CHAPTER 5
ENVIRONMENTAL AND SOCIAL ACTION PLAN

INTRODUCTION

This chapter describes Newmont Ghana Gold Ltd.'s (NGGL) Environmental and Social Action Plan consisting of management programs, data requirements, resource-specific mitigation measures, monitoring plans, and implementation schedules. This plan will be implemented during all phases of the Ahafo South Project, including construction, operation, and post operational periods. The intent of the plan is to eliminate, offset, or reduce to acceptable levels any adverse social, environmental, and occupational safety-related impacts. The plan includes action items and identifies data needed to implement these measures.

The Environmental and Social Action Plan identifies feasible and cost-effective management programs and specific mitigation measures expected to reduce potentially adverse impacts to acceptable levels. The environmental monitoring aspect of the plan provides a check to determine effectiveness of mitigation during all phases of the project. The plan also provides for timely and effective implementation of mitigation by specifying institutional responsibilities, an implementation schedule, and cost estimates. Finally, the plan is an integral component of the Ahafo South Project's overall planning, design, budget, and implementation. As an adaptive management strategy, the plan provides for modifications over time if information shows that changes should be implemented.

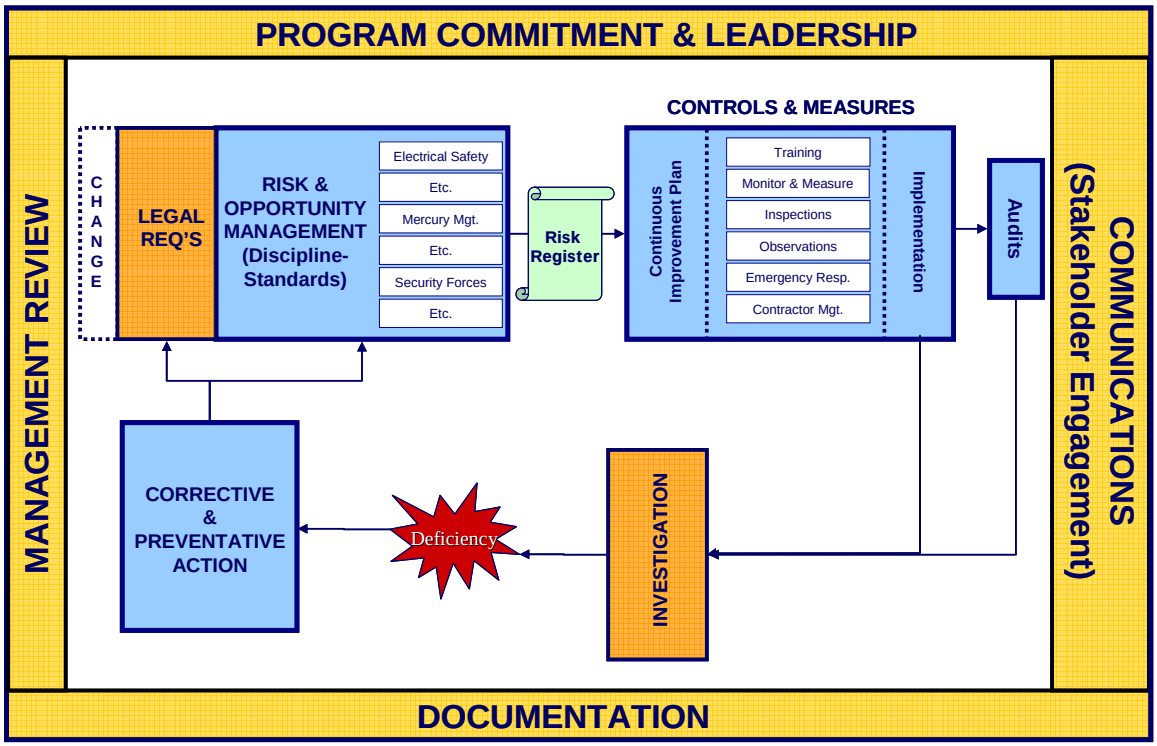
MANAGEMENT SYSTEMS

NGGL believes that social responsibility is essential to long-term success of the mining business. This philosophy extends to its workforce, communities directly impacted by mining activities, and other external stakeholders such as our shareholders, local and national governments, special interest groups, and non-governmental organizations (NGOs). NGGL recognizes three disciplines that comprise the core foundation of social responsibility: (1) Community and External Relations; (2) Environmental Stewardship, and (3) Health, Safety and Loss Prevention. NGGL is committed to achieving the highest standard of performance in these areas through responsible management of activities throughout various stages of the Project as described in this chapter. The Five Star Management Systems (plan, do, check, act) will be used to monitor implementation of the social, environmental, and health, safety, and loss prevention action plans.

FIVE STAR MANAGEMENT SYSTEM (Five Star)

Five Star is a global management system developed in-house by Newmont and administered by the corporate office to drive outstanding performance and continual improvement in the areas of social responsibility, environmental management, and occupational health and safety. Five Star is unique in that it includes discipline-specific standards to manage risks that are specific to the mining industry. The Five Star program is described in more detail in Chapter 1.

The core of Five Star is its management system standards and discipline-specific standards. These standards establish minimum expected behaviors and actions in order to drive consistency and continual improvement throughout Newmont. The Five Star model shows how these standards drive this functionality:



FIVE STAR ASSESSMENTS

A Five Star Assessment is conducted annually at each operation, in accordance with the Five Star Assessment Schedule, to provide an indication on how effectively Five Star has been implemented. Stringent assessment procedures and scoring criteria ensure a consistent and rigorous approach to the assessments. Use of external, independent assessors provides a credibility that enables Newmont to demonstrate our performance to external stakeholders while also providing accurate information to enable the internal identification of the strengths and weaknesses of the Management System. NGGL will implement the management system during 2005 and a baseline assessment will be conducted to establish a basis to measure continuous improvement.

SOCIAL ACTION PLAN

The following section presents the primary components of the Social Action Plan for the Ahafo South Project, which has been identified to focus on social impacts presented in Chapter 4 – *Affected Environment and Human/Environmental Impacts*. The majority of the actions/programs were previously introduced in Chapter 4. The description of each potential impact, mitigation measure, and additional action required is provided in **Table 5-1**. An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source are shown in **Table 5-2.** More detail regarding community and external relations programs for the Ahafo South Project is included in Chapter 2 – *Project Description*.

TABLE 5-1
Summary of Potential Impacts to the Human Environment, Mitigation Measures, and Additional Actions Required
Ahafo South Project

Potential Impact	Mitigation Measures	Additional Actions Required
Resettlement and Relocation of Local Communities		
Minimize number of Project affected people: 823 residential household physically displaced Minimize loss of agricultural areas and crops: 878 farming households economically displaced	Conformance to the Resettlement Action Plan principles and practices Completion of resettlement villages Complete compensation process	Follow-up with displaced Project affected people Monitor quality of life issues for Project affected people
Loss of feeling of well-being	Conduct open and transparent interactions, including periodic informational meetings between NGGL and Project affected people and settlements	Evaluate RP Monitor impact of LEEP money management seminar
Local Infrastructure Pressures		
Lack of local knowledge to develop and/or manage infrastructure	Train members of local water and sanitation committees Establish multi-stakeholder task force to manage infrastructure development	Community Infrastructure audit Implement LEEP Phase 2 and Community Development program with objective to improve infrastructure
Increased pressure on existing infrastructure.	Maintain local hiring policy and training program to reduce in-migration and maintain employee busing from other communities within daily commuting distance.	
Employment, Training, and Educational Opportunities		
Increased employment opportunities Decreased poverty	Local hiring policy increases opportunities for Project affected persons to find salaried work Wage rate is adequate to pay unskilled laborers up to $2,700 per year, 10 times the current average income	Monitor/evaluate hiring/recruitment program Introduce skilled trade training program Develop and support Phase 2 of the LEEP
Improved skill base of local residents	Construction and staffing of training center at Yamfo Enhance livelihood capabilities of local residents Development of partnerships with local universities and technical facilities	
Local Economic Opportunities and Business Development		
Increases in indirect employment related to Project needs	Encourage SME and local supply opportunities Document local supply and procurement capacity Build procurement linkages with local business	
Increase business development unrelated to Project	Assist in development of sustainable business enterprises Identify new markets for local businesses	Develop and support Phase 2 of the LEEP

TABLE 5-1
Summary of Potential Impacts to the Human Environment, Mitigation Measures, and Additional Actions Required
Ahafo South Project

Potential Impact	Mitigation Measures	Additional Actions Required
Community Health		
Increased prevalence of disease: Infectious diseases Malaria HIV/AIDS	Document existing health conditions of Project affected people Implement community health awareness programs Implement Malaria and HIV/AIDS policies for employees and contractors Develop education program for HIV/AIDS on supply route corridors	Complete community health survey
Ongoing Public Consultation and Disclosure		
Project affected people lack experience in decision-making	Continue capacity building for local residents in conflict resolution	Monitor and evaluate the PCDP
Build an atmosphere of understanding that will actively involve individuals, groups, and organizations	Transition from the RNC to the CLC with appropriate training and capacity building for new members	
Continue to build broad community support for the Project	Maintain a variety of public involvement techniques and media presentations	
Cultural Resources		
Losing artifacts and historical/archaeological information and disturbance of graves.	NGGL will notify appropriate authorities of discovery of cultural artifacts or historical features, and will work with authorities to mitigate any potential disturbances in accordance with cultural or policy guidelines. Conduct a survey among Community leaders and the Community in general to understand any specific cultural aspect of the area (i.e., cultural significance of the Tano River) and take appropriate measures as required in accordance with findings of these specific surveys	Develop cultural resources management plan Implement Newmont Policy S 0.021 Continue to conduct ceremonies in accordance with local traditions as required if a shrine or sacred site is to be disturbed.
Visual Quality		
Modifying existing landscape.	Waste rock disposal facilities will be designed, where practicable, with boundaries to blend with surrounding topography. Disturbed areas no longer required for operation will be reclaimed concurrently with operations.	Inspect reclaimed areas for vegetation rooting success, and erosion control.
Noise and Vibration		
Increasing general level of noise and vibration within the vicinity of operations.	Blasting times will be made known to the public to avoid surprise effects. Sign boards will be located at strategic locations to inform people in Ntotoroso, Gyedu, Kenyase 1, and Kenyase 2 of scheduled blasting. Blasting will be performed only during daylight hours. Vibration induced by blasting will be minimized	Implement noise monitoring program.

TABLE 5-1
Summary of Potential Impacts to the Human Environment, Mitigation Measures, and Additional Actions Required
Ahafo South Project

Potential Impact	Mitigation Measures	Additional Actions Required
	because controlled blasting technology will be applied. All private buildings and infrastructure within 500m of the mine pit will be relocated.	
Generating continuous and intermittent noise and vibrations from mining activities.	A noise monitoring program will be implemented to ensure noise from activities and equipment at mine facilities meet or fall below noise guidelines established by Ghana EPA at the nearest residential uses to the mine site. Blasting demonstration will be organized for public witnessing under the close supervision of the Ghana EPA and the relevant governmental and traditional authorities.	

Notes: RP = Resettlement program; LEEP = Livelihood Enhancement and Community Empowerment Program; SME = Small and medium Enterprises; RNC = Resettlement Negotiation Committee; CLC = Consultative Liaison Committee; PCDP = Public Consultation and Disclosure Plan.

TABLE 5-2
Social Action Plan

General Action	Specific Related Impact	Specific Activity/Action	Schedule	Estimated Cost /Recurrent Cost US$	Funding Source
Resettlement/ Relocation of Local Communities	Loss of homes and farming areas	Implement resettlement and compensation plans Complete construction of resettlement villages Complete compensation process Monitor impact of LEEP money management seminar	February 2004 December 2005 August 2005 - Ongoing	\$26.3 million for resettlement villages, and direct compensation Included in cost of LEEP	NGGL Ahafo Project Development Budget Included in cost of LEEP
	Loss of feeling of well-being	Conduct open and transparent interactions, with Project affected people	February 2003 – April 2005 On-going	NA	Included in NGGL External Affairs Resettlement Program Budget
Local Infrastructure	Increased pressure on existing infrastructure	Local improvements already made; wells, street lighting, schools, road/drainage improvements. Pre-operational Community Development initiatives and LEEP Phase I Implement LEEP Phase 2 infrastructure improvement program	Pre-construction - Construction 2nd Quarter 2006 Operations	Approximately \$300,000 to date Included in cost of LEEP Included in cost of LEEP	NGGL Operations Budget*
Employment, Training, and Educational Opportunities	Improve skill base of local residents, focus job opportunities towards local hires	Introduce employment pool training program LEEP Phase I – Vocational Training Youth Project Construction semi-skilled training program Operational skill training to maximize local employment Implement LEEP Phase 2 enhance livelihood capacities program	February 2004 2nd Quarter 2006 November 2004 October 2005 July 2006	\$100,000 Included in cost of LEEP \$80,000 \$400,000 (includes cost of training simulator) Included in cost of LEEP	NGGL Operations Budget* Capital Construction Budget* NGGL Operations Budget*
Local Economic Opportunities and Business Development	Increase business development unrelated to Project	LEEP Phase I - implementation Implement LEEP Phase 2 enhance livelihood capacities program Evaluation of opportunities for Local	February 2005-June 2006 July 2006	\$715,000 LEEP Phase 2 (first 5 years) is budgeted at \$500,000 per year of which a portion will be for Local	Included in NGGL Operational Budget*

TABLE 5-2
Social Action Plan

General Action	Specific Related Impact	Specific Activity/Action	Schedule	Estimated Cost /Recurrent Cost US$	Funding Source
		Procurement of goods and services for Project Development and Operations	Ongoing	Economic Opportunities and SME Development	
Community Health	Increased prevalence of disease: Infectious diseases Malaria HIV/AIDS	Evaluate status and capacity of community health conditions and health providers with CU Medical Team	April 2005 – Ongoing	$366,000	Newmont Mining Corporation
		Complete community health survey (CU Medical Team and Kintampo Research Center)	4th Quarter 2005/1st Quarter 2006	$350,000	Included in NGGL Operational Budget*
		Implement community health awareness,	Included in LEEP Phase 2 – July 2006		Included in NGGL Operational Budget*
		Malaria, and HIV/AIDS policies for employees and contractors	Policies for employees and contractors – July 2005/ongoing	Included in NGGL Operational Budget*	Included in NGGL Operational Budget*
Ongoing Public Consultation and Disclosure	Project affected people must continue to be involved in the Project	Continue to build and assess broad community support for the Project	February 2003 – Ongoing	$30,000	Included in NGGL External Affairs Budget
		Continue meetings and other consultation activities			
		Continue working directly with RNC/CLC and Womens' Committee			
Cultural Resources	Potential destruction of resources	Develop cultural resources management plan	Cultural resources survey completed and potential impacts identified. Plan to be completed by December 2005	$30,000 Included in NGGL Operational Budget*	NGGL
Visual Quality	Modifying existing landscape	Inspect reclaimed areas for vegetation success, and erosion control.	April 2004 – On-going	Included in Construction Budget*	NGGL
Noise and Vibration	Increasing general level of noise and vibration within the vicinity of construction and operations.	Implement noise monitoring program	Construction - Operations	Additional equipment $18,000 and ongoing in NGGL Operational Budget*	NGGL
Five Star Management	Stakeholder engagement	System implementation in Community Relations Department	First audit September 2005 and ongoing	Included in NGGL Operational Budget*	NGGL
System Implementation		Conduct baseline Five-Star Assessment	September 2005	Included in NGGL Operational Budget*	NGGL
		Develop continuous	September 2005 - ongoing	Included in NGGL	NGGL

TABLE 5-2
Social Action Plan

General Action	Specific Related Impact	Specific Activity/Action	Schedule	Estimated Cost /Recurrent Cost US$	Funding Source
		improvement action plan		Budgets*	
		Conduct annual Five-Star Assessments	Annual	Included in NGGL Budgets*	NGGL
External Evaluations					
Resettlement Program	Effectiveness of the RAP Effectiveness of RP and impact on Project affected people	Evaluation study Evaluation study Annual third party evaluations beginning in 2006	Study completed and implemented in 2005, Updates in 2006 and every year for next 5 years Annual	$22,000 Included in NGGL Budgets* $100,000/yr	NGGL
LEEP	Effectiveness of Phase 1 activities	Evaluation study	First half - 2006	$30,000	NGGL
LEEP	Effectiveness of Phase 2 activities	Evaluation study	Operations - 2007	$30,000	NGGL
RAP Independent Review (F.Giovannetti)	Initial RAP Implementation Effectiveness	Implement 10 Recommendations	September 2006	$22,000 Included in NGGL Budgets*	NGGL
Ongoing RAP Implemenation Independent Reviews	Independent review of RAP Implementation	Conduct Scheduled Reviews	December 2005 March 2006 September 2006	$20,000 $20,000 $20,000	NGGL
Fallow Land Study	Loss of land availability due to Fallow Land not being compensated	Conduct participatory study with local Traditional Authorities to quantify Fallow Land impacts and identify appropriate mitigation. Included in monitoring program	Initial Study completed by July 2006	Included in NGGL Budgets*	NGGL
RAP Monitoring Program	Resettlement Effectiveness	Implementation of the Monitoring Program specified in the RAP (pA 2005)	2nd Quarter 2006	Incorporated in to Annual Operating Budget*	NGGL
PCDP Monitoring Program	Are stakeholders effective participants in the outreach program	Effectiveness of PCDP including stakeholder inclusiveness and participation	Annual Report to IFC	Incorporated in Annual Operating Budget*	NGGL
Expanded Baseline Data Collection					
Infrastructure Audit	Data augmentation	Pre-operation and Closure Planning	June 2006	$50,000	Operations Budget*
Community Health Survey	Data augmentation	Baseline health conditions of Project affected people	4th Quarter 2005	Included in Community Health Survey cost	NGGL

Notes: LEEP = Livelihood Enhancement and Community Empowerment Program; PCDP = Public Consultation and Disclosure Plan; IFC = International Finance Corporation. 2nd Quarter 2006 is the expected time frame for operations startup. *Budgets for overall operations, annual operations budget, and construction budget have not been fully developed. Items included in the Table that are components of these budgets and will be addressed as the budgets are finalized.

The primary social impacts addressed in this action plan include:

- Resettlement and relocation of local communities;
- Local infrastructure pressures;
- Employment, training, and educational opportunities;
- Local economic opportunities and business development;
- Community health and safety; and
- On-going public consultation and disclosure.

RESETTLEMENT AND RELOCATION OF LOCAL COMMUNITIES

COMPLETION OF RELOCATION ACTIVITIES

In order for the Project to develop safely, NGGL has relocated families and compensated for agricultural crops and building structures. In consultation with the Resettlement Negotiation Committee, NGGL has acquired land and buildings and is in the process of constructing resettlement communities. Current plans are for the communities to accommodate approximately 823 resettled households. Types of impacts considered eligible for compensation include loss of crops and structures. As of August 2005, NGGL has compensated Project affected people for the losses of their homes, a total of $920,694 (US) (¢8,286,246,000), and compensated farmers a total of $12,878,990 (US) (¢115,910,910,000). In addition to cash compensations, NGGL provided a training allowances for each person/household receiving cash compensation, whether for structures or crops, to attend a money management seminar designed and presented by Opportunities Industrialization Centers International (OICI).

NGGL has reduced the scope of physical and economic displacement associated with the Project through the following measures:

- Minimizing the size of mine infrastructure elements and shortening distances between them, in order to reduce overall disturbance as much as possible;
- Minimizing buffers around mine infrastructure in order to reduce the Project area as much as possible without compromising the health and safety of nearby residents;
- Restricting construction of mine-related infrastructure to rural, sparsely settled areas, distant from towns and major public facilities or infrastructure (pA 2005);
- Improving livelihoods and standard of living of those adversely affected by land acquisition and resettlement activities; and
- Involving displaced people in the decision making process of resettlement and help them benefit from the Project.

RECONSTITUTION OF THE RESETTLEMENT NEGOTIATION COMMITTEE

The existing Resettlement Negotiation Committee, upon conclusion of its mandate to manage resettlement and compensation issues, will be reconstituted with broader stakeholder representation as a Consultative Liaison Committee (CLC) providing a structured and sustainable consultation mechanism for the life of the Project. This committee will address all communities in NGGL operational areas in the coming months.

MONITORING AND EVALUATION OF THE RESETTLEMENT PROGRAM

Monitoring and evaluation are key components of the Resettlement Action Plan (RAP) and, as such, are part of Newmont's commitments to the Ahafo South Project. Monitoring and evaluation have the following general objectives:

- Monitoring of specific situations or difficulties arising from initiation of resettlement activities; and
- Evaluation of mid- and long-term impacts of resettlement on impacted household livelihoods, environment, location capacities, economic development, and settlement.

Monitoring will be performed by project-appointed consultants, working with impacted communities. Project-impacted communities will participate fully in the selection, design and application of methods chosen for monitoring, with the CLC central to this participation. The Project will monitor (a) inputs and (b) impacts.

Input monitoring will address:

- Negotiation process and execution of negotiated agreements;
- Supervision of infrastructure and housing construction, commissioning and testing of the technical components of the resettlement housing;
- Implementation organization – adequacy of staff and means vis-à-vis tasks; and
- Grievances and grievance management system.

Impact monitoring will include:

- Status of resettlers and relocatees, access to employment, cost of housing in the area, re-establishment of agriculture, and state of vulnerable persons;
- Livelihood restoration and skills enhancement;
- Skills enhancement and recruitment of Project-affected people;
- Sustainability of land use; and
- Health of project impacted persons and host communities.

Project monitoring will continue for the life of the mine with annual monitoring reports prepared and made accessible to the public.

Monitoring data will be analyzed on an ongoing basis by NGGL Community Relations and Development staff to ensure that:

- Resettlement goals and objectives are being met;
- Resettlers/relocatees are enjoying improved quality of life;
- No unforeseen impacts have emerged; and
- Resettlement villages are functioning as intended.

This will allow alteration of ongoing management of the program as necessary.

The evaluation will be conducted by an independent consultant or NGO with experience in resettlement design and practical implementation, and with no previous involvement in the Project. Independent evaluation of the resettlement implementation will take place in three stages following similar methodologies and using the same indicators:

- Within one year after the first resettlements and relocations occur;
- Two years after full completion of the implementation; and
- Five years after full completion of implementation and every five years thereafter through the post-closure monitoring period (a period lasting approximately three years after closure and reclamation activities are complete).

Resettlement evaluation has the following specific objectives:

- Provide a general assessment of the level of compliance in implementation of the RP with objectives and methods set out in this document;
- Provide a general assessment of the level of compliance in implementation of the RP with the laws, regulations and safeguard policies referred to above;
- Provide an assessment of resettlement and relocation procedures as they have been implemented;
- Provide an evaluation of the impact of the RP on income and standard of living, with a focus on the "no worse-off if not better-off" objective; and
- Identify actions to take as part of the on-going monitoring to improve the positive impacts of the RP and to mitigate any negative impacts.

Resettlement implementation will be evaluated against the following indicators, applied to both resettlement villages:

- Technical factors related to housing – durability of materials, maintenance requirements, and cost;
- Architectural and functional factors related to housing – convenience, satisfaction of inhabitants of both sexes; and
- Socioeconomic factors – access to employment, livelihood restoration, and agriculture.

Vulnerable persons will be put into specific focus, and the methods for assisting them will be assessed.

The grievance management system will also be evaluated.

A description of each potential resettlement and relocation impact, mitigation measure, and additional action required is provided in **Table 5-1.** An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source are shown in **Table 5-2**. Justification for managing these issues includes:

- Provide impacted people/households with a choice between acceptable, fair, and equitable alternatives for compensation;
- Restore and improve livelihood and welfare of impacted people, households, and communities such that they are equal to or better off than before Project impact;
- Address immediate, interim, and long-term well-being of impacted people/households; and
- Reward self-reliance, encourage self-help and respect, and build upon the socioeconomy of the Study Area.

LOCAL INFRASTRUCTURE PRESSURES

Mine development may potentially increase use of existing infrastructure due to in-migration of people seeking employment. The presence of employees relocating from outside areas may increase competition for basic services and may exceed existing infrastructure capacities.

To address stresses on infrastructure and mitigate lost infrastructure in the Study area, NGGL has created a community development program targeting infrastructure improvement. The level of service for the infrastructure system adopted for the Project is based on the following:

- Existing level of service in host communities (i.e., Kenyasi II and Ntotoroso);
- Standards and guidelines recommended by various Ghana Government regulatory agencies; and
- World Bank and other applicable international standards / guidelines.

Infrastructure projects will adhere to the following standards:

- **Roads and Drainage:** Ghana Planning Standards and Road Design Guide from the Ghana Highway Authority (March 1991 Edition) and World Bank Guidelines.

- **Water Supply:** Ghana Planning Standards, Community Water and Sanitation Agency (CWSA) and World Bank Guidelines.

- **Sanitation and Sewage:** Community Water and Sanitation Agency and Ghana National Building Regulations (1996, L.I. 1630).

- **Solid Waste:** Ghana Planning Standard and Ghana National Building Regulations (1996, L.I. 1630).

- **Electricity:** Volta River Authority, local electric distribution company, and the Ghana Planning Regulations.

With respect to education facilities, NGGL is in the process of designing and constructing the following schools to replace – and improve upon – existing facilities in the Study area.

- Kenyase II West Resettlement Village

  - 1 three-classroom block with a store, library and two offices;
  - 2 three-classroom blocks; each with a store, and an office; and
  - 1 four-seat Ventilated Improved Pit latrine.

- Ntotoroso South Resettlement Village

  - 1 five-classroom block with a store and an office;
  - 1 three-classroom block with a staff common room;
  - 1 six-seat Ventilated Improved Pit latrine;
  - 1 two-seat Ventilated Improved Pit latrine for staff; and
  - Urinal.

The description of each potential infrastructure impact, mitigation measure, and additional action required is provided in **Table 5-1**. An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source are shown in **Table 5-2.** Justifications for managing these issues include:

- Increased pressure on accommodation, health, education, and sanitation resulting in inadequate supply;

- Increase local government capacity to handle the issue;

- Limited health facilities will impact health care (malaria, HIV/AIDS, infectious diseases); and

- Water infrastructure will be required to mitigate potential impacts to local water supply.

EMPLOYMENT, TRAINING, AND EDUCATIONAL OPPORTUNITIES

Over 1,000 long term direct (either employed by NGGL or one of its contractors) jobs will be created to construct and operate the Ahafo South Project. NGGL has introduced a proactive local recruitment policy, with a skills training program component, to ensure maximum local capture of the economic benefits of the Project. This program applies equally to NGGL's contractors.

People that will be resettled, residents of the five surrounding communities (i.e. Kenyase I, Kenyase 2, Ntotoroso, Gyedu and Wamahinso) in the Study Area are entitled to 80 percent of unskilled positions at NGGL and its contractors. Residents of the neighboring communities of Yamfo, Terchire, Adrobaa, Susuanso, Hwidiem, Nkaseim, Tanoso, Afrisipa, and Obengkrom are, based on population, entitled to a relative share of 10 percent of unskilled positions. The remaining 10 percent of unskilled jobs will be filled by appointees of government officials, chiefs, and chief farmers (pA 2005). This quota system was developed in consultation and agreement with the local communities. Members of the local community participate in the vetting process to verify local residency status. While specific targets have not been set for skilled recruitment, policies are in place to support and encourage local capture of these positions.

Employing local residents will help decrease the poverty rate in the Study area and the surrounding region. Average annual income of unskilled workers from the Study area is estimated to be ¢24,360,000 ($2,700 US) per year. Senior Ghanaian staff are estimated to earn up to ¢100,200,000 ($11,133 US) per year.

NGGL estimates that an additional 5.4 people will be supported by each local worker from the Study area, given the existing population per household of 6.4 (the dependency factor). This will be new money invested in the community to use on household and personal needs, thus spreading the reach of salaries to increases in indirect employment.

Given that the Study area is rural, few existing residents have appropriate industrial job skills. NGGL is training locally sourced employees at its training center in Yamfo but anticipates hiring a number of workers with required skills from other areas in Ghana. NGGL will develop the local community and promote local employment through its education and career-based training programs.

NGGL anticipates this approach will have cost and efficiency implications, particularly at start-up, but is considered essential to demonstrating its social responsibility. In the long-term, maximizing the use of local labor resources will reduce administration costs and reduce allowances related to relocation, accommodation, and transport.

EMPLOYMENT MONITORING PROGRAM

Training candidates for NGGL and Contractor employee positions is closely monitored and evaluated as is the continuing employment of all NGGL employees. In the unskilled labor pool, where over 650 trainees will receive both basic skills training and workplace and NGGL values orientation, all trainees are carefully tracked and measured against goals by use of a standard, consistent assessment tool. Documented results of this training become a part of the trainee's permanent file and constitute a part of the overall profile by which Newmont and Contractors drawing from the labor pool make their hiring decisions.

Skills training, which is done in association with local and regional government training centers and technical Institutes, is similarly managed and class room and hands-on work is graded and grades recorded. In some areas internationally recognized certifications through United Kingdom (UK) Cities and Guilds are earned.

Newmont employee performance is monitored and managed by a formal Performance Management System. This is an ongoing career development and performance management tool which aligns employee objectives to that of their work group and manages employee performance through periodic communications. Performance is documented for employee records at year end and this becomes a basis for both promotion and salary increases.

The description of each potential employment impact, mitigation measure, and additional action required is provided in **Table 5-1**. An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source are shown in **Table 5-2**. Justifications for managing these issues include:

- Provide long-term stable employment;
- Decrease poverty;
- Maximize local resources;
- Increase skills in the local area;
- Reduce in-migration and disruption to existing social structure; and
- Minimize pressure on local housing market to provide in-migrant housing.

LOCAL ECONOMIC OPPORTUNITIES AND BUSINESS DEVELOPMENT

LOCAL ECONOMY AND BUSINESS DEVELOPMENT

Participation in the provision of goods and services is a basic component of creating value for local communities and affected populations. The following section identifies opportunities that will be evaluated relative to local procurement of goods and services for construction and operation of the Ahafo South Project. Generation of local procurement opportunities is naturally limited by local markets, business capacity and local skill; however, evaluation and capacity building facilitate the recognition and matching of local skills to procurement needs that can then be diversified over time.

BUSINESS DEVELOPMENT MONITORING

NGGL will evaluate losses in productive capacity of the land affected by mining by reviewing the breadth of the loss. NGGL would follow this analysis by identifying opportunities to assist or facilitate improvements to sustainable food and cash crop production off-site among local farmers through the following activities:

- Training in sustainable and diversified food and cash crop production;
- Training in sustainable livestock and aquaculture systems;
- Provision and facilitation of access to agricultural inputs (e.g., fertilizer and seed), equipment, and tools;
- Training in participatory farm management and agri-business development and marketing;
- Bio-intensive gardening; and
- Improved marketing of agricultural products.

LIVELIHOOD ENHANCEMENT AND COMMUNITY EMPOWERMENT PROGRAM IMPLEMENTATION

OICI designed a Project-specific Livelihood Enhancement and Community Empowerment Program (LEEP) based on the census and socioeconomic survey the NGO-partner performed in 2004 to mitigate the loss of future income from farming and improve the livelihood of those affected by resettlement. LEEP Phase 1, launched February 15, 2005, is a comprehensive 18-month program that is the initial phase of a larger 5-year development plan that will be implemented when mine operations start in July 2006. The goal of LEEP is to improve livelihood security and quality of life to residents of towns and surrounding rural communities in the Study area directly and/or indirectly affected by the Project.

LEEP PROGRAM OBJECTIVES

1. To enhance livelihood capacity of an estimated 2,000 households in income generating activities, alternative livelihoods, and improved farm techniques through programs designed to:
    - Provide training for increasing crop yield and improving storage methods;
    - Provide technical and vocational skill training to enhance employment and self-employment opportunities; and
    - Provide micro-credit training for business creation, expansion, and performance.
2. To enhance human capabilities of an estimated 2,000 households in health, nutrition, and education by improving the quality of life of the households through programs designed to:
    - Increase access to potable water and sanitation facilities for 10,000 people;
    - Rehabilitate and equip health care facilities to improve health and nutrition practices;
    - Provide additional sources of potable water and sanitation facilities; and
    - Construct or rehabilitate schools to increase access to quality education, skills training, and recreation.

3. To enhance community resiliency and participation of resettled and relocated populations through programs designed to:

   - Provide training and counseling on financial management, entrepreneurial skills, and business development to encourage creation of small and medium enterprises for income generation;

   - Provide training in problem solving to increase social/organizational and motivational capacity; and

   - Provide training for local governments to respond to mining operations and community development issues.

MONITORING LEEP

Monitoring and evaluation are an integral part of the LEEP Phase I activities. The design of the project provides a logical framework that links project activities to expected results, which in turn relate to the LEEP objectives and overall goal. The design also contains impact indicators that help measure progress toward achieving results. Tracking Project impact and follow-up is the responsibility of all staff assigned to the Project. OICI staff will visit sites and stakeholders associated with the Project to interview, survey, and evaluate progress.

OICI staff collects the data from field reports, surveys, and interviews, which are then incorporated into a management information system for analysis and reporting. OICI will implement a performance tracking system using its experience in database management for program and resource development purposes.

The description of potential local economic opportunities and business development impact, mitigation measure, and additional action required is provided in **Table 5-1**. An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source for the Social Action Plan are shown in **Table 5-2.** Justifications for managing these issues include:

- Procuring locally can decrease poverty and increase entrepreneurial capacity and broaden potential markets;

- Competition from community members to gain share of procurement promotes product and service choices;

- Improve productivity of the workforce by building reputation among government, stakeholders, NGOs banks/financiers, and improve productivity of workforce; and

- Enable local economy to diversify to reduce long-term dependency on the Project for post-closure economic success.

COMMUNITY HEALTH AND SAFETY

Development and upgrading roads that access the Project as well as increased heavy vehicle traffic will likely increase risks to local residents' health and safety. Additional traffic volumes around existing towns could increase this impact. In order to mitigate these hazards, strict codes of conduct will be implemented for mine personnel operating heavy and light vehicles to minimize traffic hazards. Information should be distributed to local residents highlighting health and safety risks in the Study area. In addition, NGGL will design and build haul and access roads in a manner which facilitates safe and efficient movement of local people as well as vehicles.

Several types of waste would be generated during construction and operation of the Ahafo South Project including: household waste (sanitary wastewater, domestic trash); non-toxic industrial waste (tires, discarded metal parts and fittings, plastic packaging and containers); waste oil and filters; refinery slags and cupels (recycled into the milling circuit); and solid and liquid laboratory waste (acidic and aqueous solutions, solvents, crucibles, cupels, and slag). This waste will be managed to prevent pollution of the physical environment surrounding the infrastructure. Infrastructure planning and environmental management will be implemented to minimize or eliminate potential impacts.

Waste disposal will be conducted in accordance with NGGL waste disposal protocols. Some mine waste may be of use to local communities (e.g. tin cans, plastic) To prevent potential accidents with these items, agreement should be reached between the developer and local representatives identifying recyclable material that is not dangerous to people's health. Such items could be separately disposed of while other materials would be disposed of at a designated and managed disposal site.

Risk of accidents and potential chemical spills during transport must be recognized. Use of these materials in the processing plant will be managed with engineering controls combined with proper training and handling procedures. NGGL has generated safety procedures, standard operating procedures, and quality procedures to address all aspects of construction and operational phases of the Ahafo South Project, including documents on transportation, handling chemicals, operating machinery, and emergency response procedures. Training for mine workers include proper handling, use, storage, transport, cleanup, and disposal of chemical reagents used for processing ore.

The national road infrastructure is under authority of Ghanaian public services and is not within NGGL's control. Specific measures will be implemented during transport of materials (particularly hazardous chemicals) along national roads. Appropriate convoy structures will be identified to protect transport vehicles, local inhabitants, and other road users from potential accidents. Emergency procedures will be established that provide immediate response along the entire transport corridor, should an accident and/or spillage occur. To date, these protocols include use of pilot cars to accompany each shipment of chemicals to the Project site, as well as conducting safety audits of all transportation routes (Morrow 2005).

Construction activities that result in installation of ponds or reservoirs (e.g., the water storage facility; environmental control ponds) often result in an increase in waterborne disease such as malaria or schistosomiasis (bilharzias). Project construction camps will be near the Subri Reservoir. To prevent a major increase in waterborne diseases, NGGL will implement the following measures:

- Establish a fishery resource in the Subri Reservoir known to feed on insect larva, including mosquito larvae;

- Develop an educational program related to waterborne disease and on parasite cycles of selected species such as *Schstosoma spp;*

- Prevent community or residential development adjacent to the reservoir; and

- Monitor presence of vector-borne diseases in the reservoir (SGS 2000a).

NGGL is committed to reducing and controlling mosquito presence in and around Company-provided living, dining, recreational facilities, and working locations to reduce exposure to individuals. NGGL has developed a malaria prevention program, summarized below and presented in full in **Appendix A:**

- The NGGL Director of Human Resources is responsible for development, implementation, and maintenance of the Malaria Procedure for Ghana and addendums;

- Managers of Environmental and Safety Departments are responsible for safe use and application of anti-mosquito chemicals used in spraying and fogging activities;

- Contractors are responsible for implementing and managing mosquito control programs as directed by NGGL through purchase order or contract documents; and

- Anti-malaria precautions will be implemented to protect employees and their families from mosquito bites.

In African countries with a high incidence of HIV/AIDS, groups most affected are between 16 and 36/40 years of age, the age of males most likely to seek employment at the mine. Infection rate among women is also increasing. The potential issue associated with public and employee health is the increase in HIV/AIDS prevalence among communities and workforce due to increased population, transporters to the mine, and temporary migrant workers. Mitigation of HIV/AIDS will be a joint effort between NGGL, health authorities, and community leadership.

NGGL has adopted HIV/AIDS standards and guidelines summarized below and presented in full in **Appendix A.** The workplace and community programs addressing HIV/AIDS are consistent with NGGL's social responsibility policy and represents ethical responses to the threat of HIV/AIDS.

NGGL has made the following commitments in its HIV/AIDS policy:

- To ensure that non-discriminatory policies, procedures, and practices regarding HIV+ workers are instituted and maintained;

- To provide information and communication to workers about the disease and how to prevent infection;

- To treat HIV/AIDS in the same manner as any other progressive or debilitating illness; and

- To develop clearly-defined procedures that reflects Ghanaian practices, procedures, culture, and legislation.

NGGL has hired an HIV/AIDS Coordinator for voluntary prevalence testing and counseling. Employees infected with the virus will be counseled and receive anti-retroviral treatment. NGGL will also identify and train peer counselors and community educators to provide services in the field.

MONITORING COMMUNITY HEALTH PROGRAMS

NGGL is conducting a baseline study of community health factors based on World Health Organization criteria, which will provide information to evaluate community health policies and standards.

A description of each potential community health and safety impact, mitigation measure, and additional action required is provided in **Table 5-1**. An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source for the Social Action Plan are shown in **Table 5-2.** Justification for managing these diseases includes:

- Minimizing lost productivity;
- Contributes to community health; and
- Helps manage a national/international crisis. Management of these diseases is a national priority for the Ghanaian government.

ON-GOING PUBLIC CONSULTATION AND DISCLOSURE

A Public Consultation and Disclosure Plan (PCDP) has been prepared for the Ahafo South Project. The goal of the PCDP program is to improve and facilitate decision making and build an atmosphere of understanding to actively involve individuals, groups, and organizations that can affect or be affected, in some way, by development of the Project.

The main objectives of the program are to:

- Keep stakeholders informed as to the activities of NGGL;
- Generate and document broad community support for the Project;
- Improve communications between interested parties;
- Document development of formal public consultation; and
- Establish formal grievance submittal/resolution mechanisms.

Providing access to information about mine plans/activities to external stakeholders is expected to have the following benefits:

- Building of trust;
- Relationship building;
- Increased accountability and transparency;

- Reduced litigation;
- Increased business opportunities and improved reputation;
- Increased productivity; and
- Continuous improvement in operations.

MONITORING AND EVALUATION OF THE PCDP

Monitoring and evaluation of the program and behavior of the parties will enable program evolution and improvements over time. The NGGL External Affairs Department is responsible for managing the PCDP, with assistance from the Community Relations Manager, the Ahafo Communications Officer, and the Ahafo Resettlement Project Manager. When necessary, support will be provided by the regional Communications Manager and Land Access Manager. The NGGL Regional Manager and the Ahafo South Project General Manager are responsible for an annual review of the PCDP and will sign the annual report sent to the IFC.

A description of each potential resettlement and relocation impact, mitigation measure, and additional action required is provided in **Table 5-1**. An Implementation Schedule, Capital Cost Estimate, Recurrent Cost Estimate, and Funding Source for the Social Action Plan are shown in **Table 5-2.** Justification for managing these issues includes:

- Ability to assess community vulnerabilities and expectations;
- Help promote community stability;
- Assist in maintaining productivity;
- Protects company's reputation; and
- Conforms to the NGGL's Social Responsibility Policy.

FIVE STAR MANAGEMENT SYSTEM

Monitoring and evaluation of the Social Action Plan and specific programs that are, or will be, implemented for the Ahafo South Project will be reviewed under Newmont's Five Star Management System. The specific components of the Five Star system are described in detail in Chapter 1. Implementation schedule of the Five Star program is included in **Table 5-2**.

ENVIRONMENTAL ACTION PLAN

This section summarizes potential environmental impacts of the Ahafo South Project as presented in Chapter 4 – *Affected Environment and Human/Environmental Impacts* along with identified environmental control mechanisms and additional actions required to mitigate and/or manage impacts. Chapter 2 – *Project Description* provides a detailed description of the Ahafo South Project and environmental controls that will be used to address impacts. Chapter 4 – *Affected Environment and Human/Environmental/ Impacts* provides descriptions of potential impacts of the Project on the physical, biological, and human environment.

ENVIRONMENTAL MANAGEMENT PROGRAMS

NGGL is committed to design, develop, and operate the Ahafo South Project in a manner that will protect environmental quality and human health in the Project area. Upon completion of mining activity, reclamation will re-establish vegetation and stabilize disturbed areas such that the reclaimed site is compatible with the surrounding landscape and can support pre-mining agriculturally based land uses. Mine and process facilities will be designed and operated to protect the environment, consistent with Ghanaian laws.

MANAGEMENT OF ENVIRONMENTAL IMPACTS

Potential impacts to environmental resources that could result from the Ahafo South Project are summarized in **Table 5-3**. Environmental controls that NGGL has included in the design and operation of the Project are included in the table, as well as environmental monitoring activities which will be conducted to identify impacts which may exceed expected levels. Detailed description of the Ahafo South Project is contained in Chapter 2 – *Project Description.*

Potential mitigation measures, management actions, and technical studies that would provide additional protection, reduce impacts, or provide information from which to improve management decisions are presented in **Table 5-4**. **Table 5-4** also includes the estimated schedule and budget for implementation of mitigation measures and management actions, and identifies responsible parties for implementing the measures/actions. Detailed descriptions of potential impacts of the Project are included in Chapter 4 – *Affected Environment and Human/Environmental Impacts*.

NGGL's implementation schedule and capital/recurrent cost estimates for mitigation measures outlined in this Environmental and Social Action Plan are included in **Table 5-4**. For each management action, funding sources have been assigned to the NGGL construction or operations budget, depending on the Project phase.

TABLE 5-3
Summary of Potential Impacts and Environmental Monitoring and Control Measures
Ahafo South Project

Potential Impact	Environmental Control Measures	Additional Actions Required
Air Quality		
Fugitive dust generated during mine operations resulting from blasting, ore, and waste rock hauling, dumping, grading, and backfilling actions.	Fugitive dust emissions will be controlled through use of direct water application, chemical binders, or wetting agents. Disturbed areas will be revegetated concurrent with operations where possible.	Implement air monitoring programs for dust and gaseous emissions.
Dust generated from increased vehicle travel through villages.	Speed limits are set for vehicles traveling through populated areas to limit dust generation. Haul roads will be maintained on a continuous basis to ensure safety and minimize fugitive dust emissions.	
Dust generated from transfer points on conveyor systems, grinding and milling operations, and stockpiling.	Dust suppression sprays and dry dust collection systems will be installed on respective ore crushing circuits and all ore transfer points in the plant.	
Gaseous emissions resulting from operation of mine equipment and light vehicles.	Gaseous emissions will be minimized through proper operation and maintenance of equipment.	
Surface Water Resources		
Degraded surface water quality as a result of direct disturbance to the land (increased erosion and sedimentation), and exposure of fresh rock and mineral surfaces to weathering and leaching (potential for acid generation and/or increased leaching of metals).	Seasonal surface water that flows toward the mine facilities will be diverted in channels designed to transport the 100-year, 24-hour storm event. Runoff from disturbed areas and water that collects in the mine pits during operations will be diverted to one of the environmental control dams. If the mine pits remain open after cessation of mining, diversion channels will prevent natural surface water runoff from entering the mine pits. Waste rock dumps will be placed on a low permeability layer and covered with growth medium. A minimum 1 percent gradient would be maintained on lift surfaces to further reduce infiltration. Potentially acid-generating (PAG) waste rock will be encapsulated within the waste rock dumps using acid-neutralizing rock with an overlying low permeability layer. This will limit exposure of PAG rock to meteoric water. Waste rock dumps will be inspected quarterly and following heavy precipitation to detect abnormal conditions.	Implement surface water quality programs.
Accidental spills of chemicals and petroleum products used for mine processing activities.	Emergency response plans, backup systems, and treatment methods have been developed to prevent or respond to spills of mine process chemicals and fuels. Discharge of water containing cyanide or other chemicals will be prevented by operating all gold extraction and processing operations using a water/chemical solution recycle system. No effluent will be released to the environment, except possibly under an accident.	

TABLE 5-3
Summary of Potential Impacts and Environmental Monitoring and Control Measures
Ahafo South Project

Potential Impact	Environmental Control Measures	Additional Actions Required
Blocking or diverting surface water flow from natural drainages.	Water quality and flow will be monitored in the Subri and Awonsu streams and at other seep/spring locations. Mine closure actions will include removal of sediment accumulated behind environmental control dams and the dams will be breached to restore free-flowing conditions.	
Short-term increase in sediment load to drainages during construction of road crossings.	Roads will be constructed with ditches and culverts to collect and convey water runoff from road surfaces to sediment traps or ponds.	
Changes in topography resulting from mining activities that progressively modify watershed characteristics of the Tano River sub-basins.	Implement Best Management Practices (BMPs) to prevent or reduce increased sediment load to streams outside of direct disturbance areas.	
Increasing overland runoff volume as a result of vegetation removal for land development.	Disturbed areas will be revegetated concurrent with operations where possible.	
Surface water captured by mine-related facilities and not released back into the natural drainages, affecting downstream water users.	Excess water that collects in the tailing storage facility will be recycled to a process water pond at the plant site. No settlements will be developed below the tailing storage facility within the mining concession boundary. Continued operation of the water storage facility will be a potential source for potable water in the area.	
Waste rock dumps increase overland runoff due to steeper slopes and less vegetative cover; these effects would be localized.	Waste rock dumps will be inspected quarterly and following heavy precipitation to detect abnormal conditions.	
Mine pit dewatering increasing stream flow if discharged to drainages.	Only water that meets applicable water quality standards and that is approved by the Ghana EPA will be discharged from the facility.	
Groundwater Resources		
Localized groundwater drawdown immediately surrounding the mine pits.	After cessation of mining and dewatering, pit lakes will develop in each mine pit, with water levels eventually approaching pre-mine elevations (20 to 30 meters below ground surface).	Implement groundwater monitoring programs.
Potential impacts to groundwater quality from the waste rock dumps, tailing storage facility, ore stockpiles, mine pits, septic systems, landfills, or spills of chemicals and fuels.	Potentially acid-generating (PAG) rock will be encapsulated within the waste rock dumps using acid-neutralizing rock with an overlying low permeability layer. This will limit exposure of PAG rock to meteoric water. To prevent leakage, the process water pond will have multiple geomembrane liners and a leachate collection system, and the ore stockpiles will be constructed on low permeability clay material.	

TABLE 5-3
Summary of Potential Impacts and Environmental Monitoring and Control Measures
Ahafo South Project

Potential Impact	Environmental Control Measures	Additional Actions Required
	The tailing storage facility would be constructed with a low permeability base, and geomembrane liner where beneath the supernatant pond. An underdrain collection system will be constructed at the base of the facility to collect and discharge any seepage to a collection pond. Reclamation of the tailing storage facility and waste rock dumps will minimize infiltration of precipitation into these facilities. Groundwater monitoring wells will be installed downgradient of the tailing storage facility and waste rock dumps, and sampled at a frequency and duration per approval of Ghana EPA. Community boreholes and potable water wells will be monitored for water quality and water elevations to ensure sources are unaffected by dewatering activities. Continued operation of the water storage facility will recharge groundwater with good quality water.	
Soil Resources		
Surface disturbance resulting in reduced fertility, loss of soil structure, reduced infiltration and water holding capacity, erosion, and reduced productivity	NGGL will salvage soil to be used in reclamation. Stormwater-related erosion will be controlled using various BMPs, including brush barriers, sediment ponds, small check dams, sediment fences, and other controls until vegetation is established to provide stable soil conditions. All surface-disturbing activities will be conducted in accordance with project sediment control guidelines/BMPs and an approved Construction Management Plan. Regraded areas will be ripped and scarified to reduce soil compaction. Previously salvaged growth media will be placed to a minimum depth required to support plant community development over regraded areas, finish graded, fertilized, and seeded.	Visually inspect revegetated areas for rooting success or erosion. Inspect stormwater collection points and integrity of BMPs following storm events.
Increased soil erosion due to vegetation removal, and immediately following soil replacement before new vegetation has been established.	Disturbed areas will be revegetated concurrent with operations where possible.	
Impacting previously uncultivated areas as relocated populations begin to relocate crops.	Deforestation and land clearance will be limited to the extent practicable and will be conducted only on an as-needed basis.	

TABLE 5-3
Summary of Potential Impacts and Environmental Monitoring and Control Measures
Ahafo South Project

Potential Impact	Environmental Control Measures	Additional Actions Required
Flora		
Ground disturbance and vehicular traffic increasing incidence of noxious weed invasion. Removing agricultural crops, trees, and other plant species during surface disturbance actions. Crop and timber production potential on unreclaimed disturbed land would be permanently lost. Increased population density creating an increased demand for crop production. Site-specific and local reductions in crop land from mine footprint would increase demand for unaffected land outside of mine disturbance area for crop production, charcoal, and other natural amenities derived from plant communities. Shortened fallow cycles and reduced productivity of land over the long-term due to increased local demands for production of food crops and cash crops.	A noxious weed monitoring and control plan will be developed to ensure that reclaimed areas are protected from noxious weed invasion. Disturbed areas no longer essential for mine operations will be reclaimed concurrent with mining activities.	Conduct biannual monitoring to determine plant community characteristics, including herbaceous cover, production, and species diversity.
Fauna		
Removing wildlife habitat at locations of mine pits, waste rock dumps, tailing storage facility, and other ancillary facilities; also reducing availability of forage, security, and breeding cover for wildlife inhabiting the area. Species dependent on these sites would die or be displaced. Displaced animals may be incorporated into adjacent populations, depending on variables such as species behavior, density, and habitat quality. Adjacent populations may experience increased mortality, decreased reproductive rates, or other compensatory or additive responses.	Fencing around mine pit rims will prevent or minimize terrestrial wildlife from entering the pits. Some species of wildlife could use additional habitat developed on the waste rock dumps if slopes are reduced. Administrative controls, including policies that prohibit employees and contractors from engaging in hunting activities on all mine properties, will be implemented. Continued operation of the water storage facility will provide an environment for fish.	Continue collecting fauna data to augment baseline studies. Inspect fences and other controls designed to safeguard wildlife. Monitor reclamation areas to verify habitat regeneration. Monitor water quality to insure quality is protective of human health and the environment
Permanent loss of habitat for terrestrial species at the mine pit areas. If water in the pits contains high concentrations of heavy metals or other toxic constituents, long-term ingestion by wildlife may pose a risk to some species.	Depending on water quality in the pit lakes, some species of bats, birds, and other wildlife may be able to use the pit lakes as a drinking water source.	
Destruction of Black Kite young and eggs if nesting trees are removed. Mortality of bush baby and Bosman's potto as trees are removed. Habitat loss and mortality of species with conservation priority (First Schedule Ghana Wildlife Regulations), as a result of the Ahafo	Reclamation of the tailing storage facility will benefit wildlife.	

TABLE 5-3
Summary of Potential Impacts and Environmental Monitoring and Control Measures
Ahafo South Project

Potential Impact	Environmental Control Measures	Additional Actions Required
South Project, resulting in site-specific loss of biodiversity. Population densities of species of conservation priority would be reduced or eliminated on mined areas.		
Forest Reserves		
Indirect impacts may occur related to potential induced activity related to improved access and/or use of Forest Reserve areas due to increased workers in the Project area.	See Biodiversity Management Program discussion in Chapter 5 Environmental and Social Action Plan	Implement Biodiversity Work Plan.
Wetlands		
Filling wetlands in the Subri drainage as a result of construction of the tailing storage facility and water storage dam.	New wetlands will be created by the water storage facility and possibly environmental control dams. The net effect is likely that more wetlands would be created than destroyed.	Inspect environmental control dams and other sediment controls.
Changes in hydrological regime possibly reducing wetland areas downstream from water impoundments and mine pits.	All surface-disturbing activities will be conducted in accordance with project sediment control guidelines/BMPs and an approved Construction Management Plan.	
Increasing sediment in wetland areas from soil disturbance associated with mine development and operation.	Seasonal surface water that flows toward the mine facilities will be diverted in channels around the facilities and back to natural drainages. Runoff from disturbed areas and water that collects in the mine pits during operations will be diverted to one of the environmental control dams.	
Aquatic Organisms		
Altering natural stream flow patterns as a result of mine facility construction will affect fish and aquatic insects present in the stream.	Minimize disturbance of natural drainages to the extent possible.	Implement water quality monitoring programs.
Increased breeding habitat for mosquitoes and aquatic invertebrates such as snails at the water storage facility. Because mosquitoes are carriers of malaria, and snails are host for a stage in life cycle of a parasite that causes disease bilharzia in humans, humans may be negatively affected by enhanced habitat for aquatic organisms.	Establish fishery resource in water storage facility with species known to feed on insect, including mosquito, larva.	
Mine pits remaining after mining will partially fill with water. Depending on water quality, these water bodies may become habitat for fish and other aquatic organisms. If water quality is poor, fish and aquatic organisms likely would not become established in the pit lakes.	Seasonal surface water that flows toward the mine facilities will be diverted in channels around the facilities and back to natural drainages. Runoff from disturbed areas and water that collects in the mine pits during operations will be diverted to one of the environmental control dams. Water quality and/or flow rates will be measured monthly, quarterly, or semi-annually at designated springs/seeps and surface water stations.	

TABLE 5-4
Environmental Action Plan

General Action	Specific Related Impact	Specific Activity/Action	Schedule	Estimated Cost /Recurrent Cost US$	Funding Source
Dust Emissions	Elevated Fugitive Dust	Construction/Road watering	May 2004	150,000/150,000	Projects Construction Budget
		Mine Operations/Road watering and engineering controls	November 2005	2,700,000/600,000	Operations Budget
		Facility Reclamation	Completion of operations	See Reclamation and closure below	Operations Budget
Water Quantity	Reduction of Surface Water Flow	Construction of ECDs and water storage reservoir/Monitoring & provision of alternative water sources to impacted population.	April 2005	2,000,000/100,000	Project Construction/ Operations Budget
	Reduction of Groundwater table	Mine Dewatering	November 2005	500,000/1,200,000	Operations Budget
Water Quality	Erosion/Sediment Release	Pre-Construction/ Develop Sediment control guidelines	October 2003	Included in Construction Costs	Completed
		Construction/Concurrent reclamation, implement BMPs, construction of Sediment control structures (ECDs)	April 2004	500,000/300,000	Projects Construction Budget
		Mine Operations/Concurrent reclamation, BMPs, surface water management & sediment control structures	November 2005	See Reclamation and closure below	Projects Construction Budget
		Facility Reclamation	Completion of Operations	300,000/100,000	Operations Budget
	Process Solution Release	Mine Operation/Engineering controls, training, contingency planning	Design Phase Completed. Operations planning ongoing	Included in Construction Costs.	Projects Construction Budget
	Cyanide Management*	Mine Operation/ICMC implementation including external audits	Design Phase completed-development of contingency plans and other related ICMC requirements during Pre-operations	60,000/40,000	Operations Budget
	Acid Rock Drainage (ARD)	Mine Operations/ongoing characterization testing and monitoring	Contingency if ARD develops	Included in Mine Operation Costs	Operations Budget
		Reclamation	Completion of Operations	Included in Mine Operations Costs	Operations Budget
Hazardous Materials	Materials Safety	Project Wide	Previously Completed	Not Applicable	Procedures Implemented

TABLE 5-4
Environmental Action Plan

General Action	Specific Related Impact	Specific Activity/Action	Schedule	Estimated Cost /Recurrent Cost US$	Funding Source
Occupational Health and Safety	Health and Safety	Project Wide	Previously Completed	Not Applicable	Procedures Implemented
Emergency Response*	Facility Safety	Project Wide	Previously Completed	Not Applicable	Procedures Implemented
Waste Management*	Waste Management	Project Wide	Previously Completed	Not Applicable	Procedures Implemented
Reclamation Closure*	Facility Reclamation	Project Wide	Draft Plan developed for feasibility Study. Draft Plan updated in 2005.	53,000,000	Operations budget
Five Star Management	Stakeholder engagement	System implementation in Community Relations Department	2nd Quarter 2006	Included in Department Overhead	Operations budget
System Implementation		Conduct baseline Five-Star Assessment	2nd Quarter 2006	Included in Department Overhead	Operations budget
		Develop continuous improvement action plan	2nd Quarter 2006	Included in Department budget	Operations budget
		Conduct annual Five-Star Assessments	Annual	Included in Depart. Overhead	Operations budget
Environmental Studies					
Pit Lake Study – Site Water Balance	Groundwater quality- pit lake water quality	Closure planning	Study being implemented in 2005	Included in Department Budget	Operations budget
Environmental Geochemistry Confirmation Testing	Reactivity of rock in response to exposure to oxygen and water	Waste Dump Management and Closure planning	Study being implemented in 2005	Included in Department Budget	Operations budget
Biodiversity Management	Promote biodiversity in affected areas	Pre-operation, operation, and closure planning	Pre-operation beginning in 2005	50,000/25,000	Operations budget
Evaluate CN Risk on fauna and livestock	Concentration of WAD CN and CN complexes in TSF supernatant pond	Pre-operation risk assessment of TSF operation	2nd Quarter 2006	50,000/0	Operations Budget
Expanded Baseline Data Collection					
Soil Survey	Data augmentation	Pre-operation and Closure Planning	June 2006	50,000	Operations budget
Fauna	Data augmentation	Pre-operation and Closure Planning	January 2005	25,000/50,000	Operations budget

Notes: ECDs = Environmental Control Dams; BMPs = Best Management Practices; ICMC = International Cyanide Management Code. Operations are expected to begin in 2nd Quarter 2006; activities scheduled during this time frame would be completed prior to operations startup.

* Various plans in development phase will be finalized by 2nd Quarter 2006 or within initial startup phase to allow plans to be field-fit to actual site conditions. All plans will be disclosed to the various agencies, institutions involved in plan implementation. Other plans will be disclosed as specified by Newmont 5 Star Management System standards and consistent with IFC Safeguard policies.

BIODIVERSITY MANAGEMENT PROGRAM

Biodiversity is a measure of the variety of life, and its processes, including the variety of living organisms, genetic differences among them, and the communities and ecosystems in which they occur (Langner and Flather 1994). Biodiversity is often interpreted as a measure of biological complexity and variation within the Project area. Although there is no specific regulatory guidance on methods for assessing and monitoring biodiversity, the concept is widely interpreted as a measure of ecosystem integrity and stability. Following the Convention on Biological Diversity at the 1992 UNEP Earth Summit, international projects funded by the World Bank and many other ending institutions undergo biodiversity assessments and monitoring.

Biodiversity management will be incorporated into the Ahafo South Project environmental management program to promote biodiversity conservation related to the following activities. Of obvious importance is the proximity of Forest Reserve areas to the Ahafo South Project mine development and future foreseeable actions that may encroach upon established Forest Reserve areas. Biodiversity management opportunities will be evaluated for both on-site and off-site applicability:

On-Site Biodiversity Management

- Interim Reclamation and Management; and
- Final Reclamation and Management.

Off-Site Biodiversity Management

- Natural Habitat Biodiversity Improvement;
- Natural Habitat Conservation Management; and
- Biodiversity Offset Projects (Forest Reserve Impact Mitigation).

Biodiversity Partnership

NGGL has established a partnership with Conservation International-Ghana to collectively explore opportunities for integrating biodiversity management into the Ahafo South Project. General areas of focus for the partnership are listed below and will form the basis for NGGL's Biodiversity Management Program.

- Integrate biodiversity conservation with NGGL's environmental policies, operating standards, and management system;
- Develop and apply indicators for tracking and benchmarking performance in regard to biodiversity conservation;
- Share biodiversity information and scientific and technical expertise to assess biodiversity resources, identify biodiversity priority areas, and implement landscape scale conservation planning methodology and pilot projects;

- Identify opportunities to make strategic investment in regional efforts to achieve clear and measurable conservation outcomes in areas of interest to members of the partnership;

- Promote biodiversity conservation within the mining sector; and

- Communicate and promote with key stakeholders about partnership and key activities.

NGGL and Conservation International–Ghana have identified a work plan that will be implemented at the Ahafo South Project area during 2005. The work plan activities are described in Chapter 4 and are designed to develop a full understanding of biodiversity conditions in and around the Project area to determine management opportunities related to current and future foreseeable actions which may impact local biodiversity and likewise identify, where necessary, off-site offset projects which enhance biodiversity conditions in areas which contain greater biodiversity value. Key components of the work plan are:

- Integrate biodiversity conservation with NGGL environmental standards and develop meaningful biodiversity indicators;

- Integrate NGGL's environmental management strategies relative to landscape-scale conservation planning and priority setting;

- Identify opportunities for NGGL to make targeted, outcome-driven conservation investments in Ghana; and

- Promote biodiversity conservation concepts within the mining sector.

The Star Rating System for plant and animal species in Ghana is described in the *Flora* and *Fauna* sections of Chapter 4. This system provides for a measure of "bioquality" which considers the quality and quantity of species. The Star Rating System rates individual plant and wildlife species on their conservation priorities, with most consideration given to rarity and risk of extinction.

INTERIM RECLAMATION/ REVEGETATION

As various facilities reach the end of their period of use, they will be reclaimed. Reclamation of disturbed areas has been occurring since construction began and will continue throughout operations in disturbed areas no longer essential to exploration, construction or operation. Non-essential disturbed areas may include exploration roads, drill pads, trenches, sumps, or other features. Following reclamation of these areas, resource monitoring as described above will occur.

ENVIRONMENTAL TRAINING PROGRAM

Environmental training will be required for employees in order to ensure that they perform their jobs fully cognizant of and in compliance with the governing regulations and policies designed to protect the environment. Training programs would be job-specific, and may include topics such as hazardous materials and waste management, spill prevention and response, transportation incident prevention and abatement, and other topics as deemed relevant and appropriate to the assigned task.

HAZARDOUS MATERIAL MANAGEMENT PROGRAM

NGGL has completed major hazard assessments for its existing operations worldwide. The assessments are tailored to address site-specific circumstances, mining practices, and operational control programs. Contingency plans have been developed for transportation incidents, and other on-site release emergencies. Specific chemical handling procedures are provided during worker training (as described in the Occupational Health and Safety section, below).

HAZARDOUS WASTE MANAGEMENT PROGRAM

There are currently no methods for disposal of hazardous waste in Ghana. NGGL has a waste minimization program to evaluate hazardous substances used on mine property. Where possible, products that generate no waste or non-hazardous waste rather than hazardous waste would be used. An incinerator capable of generating temperatures over 1000° C will be used to process any organic liquid, medical waste, solvents, and paint.

NON-HAZARDOUS WASTE MANAGEMENT PROGRAM

Non-hazardous waste disposal will be conducted in accordance with Ghanaian requirements and NGGL's waste disposal protocols. NGGL will monitor waste generation and disposal conditions during construction, operation, and closure. Should conditions warrant, NGGL will implement additional waste minimization, treatment, and disposal measures beyond those currently identified.

CYANIDE MANAGEMENT AND TREATMENT PROGRAM

NGGL's cyanide management practices are derived from the International Cyanide Management Code and all aspects of the code will be applied to the Ahafo South Project. Cyanide and facilities associated with cyanide shipment, storage, use, and spill response will be operated and managed in a manner to protect workers, the community, and the environment. Cyanide management would include protection of typical environmental receptors including air, water (surface water and groundwater), soil, and vegetation (fauna).

ENVIRONMENTAL AUDITS

The Ahafo South Project will be audited annually by a qualified external consultant in accordance with requirements outlined in Newmont's 5-Star management system. The Ahafo South Project will also be audited externally to verify compliance with requirements defined in the International Cyanide management Code. Additionally, Newmont will conduct internal audits as part of Newmont's Management Services Agreement with NGGL. This program will ensure compliance with Newmont's environmental, operational, and administrative policies.

ENVIRONMENTAL MONITORING PLANS

Components of the Ahafo South Project monitoring program have been implemented and other components will be initiated as mine development progresses. The various monitoring programs will continue until reclamation is successfully completed. Data collected from monitoring will be used to supplement data collected during baseline studies and the current monitoring program at the Ahafo

South Project site. Specific environmental monitoring programs for air quality, water, and revegetation, as well as implementation of fluid management plans and external and internal audit programs are described in this section. A site-specific Environmental Monitoring Manual will be developed to detail specific aspects of these programs.

AIR QUALITY MONITORING

Results of air modeling indicate that expected effects of the Project on the air-shed are minimal. The primary emission source associated with the Project is fugitive dust. Fugitive dust emissions will be controlled through use of direct water application, chemical binders or wetting agents, and revegetation of disturbed areas concurrent with operations. All ore transfer points in the processing plant will have water sprayer units. Dust deposit gauges and volumetric sampling methods will provide specific information appropriate to assess health and safety issues.

After completion of the elution process, the barren carbon will be transferred to a 900 kg/hr regeneration kiln circuit. Carbon will be heated to 650-750°C and maintained for 15 minutes to allow effective regeneration to occur. Gaseous emissions from the carbon regeneration kiln will be scrubbed to remove volatized heavy metals and toxic gases.

Baseline air quality data are being collected to allow comparison to future data collected in NGGL's air quality monitoring program.

WATER RESOURCES MONITORING

Surface Water

Surface water monitoring began with collection of baseline water quality information. This program is ongoing and will continue through construction, operation, and closure of the Ahafo South Project. The objective of this program is to monitor surface water quality and quantity in the vicinity of the Project to ensure that impacts on water from the Project are detected and mitigated, as necessary.

Surface water monitoring stations have been established through the baseline study and these stations will continue to be used for operational monitoring (refer to **Figure 4-7**). Once operations commence, sampling stations will also be located upstream and downstream of Project facilities including water storage facility, tailing storage facility, and all drainages from mine pits, waste rock disposal facilities, stockpiles, and plant operations.

Samples will be collected periodically, preserved, shipped, and analyzed in accordance with accepted Ghanaian and international standards. Samples will be analyzed for parameters described in Chapter 4. Monthly reports will be prepared and submitted to the Ghanaian EPA.

Groundwater

Baseline groundwater data have been collected from monitoring stations identified in Chapter 4, including mine site monitoring wells and off-site village boreholes. Additional groundwater monitoring wells will be located to measure water quality and water table levels around the tailings storage facility and other locations as needed within the Project area. Groundwater will be sampled during construction, operation, and closure of the Project.

Groundwater samples will be collected periodically, preserved, shipped, and analyzed in accordance with accepted Ghanaian and international standards. Samples will be analyzed for parameters described in Chapter 4, and monthly reports will be submitted to Ghanaian EPA.

Stormwater and Water Storage Facility

Stormwater run-off will be controlled through installation of physical barriers and drainage control features, utilization of best management practices to minimize erosion, and by minimizing exposure of mine process materials to stormwater. NGGL's policy is to sample stormwater prior to discharge of this water from any of the environmental control dams. Sampling and analysis of stormwater, including water impounded behind the environmental control dams, will ensure that no contaminants will be discharged from the Project site. Samples will be collected and analyzed periodically from the water storage facility to confirm that this water is good quality.

Seepage from Waste Rock Disposal and Tailing Storage Facilities

Any discharge from the under-drainage systems for the waste rock disposal and tailing storage facilities will be sampled periodically for parameters listed in Chapter 4. During operations, this water will be recycled back into the tailing impoundment or process water pond. After mine closure, this water will be captured and treated or recycled in the tailing impoundment until the quality is acceptable for discharge to natural drainages, or flow ceases. Moisture content, density, and a visual survey of the tailing storage facility will be performed quarterly.

VEGETATION MONITORING

Vegetation monitoring will be conducted as soon as areas within the Project site have been reclaimed and during final reclamation of the site. Vegetation monitoring will continue for three years after final reclamation. Information developed on revegetation of disturbed areas during the life of the mine will be used to modify the final reclamation procedures as necessary. Vegetation monitoring will include annual sampling to determine plant community characteristics such as herbaceous cover, herbaceous production, and species diversity. Vegetation will also be inspected to evaluate its success in stabilizing the soil and minimizing erosion and to verify that the noxious weed control programs are successfully implemented.

NOISE AND VIBRATION MONITORING

A noise monitoring program will be implemented to ensure that noise from activities and equipment do not exceed noise guidelines established by the Ghanaian EPA at the nearest residential uses to the mine site.

ENVIRONMENTAL MONITORING REPORTING

Monitoring programs have been implemented to provide early warning of any deficiency or unanticipated performance in environmental safeguards. Data collected as part of the monitoring program will be organized into comprehensive databases that will be updated as monitoring continues. Information will be used to further characterize baseline conditions and to provide assessment of

potential Project-related impacts to environmental receptors. Monitoring reports will be submitted to the Ghanaian EPA on a monthly, quarterly, and annual basis depending on the media being monitored.

ENVIRONMENTAL STUDIES

This section describes environmental data NGGL will collect to supplement information obtained during baseline studies and to confirm baseline data. Environmental data collected from ongoing programs will be used to evaluate whether modifications to NGGL's existing operation or closure plans for the Ahafo South Project are warranted.

PIT LAKE

NGGL is completing additional studies to confirm aquifer characteristics in the vicinity of the mine pits at the Ahafo South Project. Additional groundwater information for areas surrounding the mine pits will be used to augment existing data for NGGL's water management. Groundwater recovery data will also be evaluated with respect to the amount of time for groundwater levels to recover to near pre-mine conditions after cessation of mining and processing.

NGGL is completing a pit lake analysis that describes expected development of pit lakes after cessation of mining. Expected quality of pit lake water will be confirmed in this analysis. This study currently is underway by Golder Associates for NGGL.

Overall expected quantity and quality of water predicted to seep from the base of the waste rock disposal and tailing storage facilities will be confirmed with ore and waste rock characterization programs identified in *Geology and Minerals – Environmental Geochemsitry* previously described.

ENVIRONMENTAL GEOCHEMISTRY

NGGL is conducting additional geochemical characterization of ore and waste rock from the Ahafo South Project. Characterization of waste rock composite samples will include SPLP, BAPP, PAG, and other kinetic tests. Results of these analyses will be used to confirm results of geochemical testing completed to date.

FAUNA

NGGL is committed to ensure that cyanide, and cyanide process solutions are managed to protect human health and the environment. NGGL will undertake a risk assessment of the operation of the tailings storage facility to ascertain the potential risks of mortality on wildlife and livestock due to cyanide and metal-cyanide complexes (e.g., copper cyanide complex). Should results of the risk assessment identify the need for installation of a cyanide detoxification circuit, NGGL would install such a facility as appropriate.

EXPANDED BASELINE DATA COLLECTION

As an adaptive management strategy, the Environmental and Social Action Plan provides modifications over time if information shows that changes should be implemented. Assessment of effectiveness of environmental controls, interim reclamation, and closure programs may require additional resource-

specific studies designed to augment existing data in order to provide a sound basis of comparison, and if necessary, modified strategies to achieve desired post-mining uses. The following sections describe additional studies that are anticipated.

SOIL SURVEY

A detailed soil survey in areas proposed for disturbance should be conducted. This survey would be conducted in a manner comparable to an Order II survey as described in the United States Department of Agricultural (USDA) Soil Survey Manual (USDA 1993) and would focus on identifying and describing soil variability as necessary to accurately characterize the soil resource, refine determinations of effect, and develop a detailed closure plan including mitigation measures.

The scope of this survey would include description, analysis, and summary of the following physical, chemical, and biological properties:

- Parent Materials;
- Vegetation Cover;
- Drainage;
- Permeability;
- Topographic Positions;
- Horizon Designations (e.g., topsoil, plinthite);
- Depths;
- Texture (Percent Sand, Silt, Clay, and Very Fine Sand);
- Structure (size, strength, class);
- Estimates of Coarse Fragment Size and Quantity;
- Nutrient Content (at a minimum, nitrogen, potassium, and phosphorus);
- Soluble and Total Trace Element Concentrations (select list of those likely to be elevated);
- Saturation Percentage;
- pH (Acidity); and
- Cation Exchange Capacity.

Additional surveys should be conducted where soil information is required for areas outside of the proposed disturbance, such as resettlement areas and nearby agricultural operations. The scope and detail of these surveys would likely be different than that for areas proposed for disturbance as the

expected impacts and information needs are dissimilar. These surveys quantify and delineate the variability of soil texture, nutrient availability, historical erosion, plinthite formation, and other factors directly related to historical use and current capacity for agricultural production.

Detailed soil survey information would be used in development of a detailed reclamation and closure plan. Following determination of the desired postmine conditions, specific soil handling plans including necessary salvage depths, stockpile locations for various soil types, and locations for replacement would be detailed.

In order to further ensure success of resoiling and revegetation efforts aimed at reclaiming productive postmine land uses, a review of regional reclamation practices should be conducted. Such a review would investigate the relative successes and failures of various practices in establishing sustainable cropland, native forest, and other vegetative communities on disturbed areas.

In conjunction with data gathered on geochemistry of ore and waste rock as described in Environmental Geochemistry above, NGGL would evaluate residual trace metal concentration and general characteristics of these materials to affect plant uptake of constituents that could cause concern for consumption of vegetation by animals and humans. This information would be used to review soil replacement depths on reclaimed areas as well as the need to create capillary breaks between topsoil and underlying materials to inhibit trace metal mobility into vegetation on reclaimed areas. These analyses would also consider post-closure land uses to ensure appropriate closure design is used to address this potential issue.

FAUNA

Techniques for reducing mortality of bushmeat species should be evaluated. For example, increased mortality of wildlife for use as bushmeat could be reduced by establishing farms to raise favored bushmeat species (e.g., grass cutters and snails) and developing and implementing educational programs to raise conservation awareness of these species. Plant communities in the fallow cycles of crop rotation may support growth of bushmeat species without exerting additional demands on areas producing food and cash crops. The giant African snail, a delicacy and a good source of protein, is traditionally gathered from the wild, but snail stocks are increasingly threatened by loss of habitat due to expansion of farming, use of pesticides on farms, mining activities, and over-harvesting. Climatic conditions and abundant sources of food in the Project area are optimum for raising snails.

Consumption of bushmeat is deeply ingrained in the culture of West Africa and bushmeat is generally considered a special food as opposed to a staple. Hunting and trade of bushmeat is officially regulated; however, law enforcement is often ineffectual in limiting the impacts of overexploitation on local fauna. Several programs in Ghana that focus on conservation awareness have been conducted by various NGOs. These programs apparently have had localized positive impacts on reducing overexploitation of fauna to support the bushmeat trade. Educational programs could be developed for the Brong Ahafo Region to raise conservation awareness for the bushmeat species.

Potential for community members to produce poultry successfully is high, especially if the supply of chicks, feed, and veterinary products can be guaranteed and supply is accompanied by training in feed production, health, housing requirements, and production techniques. Basic requirements for establishing fish farms are: dependable supply of water, equipment to construct fish ponds or dugouts that can hold water perennially, supply of healthy fingerlings, feed, and technology for putting these

components together to produce fish in captivity successfully. All these requirements can be met in the area. The amount of rainfall recorded is sufficient. Preferred types of fish (tilapia and mud fish) also lend themselves to aquaculture development.

FIVE STAR MANAGEMENT SYSTEM

Monitoring and evaluation of the Environmental Action Plan components and specific programs currently being implemented or will be implemented for the Ahafo South Project will be reviewed under Newmont's Five Star Management System. The specific components of the Five Star system are described in detail in Chapter 1. **Table 5-3** identifies the implementation schedule for the Five Star program for the Environmental Management Plan.

OCCUPATIONAL HEALTH AND SAFETY ACTION PLAN

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

MITIGATION OF HEALTH AND SAFETY EFFECTS

Potential impacts to health and safety that could result from the Ahafo South Project are summarized in **Table 5-5**. Health and safety controls that NGGL has included in the design and operation of the Project are included in the table, as well as potential mitigation measures that would further reduce or eliminate adverse effects. **Table 5-5** also includes an estimated schedule and budget for implementation of mitigation measures and management actions, and identifies responsible parties for implementing the measures/actions.

On-site staff, responsible for ensuring that health and safety policies and procedures are properly implemented and recorded, manages the Loss Control program. Policies and procedures are specified in a manual that is updated annually, or as necessary, based on site-specific requirements. Detailed descriptions are presented in the manual provided to all employees and contractors prior to initiating work-related activities. Primary components of the Loss Control program manual include:

- **Policies:** Specifies NGGL health and safety policies and procedures associated with all aspects of occupational health and safety.

- **Prevention Programs:** Specifies prevention programs, safety meetings, reporting procedures and contractor requirements associated with accident prevention measures to be implemented for all aspects of mine construction, operation and closure.

- **Procedures:** Specifies procedures that must be completed if, and when, an accident occurs involving any person working on NGGL property or associated projects.

- **Health and Hygiene Program:** Specifies known hazards associated with NGGL operations, outlines programs for respiratory and auditory protection, and describes monitoring programs used to assess exposures and determine required remedial actions, if necessary.

- **Required Authorizations:** Authorizations are specifically required for various activities that are deemed hazardous. These activities require prior notification and authorization to ensure proper safety precautions are implemented before commencing the activities. Activities subject to this requirement include confined-space entry, heat exposure areas, high-voltage and exposed machinery, excavations/trenches, and borrow area excavations.

Table 5-5 presents specific Management Actions that will be implemented by the Loss Control Department to manage potential health and safety impacts associated with the Ahafo South Project.

TABLE 5-5
Occupational Health and Safety Action Plan

General Action	Specific Potential Impact	Specific Activity/Action	Schedule	Estimated Cost US$ (Note 1)	Funding Source
Occupational Health and Safety Training	Increased awareness of hazardous circumstances in the work place; reduced number of accidents and severity of accidents.	Implement the Occupational Health and Safety training program for all project, operations, and contractor employees.	Ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget
Emergency Response*	Increase in safety of workers; reduced impacts to environmental receptors;	Develop project specific emergency response plans.	Pre-operation and ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget
		Conduct education and training of employees and contractors for emergency response procedures.	Pre-operation and ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget
		Test and implement emergency response plans to ensure proper equipment and training needs are met.	Pre-operation and ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget
Waste Management*	Properly designed management of waste generated by the Project; reduction in inappropriate exposure of employees to waste; reduction in effects on environmental receptors.	Develop project specific waste management and disposal plans	Pre-operation and ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget
		Conduct employee and contractor training in proper handling and disposal of waste material – in accordance with design standards	Ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget
		Implement waste management programs	Ongoing	Initially included in Project Development budget.	Costs will be part of Department annual budget

TABLE 5-5 (continued)
Occupational Health and Safety Action Plan

General Action	Specific Potential Impact	Specific Activity/Action	Schedule	Estimated Cost US$ (Note 1)	Funding Source
Transportation and Management of Hazardous Materials*	Reduction in conflicts during transportation of hazardous materials on roads; increase in safety of public and workers during haulage of materials.	Transportation plan development including route risk assessment	2nd Quarter 2006 and Ongoing	Initially included in Project Development budget	Costs will be part of Department annual budget
		Contractor education, capacity building, and route monitoring	2nd Quarter 2006 and Ongoing	Initially included in Project Development budget	Costs will be part of Department annual budget
		Community liaison and consultation	2nd Quarter 2006 and Ongoing	Initially included in Project Development budget	Costs will be part of Department annual budget
		Coordination with local authorities and emergency response	2nd Quarter 2006 and Ongoing	Initially included in Project Development budget	Costs will be part of Department annual budget
Five Star Management System Implementation	Stakeholder engagement	System implementation in Community Relations Department	2nd Quarter 2006	Included in Department Overhead	NGGL
		Conduct baseline Five-Star Assessment	2nd Quarter 2006	Included in Department Overhead	NGGL
		Develop continuous improvement action plan	2nd Quarter 2006	Included in Department budget	NGGL
		Conduct annual Five-Star Assessments	Annual	Included in Department Overhead	NGGL
		System implementation in Community Relations Department	2nd Quarter 2006	Included in Department Overhead	NGGL

Notes: Reference to 2nd Quarter 2006 for implementation schedule is based on an anticipated startup of operations in that time period. . * Various plans in development phase will be finalized by 2nd Quarter 2006 or within initial startup phase to allow plans to be field-fit to actual site conditions. All plans will be disclosed to the public upon acceptance by EPA and IFC as appropriate.

OCCUPATIONAL HEALTH AND SAFETY TRAINING

The Loss Control training program is provided to all new employees and contractors working on NGGL projects. The program involves training relative to worker responsibilities, unsafe working conditions, personal protective equipment, company policies, housekeeping, and basic safety rules.

NGGL has developed and implemented specific training programs relative to the following areas in order to minimize employee exposure to potentially hazardous chemical substances or environments:

- Nature of hazardous materials;
- Selection of applicable PPE;

- Selection and use of a respirator;
- Respirator fit testing, maintenance, cleaning and storage; and
- Respirator limitations.

In addition, NGGL has developed specific training programs for all employees relative to the type of work being conducted. Specific training programs are targeted for the following employee groups:

- Management level;
- Supervisor level;
- New-hire;
- Refresher; and
- Contractor.

Detailed descriptions of NGGL's occupational health and safety program are included in Chapter 2 – *Project Description.*

MATERIAL HANDLING

NGGL has developed a material handling program specific to chemicals and other materials located on NGGL properties. These specifications and handling procedures include information regarding the following materials and activities:

- Cyanide transportation, storage, handling and mixing;
- Caustic soda transportation, storage, handling and mixing;
- Sodium hypochlorite transportation, storage, handling and mixing; and
- Explosives and accessories handling, storage and use.

Specific procedures with regard to material handling include the following:

- Spill response actions;
- Disposal of shipment containers;
- Emergency evacuations;
- Mixing and usage precautions;
- Personal Protective Equipment requirements; and
- First-aid procedures.

Work Station Monitoring

NGGL has developed a workstation monitoring program intended to evaluate, document and monitor potential physical and chemical stresses in the workplace. Monitoring programs have been developed for employees with respect to applicable environmental parameters. Main components of the monitoring program are listed below.

- Periodic monitoring of employees potentially exposed to hazardous workplace stresses, incorporating both short-term and long-term exposure levels. Workers are monitored primarily for metals;
- Periodic monitoring of exposure control methods to assess effectiveness in reducing or eliminating worker exposures;
- Sample collection and analysis including air quality, blood samples, and observational data;
- Observation of worker behavior during normal activities;
- Worker interviews to determine whether exposures are common characteristics of the specific work environment; and
- A quality assurance/quality control (QA/QC) program to ensure proper data collection.

NGGL maintains a professional on-site staff, in addition to consultants and other technical professionals, to ensure all monitoring programs, data collection techniques and data interpretation are properly implemented.

FIVE STAR MANAGEMENT SYSTEM

Monitoring and evaluation of the performance of the components of the Occupational Health and Safety Action Plan and specific programs that are currently being implemented or will be implemented for the Ahafo South Project will be reviewed under Newmont's Five Star Management System. The specific components of the Five Star system are described in detail in Chapter 1 – *Introduction*.

PROJECT INTEGRATION PLAN

To ensure that the ESAP will receive necessary funding and supervision along with the other project components, NGGL has fully integrated the plan into the Ahafo South Project's overall planning, design, budget, and implementation. In general, the ESAP for Ahafo South Project has been modeled after other Newmont operations worldwide. Plans included in this ESAP have received full support of top management that has committed the necessary resources to ensure that the plans remain an integral component of each project. Plans are reviewed on an ongoing basis and adjustments are made if necessary to accommodate the needs of the organization.

Newmont's Five Star Management System is the vehicle which houses the integrated management system. This system includes application of specific standards that provide for systematically identifying, managing, monitoring, tracking, and minimizing risks associated with individual operations. The management system applies to all discipline specific performance areas including Health and Safety, Environmental, and Community and External Relations.

The Five Star system establishes criteria by which implementation of the management standards is scored and judged to rate the performance for each project site. Annual assessments and project specific audits ensure integration occurs across all departments and between disciplines.