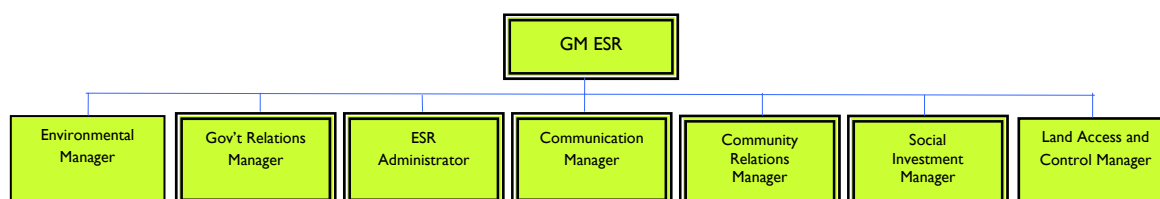


7.0 PROVISIONAL ENVIRONMENTAL MANAGEMENT PLAN

This section describes the Company's Provisional Environmental Management Plan that would govern activities during construction, operation and closure of the Project. After 18 months following permit issuance, in accordance with the Environmental Assessment Regulations (L.I. 1652), the Company would issue an Environmental Management Plan that updates this plan and addresses activities to be conducted during the subsequent 3 years of operation. The Environmental Management Plan would be updated every 3 years thereafter throughout the life of the Project.

7.1 ENVIRONMENTAL MANAGEMENT STRUCTURE

The Company has developed an organizational structure for management of Environmental and Social Responsibility (ESR) components of the Project. The ESR organization is headed by a General Manager who oversees a team of professionals that is responsible for environmental compliance, government relations, communication, community relations, social investment and land access. The structure of the ESR Organisation is described in the following chart:



The Company recognizes that environmental and social responsibility is essential to long-term success of the mining business. This philosophy extends to the Company's workforce, communities directly affected by the Project and other external stakeholders including local and national governmental entities, special interest groups and non-governmental organizations. The Environment Manager's role is to ensure that the Company's operations and closure / decommissioning of the Project are conducted in accordance with applicable environmental standards. The Environment Manager reports to the General Manager of ESR.

7.2 POLICY ON ENVIRONMENT AND HEALTH AND SAFETY

7.2.1 POLICY ON ENVIRONMENT

The Company would construct and operate the Project under the Newmont Corporate Environmental Policy and Environmental Management System as its standard operating procedure. Key elements of the policy include:

- Recognition that sound environmental management is essential to successful operation of the facility,
- Accountability of all staff to minimize environmental risk and assure compliance with regulatory requirements as well as Newmont Corporate environmental objectives,
- Implementation of monitoring programmes to provide early warning of any deficiency or unanticipated performance in environmental safeguards,
- Training and orientation of employees in order to perform their jobs in compliance with sound environmental practices,
- Consideration of environmental factors to be included in all new or modified facilities and in the purchase of equipment and material by the Company,
- An environmental incident reporting system would be established and incident reports would be prepared in a timely fashion;
- Completion of environmental response planning to provide the basis for response to environmental incidents, including spill prevention, control and response plans, monitoring plans and mitigation plans,
- Conducting periodic reviews to verify environmental performance and to continuously strive towards improvement and
- Implementing procedures to assure ongoing dialogue with government entities in connection with regulatory changes, which may affect the operation.

Periodic auditing and reviews will be conducted by internal/external auditors to verify conformance and confirm management behaviour is in accordance with environmental procedures (see *Now and Beyond Report* at www.newmont.com).

7.2.2 POLICY ON HEALTH AND SAFETY

This Policy provides the framework for the development of Health, Safety and Loss Prevention (HSLP) Standards, Procedures and Guidance which will address the environment, risk assessment, information and communication, control activities and monitoring of Core Business Processes. The Company's (as developed by Newmont) Health and Safety Policy is as inserted below:

- The Company will identify and proactively control health and safety exposures and hazards with the potential for loss to people, equipment, process, work environment and community health impacts,
- The Company will adhere to *Newmont Safety Principles*, which includes HSLP leadership in all our people,

- The Company will implement and maintain a HSLP management system that identifies, assesses and controls HSLP risks,
- The Company will identify measurable objectives and targets that will drive the continuous improvement necessary to pursue an injury-free, healthy work environment and community health improvement opportunities,
- The Company will comply with statutory and other applicable requirements,
- The Company will positively reinforce safe behavior in pursuit of superior HSLP performance,
- The Company's activities will be reviewed by internal and external resources to ensure that the HSLP organizational goals and objectives are being achieved and
- The Company will publicly report its HSLP performance.

The Company's on-site staff is responsible for ensuring that health and safety policies and procedures are properly implemented and recorded. Policies and procedures are updated annually, or as necessary, based on site-specific requirements. Detailed descriptions are provided to all employees and contractors prior to initiating work-related activities. Key components of the policies and procedures manual include: policies, prevention programmes, procedures, health/hygiene and required authorizations.

7.3 PROJECT OUTLINE

The proposed Project would involve extraction of gold ore from the Golden Ridge and Kenbert Concession areas located in the Birim North District. Current gold reserves associated with the Project are estimated at 116 million metric tonnes of ore containing approximately 7.7 million ounces of gold. The total Proposed Mining Area would consist of 1,903 hectares of development area that includes 475 hectares of designated buffer zones and controlled farm land (under Scenario C) which would not be impacted by surface disturbances.

The primary components associated with the proposed Project are described in detail in this Draft EIS in **Section 2.0** (*Project Description*). The following is a summary of the primary Project components:

- Open Pit Mine

The proposed open pit would be an elongated structure containing a larger western lobe and a smaller eastern lobe, with the two pits connected at the surface. The combined lengths of the lobes would be approximately 2,560 metres and the pits would cover an area of 139 hectares. The ultimate pit depth of the larger western pit at full build-out would be approximately 480 metres. Approximately 74 hectares of the overall pit would be located in the Ajenjua Bepo Forest Reserve. Ore and waste rock would be drilled and blasted in benches that are developed sequentially to facilitate loading and hauling from the pit. Benches would be established at

approximately 4-metre vertical intervals with bench widths varying to include safety berms and haul roads. Blasted ore and waste rock would be loaded into off-road, end-dump haul trucks using shovels, backhoes and front-end loaders.

➤ Waste Rock Disposal Facility

Waste rock disposal associated with the open pit mining during the operational phase of the Project will be comprised of the following: (1) concurrent placement of waste rock in the relatively small eastern lobe of the mine pit as described above during the latter 3 to 5 years of mining and (2) disposal of waste rock in a facility located outside of the open pit in an engineered structure (Eastern Waste Rock Disposal Facility). Approximately 20 million metric tonnes of waste rock would be placed in the eastern lobe of the open mine pit concurrent with mining during the latter stages of active mining in the pit. This area would be reshaped to ensure surface runoff is routed appropriately and re-vegetated as part of the site reclamation. The majority of the waste rock generated during the life-of-mine (approximately 376 million metric tonnes) would be placed in the Eastern Waste Rock Disposal Facility.

Following mining, the preliminary closure and decommissioning plan is to place waste rock in approximately one half (eastern portion) of the larger western open pit using waste rock obtained from the Eastern Waste Rock Disposal Facility. Placement of waste rock in the open pit would be completed provided the safety of people and the integrity of the environment are not compromised. The determination as to whether waste rock placement would occur would be made in consultation with EPA.

➤ Mill and Processing Plant

The Mill and Processing Plant would be designed to process 8.8 million metric tonnes of ore annually consisting of both run-of-mine (ROM) primary and oxide ore. The Processing Plant would treat a blend of oxide and primary ores during the initial period of operation. The oxide reserves would be fully processed by about year 3 of operations after which only primary ore would be processed. Physical characteristics of ore, the presence of free milling gold and metallurgical test work were used to develop an ore processing plant flow-sheet design (**Figure 2-3**). In general, the process includes primary and secondary crushers, a semi-autogenous grinding (SAG) mill, hydrocyclones (to size the materials), a ball mill, leach-feed thickening tanks, a Carbon-in-Leach (CIL) circuit (to dissolve the gold), cyanide recovery circuit, carbon recovery systems and a stripping/refining facility (to produce the gold product).

➤ Water Storage Facility

A Water Storage Facility, covering an area of approximately 56 hectares and with a design capacity of 2.29 million cubic metres, would be constructed between the Process Plant and Tailing Storage Facility (**Figure 2-1**). A separate but much smaller

water pond would also be constructed adjacent to the Processing Plant. Water from these impoundments would be used for elution, reagent make-up, cooling and process water make-up.

An amount of water, governed by an abstraction permit issued by the Water Resources Commission would be pumped from the Pra River to the Water Storage Facility during the wet seasons (late-March to late-July, and late-September to mid-November) and routed to the processing plant for subsequent use in the mill and for other uses. The pipeline would extend approximately 8.5 kilometres from the Pra River to the Water Storage Facility.

➤ Tailings Storage Facility

The Tailings Storage Facility would be constructed initially as a cross-valley storage facility and located south of the mill facility (**Figure 2-1**). As the tailings impoundment increases in size over time, the facility would have embankments constructed to contain tailings on all four sides of the impoundment. Tailings would be delivered to the storage facility via an aboveground pipe placed in a high-density polyethylene- (HDPE-) lined trench. Process solutions collected at the tailings impoundment would be returned to the mill for reuse.

➤ Sediment Control Structures

Five Sediment Control Structures would be located to form relatively small basins to collect sediment and runoff from upstream construction and mining activity sites (**Figure 2-1**). Water impounded in these structures would be used for dust suppression or released to natural drainages, provided water quality in the basins meets applicable discharge standards for total suspended solids. Sediment captured in the sediment control structures would be removed, as needed, from these basins to maintain capacity of the structures and stockpiled for later use in site reclamation.

Surface water diversion systems or channels would be constructed, as necessary, to intercept and divert natural run-on water from flowing into/onto the open pit, Tailings Storage Facility, Waste Rock Disposal Facility and ore stockpiles. These channels would divert natural run-on water from precipitation back into natural drainages downgradient from disturbed areas or into Sediment Control Structures or other small sediment catchment basins as needed. The diversion system would minimize the amount of water retained in sediment catchment basins and maximize the amount of water that is returned to the natural drainages.

7.4 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

During site preparation, construction, operation and closure for the Project, several specific activities would occur that may result in environmental impacts which are discussed in **Section 4.0 (Impacts)**. These activities, the probable environmental consequences and proposed mitigations are described in **Section 5.0 (Mitigations)**. The following summarizes these potential impacts as well as the mitigations that have been presented by the Company

to reduce such effects to acceptable levels. The summary is organized to address those impacts associated with the biological and physical resources within the Proposed Mining Area as well as those associated with pre-construction and operational phases of the Project.

7.4.1 BIOLOGICAL ENVIRONMENT

Potential effects of the Project on biological resources include the following:

- Loss of ecological habitat (including a portion of Ajenjua Bepo Forest Reserve) and increased pressure on remaining fauna,
- Loss of integrity of the Ajenjua Bepo Forest Reserve,
- Impacts to forest habitat and
- Protection of endangered species.

Mitigation measures that have been identified to date by the Company to reduce or eliminate these potential effects include:

- Implement reforestation programme developed in concert with agencies,
- Use the Project as pilot project in evaluating biodiversity offsets in conjunction with Non-Governmental Organisations,
- Implement a closure and decommissioning plan that would include provisions for re-establishing habitat throughout disturbed areas,
- Implement community education programmes to develop alternative means to secure bushmeat, forums for reducing pressure on fauna and establishing farms to raise bushmeat and snails,
- Implement administrative controls, including policies that prohibit employees and contractors from engaging in hunting activities on all mine properties and
- Develop and implement a Critical Species Management Plan that includes provisions for avoidance of nesting and brood-rearing periods for raptors and other species of high conservation priority, instigating an endemic plant species propagation programme and sponsoring educational opportunities for individuals to reduce stress on flora and fauna.

7.4.2 PHYSICAL ENVIRONMENT

Potential effects of the proposed Project include deterioration of air quality from increased dust levels and emissions. Mitigation measures that would be implemented to address these effects include:

- Control fugitive dust using water and/or chemical binders on roads and control speed of vehicles,
- Revegetate areas that would not be re-disturbed as soon as possible to bind soil and
- Control emissions from mining equipment through proper maintenance of exhaust systems and installation of scrubber equipment.

Project activities also have the potential to affect the quality and quantity of surface water and/or groundwater resources. These activities include tailings storage, waste rock disposal, chemical transport and handling and water captured in sediment control structures. Several mitigation measures would be employed to prevent impacts to water resources, including:

- Control run-on and run-off water to avoid contamination of water from mine areas through use of Best Management Practices,
- Maintain capacity of sediment control structures through routine maintenance,
- Implement a plan to control the transport, storage, use and disposal of chemicals and reagents,
- Implement a spill prevention, control and response action plan,
- Implement programme to restore water supplies that could be lost as a consequence of mine development,
- Implement water treatment programmes, where necessary and
- Implement engineered design for mine facilities to control and manage trace metals associated with waste rock and tailings.

Potential for soil erosion during construction, operation and closure of the Project has been identified as a concern; especially where bare soil is exposed to wind and water for extended periods of time. Measures that would be taken to control soil loss due to wind and water include the following:

- Implement Best Management Practices to arrest soil movement from disturbance areas,
- Maintain sediment control structures to ensure capacity is not compromised and return sediment to growth medium stockpiles and
- Conduct concurrent and final reclamation including establishment of vegetation to bind soil.

7.5 MONITORING PROGRAMMES

Monitoring programmes would be developed and implemented by the Company to monitor environmental and social aspects at all stages of the Project. The monitoring programmes would include the following to ensure this Provisional Environmental Management Plan achieves its goals and objectives:

- Meteorological Data Collection,
- Air Quality,
- Surface Water Quality and Quantity,
- Groundwater Quality and Quantity,
- Erosion and Sediment Control,
- Socioeconomic Conditions and
- Blast Monitoring and Surveys of the conditions of nearby structures.

This monitoring and reporting would be completed in accordance with programmes described in **Section 6.0 (Monitoring)** of this EIS. The Company would incorporate all aspects of these monitoring programmes when the revised Environmental Management Plan is developed 18 months following issuance of the permit for the Project.

7.6 OCCUPATIONAL HEALTH AND SAFETY

The Company currently maintains an occupational health and safety programme (“Loss Control”) actively managed by on-site staff at Akyem. This programme, including appropriate training and monitoring procedures, would be maintained and expanded during the construction period to ensure that standards of health and safety are maintained. The primary components of the Loss Control programme are policies, prevention programmes, procedures, health and hygiene programmes and established signing responsibilities and authorities.

The Company would implement a Loss Control training programme for all new employees and contractors working on Company projects. The programme covers identification of unsafe working conditions, personal protective equipment (PPE), company policies, housekeeping and basic safety rules, with the level of detail varying relative to worker responsibilities.

Personal protective equipment would be mandatory for all activities based upon job risk assessment. At a minimum, all employees would be required to wear hard-hats, steel-toed boots, safety glasses and reflective clothing in designated work areas. Rubber gloves, rubber arm protectors, rain suits, face shields, splash goggles, safety belts and lanyards, dust respirators, hearing protectors, welding hoods and goggles and high voltage insulated gloves would be available and required where appropriate. The Company would develop training programmes for all employee groups (management, supervisor, new hire, refresher and contractor) relative to the type of work to be conducted and would develop and implement specific training programmes to minimize employee exposure to potentially hazardous chemical substances or environments.

Operators at the Project site would be trained in all aspects of their work environment, hazard recognition, first aid, personal hygiene, electrical safety, rigging and lifting, vehicle safety, fire safety, safety practices for working around machinery with moving parts and other topics that may relate specifically to a job assignment or physical location at the Project. Health and safety training programmes are described in **Table 7-1**.

Course	Personnel	Frequency	Duration	Instruction
New-hire Training	All new hires exposed to mine hazards	Once	24 hours	Employee rights Supervisor responsibilities Self-rescue Respiratory devices Transportation controls Communication systems Escape and emergency evacuation Ground control hazards Occupational health hazards Electrical hazards First aid Explosives Toxic materials
Task Training	Employees assigned to new work tasks	Before new assignments	Variable	Task-specific health and safety procedures Supervised practice in assigned work tasks in non-productive duty
Refresher Training	All employees who received new-hire training	Yearly	8 hours	Required health and safety standards Transportation controls Communication systems Escapeways, emergency evacuations Fire warning Ground control hazards First aid Electrical hazards Accident prevention Explosives Respirator devices
Hazard Training	All employees exposed to mine hazards	Once	Variable	Hazard recognition and avoidance Emergency evacuation procedures Health standards Safety rules Respiratory devices

Source: Newmont (2003b)

The Company has developed a monitoring programme intended to evaluate, document and monitor potential physical and chemical stresses in the workplace. Monitoring programmes have been developed for employees with respect to applicable environmental parameters. The main components of the monitoring programme to be implemented during the first 18 months of Project start-up are listed below:

- Periodic monitoring of exposure control methods to assess effectiveness in reducing or eliminating worker exposures,
- Collection and analysis of air quality samples obtained from the work environment,

- Observation of worker behaviour 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) programme to ensure proper data collection.

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

7.7 SOCIO-ECONOMIC ISSUES

The Company is committed to design, develop and operate the Project in a manner that would protect and enhance the quality of life for local residents and would comply with all applicable Ghanaian laws and Company standards (see **Annex A-3**). All social and economic programmes for the Project have been and would continue to be developed in concert with stakeholders. The primary impacts and issues identified to date include the following:

- Loss of farm holdings,
- Loss of agricultural land and lifestyles,
- Increased vibrations from blasting that could impact structures,
- Increased noise levels,
- Resettlement of Yayaaso, eight hamlets and farmsteads,
- Compensation process and procedures,
- Disruption of socio-economic conditions,
- Influx of outsiders,
- Changes to the social fabric of local communities,
- Respect for Traditional Authorities and traditional ways of life,
- Clear and transparent communication,
- Positive socio-economic impacts such as increased employment, tax and improved infrastructure,
- Special employment schemes for youth and women and
- Success of reclamation with a view to future generations.

7.8 FINANCIAL ALLOCATIONS

The Company is committed to finance the environmental and social aspects of the Project from its integrated annual budget and operating costs. An annual operating budget has been allocated for implementation of the tasks defined in this Provisional Environmental Management Plan for the 18 months the Plan is effective. This budget includes costs for department salaries, wages, taxes and benefits; monitoring equipment purchases and maintenance; monitoring activities; on-site and off-site laboratory analyses; consultants; training and development; vehicles; and reporting. In addition, a capital expenditure budget has been allocated to meet the costs associated with compensation for crops, resettlement

and initial community development through the construction phase. The budget would be revised consistent with the requirements of the revised Environmental Management Plan to be prepared within 18 months of issuance of the Environmental Permit.

Financial allocations would also be made in the operating budget for concurrent reclamation in accordance with the Company's Environmental Management Systems standards and would vary in relation to mine plan and facilities development. Reclamation activities would commence as soon as practicable in areas to be re-contoured, topsoiled and revegetated. The amount of financial allocation would be in accordance with unit rates and total reclamation costs described in **Section 8.0** (*Closure and Decommissioning*).

7.9 LAND REHABILITATION AND PROJECT DECOMMISSIONING

A description of the methods and techniques that would be used to decommission and reclaim the Project area is included in **Section 8.0** (*Closure and Decommissioning*). A Provisional Land Rehabilitation Plan is included in **Annex G-I**.

7.9.1 GENERAL APPROACH

Short-term reclamation goals are to stabilize disturbed areas and protect disturbed and adjacent undisturbed areas from unnecessary or undue degradation by erosion or sediment transport and deposition. Long-term reclamation goals are to ensure public safety, stabilize the site and establish a productive vegetative community consistent with specific and targeted post-mine land uses and in line with the EPA reclamation criteria. The Company's priority is to decommission and reclaim the Project area in a manner that is protective of human health and the environment, to the maximum extent practicable. General reclamation activities would include the following:

- Contour the surface of the Tailings Storage Facility,
- Place a portion of the waste rock from the Waste Rock Disposal Facility in approximately half of the open pit,
- Contour the surface of the Waste Rock Disposal Facility,
- Regrade roads,
- Complete grading to ensure adequate drainage control,
- Remove and grade stockpile areas,
- Replace salvaged topsoil,
- Seed disturbed areas and
- Monitor reclamation success.

Reclamation activities would be progressively completed during the construction and operational phases of the Project as specific areas or facilities would no longer be needed to support operation. Reclamation activities are expected continue for approximately two years after mining ceases.

Upon completion of reclamation and decommissioning activities, the site would be subject to post-closure monitoring (see **Section 6.4**, *Monitoring – Post Closure Monitoring*). Post-

closure monitoring would continue for a period of time after the reclamation phase of the Project is complete or until such time as all closure objectives and success criteria defined in the final approved closure plan have been met.

SITE CLEARANCE

A Preliminary Site Clearance Management Plan is included in **Annex B-I**. All construction activities would be preceded by clearing and grubbing operations as described in that plan.

TOPSOIL SALVAGE

Prior to construction of the mine, haul and access roads, stockpiles, waste rock disposal and tailings storage facilities, the Company would recover available topsoil from these sites for future use in reclaiming disturbed areas. Topsoil profiles vary considerably across the Project Area. Recovery depths would be determined through an analysis of soil data collected during baseline studies of the Proposed Mining Area as verified by on-the-ground reclamation specialists during salvage operations. The overall intent is to obtain only the growth medium (topsoil and subsoil) necessary to achieve the objectives of the Closure and Decommissioning Plan. Topsoil would be salvaged and transported to stockpiles using scrapers, wheel and track dozers, haul trucks and loaders. Subsoil materials, where suitable for use as growth media in reclamation, would be salvaged and stockpiled separately from topsoil.

GRADING DISTURBED AREAS

Prior to replacing topsoil or suitable growth media, facility sites and other disturbed areas would be graded to attain a stable configuration, establish effective drainage, minimise erosion and protect surface water resources. The regraded surface would be ripped where necessary prior to placement of topsoil. Ripping would reduce compaction, maximise infiltration, provide a uniform seed bed and establish a bond between subsoil and topsoil. To the extent practicable, grading would blend topography of disturbed areas with the surrounding natural terrain. Angular features, including tops and edges of the Waste Rock Disposal Facility, would be rounded.

REVEGETATION

Prior to initiating the proposed reclamation vegetation plan, the Company would evaluate topsoil replacement depths for various exposures to arrive at a design that accounts for soil replacement depths that may vary according to location and soil type. The variety of soil replacement depths would provide opportunity to establish different vegetation mosaics on reclaimed areas. The Company's revegetation programme goals would be to stabilize reclaimed areas, ensure public safety and establish a productive vegetative cover based on applicable land use plans and designated post-mining land uses.

7.10 EMERGENCY RESPONSE PLAN

The Company would develop contingency plans and emergency response plans for activities that could potentially impact health and safety or the environment. Emergency response and contingency plans would be implemented on a site-specific, as-needed basis, depending upon specific working conditions.

Emergency response and contingency procedures would be clearly established such that proper notifications and corrective actions are implemented in the event an accident occurs. The Company would also establish appropriate contacts with local officials for notification of events that may affect persons or environments outside the Proposed Mining Area.

An Emergency Response Plan would be developed and implemented as a comprehensive document for management of incidents that may occur in the Proposed Mining Area. The Plan establishes critical aspects of incident management including notification, incident management, organisation and responsibilities. The Plan would be developed to complement the Spill Prevention, Control, and Response Plan. The following components would be included in the Emergency Response Plan:

- Important telephone numbers,
- Incident management activation/ notification process,
- Incident management organisation,
- Emergency response organisation,
- General functions and responsibilities,
- Action/notification levels,
- Organisation chart,
- Control and command centres,
- General evacuation procedures,
- Search and rescue procedures,
- Emergency termination/return to work procedures,
- Closure procedures and
- Equipment/material resource requirements.

The emphasis of the Plan would be to establish incident management procedures, organisation and responsibilities for all emergency response actions. Company personnel would be regularly trained to manage incidents using the Emergency Response Plan. The Plan would provide additional details regarding specific actions.