, and a Plan for Noxious Weed Management.

The contents of these plans (excluding social) are reviewed in the context of the Performance Standards and associated guidelines to identify if there are any compliance gaps, although within the category of “Social”, cultural resource management has also been included within this review. As presented to D’Appolonia, the subject of cultural resource management is actually covered under the topic of “*Closure and Reclamation Planning*” and the plans and procedures are assigned environmental headers. For purpose of the above outline, the cultural resource management plans and procedures are assumed to be under the category of “*Management of Cultural and Heritage Site*”. This gap analysis excludes Performance Standards 2 (Labor and Working Conditions, except for occupational health and safety), 4 (Community Health, Safety, and Security, except for Emergency Action Planning), 5 (Land Acquisition and Involuntary Resettlement), and 7 (Indigenous Peoples) as these are outside of the scope of an EHS review.

Compliance categorizations are as follows:

- **Action required:** Compliance gaps have been identified with respect to the Performance Standards and Guidelines.
- **No Action required:** Compliance gaps have not been identified with respect to the Performance Standards and Guidelines.

It is emphasized that although changes to the IMS to comply with the Performance Standards are presented in terms of “**no action required**” or “**action required**”, the Performance Standards are associated with guidelines that represent current good practice, but are not absolute requirements. An “**action required**” may be discretionary if it is presented within the context of a guideline.

Table 1.1: Gap Analysis – Integration of IMS with Performance Standards and Associated Guidelines

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
PS1: Social and Environmental Assessment and Management System			
1.1	<p><u>Social and Environmental Management System</u></p> <p>The client, in coordination with other responsible government agencies and third parties as appropriate will conduct a process of environmental and social assessment, and establish and maintain an ESMS appropriate to the nature and scale of the project and commensurate with the level of its environmental and social risks and impacts. The ESMS will incorporate the following elements: (i) policy; (ii) identification of risks and impacts; (iii) management programs; (iv) organizational capacity and competency; (v) emergency preparedness and response; (vi) stakeholder engagement; and (vii) monitoring and review. (Paragraph 5).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations</p>	<p>Action required</p> <p>Although the IMS is a generally complete ESMS when taken together with the ESIA and ESAP, there are some structural changes that would serve to comply with PS1. In particular, the biodiversity and ecological management aspects of the Ahafo Mine have independent management requirements from the IMS. These topics should also be part of the IMS. PS6 has a requirement for having standards for Procurement and Supply, which is also not provided in the IMS and is a typical topic within most ESMS documentation. Also, there are some H&S topics for which there are no management plans (see Item 2.1).</p> <p>Additional structural changes are also needed for the overarching Newmont Standards (Environmental, Social, or H&S) to fit them with the site-specific Ahafo Plans and Procedures. As noted in Item Number 8.1, the Social Responsibility Standard - <i>Management of Cultural and Heritage Sites</i> does not make any reference to the Ahafo South Cultural Resource Management Plan that is oddly located as a supporting document to “<i>Closure and Reclamation Planning</i>” along with an SOP for Cultural Resource Management. Another example is the Environmental Standard – Water Management, that refers to an <i>Erosion and Sediment Control Plan</i> that does not exist.</p> <p>Recommendation: The IMS manual does not refer to IFC compliance. As an overarching document, it could be improved with reference to the Performance Standards and how the overall management system incorporates the requirements of these standards.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.2	<p><u>Policy</u></p> <p>The client will establish an overarching policy defining the environmental and social objectives and principles that guide the project to achieve sound environmental and social performance. The policy provides a framework for the environmental and social assessment and management process, and specifies that the project (or business activities, as appropriate) will comply with the applicable laws and regulations of the jurisdictions in which it is being undertaken, including those laws implementing host country obligations under international law. The policy should be consistent with the principles of the Performance Standards. Under some circumstances, clients may also subscribe to other internationally recognized standards, certification schemes, or codes of practice and these too should be included in the policy. The policy will indicate who, within the client’s organization, will ensure conformance with the policy and be responsible for its execution (with reference to an appropriate responsible government agency or third party, as necessary). The client will communicate the policy to all levels of its organization. (Paragraph 6).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations</p>	<p>No action required</p> <p>Overarching policy is clearly defined in a manner consistent with the Performance Standards in the HSLP and ESR Statement of Commitment</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.3	<p><u>Identification of Risks and Impacts</u></p> <p>The client will establish and maintain a process for identifying the environmental and social risks and impacts of the project (see paragraph 18 for competency requirements). The type, scale, and location of the project guide the scope and level of effort devoted to the risks and impacts identification process. The scope of the risks and impacts identification process will be consistent with good international industry practice, and will determine the appropriate and relevant methods and assessment tools. The process may comprise a full-scale environmental and social impact assessment, a limited or focused environmental and social assessment, or straightforward application of environmental siting, pollution standards, design criteria, or construction standards. When the project involves existing assets, environmental and/or social audits or risk/hazard assessments can be appropriate and sufficient to identify risks and impacts. If assets to be developed, acquired or financed have yet to be defined, the establishment of an environmental and social due diligence process will identify risks and impacts at a point in the future when the physical elements, assets, and facilities are reasonably understood. The risks and impacts identification process will be based on recent environmental and social baseline data at an appropriate level of detail. The process will consider all relevant environmental and social risks and impacts of the project, including the issues identified in Performance Standards 2 through 8, and those who are likely to be affected by such risks and impacts. The risks and impacts identification process will consider the emissions of greenhouse gases, the relevant risks associated with a changing climate and the adaptation opportunities, and potential trans-boundary effects, such as pollution of air, or use or pollution of international waterways (Paragraph 7).</p>	<p>N/A as the assessment and management assessment phase of the Ahafo Mine was undertaken prior to the IMS as contained in the ESIA and ESAP.</p>	<p>No action required</p> <p>There can be no motivation to revisit the ESIA or ESAP, even if aspects of their preparation would not clearly conform to the requirements of the Performance Standards (e.g., greenhouse gas emissions). Such details can be dealt with modifications to the procedures defined in the IMS Plans, as appropriate.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.4	<p><u>Identification of Risks and Impacts</u></p> <p>Where the project involves specifically identified physical elements, aspects, and facilities that are likely to generate impacts, environmental and social risks and impacts will be identified in the context of the project’s area of influence. This area of influence encompasses, as appropriate:</p> <ul style="list-style-type: none"> • The area likely to be affected by: (i) the project and the client’s activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities’ livelihoods are dependent. • Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable. • Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted (Paragraph 8). 	N/A as the assessment and management assessment phase of the Ahafo Mine was undertaken prior to the IMS as contained in the ESIA and ESAP.	<p>No action required</p> <p>Same as above. There can be no motivation to revisit the ESIA or ESAP, but in any case NGGL did address the area of influence in the ESIA; one specific associated facility was identified (the VRA Transmission Line) and has been stewarded consistent with Performance Standard requirements; and the ESIA addresses cumulative impacts.</p>
1.5	<p><u>Identification of Risks and Impacts</u></p> <p>In the event of risks and impacts in the project’s area of influence resulting from a third party’s actions, the client will address those risks and impacts in a manner commensurate with the client’s control and influence over the third parties, and with due regard to conflict of interest. (Paragraph 9).</p>	Under Social Management System	Not reviewed
1.6	<p><u>Identification of Risks and Impacts</u></p> <p>Where the client can reasonably exercise control, the risks and impacts identification process will also consider those risks and impacts associated with primary supply chains, as defined in Performance Standard 2 (paragraphs 27–29) and Performance Standard 6 (paragraph 30) (Paragraph 10).</p>	Under Social Management System	Not reviewed

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.7	<p><u>Identification of Risks and Impacts</u></p> <p>Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate environmental and social impacts, the identification of risks and impacts will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence. These include master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant. The risks and impacts identification will take account of the outcome of the engagement process with Affected Communities as appropriate (Paragraph 11).</p>	<p>N/A as the assessment and management assessment phase of the Ahafo Mine was undertaken prior to the IMS as contained in the ESIA and ESAP.</p>	<p>No action required</p> <p>There can be no motivation to revisit the ESIA or ESAP, but, in any case, these documents did account for other studies.</p>
1.8	<p><u>Identification of Risks and Impacts</u></p> <p>Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, and as part of the process of identifying risks and impacts, the client will identify individuals and groups that may be directly and differentially or disproportionately affected by the project because of their disadvantaged or vulnerable status.¹⁸ Where individuals or groups are identified as disadvantaged or vulnerable, the client will propose and implement differentiated measures so that adverse impacts do not fall disproportionately on them and they are not disadvantaged in sharing development benefits and opportunities. (Paragraph 12).</p>	<p>Under Social Management System</p>	<p>Not reviewed, but covered as part of the ESIA and ESAP</p>
1.9	<p><u>Management Programs</u></p> <p>Consistent with the client’s policy and the objectives and principles described therein, the client will establish management programs that, in sum, will describe mitigation and performance improvement measures and actions that address the identified environmental and social risks and impacts of the project. (Paragraph 13).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations with associated Management Plans and supporting documents that comprise the IMS</p>	<p>No action required</p> <p>Although there are some details that need to be updated, the IMS is a complete ESMS.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.10	<p><u>Management Programs</u></p> <p>Depending on the nature and scale of the project, these programs may consist of some documented combination of operational procedures, practices, plans, and related supporting documents (including legal agreements) that are managed in a systematic way. The programs may apply broadly across the client's organization, including contractors and primary suppliers over which the organization has control or influence, or to specific sites, facilities, or activities. The mitigation hierarchy to address identified risks and impacts will favor the avoidance of impacts over minimization, and, where residual impacts remain, compensation/offset, wherever technically and financially feasible. (Paragraph 14).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations with associated Management Plans and supporting documents that comprise the IMS</p>	<p>No action required</p> <p>Recommendation: The IMS manual as an overarching document could be improved with clear reference to follow the IFC mitigation hierarchy – in particular the concept of “footprint minimization.”</p>
1.11	<p><u>Management Programs</u></p> <p>Where the identified risks and impacts cannot be avoided, the client will identify mitigation and performance measures and establish corresponding actions to ensure the project will operate in compliance with applicable laws and regulations, and meet the requirements of Performance Standards 1 through 8. The level of detail and complexity of this collective management program and the priority of the identified measures and actions will be commensurate with the project's risks and impacts, and will take account of the outcome of the engagement process with Affected Communities as appropriate (Paragraph 15).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations with associated Management Plans and supporting documents that comprise the IMS</p>	<p>No action required</p> <p>Although there are some details that need to be updated, the IMS is a complete ESMS.</p>
1.12	<p><u>Management Programs</u></p> <p>The management programs will establish environmental and social Action Plans, which will define desired outcomes and actions to address the issues raised in the risks and impacts identification process, as measurable events to the extent possible, with elements such as performance indicators, targets, or acceptance criteria that can be tracked over defined time periods, and with estimates of the resources and responsibilities for implementation. As appropriate, the management program will recognize and incorporate the role of relevant actions and events controlled by third parties to address identified risks and impacts. Recognizing the dynamic nature of the project, the management program will be responsive to changes in circumstances, unforeseen events, and the results of monitoring and review (Paragraph 16).</p>	<p>ESAP</p>	<p>No action required</p> <p>There can be no motivation to revisit the ESAP but, in any case, the ESAP was prepared in a manner consistent with PS1.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.13	<p><u>Organizational Capacity and Competency</u></p> <p>The client, in collaboration with appropriate and relevant third parties, will establish, maintain, and strengthen as necessary an organizational structure that defines roles, responsibilities, and authority to implement the ESMS. Specific personnel, including management representative(s), with clear lines of responsibility and authority should be designated. Key environmental and social responsibilities should be well defined and communicated to the relevant personnel and to the rest of the client’s organization. Sufficient management sponsorship and human and financial resources will be provided on an ongoing basis to achieve effective and continuous environmental and social performance (Paragraph 17).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations</p>	<p>No action required</p> <p>The EHS organization at the Ahafo Mine is fully mature.</p>
1.14	<p><u>Organizational Capacity and Competency</u></p> <p>Personnel within the client’s organization with direct responsibility for the project’s environmental and social performance will have the knowledge, skills, and experience necessary to perform their work, including current knowledge of the host country’s regulatory requirements and the applicable requirements of Performance Standards 1 through 8. Personnel will also possess the knowledge, skills, and experience to implement the specific measures and actions required under the ESMS and the methods required to perform the actions in a competent and efficient manner (Paragraph 18).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations</p>	<p>No action required</p> <p>The EHS organization at the Ahafo Mine is fully mature.</p> <p>Recommendation: Initiate a training program whereby EHS (and social) staff is fully apprised of the requirements of the Performance Standards.</p>
1.15	<p><u>Organizational Capacity and Competency</u></p> <p>The process of identification of risks and impacts will consist of an adequate, accurate, and objective evaluation and presentation, prepared by competent professionals. For projects posing potentially significant adverse impacts or where technically complex issues are involved, clients may be required to involve external experts to assist in the risks and impacts identification process. (Paragraph 19).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations</p>	<p>No action required</p> <p>NGGL staff at the Ahafo Mine is professionally competent and external consultants are used where specialty expertise is required.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.16	<p><u>Emergency Preparedness and Response</u></p> <p>Where the project involves specifically identified physical elements, aspects and facilities that are likely to generate impacts, the ESMS will establish and maintain an emergency preparedness and response system so that the client, in collaboration with appropriate and relevant third parties, will be prepared to respond to accidental and emergency situations associated with the project in a manner appropriate to prevent and mitigate any harm to people and/or the environment. This preparation will include the identification of areas where accidents and emergency situations may occur, communities and individuals that may be impacted, response procedures, provision of equipment and resources, designation of responsibilities, communication, including that with potentially Affected Communities and periodic training to ensure effective response. The emergency preparedness and response activities will be periodically reviewed and revised, as necessary, to reflect changing conditions. (Paragraph 20).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations and associated Emergency Preparedness and Response Management System Procedure (in turn associated with a Site Emergency Response Plan)</p> <p>Emergency Preparedness Plan for Water and Tailings Disposal Facilities</p>	<p>Action required</p> <p>The guideline for emergency response in the case of a mine adopted by the IFC (refer to EHS Guidelines for Mining) is Awareness and Preparedness for Emergencies at Local Level (APELL) published by the UNEP. APELL promotes a more integrated approach to emergency response than currently undertaken by NGGL. The main emergency scenarios for the Ahafo Mine include failure of the WSF/TSF; pipeline failure, e.g. leach solutions; transport of chemicals to and from site; spills of chemicals at site, e.g., fuel tank rupture, reagent store damage; and blasting and explosives accidents. With the APELL approach all of the emergency response documents would be combined into a single document that is developed in association with local communities, governments, emergency responders and others. Currently, NGGL has an Emergency Response Plan (ERP) dedicated primarily to ensuring worker safety and an Emergency Preparedness Plan (EPP) that is not yet fully rolled out into the local communities.</p> <p>Recommendation: Conduct a social gap analysis of the application of the APELL approach to emergency response.</p>
1.17	<p><u>Emergency Preparedness and Response</u></p> <p>Where applicable, the client will also assist and collaborate with the potentially Affected Communities (see Performance Standard 4) and the local government agencies in their preparations to respond effectively to emergency situations, especially when their participation and collaboration are necessary to ensure effective response. If local government agencies have little or no capacity to respond effectively, the client will play an active role in preparing for and responding to emergencies associated with the project. The client will document its emergency preparedness and response activities, resources, and responsibilities, and will provide appropriate information to potentially Affected Community and relevant government agencies. (Paragraph 21).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations and associated Emergency Preparedness and Response Management System Procedure (in turn associated with a Site Emergency Response Plan)</p> <p>Emergency Preparedness Plan for Water and Tailings Disposal Facilities</p>	<p>Action required</p> <p>Same as above</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.18	<p><u>Monitoring and Review</u></p> <p>The client will establish procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements. Where the government or other third party has responsibility for managing specific risks and impacts and associated mitigation measures, the client will collaborate in establishing and monitoring such mitigation measures. Where appropriate, clients will consider involving representatives from Affected Communities to participate in monitoring activities. The client’s monitoring program should be overseen by the appropriate level in the organization. For projects with significant impacts, the client will retain external experts to verify its monitoring information. The extent of monitoring should be commensurate with the project’s environmental and social risks and impacts and with compliance requirements (Paragraph 22).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations</p>	<p>No action required</p> <p>Procedures to monitor EHS performance are fully integrated into the Ahafo IMS.</p>
1.19	<p><u>Monitoring and Review</u></p> <p>In addition to recording information to track performance and establishing relevant operational controls, the client should use dynamic mechanisms, such as internal inspections and audits, where relevant, to verify compliance and progress toward the desired outcomes. Monitoring will normally include recording information to track performance and comparing this against the previously established benchmarks or requirements in the management program. Monitoring should be adjusted according to performance experience and actions requested by relevant regulatory authorities. The client will document monitoring results and identify and reflect the necessary corrective and preventive actions in the amended management program and plans. The client, in collaboration with appropriate and relevant third parties, will implement these corrective and preventive actions, and follow up on these actions in upcoming monitoring cycles to ensure their effectiveness. (Paragraph 23).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations and supporting Management and System Procedure - Corrective and Preventative Action</p>	<p>No action required</p> <p>NGGL also uses dynamic mechanisms to monitor and control EHS performance and has appropriate reporting and feedback mechanisms consistent with their CAPA (Corrective and Preventative Action) system</p> <p>Recommendation: The CAPA descriptions for non-compliances and non-conformances could benefit from assigning tiers whereby their severity can be readily appreciated.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
1.20	<p><u>Monitoring and Review</u></p> <p>Senior management in the client organization will receive periodic performance reviews of the effectiveness of the ESMS, based on systematic data collection and analysis. The scope and frequency of such reporting will depend upon the nature and scope of the activities identified and undertaken in accordance with the client's ESMS and other applicable project requirements. Based on results within these performance reviews, senior management will take the necessary and appropriate steps to ensure the intent of the client's policy is met, that procedures, practices, and plans are being implemented, and are seen to be effective (Paragraph 24).²</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations and supporting Policy – Integrated Management System (IMS) Governance</p>	<p>No action required</p> <p>NGGL has a specific policy whereby senior management is responsible for direct involvement in the implementation of the IMS.</p>

² NOTE: The remaining portion of Performance Standard 1 covers Stakeholder Engagement, External Communications and Grievance Mechanisms and Ongoing Reporting to Affected Communities. As these topics relate to the social portion of the IMS they are not reviewed.

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
Performance Standard 2: Labor and Working Conditions			
2.1	<p><u>Occupational Health and Safety</u></p> <p>The client will provide a safe and healthy work environment, taking into account inherent risks in its particular sector and specific classes of hazards in the client's work areas, including physical, chemical, biological, and radiological hazards, and specific threats to women. The client will take steps to prevent accidents, injury, and disease arising from, associated with, or occurring in the course of work by minimizing, as far as reasonably practicable, the causes of hazards. In a manner consistent with good international industry practice, as reflected in various internationally recognized sources including the World Bank Group Environmental, Health and Safety Guidelines, the client will address areas that include the (i) identification of potential hazards to workers, particularly those that may be life-threatening; (ii) provision of preventive and protective measures, including modification, substitution, or elimination of hazardous conditions or substances; (iii) training of workers; (iv) documentation and reporting of occupational accidents, diseases, and incidents; and (v) emergency prevention, preparedness, and response arrangements. For additional information related to emergency preparedness and response refer to Performance Standard 1 (Paragraph 23).</p>	<p>All of the plans and procedures within the NGGL HSLP Department</p>	<p>Action required</p> <p>The IFC EHS General Guidelines cover occupational health and safety under several headings:</p> <ul style="list-style-type: none"> • General Facility Design and Operation • Communication and Training • Physical Hazards • Chemical Hazards • Biological Hazards • Radiological Hazards • Personal Protective Equipment (PPE) • Special Hazard Environments • Monitoring • Accidents and Diseases monitoring <p>The NGGL HSLP program generally covers all of the OHS requirements of the EHS General Guidelines, although some gaps can be identified:</p> <ul style="list-style-type: none"> • Procedure to prevent injury on the basis of ergonomics, repetitive motion, and manual handling; • Procedure to protect lone or isolated workers. <p>Although there are no specific SOPs for general facility design, previous IESC audits have determined that NGGL facilities are consistent with IFC requirements. Communication programs and training are also compliant with IFC requirements, as is the monitoring of workplace environmental exposures, accidents and disease.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
Performance Standard 3: Pollution Prevention and Abatement			
3.1	<p><u>General Requirements</u></p> <p>During the project life-cycle, the client will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention principles and techniques that are best suited to avoid, or where avoidance is not possible, minimize adverse impacts on human health and the environment. The principles and techniques applied during the project life-cycle will be tailored to the hazards and risks associated with the nature of the project and consistent with good international industry practice (GIIP), as reflected in various internationally recognized sources, including the World Bank Group Environmental, Health and Safety Guidelines (EHS Guidelines) (Paragraph 4).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations with associated Management Plans and supporting documents that comprise the environmental portion of the IMS</p>	<p>Action required</p> <p>The environmental management plans generally reflect the requirements of the IFC, but there are several details that require attention as identified under specific topics.</p> <p>Recommendation: The environmental management plans do not refer to IFC compliance. All of the specific plans could benefit by incorporating explanations of how they incorporate PS3.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
3.2	<p><u>General Requirements</u></p> <p>The client will refer to the EHS Guidelines or other internationally recognized sources, as appropriate, when evaluating and selecting resource efficiency and pollution prevention and control techniques for the project. The EHS Guidelines contain the performance levels and measures that are normally acceptable and applicable to projects. When host country regulations differ from the levels and measures presented in the EHS Guidelines, clients will be required to achieve whichever is more stringent. If less stringent levels or measures than those provided in the EHS Guidelines are appropriate in view of specific project circumstances, the client will provide full and detailed justification for any proposed alternatives through the environmental and social risks and impacts identification and assessment process. This justification must demonstrate that the choice for any alternate performance levels is consistent with the objectives of this Performance Standard (Paragraph 5).</p>	<p>Ahafo Fluid Management Plan; Blast Monitoring SOP; Noise Monitoring SOP; Air Quality Management Standard, Ambient Air Monitoring SOP</p>	<p>Action required</p> <p>Performance levels for emissions need to be better defined and updated to the EHS Guidelines:</p> <ul style="list-style-type: none"> • Noise: Ghana EPA requirements are all that are mentioned in the Noise Monitoring Plan, although IFC standards are more conservative and have not changed from pre-PS requirements. • Blast vibrations and overpressure: the Blast Monitoring Plan does not state Project standards, although the Project limits as reported to the Ghana EPA are consistent with industry “best practice”. The IFC does not define allowable limits, except to be consistent with industry good practice. • Ambient air: Ambient air monitoring is undertaken consistent with the SOP – PM₁₀ / TSP Monitoring, but the standard is not provided, except that the Air Quality Management Standard indicates that USEPA standards are applicable, without explaining what they are. The standard reported to the Ghana EPA is against the Ghana EPA guidelines: Particulate Matter (PM₁₀) - 24hr (70 µg/m³) and Total suspended Particulates (TSP) - 24hr (150 µg/m³). IFC requirements are for more parameters including SO₂, NO₂, PM_{2.5} and ozone, although IFC requirements for PM₁₀ are similar to Ghana EPA requirements. Given the dry Harmattan conditions encountered in Ghana during certain times of the year, D’Appolonia has previously recommended risk-based evaluation of dust based on measurements from near the Ahafo site, but not affected by Project dust. • Effluent discharge: Ahafo Fluid Management Plan needs to be finalized, as it is a draft document. There are also problems with this document in terms of compliance with the EHS Guidelines. The AFMP indicates that “Bacterial analysis and BOD & COD will not apply to NGGL discharges due to background levels”, which is contrary to IFC requirements. Other parameters for which the IFC has more conservative standards include: arsenic, cadmium, total nitrogen, phenols, and zinc.

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
3.3	<p><u>Resource Efficiency</u></p> <p>The client will implement technically and financially feasible and cost effective measures for improving efficiency in its consumption of energy, water, as well as other resources and material inputs, with a focus on areas that are considered core business activities. Such measures will integrate the principles of cleaner production into product design and production processes with the objective of conserving raw materials, energy, and water. Where benchmarking data are available, the client will make a comparison to establish the relative level of efficiency (Paragraph 6).</p>	Not identified	<p>Action required</p> <p>This topic could not be found addressed anywhere within the IMS. It could be framed as a policy statement in the IMS Manual or could be a component of a document whereby the overarching policies for environmental management are outlined</p>
3.4	<p><u>Resource Efficiency – Greenhouse Gasses</u></p> <p>In addition to the resource efficiency measures described above, the client will consider alternatives and implement technically and financially feasible and cost-effective options to reduce project-related GHG emissions during the design and operation of the project. These options may include, but are not limited to, alternative project locations, adoption of renewable or low carbon energy sources, sustainable agricultural, forestry and livestock management practices, the reduction of fugitive emissions and the reduction of gas flaring (Paragraph 7).</p>	Air Quality Management Plan; Hydrocarbon Management Plan	<p>Action required</p> <p>This topic could not be found addressed anywhere within the IMS. Greenhouse gas emissions are not reported to the Ghana EPA and the management plans and procedures do not define a need to do this, nor is there an SOP to use as guidance for doing the calculations.</p>
3.5	<p><u>Resource Efficiency – Greenhouse Gasses</u></p> <p>For projects that are expected to or currently produce more than 25,000 tons of CO₂-equivalent annually, the client will quantify direct emissions from the facilities owned or controlled within the physical project boundary, as well as indirect emissions associated with the off-site production of energy used by the project. Quantification of GHG emissions will be conducted by the client annually in accordance with internationally recognized methodologies and good practice. (Paragraph 8).</p>	Air Quality Management Plan; Hydrocarbon Management Plan	<p>Action required</p> <p>Same as above –calculation from NGGL to understand if the Ahafo Mine produces more than 25,000 tons of CO₂-equivalent annually has not been submitted for review.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
3.6	<p><u>Resource Efficiency – Water Consumption</u></p> <p>When the project is a potentially significant consumer of water, in addition to applying the resource efficiency requirements of this Performance Standard, the client shall adopt measures that avoid or reduce water usage so that the project’s water consumption does not have significant adverse impacts on others. These measures include, but are not limited to, the use of additional technically feasible water conservation measures within the client’s operations, the use of alternative water supplies, water consumption offsets to reduce total demand for water resources to within the available supply, and evaluation of alternative project locations (Paragraph 9).</p>	Water Management Plan	<p>No action required</p> <p>NGGL states a policy not to impact the quality and quantity of water resources. Extraction of water for production use is regulated with the Ghana EPA and there have been no issues to date.</p>
3.7	<p><u>Pollution Prevention</u></p> <p>The client will avoid the release of pollutants or, when avoidance is not feasible, minimize and/or control the intensity and mass flow of their release. This applies to the release of pollutants to air, water, and land due to routine, non-routine, and accidental circumstances with the potential for local, regional, and trans-boundary impacts. Where historical pollution such as land or ground water contamination exists, the client will seek to determine whether it is responsible for mitigation measures. If it is determined that the client is legally responsible, then these liabilities will be resolved in accordance with national law, or where this is silent, with GIIP (Paragraph 10).</p>	Water Management Plans and Procedures; SOQ Sewage Treatment Plant	<p>No action required</p> <p>NGGL states a policy not to impact the quality and quantity of water resources. Extraction of water for production use is regulated with the Ghana EPA and there have been no issues to date.</p>
3.8	<p><u>Pollution Prevention</u></p> <p>To address potential adverse project impacts on existing ambient conditions, the client will consider relevant factors, including, for example (i) existing ambient conditions; (ii) the finite assimilative capacity of the environment; (iii) existing and future land use; (iv) the project’s proximity to areas of importance to biodiversity; and (v) the potential for cumulative impacts with uncertain and/or irreversible consequences. In addition to applying resource efficiency and pollution control measures as required in this Performance Standard, when the project has the potential to constitute a significant source of emissions in an already degraded area, the client will consider additional strategies and adopt measures that avoid or reduce negative effects. These strategies include, but are not limited to, evaluation of project location alternatives and emissions offsets (Paragraph 11).</p>	N/A	<p>No action required</p> <p>These issues were addressed at the time of the preparation of the ESIA</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
3.9	<p><u>Pollution Prevention</u></p> <p>The client will avoid the generation of hazardous and non-hazardous waste materials. Where waste generation cannot be avoided, the client will reduce the generation of waste, and recover and reuse waste in a manner that is safe for human health and the environment. Where waste cannot be recovered or reused, the client will treat, destroy, or dispose of it in an environmentally sound manner that includes the appropriate control of emissions and residues resulting from the handling and processing of the waste material. If the generated waste is considered hazardous, the client will adopt GIIP alternatives for its environmentally sound disposal while adhering to the limitations applicable to its trans-boundary movement. When hazardous waste disposal is conducted by third parties, the client will use contractors that are reputable and legitimate enterprises licensed by the relevant government regulatory agencies and obtain chain of custody documentation to the final destination. The client should ascertain whether licensed disposal sites are being operated to acceptable standards and where they are, the client will use these sites. Where this is not the case, clients should reduce waste sent to such sites and consider alternative disposal options, including the possibility of developing their own recovery or disposal facilities at the project site (Paragraph 12).</p>	Waste Management Plans and Procedures	<p>Action required</p> <p>NGGL has plans and procedures to comply with the requirements of Paragraph 12 and has developed and implemented a policy not to use disposal sites determined to be non-compliant with environmentally sound practice and achieve self-sufficiency. The only aspect where action is required is that the current Ahafo Waste Management Plan should be upgraded to reflect the language of PS3 and associated guidelines, rather than the pre-PS IFC standards. The Ahafo Waste Management Plan is one of the few NGGL plans that reviews IFC requirements in detail.</p>
3.10	<p><u>Hazardous Materials Management</u></p> <p>Hazardous materials are sometimes used as raw material or produced as product by the project. The client will avoid or, when avoidance is not possible, minimize and control the release of hazardous materials. In this context, the production, transportation, handling, storage, and use of hazardous materials for project activities should be assessed. The client will consider less hazardous substitutes where hazardous materials are intended to be used in manufacturing processes or other operations. The client will avoid the manufacture, trade, and use of chemicals and hazardous materials subject to international bans or phase-outs due to their high toxicity to living organisms, environmental persistence, potential for bioaccumulation, or potential for depletion of the ozone layer (Paragraph 13).</p>	Chemical Management Plan, Hydrocarbon Management Plan, Cyanide Management Plan, Guidelines for the Safe Transport of Hazardous Chemicals in Ghana	<p>No action required</p> <p>NGGL has solid plans in place for the handling and transportation of hazardous materials.</p> <p>Recommendation: The plans could benefit from inclusion of a policy statement to the effect that NGGL will consider less hazardous substitutes where hazardous materials are intended to be used in manufacturing processes or other operations and avoid banned substances.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
3.11	<p><u>Pesticide Use and Management</u></p> <p>The client will, where appropriate, formulate and implement an integrated pest management (IPM) and/or integrated vector management (IVM) approach targeting economically significant pest infestations and disease vectors of public health significance. The client's IPM and IVM program will integrate coordinated use of pest and environmental information along with available pest control methods, including cultural practices, biological, genetic, and, as a last resort, chemical means to prevent economically significant pest damage and/or disease transmission to humans and animals (Paragraph 14)</p>	Closure and Reclamation Plan	<p>Action required</p> <p>NGGL follows good practice consistent with Paragraph 14 for weed management. A weed management program is in place that relies on monitoring and the use of mechanical removal of weeds encountered, but there is no mention of the use of pesticides and the plans should state that chemical will be used consistent with Paragraph 14.</p>
3.12	<p><u>Pesticide Use and Management</u></p> <p>When pest management activities include the use of chemical pesticides, the client will select chemical pesticides that are low in human toxicity, that are known to be effective against the target species, and that have minimal effects on non-target species and the environment. When the client selects chemical pesticides, the selection will be based upon requirements that the pesticides be packaged in safe containers, be clearly labeled for safe and proper use, and that the pesticides have been manufactured by an entity currently licensed by relevant regulatory agencies (Paragraph 15)</p>	Closure and Reclamation Plan	<p>Action required</p> <p>Same as above.</p>
3.13	<p><u>Pesticide Use and Management</u></p> <p>The client will design its pesticide application regime to (i) avoid damage to natural enemies of the target pest, and where avoidance is not possible, minimize, and (ii) avoid the risks associated with the development of resistance in pests and vectors, and where avoidance is not possible minimize. In addition, pesticides will be handled, stored, applied, and disposed of in accordance with the Food and Agriculture Organization's International Code of Conduct on the Distribution and Use of Pesticides or other GIIP (Paragraph 16).</p>	Closure and Reclamation Plan	<p>Action required</p> <p>Same as above.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
3.14	<p><u>Pesticide Use and Management</u></p> <p>The client will not purchase, store, use, manufacture, or trade in products that fall in WHO Recommended Classification of Pesticides by Hazard Class IA (extremely hazardous); or IB (highly hazardous). The client will not purchase, store, use, manufacture or trade in Class II (moderately hazardous) pesticides, unless the project has appropriate controls on manufacture, procurement, or distribution and/or use of these chemicals. These chemicals should not be accessible to personnel without proper training, equipment, and facilities to handle, store, apply, and dispose of these products properly (Paragraph 17).</p>	<p>Closure and Reclamation Plan; Chemical Management Plan</p>	<p>Action required</p> <p>Same as above.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
Performance Standard 4: Community Health, Safety and Security			
4.1	<p><u>Emergency Preparedness and Response</u></p> <p>In addition to the emergency preparedness and response requirements described in Performance Standard 1, the client will also assist and collaborate with the Affected Communities, local government agencies, and other relevant parties, in their preparations to respond effectively to emergency situations, especially when their participation and collaboration are necessary to respond to such emergency situations. If local government agencies have little or no capacity to respond effectively, the client will play an active role in preparing for and responding to emergencies associated with the project. The client will document its emergency preparedness and response activities, resources, and responsibilities, and will disclose appropriate information to Affected Communities, relevant government agencies, or other relevant parties (Paragraph 17).</p>	<p>Integrated Management System (IMS) Manual Newmont Ahafo Operations and associated Emergency Preparedness and Response Management System Procedure (in turn associated with a Site Emergency Response Plan)</p> <p>Emergency Preparedness Plan for Water and Tailings Disposal Facilities</p>	<p>Action required</p> <p>Same as response to Item No. 1.16. The guideline for emergency response in the case of a mine adopted by the IFC (refer to EHS Guidelines for Mining) is Awareness and Preparedness for Emergencies at Local Level (APELL) published by the UNEP. APELL promotes a more integrated approach to emergency response than currently undertaken by NGGL. Currently, NGGL has an Emergency Response Plan (ERP) dedicated primarily to ensuring worker safety and an Emergency Preparedness Plan (EPP) that is not yet fully rolled out into the local communities.</p> <p>Recommendation: Conduct a social gap analysis of the application of the APELL approach to emergency response.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management			
6.1	<p><u>Scope of Application</u></p> <p>The applicability of this Performance Standard is established during the environmental and social risks and impacts identification process. The implementation of the actions necessary to meet the requirements of this Performance Standard is managed through the client’s Environmental and Social Management System (ESMS), the elements of which are outlined in Performance Standard 1 (Paragraph 4).</p>	<p>Biodiversity Management Plan (BMP), Biodiversity Implementation Plan (BIP), Biodiversity Impact Monitoring Plan, Strategic Plan for the Management of Invasive Species at the Ahafo Project</p>	<p>Action required</p> <p>Biodiversity issues are not addressed in the NGGL IMS, except in terms of the Environmental Standard - Closure and Reclamation Planning. Similarly, the Strategic Plan for the Management of Invasive Species is not part of the IMS and the Vegetation Monitoring for Newmont Ghana SOP does not even mention monitoring the presence of invasive species should they be encountered. Given that PS6 indicates that the actions necessary to implement this standard be managed through the client’s Environmental and Social Management System (ESMS), this should be interpreted as part of NGGL’s IMS.</p> <p>In subsequent interpretations of compliance with PS6, where “no action required” is the finding, this means that plans or procedures outside of the IMS fit with PS6 requirements, not the IMS itself.</p>
6.2	<p><u>Scope of Application</u></p> <p>Based on the risks and impacts identification process, the requirements of this Performance Standard are applied to projects (i) located in modified, natural, and critical habitats; (ii) that potentially impact on or are dependent on ecosystem services over which the client has direct management control or significant influence; or (iii) that include the production of living natural resources (e.g., agriculture, animal husbandry, fisheries, forestry) (Paragraph 5).</p>	<p>Biodiversity Management Plan (BMP), Biodiversity Implementation Plan (BIP), Biodiversity Impact Monitoring Plan, Strategic Plan for the Management of Invasive Species at the Ahafo Project</p>	<p>No action required</p> <p>Paragraph 5 simply confirms that PS6 is applicable, even if the Ahafo Mine does not impact natural or critical habitat and is within modified habitat (see Item 6.3)</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
6.3	<p><u>Modified Habitat</u></p> <p>Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition. Modified habitats may include areas managed for agriculture, forest plantations, reclaimed coastal zones, and reclaimed wetlands (Paragraph 11).</p> <p>This Performance Standard applies to those areas of modified habitat that include significant biodiversity value, as determined by the risks and impacts identification process required in Performance Standard 1. The client should minimize impacts on such biodiversity and implement mitigation measures as appropriate (Paragraph 12).</p>	ESIA and associate Management Plans	<p>No action required</p> <p>The ESIA presents a discussion of local ecology that demonstrates the conditions at the Ahafo South Mine fall within what is classified under PS6 as "modified habitat" whereby the mine area "has been extensively fragmented and has little resemblance to the native forest communities once typical of the region", The ESIA nevertheless recognizes the biodiversity value of this area to local communities and proposed a biodiversity management program as reflected in the management plans.</p> <p>An offset for biodiversity impact was not proposed in the ESIA, nor is there a requirement for one in PS6, considering the nature of the local modified habitat. The ESIA does consider the possibility of an offset program should mining operations have a significant adverse effect to the Boskumese Forest Reserve located close to, but not within, the footprint of the mine. Any impacts would be determined only as part of the biodiversity monitoring programs that have yet to start.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
6.4	<p><u>Legally Protected and Internationally Recognized Areas</u></p> <p>In circumstances where a proposed project is located within a legally protected area or an internationally recognized area, the client will meet the requirements of paragraphs 13 through 19 of this Performance Standard [considerations that the area would be treated as natural or critical habitat], as applicable. In addition, the client will:</p> <ul style="list-style-type: none"> • Demonstrate that the proposed development in such areas is legally permitted; • Act in a manner consistent with any government recognized management plans for such areas; • Consult protected area sponsors and managers, Affected Communities, Indigenous Peoples and other stakeholders on the proposed project, as appropriate; and • Implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area. (Paragraph 20) 	ESIA and associate Management Plans	<p>No action required</p> <p>The mine footprint does not include legally protected habitat, but the VRA transmission line (an Associated Facility under the definition of PS1) does pass near the Tano-Offin Forest Reserve, a Globally Significant Biodiversity Area. The VRA transmission line was legally permitted, consistent with requirements of the Ghana EPA; local communities were consulted as appropriate; and a joint NGGL – VRA monitoring program is being undertaken to identify any potential encroachment and undertake mitigations as appropriate, in particular to monitor any encroachment to the Tano-Offin Forest Reserve.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
6.5	<p><u>Invasive Alien Species</u></p> <p>Intentional or accidental introduction of alien, or non-native, species of flora and fauna into areas where they are not normally found can be a significant threat to biodiversity, since some alien species can become invasive, spreading rapidly and out-competing native species (Paragraph 21)</p> <p>The client will not intentionally introduce any new alien species (not currently established in the country or region of the project) unless this is carried out in accordance with the existing regulatory framework for such introduction. Notwithstanding the above, the client will not deliberately introduce any alien species with a high risk of invasive behavior regardless of whether such introductions are permitted under the existing regulatory framework. All introductions of alien species will be subject to a risk assessment (as part of the client's environmental and social risks and impacts identification process) to determine the potential for invasive behavior. The client will implement measures to avoid the potential for accidental or unintended introductions including the transportation of substrates and vectors (such as soil, ballast, and plant materials) that may harbor alien species (Paragraph 22)</p> <p>Where alien species are already established in the country or region of the proposed project, the client will exercise diligence in not spreading them into areas in which they have not already been established. As practicable, the client should take measures to eradicate such species from the natural habitats over which they have management control. (Paragraph 23)</p>	Strategic Plan for the Management of Invasive Species at the Ahafo Project	<p>No action required</p> <p>NGGL has a plan to manage noxious weeds and implements that plan. ECMG has audited the implementation of this plan in the field and considers that it meets PS6 requirements.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
6.6	<p><u>Supply Chain</u></p> <p>Where a client is purchasing primary production (especially but not exclusively food and fiber commodities) that is known to be produced in regions where there is a risk of significant conversion of natural and/or critical habitats, systems and verification practices will be adopted as part of the client’s ESMS to evaluate its primary suppliers. The systems and verification practices will (i) identify where the supply is coming from and the habitat type of this area; (ii) provide for an ongoing review of the client’s primary supply chains; (iii) limit procurement to those suppliers that can demonstrate that they are not contributing to significant conversion of natural and/or critical habitats (this may be demonstrated by delivery of certified product, or progress towards verification or certification under a credible scheme in certain commodities and/or locations); and (iv) where possible, require actions to shift the client’s primary supply chain over time to suppliers that can demonstrate that they are not significantly adversely impacting these areas. The ability of the client to fully address these risks will depend upon the client’s level of management control or influence over its primary suppliers (Paragraph 30).</p>	Not identified	<p>Action required</p> <p>Action appears to be required in this area. The closest Management Plan to Procurement and Supply available to the ECMG was “<i>Contractor Selection & Management</i>” that does not cover this topic – this appears to be an IMS gap.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
Performance Standard 8: Cultural Heritage			
8.1	<p><u>Protection of Cultural Heritage in Project Design and Execution</u></p> <p>In addition to complying with applicable law on the protection of cultural heritage, including national law implementing the host country’s obligations under the Convention Concerning the Protection of the World Cultural and Natural Heritage, the client will identify and protect cultural heritage by ensuring that internationally recognized practices for the protection, field-based study, and documentation of cultural heritage are implemented (Paragraph 6).</p> <p>Where the risk and identification process determines that there is a chance of impacts to cultural heritage, the client will retain competent professionals to assist in the identification and protection of cultural heritage. The removal of nonreplicable cultural heritage is subject to the additional requirements of paragraph 10 below. In the case of critical cultural heritage, the requirements of paragraphs 13–15 will apply (Paragraph 7).</p>	Cultural Resource Management Plan and SOP – Cultural Heritage Management	<p>Action required</p> <p>Within the IMS there is some confusion regarding the requirements of cultural resource management. There is an overarching document entitled Social Responsibility Standard - Management of Cultural and Heritage Sites within the Social Standards part of the IMS, but this document does not make any reference to PS8 and references supporting documents as the Newmont Social Development Framework, January 2010, and the Akwé: Kon Guidelines Secretariat of the Convention on Biological Diversity, 2004. In actuality, it should refer to the Ahafo South Cultural Resource Management Plan that was prepared with reference to PS8 and is being followed such that compliance with Paragraphs 6 and 7 is achieved. This document is oddly located as a supporting document to “Closure and Reclamation Planning” along with an SOP for Cultural Resource Management.</p> <p>The basic Social Responsibility Standard - Management of Cultural and Heritage Sites needs to reference the existing CRM documents and also PS8.</p>
8.2	<p><u>Chance Find Procedures</u></p> <p>The client is responsible for siting and designing a project to avoid significant adverse impacts to cultural heritage. The environmental and social risks and impacts identification process should determine whether the proposed location of a project is in areas where cultural heritage is expected to be found, either during construction or operations. In such cases, as part of the client’s ESMS, the client will develop provisions for managing chance finds through a chance find procedure which will be applied in the event that cultural heritage is subsequently discovered. The client will not disturb any chance find further until an assessment by competent professionals is made and actions consistent with the requirements of this Performance Standard are identified (Paragraph 8).</p>	Cultural Resource Management Plan and SOP – Cultural Heritage Management	<p>No action required</p> <p>The Cultural Resource Management Plan includes protocols for chance finds.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
8.3	<p><u>Consultation</u></p> <p>Where a project may affect cultural heritage, the client will consult with Affected Communities within the host country who use, or have used within living memory, the cultural heritage for long-standing cultural purposes. The client will consult with the Affected Communities to identify cultural heritage of importance, and to incorporate into the client's decision-making process the views of the Affected Communities on such cultural heritage. Consultation will also involve the relevant national or local regulatory agencies that are entrusted with the protection of cultural heritage (Paragraph 9).</p>	Cultural Resource Management Plan and SOP – Cultural Heritage Management	<p>No action required</p> <p>The Cultural Resource Management Plan includes protocols for involving local communities and they have been involved with identification and management of cultural resources. The plan also requires involvement of relevant government authorities, which has also taken place.</p>
8.4	<p><u>Community Access</u></p> <p>Where the client's project site contains cultural heritage or prevents access to previously accessible cultural heritage sites being used by, or that have been used by, Affected Communities within living memory for long-standing cultural purposes, the client will, based on consultations under paragraph 9, allow continued access to the cultural site or will provide an alternative access route, subject to overriding health, safety, and security considerations (Paragraph 10).</p>	Cultural Resource Management Plan and SOP – Cultural Heritage Management	<p>No action required</p> <p>Same as above. The Cultural Resource Management Plan includes protocols for involving local communities and they have been involved with identification and management of cultural resources.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
8.5	<p><u>Removal of Replicable Cultural Heritage</u></p> <p>Where the client has encountered tangible cultural heritage that is replicable³ and not critical, the client will apply mitigation measures that favor avoidance. Where avoidance is not feasible, the client will apply a mitigation hierarchy as follows:</p> <ul style="list-style-type: none"> • Minimize adverse impacts and implement restoration measures, in situ, that ensure maintenance of the value and functionality of the cultural heritage, including maintaining or restoring any ecosystem processes⁴ needed to support it; • Where restoration in situ is not possible, restore the functionality of the cultural heritage, in a different location, including the ecosystem processes needed to support it; • The permanent removal of historical and archeological artifacts and structures is carried out according to the principles of paragraphs 6 and 7 above; and • Only where minimization of adverse impacts and restoration to ensure maintenance of the value and functionality of the cultural heritage are demonstrably not feasible, and where the Affected Communities are using the tangible cultural heritage for long-standing cultural purposes, compensate for loss of that tangible cultural heritage. (Paragraph 11). 	Cultural Resource Management Plan and SOP – Cultural Heritage Management	<p>No action required</p> <p>Same as above. The Cultural Resource Management Plan includes protocols for removal of replicable cultural heritage consistent with Paragraph 11.</p>
8.6	<p><u>Removal of Non-Replicable Cultural Heritage</u></p> <p>Most cultural heritage is best protected by preservation in its place, since removal is likely to result in irreparable damage or destruction of the cultural heritage. The client will not remove any nonreplicable cultural heritage, unless all of the following conditions are met:</p> <ul style="list-style-type: none"> • There are no technically or financially feasible alternatives to removal; • The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal; and • Any removal of cultural heritage is conducted using the best available technique. (Paragraph 12). 	Cultural Resource Management Plan and SOP – Cultural Heritage Management	<p>No action required</p> <p>Same as above. The Cultural Resource Management Plan includes protocols for removal of non-replicable cultural heritage consistent with Paragraph 12.</p>

Item Number	Requirement	Relevant Management Plan(s)	Comments and/or Actions (as necessary)
8.7	<p><u>Critical Cultural Heritage</u></p> <p>Critical cultural heritage consists of one or both of the following types of cultural heritage: (i) the internationally recognized heritage of communities who use, or have used within living memory the cultural heritage for long-standing cultural purposes; or (ii) legally protected cultural heritage areas, including those proposed by host governments for such designation. (Paragraph 13).</p>	<p>Cultural Resource Management Plan and SOP – Cultural Heritage Management</p>	<p>No action required</p> <p>Critical cultural heritage is not present in the Ahafo South area based on pre-construction baseline surveys involving local communities</p>
8.8	<p><u>Project’s Use of Cultural Heritage</u></p> <p>Where a project proposes to use the cultural heritage, including knowledge, innovations, or practices of local communities for commercial purposes, the client will inform these communities of (i) their rights under national law; (ii) the scope and nature of the proposed commercial development; and (iii) the potential consequences of such development. The client will not proceed with such commercialization unless it (i) enters into a process of ICP as described in Performance Standard 1 and which uses a good faith negotiation process that results in a documented outcome and (ii) provides for fair and equitable sharing of benefits from commercialization of such knowledge, innovation, or practice, consistent with their customs and traditions.. (Paragraph 16).</p>	<p>Cultural Resource Management Plan and SOP – Cultural Heritage Management</p>	<p>No action required</p> <p>The Cultural Resource Management Plan provides this assurance.</p>

1.2 ORGANIZATION AND STAFFING

Turnover is still a significant issue and staffing in many key positions has changed over the past year. Organization and staffing appear to be barely sufficient to implement the current management system, and some positions still need to be filled. At the time of this site visit, senior environmental management had left and the remaining staff, by necessity, was moving upward to fill the management gaps. This implies that the positions to be filled would be entry level staff (probably 2 or 3) that could be responsible for field environmental monitoring. As the IMS requires revision, this could be an additional drain on the time of the EHS staff.

1.3 RECOMMENDATIONS

The recommendations for revising the IMS to reflect current IFC standards (2012 Performance Standards and associated Guidelines) are generally provided in the comments to Table 1.2. Aspects of revising the IMS are discretionary, but are recommended as potential improvements.

1. Consider assigning levels of non-compliance or non-conformance to better flag action priorities;
2. Consider putting cultural resource management requirements of the IMS under its own topic as opposed to “Closure and Reclamation Planning”. Cultural Resource Management is independent of closure and reclamation and is effectively an independent discipline, and
3. Revise the IMS to incorporate requirements for underground work before the Subika Underground project becomes operational.

2 POLLUTION PREVENTION

Pollution prevention encompasses compliance with standards for air quality, noise and vibrations, surface water contamination, groundwater contamination and the associated systems and processes in place to prevent pollution. These topics are reviewed independently.

2.1 AIR QUALITY

Project Strategy:

The environmental control measures indicated in the IMS refer to the management and mitigation of both fugitive dust emissions and gaseous emissions. Fugitive dust is associated with mine operations including blasting, ore and waste rock hauling, dumping, grading, backfilling actions, as well as from increased vehicular traffic in the area. Gaseous emissions are generated from operation of mine equipment, combustion sources, and vehicular exhausts.

The control measures to mitigate fugitive dusts include watering or use of other surface binding and/or wetting agents, reclamation and revegetation, vehicular speed control, road maintenance, and use of dust suppression sprays or dry dust collection systems on ore crushing circuits and transfer points at the processing plant. Gaseous emissions are mitigated through proper operation and equipment maintenance, as well as specific end-of-pipe treatments, including scrubbing of emissions from the carbon regeneration kiln at the processing plant. The Project has committed to implement dedicated air monitoring programs for both dust and gaseous emissions control.

NGGL has incorporated requirements for air quality in an Environmental Standard - Air Quality Management with the following requirements:

- Sites shall identify point source and non-point source forms of air emissions for the mine life cycle of the mining facility including construction, operations, and closure and reclamation phases. This will include development and maintenance of an emission inventory to quantify all pollutants;
- Facilities that will be sources of air emissions shall be designed, constructed and operated with appropriate air pollution controls in order to comply with host country's applicable laws and regulations. If the host country's laws are non-existent or incomplete, USEPA national ambient air quality standards shall be used in each case, as applied at the facility boundary. Conformance shall be modeled at the facility boundary using a relevant air quality dispersion model;
- Best Management Practices shall be adopted to control fugitive dust emissions;
- Hazardous air pollutants for which annual emissions at a facility exceed 10 short tons (9 metric tons) per pollutant shall utilize risk-based, cost-effective control technologies;
- Sites shall permit air emission sources in accordance with appropriate regulatory authorities and shall operate in compliance with conditions specified in air quality permits, licenses, and regulatory requirements; and
- Sites shall conduct a review to determine if source testing of point source emissions is warranted.

These requirements also apply to contractors.

Observations:

The monitoring of ambient air continues to be a routine aspect of environmental management. Stack emissions testing has been conducted, although no new results were reported to the ECMG during this field visit. Ambient air measurements were not provided to the ECMG during this audit except for Particulate Matter (PM₁₀) - 24hr ($\mu\text{g}/\text{m}^3$) and Total suspended Particulates - 24hr ($\mu\text{g}/\text{m}^3$) as reported to the Ghana EPA. NGGL has previously reported measurements of carbon monoxide (CO), sulfur dioxide (SO₂), and nitrogen oxides (NO_x). This is an area where the new IFC standards need to be reviewed, in that there are additional guidelines for the monitoring of Particulate Matter (PM_{2.5}) - 24hr ($\mu\text{g}/\text{m}^3$), ozone - 8 hours daily maximum (100 $\mu\text{g}/\text{m}^3$), and the standards for the other parameters are more conservative than those currently followed by NGGL. It is emphasized that the IFC provides guidelines, not requirements, for air quality monitoring. As previously noted by the ECMG, given the dry Harmattan conditions encountered in Ghana during certain times of the year, a risk-based evaluation of dust based on measurements from near the Ahafo site, but not affected by Project dust, is recommended. The actual standards eventually adopted need to reflect realistic local conditions. Nevertheless, the adoption or adaptation of the new IFC standards reinforces a previous criticism of the Air Quality Management Standard in that there is no clear definition

of what standards are to be followed. There is no mention of IFC requirements and the standard requires that the user conduct an analysis of USEPA requirements and Ghana EPA requirements to determine what are allowable ambient air and stack emissions. Although reference is made to specific standards, it is not reasonable to assume that the followers of this standard are going to know what constitutes compliance.

The primary field observation regarding air quality is that the main airborne pollutant (dust) appears to be managed to the degree practical. The DustTreat process used on roadways appears to help and the watering of roads is encouraged for the additional reason that it provides a disposal solution for mine water not otherwise recycled through the process plant. Ambient air measurements show that NGGL did not exceed Ghana EPA (or the new IFC) guidelines for particulate matter in 2011, except for the month of January when Harmattan (hot, dry) conditions also contribute to the concentrations of dust.

Recommendations:

1. Take baseline measurements away from the mine area to verify that the PM₁₀ concentrations (and now PM_{2.5} measurements to be compliant with new IFC guidelines) are not due to the dust from stack emissions or other site activity (repeat recommendation).
2. Revise the Environmental Standard - Air Quality Management such that compliance standards (now to be revised for IFC EHS Guidelines) are clearly defined for the major emissions sources, in particular the Processing Plant, as well as for ambient air quality. The standards should also account for the fact that there are people who live “within the fence” of the Project such that ambient air standards should also be applied to these groups of people.
3. Verify if air dispersion models are up-to-date with respect to the current state of operations including from the Amoma pit (repeat recommendation).

2.2 NOISE AND VIBRATIONS

Project Strategy:

Sources of noise and vibrations include machinery, generators, the overall processing plant, vehicular traffic and blasting. Given that noise and vibrations can adversely affect both community and workplace environments, NGGL routinely monitors both environments. Within the NGGL IMS there is no Environmental Standard for either blast vibrations/overpressure or community noise levels, although there are SOPs for both noise and blast monitoring that describe the procedures to follow for making the physical measurements. NGGL does have a Hearing Conservation Plan/Procedure where occupational noise levels are clearly defined.

In practice, noise and vibrations from blasting are being monitored under the requirements of the Social Action Plan, but it is the Environmental Management Plan (2007) where NGGL has established limits for vibration compliance to limits of 5mm/s for peak particle velocity (ppv) and 115 dB for the air blast. It should be noted that these standards are very conservative in terms of what constitutes good practice. For the ambient noise in community areas, reference is made to IFC EHS General Guidelines where a limit of 55 dB(A) at daytime and 45 dB(A) at nighttime applies to outside Project property boundaries.

Observations:

Blasting and overpressure measurements continue to demonstrate generally good compliance with Project standards from the three pits where blasting is still taking place (Subika, Apensu and Awonsu – blasting has not started at the Amoma pit as of the last EPA report provided to the ECMG – November 2011). During 2011, none of the blast measurements from communities exceeded NGGL standards.

With respect to noise, the local community of Akorekrom, located on the north side of the Awonsu pit, has been the source of complaints associated with mining activities and noise. As noted from the December 2010 visit, nighttime ambient noise levels at this community have been higher than the 45 dBA IFC standard, apparently due to animal noises as well as mining activities,. As a result of the complaints, NGGL has increased the frequency of monitoring and stopped mining or rock dumping on the north side of the pit at night. Consistent with a previous ECMG recommendation, NGGL contracted the services of Heilig and Partners from Australia to conduct a noise survey that could distinguish mine noise from natural background and determine if the high nighttime noise levels are from NGGL activities, or some other source. In order to establish what is/are causing elevated night-time noise levels, a series of 48-hour surveys were conducted at two monitoring locations between the villages of Akorekrom, Manu Shed and

Taylor Krom. The results were reported June 2011 in terms of compliance with the Ghana EPA nighttime requirement of 48 dBA, although the appropriate reference should be the IFC standard of 45 dBA (another example of where there appears to be a confusion of what is the standard to be applied). Nevertheless, this study was able to distinguish between mine-generated noise and natural noise (mainly crickets) to arrive at the conclusion that mine noise did not exceed the Ghana EPA standard and the results also show general compliance with the IFC standard. Heilig and Partners also reviewed monitoring data obtained by the NGGL environmental group in August and September 2011 by the environmental group at Akorekrom and Manu Shed, as well as other locations and came to the same conclusion.

Recommendation:

1. An Environmental Standard or Management Plan for noise and vibrations is missing from the IMS, as the Environmental Management Plan is not a document formally incorporated as part of the IMS. This standard or plan, at a minimum, should define specifically what are the standards and responsibilities for implementation. Conversely, the 2007 Environmental Management Plan could be revised as appropriate and fully integrated into the IMS and reference made to that document when defining the standards for blasting and noise. This is a repeat recommendation, reinforced by the observation that the consultant Heilig and Partners was asked to determine NGGL compliance with a nighttime standard less conservative than the requirements of the IFC.

2.3 WATER MANAGEMENT

Project Strategy:

The ESIA defines the need for the Project to construct a WSF, several ECDs designed for sediment control as well as Best Management Practices for erosion control, waste rock facilities, and a TSF. Best Management Practices with respect to erosion and sediment control are reiterated in the Ahafo Reclamation and Closure Plan and the Water Management Plan within the IMS. The Amoma pit also has an ECD with the designation of Sediment Control Structure (SCS) 8. Aquifer characterization in the mine pits, pit-lake studies, and geochemical analyses of potential acid generating rocks have also been identified as necessary studies to be conducted. No releases of effluents containing cyanide or other chemicals to the environment will be allowed, except possibly under accidental/emergency conditions. A water/chemical solution recycle strategy is adopted by the Project.

Surface water control ditches are constructed as necessary to intercept and divert potential run-on water from flowing into mine pits, the TSF, or onto waste rock disposal facilities and ore stockpiles. These channels divert uncontaminated run-on water back into natural drainage downgradient from disturbed areas or into ECDs. Target release criteria for the sediment control system (ECDs and SCSs) are 50 mg/l total suspended solids (TSS) for a maximum storm event of 25-year, 24-hours precipitation. No water discharge is allowed from the TSF.

Water quality monitoring program includes the sampling of the surface water streams in the surroundings of the mining operations, at the ECDs and any other Project water management structures. Data were not available for the newly-constructed SCS8 at the Amoma pit. Twenty three surface water monitoring points have been selected, including locations at the ECDs and WSF. Water quality monitoring also includes the installation and periodic sampling and testing of nineteen groundwater monitoring points located upstream and downstream of the Project area, and eight wells located in the surroundings of the TSF. The groundwater monitoring points are nested wells at two different depths: shallow (around 30 to 35 meters deep) and deep wells (around 85 to 90 meters deep). Testing includes water table elevation data and a large set of physical and chemical parameters to fully characterize water quality.

The extraction of groundwater from pit dewatering has the potential for lowering the water table at community wells and also has the potential for affecting local wetlands. NGGL models groundwater extraction with the goal of predicting future conditions and the last update to this model is from a Technical Memorandum dated March 3, 2011 provided as Annex D-2 to the Draft Subika Underground Environmental Impact Statement. The new model reflects packer testing of deep exploration boreholes, drilling of three deep water exploration wells to depths of 557 m to 757 m, and performing long-term aquifer tests on the wells to evaluate groundwater flow in structures within deep bedrock.

Standards for water management within the IMS are provided in several documents. The basic Environmental Standard – Water Management is dated January 2006 and is a generic Newmont 5-Star document that has not been updated and serves only to define general policy. Details of what is required

for water management is provided as a Water Storage Facility Management Plan dated September 2009 and the Ahafo Fluid Management Plan dated June 2008. The AFMP is a draft document. Management of the TSF is covered separately.

Observations:

Surface Water

Water quality monitoring continues to take place at compliance and surveillance points for both surface and groundwater regimes. As noted in Section 1.1, Water quality standards are defined in the AFMP, although this is a draft document and the lack of final standards within the IMS formed the basis for assigning a Level I issue in Section 1.1 and as Item 7.1 in Table 1. A particular issue previously noted with the AFMP is that the document indicates that “Bacterial analysis and BOD and COD will not apply to NGGL discharges due to background levels”, which is contrary to IFC requirements.

Sediment loading from mine runoff as reflected in some high TSS readings associated with overflow from the ECDs, especially at ECD2, has been a long-term issue. This was not an issue in 2011 due to efforts to reduce the TSS content of the ECDs through the use of flocculants and not discharging from the ECDs unless measurements indicated the TSS to be lower than the Ghana EPA standard of 50 mg/L.

Another ongoing water quality issue has been the presence of high sulfate and nitrate beginning to appear in the ECDs (especially ECD4) and in the surface water regime. Concentrations of sulfate and nitrate for the ECDs were not provided to the ECMG during this field visit, but the presence of high sulfate in the Subri River downstream of ECD4 (560 mg/L measured at NSW8 on April 1, 2011) suggests that the problem at the ECDs identified from 2010 data still exists. Surface monitoring point KSW3, upstream from NSW8 and upgradient of the Subika Pit, has shown anomalous sulfate contamination since January 2010 and in 2011 has recorded concentrations as high as 930 mg/L. Groundwater contamination with sulfate and nitrate, in particular from TSF monitoring well MB-4 discussed below, is in an upgradient position from surface water point KSW3 and may indicate a source for these ions in the waste rock placed at the toe of the TSF. In any case, NGGL needs to conduct a study that determines how these chemical enter the ECDs and into the general surface water regime and what mitigation measures are required. This situation is assigned only a Level I non-compliance, because the presence of sulfate and nitrate is not a serious health threat at the measured concentrations, but the situation appears to be worsening.

At the time of the D'Appolonia field visit in December 2010, chemical releases from the dewatering of the pits into the WSF had reached the point where the actual water quality of this large body of water was starting to be impacted (ammonia). Unfortunately, this situation worsened resulting in a fish kill on January 2, 2012. This fish kill was immediately made public knowledge and NGGL has worked to understand what happened and manage the situation. High levels of ammonia coupled with low levels of dissolved oxygen were recorded at the time of the fish kill and either parameter could have triggered the event. Although it is recognized that natural sources of ammonia could have contributed to the situation and the dry Harmattan conditions may also have exacerbated the problem, pumping contaminated mine water into the WSF may have been a factor. NGGL has stopped pumping mine water into the WSF, but needs to develop solutions to recover this reservoir. A more detailed discussion of the fish kill and recommended actions to mitigate this situation are presented in Section 3.1.

Groundwater

Although groundwater extraction has continued from the Subika, Apensu and Awonsu pits and the Subika Underground project has extracted groundwater beyond what required for the open pit, community wells have yet to be impacted. This assumption is based on the lack of community complaints, as it is not practical to obtain groundwater levels from the community wells as they operate with downhole pumps. NGGL does test the community wells for water quality.

Dewatering rates from the Subika Underground project are much less than projected, minimizing impact, at least in the short-term, but impacts are still expected. Groundwater modeling has been updated from the AMEC Geomatrix 2009 analysis discussed in the 5th ECMG Site Visit Report from April 2009. The current groundwater model predicts that water withdraws due to the current dewatering system would draw down the regional water table 2 meters or more beneath 880 hectares of an area exhibiting shallow groundwater during the dry season, potentially affecting shallow groundwater ecosystems. An additional 210 hectares (1,090 hectares total) would experience drawdown of 2 meters or more due to dewatering of the Subika Underground Mine concurrently with the open pit mines. Drawdown would occur gradually as

the underground mine is developed, eventually resulting in an overall decline of up to 600 meters in community well DDW1 (located about 1,500 meters northeast of the center of the Subika pit) to 140 meters at well KDBH1, located approximately 3,200 meters southwest of the pit. Once dewatering ceases, water levels in the wells (and throughout the groundwater system) would recover to near pre-mine levels over a period of about 120 years. Ultimately, the groundwater model predicts that Subika Pit (and other pits in the area) would become long-term groundwater sinks as the rate of evaporative loss from the pit lakes would equal or exceed the rate of groundwater infill plus precipitation.

NGGL intends to proactively monitor water levels regionally through its system of monitoring and community wells and use these data in combination with the numerical groundwater model to predict, in advance, which community supplies may be potentially impacted. In addition, the monitoring program would provide baseline data for assessing changes in water and yields to groundwater supplies in the area. In this manner, continuity in water supply would be maintained for the various residents affected by dewatering activities. Wells and fetch points would be replaced on a case-by case basis. If well yield falls below the range of historical values, it would be replaced by a new well or other source of water. An issue that will need to be addressed by NGGL is in making sure that local communities have viable water supplies, even after NGGL has fully demobilized, given that recovery is projected to take 120 years and if the pits are long-term groundwater sinks due to evaporation, recovery would only be to the level of water in the pits.

There is some evidence that groundwater resources are being impacted by both sulfate and nitrate. Nitrate has previously been flagged as an issue in the shallow groundwater at Ground Water Compliance (GWC) 7 next to EDC4, but 2011 testing did not reveal any anomalous concentrations at that or any other groundwater monitoring well. Monitoring well GWC-3 next to ECD6 in 2011 continues to show sulfate contamination above the NGGL discharge limit of 300 mg/l in the shallow part of the monitoring well and the deep monitoring point shows sulfate well above background levels. As previously presented in the December 2010 field visit report, the World Health Organization has not derived any health-based guideline value for sulfate in drinking water, but notes that there could be taste impairment at levels above 250 mg/l. High sulfate and nitrate concentrations are also being encountered in some of the TSF monitoring wells, at concentrations higher than in the Leachate Collection and Recovery System (LCRS) below the liner, indicating the TSF is not the source. The significant increase in sulfate and nitrate, but especially sulfate, in MB-4 in the middle of 2010 might relate to the placement of waste rock at the western edge of the TSF as part of the Stage 5/6 expansion. As noted in the discussion of surface water, the increase in sulfate and nitrate from the surface water sampling point KSW3 in 2010 could be related to the same source of sulfur encountered in the groundwater.

Another anomalous situation observed in the TSF monitoring wells, but not necessarily related to the TSF, is with respect to pH. Since monitoring started in 2006, pH values have shown a clear pattern of increasing acidity in MB-3, MB-6, MB7, and MB8. pH values also declined in MB4 and MB5 until the wells were replaced and the pattern is no longer obvious. In some cases the changes are striking, as in the case of MB-3 where since 2006 the pH has dropped from about 7 to 4.5. In the case of MB-3, the well water has always been anomalously acidic, but in 2011 pH values less than 4 have been recorded. As the decant water has a high pH and in the underdrain is neutral to only slightly acidic, it is not obvious that the pH changes relate to the TSF.

Arsenic, manganese, iron and sometimes aluminum are often encountered in the groundwater at elevated levels. As discussed in greater detail in the ECMG report for the December 2010 site visit, these elements are interpreted to be part of the natural environment at Ahafo and not a consequence of mining.

As also discussed in Section 8.0, groundwater monitoring at and around the TSF reveals that there is some minor leakage through the liner. The only evidence that this leakage enters local groundwater is on the basis of cobalt, which is found in the LCRS (maximum concentration: 0.4 mg/L in 2011) and also from monitoring well MB-7 located at the northern end of the TSF near the spillway for the WSF, where cobalt has also appeared above background levels since 2006 (the maximum historical concentration is only 0.14 mg/L). Although this well appears to be upgradient from the TSF, the well screen is at a lower elevation than the saturated fine tailings at the soil lined portion of the TSF and it seems plausible that the well intersects with a fracture that connects with the upper part of the TSF whereas other wells do not. In any case, the situation as currently encountered is not serious, but the presence of cobalt is interpreted to possibly indicate a small amount of seepage to the environment from the TSF, as it is not normally a

naturally-occurring element. It should be noted that although present in low concentrations in the LCRS, cyanide has not been detected from the TSF monitoring wells.

Recommendations:

1. Improve management of the WSF (detailed recommendations included in Section 3.1).
2. Evaluate the source of sulfate/nitrate and decline in pH observed in the TSF monitoring wells and determine if any actions need to be taken, such as adding additional monitoring points and/or establishing control measures (even if the solution is dilution), especially because this source also appears to be the source of surface water contamination that is affecting the Subri River.
3. Consider increasing the number of monitoring wells and the frequency of monitoring to better characterize the nature of seepage from the TSF. Should the existing minor situation worsen, actions such as pump-back wells could be considered.

3 BIODIVERSITY AND ECOLOGICAL MANAGEMENT

NGGL's commitments are for the protection, maintenance, and rehabilitation of natural habitats, and also to assure that plans and procedures are in place and being implemented for mine reclamation activities (topsoil management; planting of vegetation to prevent erosion and encourage self-sustaining development of a productive ecosystem on the reclaimed land). An associated project with a focus on biodiversity is monitoring of the VRA transmission line corridor, work that is conducted with the VRA.

3.1 BIODIVERSITY AND ECOLOGY

Project Strategy:

The ESIA presents a discussion of the potential impacts on flora, fauna, wetlands, aquatic organisms, and forest reserves associated with Project activities in the Ahafo South project area. The Project's ESAP outlines a series of commitments, environmental control measures and additional actions for these natural resources. These control measures (e.g., noxious weed monitoring and control plan, fencing around mine pit rims, policies for employees and contractors, reclamation of certain facilities, and sediment and surface water control and management) are primarily designed to address direct impacts.

NGGL has strived to build alliances with local communities and with NGOs. As part of this effort, the Project entered into a biodiversity partnership with Conservation International (CI), an internationally recognized NGO and leader in global conservation. Conservation International officially entered into partnership with NGGL in 2006, but their partnership memorandum of understanding expired in February 2010 and in any case CI pulled out of Ghana. NGGL's primary conservation specialist organization is now Conservation Alliance, a local NGO.

Observations

At the time of this ECMG field visit, NGGL was in the process of evaluating a major fish kill in the WSF that had taken place immediately prior to the field visit and it was also revealed that a relatively minor fish kill had taken place in January 2011. Accordingly, this report reviews the fish kill incidents, as well as other topics associated with biodiversity and ecological management.

Fish kill incidents:

As background, the last ECMG audit report from December 2010, flagged an issue of contamination of the WSF reservoir with NH₃ ammonia originating from the dewatering of the open pits where the source of contamination is associated with inefficient blasting. In early January 2011, a fish-kill event occurred resulting in the death of several hundred fish. A definitive cause could not be determined, as the environmental data gathered after the fish kill incident did not indicate any definitive contributing factors or issues; however, agreement was reached that a zeolite-based water treatment plant would be constructed to provide additional decontamination of discharge of mine water to the WSF. This plant is now expected to be constructed and commissioned by the end of 2012.

NGGL subsequently began monitoring the WSF for dissolved oxygen (DO), NH₃ ammonia, temperature, and pH at three locations and three depths. NGGL stopped discharging mine water into the WSF in December 2011 when increasing NH₃ ammonia and decreasing DO were identified as significant issues. These trends continued and appear to have produced the fish kill reported publicly on January 4, 2012. The lack of oxygen can obviously kill fish, but ammonia could have also played a role. Ammonia is a well-known aquatic pollutant and increased ammonia concentrations can have a particularly detrimental impact on fish health (e.g., behavior, blood glucose stress response and disease susceptibility) and cause fish mortality. *Nile tilapia*, the most common fish, is especially sensitive to ammonia as lethal concentration levels are considered to be only about 1.5 milligrams/liter (mg/L) when fish are exposed over a 24 or 48 hour period, lower than the concentrations measured. At the same time that the ammonia levels were high, the DO levels also dropped to the point where the lack of oxygen could have caused the fatalities. Although it is recognized that natural sources of ammonia could have contributed to the situation and the dry Harmattan conditions may have also exacerbated the problem, pumping mine water into the WSF may have been a significant factor.

In September 2011 the Ghana EPA called for a mitigation plan specifically to avoid re-occurrence of the dead fish incident that had previously occurred. Independent of the fish kill, NGGL has committed to contracting the CSIR WRI to carry out further monitoring and studies into the health of the WSF, which should shed additional light on the best means to manage this reservoir. Another of the requests by the

Ghana EPA was to lower the level of the WSF. At the time of the field visit, construction of new discharge pipes has been completed such that the water level can be reduced by 1.7 meters at any time, which would effectively reduce the total volume of the WSF by about a third. If this were undertaken immediately, however, this could allow for contaminated water to enter surface water regime downstream and potentially impact an important community resource, which would not be advisable unless the quality of the reservoir is significantly improved. However, the strategy to lower the water level to a depth suitable to allow for adequate seasonal changes in precipitation and operational requirements is sensible.

At the time of the audit, discussions were held with NGGL personnel to identify options that could be taken to help prevent reoccurrence of the fish-kill situation, including:

- Expedite the construction of the zeolite-based water treatment plant (underway);
- Eliminate the use of the WSF as a mine-water effluent disposal site, unless modifications to blasting and/or construction of the zeolite treatment plant can effectively reduce ammonia to negligible amounts;
- The fish population levels should be managed so that over-population or dominance of one particular species does not reoccur. The carefully managed introduction of an appropriate number of predator-species fish, in conjunction with a variety of different forager species, could allow a more natural forager/carnivore balance to be achieved over time. A selective culling might be necessary;
- Stagnant waters and turbidity cause additional stress for Nile tilapia. Actively encouraging through-flow of non-contaminated waters would assist in avoiding turbid conditions, and help maintain the health of fauna/flora; and
- The introduction of artificial aeration should contribute to an increased level of dissolved oxygen within the water body. This is especially important during times when the photosynthetic ability of aquatic plants might be impaired, for example during cloudy weather or Harmattan conditions, or when through-flow discharges are to be curtailed.

It is understood that the reservoir is to be lowered in stages under Ghana EPA supervision, which will need to be done carefully. Our main recommendation is to not deliberately discharge water into the local river system until it is safe to do so.

Biodiversity monitoring and management program/ecological management:

As of early 2011, NGGL now works with Conservation Alliance as their primary biodiversity management and monitoring partner, and the relationship with Conservation International has been terminated. Although CA's primary offices are in Accra, and at NGGL's offices, they also operate in Monrovia (Liberia) and Freetown (Sierra Leone).

The CI-initiated community projects conducted in association with NGGL still exist, in particular the two herbal plant farms, of an acre each, at the OLA and Ntotoroso Resettlement communities, whose residents were displaced by the Ahafo South Project. The herbal farms contain a variety of herbal plant species that serve as herbal medicinal plant resources for communities and schools in an effort to expand local knowledge on how to sustainably manage natural resources. The farms continue to be managed by local residents.

The Biodiversity Management Plan and Biodiversity Implementation Plan have been operational since 2009. Baseline surveys were conducted in 2006-07; in recognition of the need to assess changes since that time, the intention has been to develop a Biodiversity Impact Monitoring Plan in conjunction with the NGO partner (CI, then later CA). At the time of the December 2010 ECMG field visit, CA had proposed a Biodiversity Impact Monitoring Plan that was due to be finalized early 2011. Approval of this plan by NGGL took place the third quarter of 2011. Fieldwork is due to start during the first quarter 2012.

CA's proposed Monitoring Plan, dated August 2010 and only provided to ECMG for the first time during this field visit, is a good start, but confusingly presents itself as a guideline, a protocol, a program, and a monitoring and evaluation plan. The proposal contains objectives with activities and outputs, provides a summary of scales and approaches to be taken; presents a concept on indicators (and annexes of broad indicators at various scales); and includes a work-plan. The stated objectives are:

1. Collate and review baseline data generated including other biodiversity surveys, historical data within the mine-take and off-site to verify or identify new species for monitoring;

2. Undertake data collection, storage and processing for management;
3. Build the capacity of NGGL monitoring staff and community facilitators on monitoring mining impacts at Ahafo;
4. Develop a comprehensive field report on accomplished activities;
5. Dissemination of information to stakeholders at local, national, and global levels; and
6. Prepare user friendly manual for training of monitoring agents.

The proposal is weak in distinguishing its overall aim; for example, the production of field reports would not be expected to be an objective in its own right. Although capacity-building, training and dissemination are important, for a monitoring proposal intended to satisfy the needs of the Ahafo South mine complex, the objectives do not seem to carry sufficient weight with regard to determining the quality of the baseline, clearly identifying what monitoring is required, the identification of appropriate indicators, the identification of ways to capture changes that may have occurred since baseline, and approaches the Project might take in adaptive management.

Species presence/absence, abundance, and distribution should have been recorded within early baseline surveys prior to the Project breaking any ground. If, after reviewing the baseline data, these are seen to be deficient, data gaps should be identified and targeted for further survey. The threats from which biodiversity may potentially suffer (both directly or indirectly as a result of the Project, or likely to occur anyway) should be identified, as these will help indicate the scope and form of the monitoring program. These threats should also feed into the choice of fauna/flora indicators, and help guide which species can be used as indicators, whether of Project-related impact, conservation actions taken, and/or indicators of general ecosystem health. When used in combination with some of the 'broad indicators' listed in the proposal's Annex, only then will the Project understand whether mitigation measures and conservation actions are having the desired effect. Although many useful 'broad indicators' are provided in the Annex, it is not clear if the proposal suggests the monitoring program should adopt all of these or if these are presented as an overarching philosophy. They are not described in the text of the proposal, so appear as an 'add-on'.

As indicated within Objective 2, much more specific protocols will need to be developed prior to any fieldwork. Further detail should be sought by NGGL on exactly how Objective 2 will be undertaken, to ensure an appropriate level of scientific rigor is applied, that the results are targeted to the objectives of the company's biodiversity strategy, and that the maximum use is made of any field work and data gathering opportunities. The monitoring approaches identified (remote sensing, transect/point sampling, data collection and local knowledge) appear to be appropriate, but the descriptions are simplistic and lack sufficient detail to be able to determine the credibility of scientific approach and resources required. Practical details such as how each of these would be undertaken, the costs involved, how responsibilities and accountabilities for data quality would be managed, how data gathered should inform company action, etc., all need to be further defined, especially in regard to how the overall monitoring approach ties into NGGL's IMS. Such information should be discussed and agreed prior to commencement of the full fieldwork program.

As highlighted in the fish-kill incident section above, the CSIR WRI delivered their evaluation of the ecological and public health status of the WSF in December 2010. Their report is well-written and informative. Macro-vertebrate, fish fauna and other fauna were assessed, along with aquatic macrophytes and phytoplankton. Water-related vector and transmitted diseases and parasitological related diseases were also assessed, along with the suitability of fish for human consumption. Their recommendations regarding the health of the WSF ecosystem are summarized as follows:

- Conduct yearly monitoring of the WSF using macro-invertebrate as bio-indicators and also put in place strategies for environmentally sound management of the WSF;
- Regarding organic pollution, the water quality of the reservoir should be improved by increasing fresh water inflow while allowing some of the resident water out;
- Once the water quality is improved, new species (e.g., the Nile perch *Lates niloticus*, *Chrysichthys* and the bony tongue *Heterotis niloticus*) could be introduced to ensure a more diversified and balanced fish community;

- Investigate further the eco-parasites of the skin of some tilapia, and any implications for human health, prior to sanctioning them safe for human consumption. In addition, conduct annual trace-metal assessments of fish tissues to ensure the low metal concentrations observed continue;
- It is believed that the ability of the WSF to compensate for the lost wetlands/swampy drainage areas that were previously located in the vicinity of the Project cannot be guaranteed. Therefore, there should be a long-term planning for the WSF area through a feasibility study on the potential of this area to support viable wetland habitat in the future;
- A basic, qualitative, biology-based aquatic monitoring program should be designed (e.g. aquatic weeds, algae, macro-invertebrates, benthic organisms, fish, waterfowl) in the WSF as part of long-term planning and monitoring efforts. That is, a multi-taxa biodiversity monitoring program should be developed and made available;
- A management plan for aquatic weeds (including alien/exotic/noxious) must be developed against the invasion of the WSF by these weeds in future; and
- Recommendations are also made on reducing the potential for the WSF to encourage transmission or hosting of vector for malaria, guinea worm, blackfly and tsetse fly. Recommendations are also included for reducing the prevalence of schistosomiasis vectors and protozoan parasites in the WSF.

These are the recommendations made as a result of NGGL's request for the CSIR WRI to apply their expertise to assessing the state of the WSF. The recommendations seem appropriate to the ECMG regarding the quality, health, and potential use of the WSF.

Invasive species

NGGL provided the ECMG with a strategic plan for management of invasive species and a weeds control implementation table. Although the strategic plan mentions it focuses on invasive 'tree' species, it contains information on the primary weed species found in the area. It highlights the Project is contained within a zone where 55% of the total land area has been affected by any of the seven invasive alien tree species featured.

The strategy provides a useful summary for NGGL regarding the challenge of invasive species, and details seven of the most likely species that require managing in the Ahafo project area. It contains some useful photographs showing identifiable characteristics, that NGGL could use within a field guide compendium, to assist during eradication visits. Approaches for the control of invasive species are indicated, including mechanical, chemical, biological, fire, or a combination of several, although not in any great detail. Several actions are provided to constitute an action plan, including:

- Maintain and create large, structurally complex patches of native vegetation in the area;
- Create buffers around sensitive areas;
- Maintain or create corridors and stepping stones; and
- Control aggressive, over abundant and invasive species.

It is not clear from the document, as this is written by a third party, the extent to which NGGL has adopted this strategy (and action plan), and how NGGL has chosen to internalize the responsibility of addressing invasive species within the Project area, acknowledging that this is a problem affecting a much larger area than that occupied or influenced by the Project. Nevertheless, invasive species management has been an operational process over the past four years and NGGL continues to follow their Implementation Plan for Noxious Weed Management developed in 2008. Ongoing work has been to implement pilot weeds control using mechanical, chemical and Integrated Weeds Management at a reclamation trial plot, assess the effectiveness of various controls, and update the invasive species management plan in the light of the results of the pilot project. Nevertheless, as discussed in Section 1.1 and in previous reports, this and other biodiversity issues are not addressed, except in terms of the Environmental Standard - Closure and Reclamation Planning, within NGGL's IMS.

Recommendations:

1. NGGL should seek external expertise to ecologically engineer the WSF back to a condition suitable for the species that inhabit it, and ensure that it remains as such.

2. Consider the various actions identified above for the WSF. Do not initiate the lowering of the reservoir level until the reservoir has been cleaned up to the point that it is safe to discharge water downstream.
3. The ECMG considers that any decision to allow community fishing access to the WSF would be premature considering the ongoing investigative studies into the health and sustainability of the WSF ecosystem (following the 2010 and 2011 fish-kill incidents). NGGL needs to increase their enforcement of preventing community-use so as to meet their stated company policy of no access or community-use.
4. ECMG would recommend that NGGL considers and adopts the recommendations of the CSIR WRI ecological report of the WSF.
5. Consider seeking additional external support from an international conservation organization to provide world-class scientifically credible support to the Project, and supplement the support provided by CA.
6. Review the CA monitoring proposal in the light of additional detail required to secure confidence that the eventual monitoring program will meet both the projects needs and be undertaken with a sufficient level of scientific rigor.
7. Incorporate biodiversity and ecological management into the IMS (same recommendation outlined in Section 1.1 and recommended in previous reports).

3.2 VOLTA RIVER AUTHORITY (VRA) TRANSMISSION LINE – ASSOCIATED FACILITY

Project Strategy:

A 161kV overhead power transmission line, identified as an associated facility in the Ahafo South ESIA, was constructed by VRA between Kumasi and Sunyani substations primarily to serve NGGL. The power line was constructed along a 30-meter wide right-of-way, extending 154-km and covering an approximate 470-hectares, including access tracks.

In addition to supplying electricity to the mine site, the transmission line provides an alternative power supply route to the load centers located in Brong Ahafo, Northern, Upper East, and Upper West Regions of Ghana. As the IFC considers the VRA transmission line an associated facility to the Ahafo South Project, general compliance with applicable Operational Policies was required.

A Gap Analysis was conducted by an independent consultant in August 2006 to determine if there were any evident policy violations of the IFC's Operational Policies, including Operational Policies (OP) 4.04 - Natural Habitats, among others. In the Final Report produced from this exercise, it was determined that there were no major policy violations at the time of writing; however, a series of recommendations were made to ensure future compliance. Of particular significance is that part of the transmission line corridor was subsequently rerouted away from Compartment 98 of the Tano Offin Forest Reserve, which is considered as a Globally Significant Biodiversity Area. NGGL committed to conduct biannual inspections of the right-of-way to monitor any potential encroachment in the vicinity of Compartment 98.

Observations:

As OP 4.04 is no longer the applicable biodiversity standard, having been replaced by IFC Performance Standard 6. As discussed in Section 1.1, since the VRA transmission line does not directly impact Compartment 98 of the Tano Offin Forest Reserve, the current procedures for monitoring potential encroachment on the basis of biannual inspections is consistent with the requirements of PS6.

One of the major downfalls of linear operations is the indirect encouragement of entry by people not previously able to access more isolated areas. Right of Way (RoW) corridors, whether containing pipelines or energy transmission lines, provide classic opportunities for induced access and allow land use change by the opening up of new areas to human activities.

As noted in the last ECMG report (2010), the 2010 VRA inspection had observed a gradual encroachment into the forest reserve of illegal small scale mining (Galamsey), presence of new logging routes, and the development of several new farms since the last inspection. The 2010 VRA inspection report recommended that these activities be halted based on a planned concerted effort between the Forest

Services Division, VRA, NGGL, Conservation Alliance and the forest fringe communities to protect the Tano – Offin Forest Reserve from further encroachment.

An inspection was conducted by NGGL staff and VRA staff during May 2011, comprising eight people over three days of survey, routed through the Tano-Offin Forest Reserve, a Globally Significant Biodiversity Area. The 2011 VRA Inspection Report does not report back specifically on whether or how well the 2010 recommendations might have been used. It notes new farms, and tracks through the forest reserve, and recommends weeding be undertaken twice a year to allow better access for future inspection teams.

Although, NGGL has complied with its requirement to conduct field visits in cooperation with VRA, the overall inspection and reporting process appears to have some deficiencies. In particular, the 2011 VRA Inspection Report is inadequate to be able to effectively assess any biodiversity impacts associated with the transmission line route. The survey is mandatory on a biannual basis, but the inspection report lacks any specificity about the types or level of encroachment observed during the inspection. There is no route map included to show those areas accessed by foot, and thus observed in more detail, or those visited by vehicle and therefore not studied in detail. No location or area data is recorded of observations made, including intensity or frequency of human activities observed. Neither is there graphical representation of the specific locations where logging, farming, or other human activities are occurring. There is no latitudinal/longitudinal data on observations or photographs. There is no list of species observed, or indication of any invasive species the team was instructed to record or destroy if sighted.

Mention is made of (“some”) logging routes but no indication of locations, widths, or lengths. The report notes that forest fringe communities stated these were created by the Forest Services Division, but does not indicate whether they are currently used by any other vehicles (e.g. illegal logging companies), the frequency that vehicles are seen to be using the tracks, or whether they carry any logged trees or bushmeat.

The presence of (‘some’) cocoa and plantain farms is reported and documented with photos of an old a new plantain farm. Some of the old farms were apparently seen during earlier inspections, and it is noted that some new farms are awaiting tree felling and burning. However, there is no way of deducing what land area is being used by farms, how quickly new farms are appearing, or whether existing farms are taking more land area once established.

As this is a biannual survey intended to document potential encroachment on a nearby designated Forest Reserve (a Globally Significant Biodiversity Area), it is a valuable opportunity to collect detailed data, and thus being able to record, present and map findings as they appear each year. This will allow any changes from baseline to be measured and actions taken to address human encroachment as required. Without such data it is impossible to use the inspection or the inspection report as a contribution to minimizing Project related impacts on biodiversity.

Recommendation:

1. ECMG concurs with this recommendation of the NGGL/VRA inspection team and that NGGL works with the other stakeholders to develop an Action Plan to mitigate against the observed situation.
2. NGGL needs to improve the quality of inspection reporting for the VRA transmission line on the basis of developing field procedures such that any impacts to the Forest Reserve can be identified, quantified as to their degree of impact.

3.3 RECLAMATION, REVEGETATION, AND TOPSOIL MANAGEMENT

Project Strategy:

The ESAP defines measures to prevent and mitigate the impacts on soil resources. Potential impacts of concern include reduction of topsoil fertility and increased erosion due to surface disturbance, vegetation removal, and lack of adequate reclamation. NGGL is committed to implementing actions to protect and preserve the topsoil in the mining area and to reuse it during reclamation. Other important actions are related to erosion minimization through temporary and permanent erosion control measures in disturbed areas. These include sediment traps, fences and barriers, and stormwater management through drainage collection structures, including berms and other drainage, the most important of which are the four ECDs (ECDs 2, 3, 4, and 6), as well as the SCS8 recently constructed to serve the Amoma pit operations.

NGGL is committed to reclaiming all surface disturbances in accordance with applicable Ghanaian regulations and Newmont's Standards for closure and reclamation of mining facilities. These standards are described as an Environmental Standard – Closure and Reclamation Planning. This policy document is supported by a Reclamation and Closure Plan, a Reclamation and Closure Plan Revision and 10 SOPs, including SOPs for topsoil management, vegetation monitoring, and weeding. A responsibility of the Reclamation team is to conduct and monitor all soil resource protection activities. As part of its commitments, this team conducts inspection of reclaimed and revegetated areas to monitor the success of the reclamation activities and ensure the minimization of erosion and sedimentation impacts. Vegetation monitoring, including visual inspection, noxious weed identification and annual sampling for plant community characteristics, is expected to continue for five years after final reclamation.

Observations:

NGGL's experiments to reclaim waste rock areas have allowed for the development of procedures that can be expected to succeed. After a period of about three years, the Apensu test plots are all well vegetated. The potential exists for movement of saprolite subsoil through rock, but overall results are good. NGGL will need to review the history of test plot maintenance to decide if improved procedures are needed.

At the time of the December 2010 ECMG site visit, NGGL was able to demonstrate successful reinstatement at the toe of the Apensu stockpile west of the Apensu pit. This area covers approximately 3.5 Ha, but represented only about 10% of the area projected to be reclaimed by this time from the Reclamation Security Agreement between NGGL and the Ghana EPA made in 2008. At the time of this field visit the situation had not improved and in fact was slightly worse, because new mining activities extended into areas previously reclaimed. This situation is being resolved by subcontracting out earthmoving to a third-party, WBHO out of South Africa that is currently working with local subcontractors on other Ahafo activities, who will begin reclamation with 40 Ha planned for 2012, the total amount previously planned for both 2011 and 2012. Again, it is noted that the delay in reclamation does not constitute any urgency from an environmental point of view, but could be a reputational risk if progress is not made in 2012.

4 WASTE AND WASTEWATER MANAGEMENT

4.1 WASTE MANAGEMENT

Project Strategy:

NGGL has quantified its commitments for waste management in terms of an Environmental Standard – Waste Management within the IMS that includes wastes generated at Newmont sites through the mine life cycle and covers the generation, collection, storage, transportation, and disposal of hazardous wastes, non-hazardous wastes and wastewater. This Standard also provides policy for the use of external disposal facilities and specifically states “*Sites shall conduct environmental audits of off-site treatment and disposal facilities prior to their selection to verify that the facility is engineered, and operates, in a fashion that is protective of human health and the environment. Sites shall conduct periodic follow up audits of treatment and disposal facilities.*” In addition, “*if off-site disposal facilities for hazardous waste are not available or not protective of human health and the environment, on-site disposal locations or methods shall be designed and constructed to treat and/or dispose of such wastes, where allowed by legal jurisdiction...*”. This Standard is supported by a site-specific Waste Management Plan prepared primarily to assure compliance with Ghanaian environmental law and IFC requirements for international operations. USEPA RCRA (Resource Conservation and Recovery Act) waste management requirements were adopted as the recommended best management practices in cases where IFC guidelines or Ghanaian regulations lacked specific detail and direction (i.e. characterization of waste streams), although the document states that best management practices from the USEPA will be implemented only when feasible and practical on a case by case basis.

Observations:

Waste streams handling and management practices have been observed to be generally good and the Project has achieved several significant achievements during the past year. However, some waste streams are still awaiting solutions for recycling/disposal and two non-compliances, one related to the disposal of hazardous material at the Kumasi landfill and one concerning coverage of the on-site inert landfill are raised.

One of the major achievements the Project accomplished is the recycling of used tires and inner tubes through a company (Nana Nsiah & Kutin Mensah) located in Kumasi. This recycling company uses the used tires and inner tubes to manufacture native sandals, bushings, and for the manufacture of furniture. The company was audited in May 2011 and although it was found suitable for the handling of the waste stream, some health and safety issues were identified that needed attention to bring the operations in line with NGGL requirements. The Project did not perform a follow-up to verify and document that these issues were rectified, however. NGGL is currently providing the recycling facility a limited number of smaller-size tires to verify the company’s recycling capabilities.

On January 28, 2011, the Project conducted an audit of the Presank facility, located in Kumasi, that is recycling used wet batteries, crushed filters, and used hydraulic hoses. It should be noted that at the time of 2010 Audit, this company had been audited only for used oil, although it had already received from the Project the complete abovementioned waste stream. Overall, the Presank facility was found suitable for the handling of these waste streams with few corrective actions needed to improve health and safety conditions. Again, NGGL has not yet performed a follow up on its initial audit to ensure the company has implemented the identified corrective actions.

Other waste streams are still awaiting a solution for recycling or disposal including; mercury filters from the fluorescent lights crushers, plastic piping, electronics, and household batteries. At present, these waste streams are stored on site and their low volumes do not cause immediate concerns giving NGGL time to investigate possible solutions. Nevertheless, NGGL should actively search for recycling/disposal options for these wastes so that they will not become a critical issue.

After testing the use of S-200 BIOGEL fertilizer to speed up the abatement of hydrocarbon on impacted soils (normal maturing time is about one year) with significant results, NGGL is now using this procedure on a regular basis at the volatilization pad located in the Integrated Waste Management Facility.

Composting with the dewatered sludge from the camps’ Sewage Treatment Plants (STPs), organic waste, paper, and wood chips is fully ongoing. The composting recipe, finalized on June 2010, allows for different mixtures depending on the availability of raw materials. The composting has been reported to be

ongoing since last year and, based on what observed during the site visit, is being undertaken appropriately. The final product is then used for the revegetation activities at waste rock piles and other areas where reclamation efforts are to be undertaken. It should be noted that sludge production from the STPs is reported to fill about 2-3 small trucks every 3 days while the composting process takes an average of 90 days to mature. It is possible that sludge production may outpace composting and therefore requiring temporary storage room before it is used.

At the time of the 2010 Audit, NGGL had just commissioned a portable SMART ASH incinerator, manufactured by Elastec/American Marine in the U.S, for the high temperature combustion of oily materials. The commissioning of this incinerator eliminated the need to dispose of this last waste stream at the Kumasi Municipal Landfill, a facility that ECMG has flagged on previous site visits as not suitable for receiving any type of waste because of the lack of any leachate treatment and poor operational practices. ECMG observation at the time was that the SMART ASH unit was very small and may have not been sufficient to keep up with the generated waste stream. As reported by Project personnel, the incinerator unit was plagued by repeated technical problems and since August 2011 the Project resumed the practice to dispose of oily rags, about six to seven cubic meter containers per month, at the Kumasi Landfill. This practice is non-compliant with NGGL Waste Management procedures (NEM-ENV-S.046, sections 3.2.11 and 3.2.13) and IFC standards (General EHS Guidelines, section 1.6) and is assigned a Level II in Table 1. It should be noted that NGGL is currently building an area, within the Integrated Waste Management Facility, to accommodate the old incinerator, which is also being repaired to become operational again. The incinerator and its facility are scheduled to be ready by mid-end of February. In the meantime, the Project should store oily rags on-site and not dispose of them at the Kumasi Landfill.

The Project is actively employing good segregation practices; however some putrescible waste, in particular waste from lunch boxes, still ends up in the on-site inert landfill. A problem that was highlighted in several previous Audits is that soil cover is not regularly placed over the waste in the pit. During the facility visit, a considerable amount of uncovered trash was present in the active trench where numerous birds were observed feeding. This practice is non-compliant with NGGL Waste Management procedures (NEM-ENV-S.046, sections 3.3.13 and 3.3.16) and IFC standards (EHS – Waste Management Facilities, sections 1.1.3 and 1.2) and is assigned a Level I in Table 1. According to Project personnel, this situation is due to the fact that they rely on mining earth moving equipment to cover the trench and therefore this operation is only done when the equipment is available. Burial of the waste, in particular as it contains some food waste, should be performed quickly so to prevent pathogens and vectors from being spread by the birds. The Project should consider providing the on-site inert landfill facility with a bobcat, or similar small earthmover, such that waste can be quickly covered (daily cover is good practice) eliminating the need to constantly rely on mining equipment, which can then be used only occasionally for intermediate soil spreading and compaction and for trench maintenance. In addition, the access to the active trench should be restricted/controlled to prevent any unauthorized dumping of inappropriate waste; therefore, the Project may want to consider moving the guard post according to the active trench location.

Recommendation:

1. Conduct follow-up audits of the selected companies used for waste recycling to verify that they have implemented the corrective actions identified by NGGL during their initial audits.
2. Promptly discontinue sending oily rags waste to the Kumasi Municipal Landfill and store this waste stream on-site until it can be incinerated in the new facility once its commissioned.
3. Implement prompt burial of the waste at the on-site inert trench to avoid pathogens and vectors to be spread by the bird population.
4. Ensure that access to the active trench at the on-site inert waste facility is properly restricted/controlled to avoid any unauthorized dumping of inappropriate waste.

4.2 WASTEWATER MANAGEMENT

Project Strategy:

The Environmental Standard for Waste Management also covers policy for the management of wastewater and states “Wastewater shall be treated using sewage treatment plants or septic systems that are capable of producing effluents that meet applicable discharge standards”. The Environmental Standard also includes the policy for effluent discharge: “The following sewage treatment plant effluent parameters shall be

monitored: pH, conductivity, dissolved oxygen, suspended solids, free chlorine (if applicable), biological oxygen demand (BOD), alkalinity, nutrients and relevant microbiological parameters. The results shall be utilized to optimize plant performance.”

Observations:

The two permanent STPs are installed behind Camp A at the plant site and at the Mensah Kumtah Village. Treated effluent from both facilities is sent to the TSF where it is mixed with tailings decant water and recycled for processing. Raw sewage from the Rank and the Kenyasi septic tanks that had been going to the Camp A STP began being diverted to the STP at the Mensah Kumtah Village in August 2010. Bulk flocculent problems were quickly resolved by changing the chemical used and the production of sludge suitable for composting has been reported to be normal throughout 2011.

Both the Camp A and Mensah Kumtah Village STPs show good compliance for effluent discharge. As noted in the 2010 Audit, the AFMP does not provide a full definition of what effluent parameters should be, nor are such parameters included in the Standard Operating Procedures for the Sewage Treatment Plant (AHF-SS-011-SOP001). As already highlighted in the 2010 Audit report, the AFMP states that all bacteriological analyses, chemical oxygen demand (COD), and biological oxygen demand (BOD) results are not applicable with the explanation “*Bacterial analysis and BOD & COD will not apply to NGGL discharges due to background levels.*” This is an inappropriate interpretation, as the quality of the receptor bodies is irrelevant to good practice management of the STPs and is also in conflict with the Environmental Standard – Waste Management document. The standards should be 400 mpn/100 ml for total coliforms, <1 mpn/100 ml for fecal coliforms and <1 mpn/100 ml for E. coli. The normal BOD standard is 30 mg/l and 125 mg/l is the normal COD standard to be consistent with IFC requirements (from the IFC EHS General Guidelines). In practice, it is noted that NGGL complies with these additional standards and no excursions above these IFC limits were recorded at any of the STPs during 2011. Only some small exceedances with respect to effluent conductivity (Camp A and Mensah Kumtah Village) and total dissolved solids (Camp A) were recorded in 2011. Although alkalinity and chlorine are reported to be constantly monitored at the STP plants, these parameters should also be included in the regular laboratory tests as they are Newmont requirements.

It should be noted that NGGL only provided partial waste water treatment data for the year 2011. For Camp A the months of April, August, October, and December were not provided, while for the Mensah Kumtah Village April, May, August to October, and December data were missing from the submitted data.

Recommendations:

1. Consider adding alkalinity and free chlorine to the effluent parameters of the testing program as these are parameters normally monitored from STP effluent and are listed as being requirements of Newmont policy.
2. All data on waste water treatment testing program should be made available for review.

5 HAZARDOUS MATERIALS MANAGEMENT

5.1 HAZARDOUS MATERIAL TRANSPORT, STORAGE, USE AND DISPOSAL

Project Strategy:

Hazardous material management is covered under a general Environmental Standard – Hazardous Material Management that is part of the NGGL IMS. There are also basic Environmental Standards specifically for hydrocarbon and cyanide management. At the Ahafo South location, the most critical hazardous material is cyanide. The Newmont Environmental Standard – Cyanide Management generally defers to the ICMC (the Cyanide Code) and includes controls to have in place to manage cyanide, including requirements for the transport of cyanide. NGGL also has controls in place to verify that fuel transport is conducted consistent under the Environmental Standard for Hydrocarbon Management.

Observations:

The ECMG observations have basically remained the same for the past several missions in the sense that hazardous materials are being properly managed. Transportation of hazardous materials is one of the activities associated with the greatest hazard, but Contractors' procedures for handling hazardous substances and segregation and management of hazardous substances are fully in place. Companies like Orica (cyanide transport) and Shell (fuel transport) have well-developed procedures to minimize the potential for accidents. Evidence that the overall system is working is that there has not been a significant spill of cyanide or fuel as part of the transport process. Good practice has been observed for the handling of hazardous materials in the workplace. Training, both for NGGL and Contractors' personnel, is continuing under NGGL's Maintenance Department responsibility.

5.2 CYANIDE MANAGEMENT

Project Strategy:

NGGL is certified under International Cyanide Management Code (Cyanide Code), a voluntary industry program for the gold mining industry to promote:

- responsible management of cyanide used in gold mining;
- enhance the protection of human health; and
- reduce the potential for environmental impacts.

Companies that become signatories to the Code must have their operations audited by an independent third party to demonstrate their compliance with the Code.

Cyanide is the means for extracting gold from the mined ore. The ore is first subject to crushing, grinding and milling and then processed with carbon-in-leach cyanidation, which is then followed by elution and refining for gold recovery. There is a secondary gravity flotation circuit for collecting gold concentrates for intense cyanidation and electrowinning prior to refining and gold recovery. Cyanide is delivered to the site as solid sodium cyanide in a truck-mounted isotank for solid-to-liquid sparging, which allows the cyanide supplier to mix the solid sodium cyanide with water at the site to achieve the required 30-percent strength for offloading in a designated mixing tank. The cyanide solution is conveyed from the mixing tank in use to storage tanks for delivery to the processing circuit. The cyanide solution conveyances are within double containment and pumped within instrumented and monitored pipelines.

After completion of the processing, the cyanide within the tailings is recycled by the Counter-Current Decantation plant to achieve acceptable wildlife and livestock contact concentrations (Weak Acid Dissociable [WAD] – cyanide concentration <50 mg/l) in the TSF, where the tailings are piped. The Project has committed not to discharge cyanide contaminated water into any stream within any receiving water body. The tailings water is decanted and conveyed back to the process facilities for re-use. Measures to prevent access by wildlife and livestock are required for all open waters (including tailings impoundments) where WAD cyanide is in excess of 50 mg/l. A hydrogen peroxide (H₂O₂) cyanide destruction unit is available on site for emergency use.

Observations:

NGGL operations continue to be certified to be in Full Compliance with the Cyanide Code. The requirements of the Code are associated with comprehensive requirements for cyanide transport, and the cyanide transportation is being managed by Orica, an international company also certified under the Cyanide Code.

With respect to cyanide waste from the processing plant, the Counter-Current Decantation plant continues to reduce the concentration of WAD cyanide by washing the tailings before they are discharged into the TSF. For 2011 (and up to January 8, 2012) all of the measurements are within standard of 50 mg/L at the spigot, the best yearly performance to date and based on approximately 750 measurements. The average WAD cyanide in the actual tailings reservoir as represented by the decant water was 0.04 ppm and the highest reading was only 1.65 mg/L, again the best yearly performance to date and well within the standard of 50 mg/L. During this field visit, the ECMG reviewed in detail the spill control measure implemented at the processing plant to prevent the occurrence of a cyanide spill similar to the one that occurred on October 12, 2009. The new spill containment systems include both physical and operational controls. The physical controls improve containment within the processing plant site in the event other systems fail during a process water overflow; augment the event pond pumping capacity to redirect process solution more quickly during rain events; and improve the reliability of the instrumentation and level detection systems. New operational controls improve onsite protocols and procedures and also improve and accelerate communication with stakeholders. The new systems and processes represent a significant effort and investment by NGGL to improve their ability to manage cyanide spills.

6 HEALTH, SAFETY AND LOSS PREVENTION

The discussion of HSLP has been expanded for this visit to include a preliminary review of the Subika Underground Project. The Project is not yet operational and is not yet a requirement of an ECMG review, but during this field visit the auditing team took the opportunity to gain some first impressions.

6.1 OCCUPATIONAL HEALTH & SAFETY MANAGEMENT

Project Strategy:

Project policy was described in the ECMG's report for the first site visit (December 2006), as follows:

“NGGL currently maintains and actively manages an extensive occupational health and safety program (“Loss Control”) at the Ahafo South Project site. The program, including appropriate training and monitoring procedures, will continue once operations commence to ensure high standards of health and safety are maintained.”

The policy and principles as evidenced in the first visit have not been modified and are still valid. A major difference is that since that first site visit the Health and Safety and Loss Prevention (HSLP) organization has prepared a complete set of plans and procedures, including for emergency response, to fulfill the requisites for certification under OSHAS 18001 requirements within the NGGL IMS. The basic standard for the HSLP within the IMS is the Management System Procedure – Occupational Health & Hygiene (September 2010) that requires the identification, management, and monitoring of occupational health and hygiene hazards within the workplace by utilizing a systematic approach that, at a minimum, includes the following:

- Occupational Exposure Limits;
- Hazard Communication;
- Training;
- Basic Characterization of the Workplace;
- Risk Assessments – both qualitative and quantitative assessments;
- Identification and Establishment of Similar Exposure Groups;
- Documented Monitoring Plan;
- Sample Identification and Tracking;
- Sample Results and Analysis;
- Employee Notification;
- Equipment Calibration;
- Hazard Control; and
- Records Management.

Community health and safety is also covered under the social plans within the IMS.

With respect to health, NGGL also has a Medical Programs Technical Standard that defines the requirements for physicals and standards for medical care. NGGL also has a comprehensive Malaria Management Plan.

Observations - Safety:

The Health and Safety program continues to grow and mature as the new plans and procedures within the new IMS have been finalized and are now implemented throughout the Project. The effectiveness of the HSLP programs is reflected in several aspect of the Project including accident statistics, the malaria prevention, the Industrial Hygiene/Occupational Health monitoring, and the HIV/Workers wellness program.

Over the past year the total recordable accident frequency ratio (TRAFR) 12-month moving average has remained leveled around the 0.35 average achieved towards the later part of 2010. The Project continues to strive for improvements and statistics show that the workplace safety is close to be as good as it can be expected. Outside-the-fence accidents have also been reduced in 2011, although there was one fatal vehicular accident recorded. NGGL has now installed GPS in all Project and contractors vehicles, including the busses used to transport workers to and from work. Currently only sub-subcontractors

vehicles, which account for about 2% of the total, are not provided with GPS but the Project plans to also equip these vehicles with GPS units. The GPS controls allow for speeders to be identified and disciplinary actions taken as needed. In addition, the Project has conducted workshops on traffic safety and is providing Department managers with daily updates on traffic non-compliances, effectively empowering each department in the control and management of traffic incidents. The effectiveness of these measures is reflected in the 80% reduction of accidents related to speeding recorded in the January to September 2011 period. Finally, NGGL has extended its traffic awareness program within the neighboring communities.

Another issue that was of concern in the past was drowning incidents associated with Ahafo South operations (two in 2005; one in 2009; and one in 2010). NGGL subsequently established a 24-hour patrol of the water bodies (ECDs and the WSF) and increased signage, both in English and local language all to further prevent trespassing into the restricted Mine areas where the water bodies are located. No drowning incidents were reported in 2011.

Observations - Health

NGGL continues in its aggressive program to ensure the use of malaria prophylaxis by their non-immune employees and its sustained effort to engineer earthworks and drainage in such a way as to eliminate potential breeding grounds. The HSLP department regularly undertakes periodic outdoor space spraying, using substances approved by the World Health Organization to further reduce the mosquito population. It should be noted that the composition of the chemicals used is periodically changed to prevent mosquitoes developing resistance. The malaria incidence rate for 2011 has remained at a low 1.4% within the fence with most new cases concerning workers living in the surrounding communities. The malaria program has also continued its community awareness program, with a particular focus on schools, and its bed nets distribution. In 2011, 2,500 additional bed nets were distributed within the surrounding communities in addition to the ~3,000 already handed out in 2010. Of note is the forthcoming publishing of a paper on the cost effectiveness of the Newmont malaria prevention program written by the Project entomologist.

Occupational health procedures and industrial hygiene monitoring continue to be fully implemented throughout the Project areas and have reached full maturity. This is indicated by changes in equipment and/or procedures brought by the results and analysis of workers' exposure monitoring activities. For example, high silica levels were detected in the ambient air in the pit areas; therefore the Project changed the dust masks for the workers (from cotton, one-use masks to a model with a plastic fitting and disposable cartridges). In 2011, three incidents of permanent hearing loss were the consequence of high noise levels recorded in the pits prompting the HSLP department to change ear plug types (the old ones were not used because they were uncomfortable), extending hearing protection requirements, and increasing enforcement. Finally, one case of high lead exposure was registered in the laboratory causing a prompt investigation to determine the causes and the implementation of a series of procedural changes, suggested by a specialized consultant, to eliminate potential exposure from cross contamination.

NGGL has a well-developed workplace and community-based health program. The Project continues its development of community-related programs (e.g. health programs and training with the collaboration of the Ghana Health Department, safety training and education, Community Integrated Management of child wellness, training of community based volunteers, etc.). Late in 2010 the Project launched a new Employee Wellbeing Program for which a baseline was completed in June 2011. The program involves voluntary testing of all workers and their families for HIV, TB, malaria, cancer, diabetes, hypertension, and hepatitis B with funds provided by NGGL, for two thirds, and the German Government under a Memorandum of Understanding signed in October 2010. Nineteen Peer Educators, from within the workforce and the local communities, have been trained to promote the new program and early results indicate the program is showing significant progress: 880 people were tested in 2010, 1,670 in 2011, with a 40% increase expected for 2012.

Recommendation:

1. The Ahafo workforce is now well receptive to new initiatives. It is recommended that NGGL managers adopt and embrace the Employee Wellbeing Program themselves to set an example for the workforce and improves its probability of being successful.

6.2 EMERGENCY PREPAREDNESS AND RESPONSE

Project Strategy:

NGGL emergency preparedness and response requirements are documented in an Emergency Response Plan that contains the following basic components:

- information about hazardous materials used, including their possible safety, health, environmental and social impacts and actions to prevent or mitigate this impact in case of accident;
- procedures for communication and emergency response;
- organization and responsibilities in case of emergency, including internal and external notifications via our Rapid Response System;
- availability of the necessary resources (e.g. Trained full-time emergency responders available 24/7, fire-fighting equipment, fire truck, 2 ambulances and other vehicles, spill response equipment, personal protective equipment) in case of emergency;
- full time medical staff including doctors, paramedics, nurses available 24/7 at an on-site clinic;
- methodology, plans and resources for medical evacuations;
- training for key personnel with emergency response responsibilities;
- testing of emergency response plan (e.g. simulation drills, actual drills); and
- periodic review of plan, including after the occurrence of incidents or emergency situations.

Additional aspects of emergency response are documented in the portions of the IMS dedicated to Accident/Incident Reporting and Investigation.

Observations:

The HSLP organization is fully staffed and equipped for emergency response. This team is capable of responding to on-site emergencies. Off-site emergencies, such as those that might be associated with cyanide or fuel transport, are managed by the contractors involved with the transportation. As also discussed in Section 1.1, a challenge for the HSLP Department will be to incorporate the new requirements of the IFC EHS Mining Guidelines, which emphasize enhanced interaction with local communities, governments, emergency responders and others with respect to emergency response following the APELL Handbook. An implication of the new IFC requirements is that the HSLP Department needs to integrate an approach to involve the community in all potential mine-related emergencies (failure of TSF; pipeline failure, e.g. leach solutions; transport of chemicals to and from site; spills of chemicals at site, e.g., fuel tank rupture, reagent store damage; and blasting and explosives accidents, which are likely to be the most significant emergency scenarios at Ahafo South). Currently, NGGL has an Emergency Response Plan dedicated primarily to ensuring worker safety and an Emergency Preparedness Plan that is not yet fully rolled out into the local communities.

6.3 SUBIKA UNDERGROUND PROJECT

During this field visit, the ECMG had the opportunity to conduct an initial visit of the Subika Underground Project and directly observe underground conditions. This project does not fall within the Ahafo South Project as audited by the ECMG until it becomes operational (estimated to be by the end of the second quarter 2012 if current plans go forward), but it was possible to make some unofficial observations with respect to the most critical health and safety systems. The Subika Underground project represents a new aspect to the HSLP program to fully incorporate the plans and procedures for underground operations into the current IMS. The Subika Underground project will also incorporate the requirements of the 2007 IFC EHS Mining Guidelines, which contain explicit requirements for the health and safety issues of underground operations, including:

- *Ventilation*
 1. Training of Operators & Maintenance Personnel;
 2. Surface Ventilation Unit Isolation from Risk;
 3. Auxiliary Fans;
 4. Mine Evacuation Program;
 5. Barricade Non-ventilated Areas; and

6. Ventilate to Return Airways Compressors, Fuel Bays.
 - *Dust Control for Blasting/Drilling/Material Transportation*
 - *Fires & Explosives*
 1. Fire hazard assessment (recurring);
 2. Warning Signs;
 3. Avoid Oil filled Transformers;
 4. Flammable Material Storage; and
 5. Conveyor Fire Control.
 - *Refuge Bays and Self Rescuers*
 1. Fire hazard assessment (recurring);
 2. Warning Signs; and
 3. Avoid Oil filled Transformers.
 - *Illumination*
 4. Separate and Independent Systems; and
 5. Cap Lamp

It is emphasized that this visit did not constitute a formal audit, but ECMG impression is that the Subika Underground project is being undertaken with the above-listed safeguards and that plans and procedures have already been developed such that it should be relatively easy to incorporate the project within the Ahafo South IMS.

7 CULTURAL RESOURCE MANAGEMENT

Project Strategy:

Cultural resource management is defined within the NGGL IMS as a Cultural; Resource Management Plan, dated February 2008, as a “related document” under the topic of Closure and Reclamation Planning. This Plan was developed in accordance with Newmont’s internal standard for the management of heritage sites and IFC Performance Standard 8 – Cultural Heritage (formerly Operational Policy 4.11 Physical Cultural Resources). During the process of achieving ISO 14001 compliance, some deficiencies to this document were identified, specifically with respect to its requirements for curating survey findings, recording data, and having a mechanism to involve local stakeholders in a periodic review of the Plan. Additional details to cultural resource management are now also provided in a Cultural Resource Management SOP.

Observations:

Over the past year, the main activity of NGGL for the Ahafo South Project has been the training of field personnel to be able to identify chance finds. Previous ECMG trip reports have highlighted a deficiency to NGGL’s CRM program in that site field personnel were not trained to identify cultural materials and archaeologists were not always present to identify inadvertent or chance finds made at the time of groundbreaking. A total of 25 individuals were trained in 2011 in accordance with the chance finds requirements of IFC Performance Standard 8. Chance finds were not identified over the past year and clearance to expand the mine footprint is based on archaeological surveying corresponding to the Subika, Apensu and Awonsu pits that was completed with the submission of site excavation reports in July 2008. The original archaeological baseline survey of the Amoma pit area was completed in February 2008 along with the rest of the Ahafo South and Ahafo North lease areas. These surveys were conducted under difficult field conditions prior to the clearing of vegetation.

Recommendation:

1. Given that it can be difficult to identify cultural heritage sites in the field prior to groundbreaking, it was expected that some chance finds would be made with the expansion of the mining footprint. Although it is to be commended that field personnel have received training in chance finds, it is still recommended that a professional archaeologist also check the ground as soon as vegetation is cleared in new areas.

8 TAILINGS STORAGE FACILITY (TSF)

This ECMG field visit differs from previous visits in that D'Appolonia's senior specialist on tailings facilities was able to participate in the audit. Accordingly, the review of the TSF is more comprehensive than undertaken in previous site visits.

Project Strategy and Operational Background of the TSF:

The TSF was designed by Knight Piésold Pty Ltd (KP) in 2004. The design of the tailings pumps, pipework and return water system were carried out by Lycopodium Engineering Pty Ltd. Construction management and QA/AC services are currently being self-performed by NGGL, supported by design and consultation services provided by Knight Piésold for the current phase of the facility expansion.

The TSF comprises a valley storage located 2 - 3 km west of the plant site. The storage is approximately 2,000 meters, from north to south, and has a decant tower that is equipped with two pumps and a spillway on the west side. The basin area is lined with HDPE where the supernatant pool collects (about 50% of the area) and where tailings accumulate with a low permeability soil liner (1×10^{-8} m/s), with an underdrainage network on top of the liners which flows by gravity to an inclined underdrainage sump at the south embankment. In addition, the facility has a leachate collection and recovery system (LCRS) beneath the liners that was constructed as part of the starter facility and flows by gravity to a separate inclined sump at the south embankment. Stage 7/8 of the TSF is under construction and anticipated to be completed in mid-2012 to provide an additional two years of capacity. The plans for final completion of the TSF are not yet finalized, pending decisions, yet to be made, on plant production expansion and mining associated with the Ahafo North area. The TSF is operated as a "zero discharge" facility, with all water returned for use in the ore processing circuit, and no water discharged to the environment.

The 8th ECMG audit includes consideration of the recent IFC Environmental, Health and Safety Guidelines for Mining (December 2007), which provide specific guidance on tailings management, including:

- Design, operation and management of structures in accordance with industry recognized standards, independent review at design and construction stages, and monitoring of the physical structure and water quality. Where there is a risk of high seismic loadings, the independent review should include a check of the maximum design earthquake assumptions and stability of the structure. Where possible liquefaction risks exist, including risks associated with seismic behavior, the design should take into consideration the maximum design earthquake;
- Design considering specific risks/hazards associated with geotechnical stability and hydraulic failure and associated risks to downstream economic assets, ecosystems and human health and safety. Emergency preparedness and response planning and containment/mitigation measures should be developed in case of catastrophic release of tailings and supernatant waters;
- Seepage management and stability considerations, including specific piezometer based monitoring system maintained throughout the structure life cycle;
- Consideration of zero discharge based on full water balance considering risk assessment for the mine process circuit including storage reservoirs and tailings structure. Use of natural and synthetic liners to minimize risks;
- Design considers the Probable Maximum Flood event and required freeboard to safely contain it (depending of site-specific risks) across the planned life of the tailings structure, including its decommissioned phase);
- Isolation acid leachate-generating material from oxidation or percolating water, such as subsequent dewatering and capping of tailings; and
- Consideration of thickening or formation of paste for backfilling pits and underground workings during mine progression.

The Tailings Management Plan was recently updated (August 2011) and documents design and operations associated with tailings and related structures management refers to the Operations Manual for TSF operations, which should be updated regularly to reflect the current stage of operation, reference levels, and associated guidance. The Tailings Management Plan will be updated to reflect the Stage 7/8 construction. The Tailings Management Plan documents the design references and operating guidance, and includes monitoring programs together with an independent annual review of construction of the TSF, and contains emergency preparedness and response planning for potential catastrophic release of tailings and supernatant

waters. Seepage, piezometers, and monitoring wells are addressed, along with freeboard. Thus, the Tailings Management Plan addresses much of the IFC guidance for tailings. An additional guidance document for emergency preparedness and response planning for the TSF, as cited in the 2007 IFC Mining Guidance, is the United Nations Environmental Programme *APELL for Mining, Guidance for the Mining Industry in Raising Awareness and Preparedness for Emergencies at Local Level* (Technical Report No. 41, 2001). This document is referenced by the IFC Mining Guidance for working with the local community for emergency response planning, including awareness of emergency actions in response to potential catastrophic release of tailings. The Emergency Preparedness Plan prepared for the TSF and technical components in support of the plan (flood routing and inundation mapping) are critical documents for working with the local community.

The Tailings Management Plan requires that a Risk Assessment be carried out annually to review operational risks related to the TSF and WSF, and the Emergency Response Plan.

Relative to seismic loadings and design, the TSF site has been characterized in the 2005 design review (CAM) as very low in seismicity. This review expressed the opinion that the 10,000 year return period earthquake would produce a lower seismic loading than adopted in the KP design that included a pseudo-static slope stability analysis using a value of 0.2 g acceleration. While this design loading may be viewed as conservative, if encountered could pose a liquefaction risk for saturated tailings. Thus, centerline and upstream construction considered for the North Embankment should address liquefaction and associated slope stability concerns. Furthermore, with consideration of increased plant production, such analyses should be considered in the development of TSF expansion plans. Cone penetrometer testing conducted for the development of Stage 5/6 should provide initial information to preliminarily assess liquefaction susceptibility.

Operation of the Counter Current Decantation (CCD) system at the plant has reliably reduced the WAD Cyanide levels in tailings discharged to the TSF, with all discharges in 2011 within the standard of 50 mg/l. Monitoring of the supernatant decant water has demonstrated lowest levels to date, as discussed in greater detail in Section 5.2. Cyanide levels within the Leachate Collection and Recovery System (LCRS) and groundwater are very low, and KP's annual audit report cites that seepage through the TSF liner system is generally good, with groundwater levels within limits, except as discussed in Section 2.3.

Observations during the 8th ECMG audit, as described below, identify issues that vary from the cited guidance or require input and clarification to be consistent with the 2007 IFC Mining Guidelines.

Observations:

The 7th ECMG site visit in December 2010 observed that Golder Associates conducted an independent audit to meet the requirements of IFC OP 4.37. This audit addressed construction and operation of the TSF, but did not completely address the design basis for freeboard. In addition, to recognizing concerns for the accumulation of supernatant volume and need to achieve the design tailings discharge solids content of 47-percent to reach desired beach slope, the Golder Associates report also raised two additional design issues:

- Potential damage of the HDPE liner during late stage operations due to shear stresses during tailings consolidation; and
- Potential need for an intermediate drain at the base of the Stage 5/6 embankment, and documentation if constructed.

These two design issues were brought to the design engineer's attention (Knight Piesold - KP) and their response and resolution is documented in the 2011 3rd Quarter TSM Meeting and Inspection Report. KP's position regarding the HDPE liner is that the liner is anchored at each construction stage which minimizes the span and loading associated with tailings, and the loading from tailings will not affect the future liner integrity. With respect to the potential need for the intermediate drain, KP position is that with use of the modified centerline construction method, the extent that the embankment stage construction extends over tailings is limited, and their assessments indicated that the drain is not required. The accumulation of supernatant water represents a threat to expand the pond beyond the limits of HDPE lining, compromises freeboard, and affects tailings deposition. Efforts to control and reduce the supernatant volume are focused on recovery and use within the plant, and KP's August 2011 Audit Report found that the supernatant level, while still too high, is being controlled within the TSF lined with HDPE and cited the need for reduction. In January 2012, it appeared that the level has declined by more than one meter, which would be a

significant reduction in supernatant volume, due to use in the plant and seasonal dry Harmattan conditions. Options to reduce the supernatant volume continue to be considered (including a water treatment plant of mine pit dewatering to allow discharge, resulting in the use of more supernatant water in the plant). The evaluation of the water balance considering a potential expansion of plant production suggests that the supernatant water will rapidly decrease due to increased water demand. KP's 2011 audit also noted an apparent increase in percent solids of the tailings discharge (average of 41 percent), and improvement in the beach slope (from 0.54 to 0.64 percent), with recommendation for further increase, as much as possible, to improve the integrity of the North Embankment beach slope that must support centerline construction for future embankment stages.

TSF freeboard between the supernatant pool level and spillway ensures that the impoundment can operate with zero discharge. The design basis for freeboard, as reported in the Operating Guidelines prepared by KP (updated July 2006) indicates that the impoundment capacity includes retention of the 1:100 year storm event or wet year condition, and that the emergency spillway provides a capacity of 1:100 year storm event. The emergency spillway is designed for the 1:100 year storm event during the operating stages, and upon reclamation the Probable Maximum Flood. Monitoring of freeboard in the inspection checklist cites comparison with a reference level of 1.2 meters, and according to KP's August 2011 Audit Report, freeboard was 3.8 meters. Freeboard appeared to exceed this value based on visual observation in January 2012.

The IFC Guidelines (December 2007) cite the management strategy of zero discharge from the TSF, and maintenance of freeboard for the Probable Maximum Flood, which is consistent with other industry standards for impoundments of this hazard classification during the life of the facility. In order to meet this criterion, a freeboard analysis considering the Probable Maximum Precipitation, rather than the 1:100 year storm event, would identify the associated freeboard reference value for the current stage of operation and for future planned stages, with periodic checks performed to confirm requirements as the impoundment configuration changes.

The monitoring of water quality should include assessment of TSF performance, including evaluation of supernatant decant pond water, LCRS water, underdrain water and groundwater well bores. Sulfate levels detected in the LCRS generally track the levels in the supernatant decant pond, although levels detected in the underdrain system are lower and do not appear to correlate with the decant pond or LCRS. Metals concentrations are generally low. Cobalt is detected in the decant pond, underdrain and LCRS at similar levels, and recently has been detected at one of the monitoring well bores at low levels. The water quality at the TSF and downstream areas should be evaluated on an on-going basis and associated risks addressed if necessary.

During the site visit, Stage 7/8 construction was proceeding with placement of materials in embankment zones and extension of the liner system. The TSF Operations Manual and design drawings call for placement of Zone B materials (washed sand suitable as Zone C filter) between Zone C (Run of Mine rock) and Zone A (select low permeability materials). The slope of these zones is indicated to be 3:1 (horizontal:vertical). Observations at the West and South Embankments indicated steeper slopes, and the zone material being placed directly against Zone C rock fill appeared insufficiently graded to provide for separation or filtering.

Recommendations:

1. Evaluate the 2007 IFC Mining Guidelines and initiate engineering studies to demonstrate compliance. Specific issues include freeboard analysis considering the Probable Maximum Flood during TSF operation, and liquefaction analysis under the Maximum Design Earthquake. Given the consideration for increased plant production which will require expansion of the TSF, these studies should be implemented as part of long term planning.
2. Evaluate water quality data for the TSF decant pond, LCRS, underdrains and groundwater monitoring bores to assess performance of the lining system and impacts to the downstream environment (see also recommendations in Section 2.2).
3. As part of implementing emergency awareness with the community, consider effective measures to raise awareness and integrate emergency planning associated with the TSF based on the APELL document. Specifically, prepare a plan to engage the community with respect to emergency response and planning, including communication systems and contacts, assessment of

capabilities and needs for community response to emergencies, and updating system and frequency.

4. Lower supernatant decant pond level to ensure that pond is restricted to within HDPE lined area, and monitor freeboard relative to re-evaluated freeboard requirements.
5. Evaluate the required slope and need for transition material or compatibility of fine materials being placed adjacent embankment rock fill materials in Stage 7/8 along the West and South Embankments, considering current design requirements and future expansion considerations.