Appendix 7C:
Standard Operating Procedures

SOP No.	SOP Title
GG-01	“Solid Waste Management”
GG-02	“Preparation, Review, Approval, and Update of Standard Operating Procedures”
GG-03	“Field Inspections”
GG-04	“Identification of Non-conformances and Corrective/Preventive Action”
GG-05	“Records Management”
GG-06	“ESMS Training Program”
GG-07	“Distribution and Control of ESMS Documents”
GG-08	“Environmental and Social Footprint Surveys”
GG-09	“Identification of Project-related Safety Hazards and Assessment of Risks”
GG-10	“Prevention and Monitoring of Communicable Diseases”
GG-11	“Personal Protective Equipment”
GG-12	“First Aid and Emergency Medical Response”
GG-13	“Transportation Safety- Light Vehicles”
GG-14	“Handling and Storage of Hazardous Materials”
GG-15	“Forklift Safety”
GG-16	“Safe Operation of Heavy Equipment”
GG-17	“Vehicle Fuelling and Spill Prevention”
GG-18	“Machine Guards and Safety Barriers”
GG-19	“Welding and Cutting Safety”
GG-20	“Electrical Safety”
GG-21	“Confined Space Work Safety”
GG-22	“Fire Prevention Program”
GG-23	“Operational Safety Meetings”
GG-24	“Recognition and Reporting of Safety Hazards”
GG-25	“Chance Archaeological Finds”
GG-26	“Safe Use of All-Terrain Vehicles”
GG-27	“Chainsaw Safety”
GG-28	“Heat Stress”
GG-29	“Determination of Environmental and Social Aspects and Significant Impacts”
GG-30	“Environmental and Social Objectives, Targets, and Performance Improvement Program”
GG-31	“Development and Maintenance of Legal and Regulatory Requirements Register”
GG-32	“Regulatory Compliance Verification Audits”
GG-33	“Internal ESMS Audits”
GG-34	“Management Reviews”
GG-35	“Community Health and Safety Awareness Meetings”
GG-36	“Lockout/Tag-out Requirements”
GG-37	“Control of Erosion and Sedimentation”
GG-38	“Working from Heights”
GG-39	“Monitoring and Maintenance of Potable Water Quality”
GG-40	“Site Security”
GG-41	“Management of Aviation Fuel and Fuelling Operations”
GG-42	“Helicopter Safety”
GG-43	“Safe Operation of Grove Model 530 Hydraulic Cranes”
GG-44	“Management of Land Clearances”

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides minimum requirements for the segregation and recycling or controlled disposal of solid waste (and certain categories of hazardous waste in liquid or sludge form) generated during the Exploration/Early Works Construction (E/EWC) phase of the Guyana Goldfields, Inc. (GGI) Aurora Project; applicability to other (non-Aurora) exploration projects shall be governed by the current approved version of the GGI *Exploration Management Plan*. The requirements established by this SOP are based on current Guyanese landfill disposal criteria and international best management practices (BMPs) for mining exploration[1], development, and operation.[2] This SOP is intended as a bridging document pending:

- the development of engineered onsite hazardous waste storage, municipal solid waste, and inert waste disposal facilities;
- completion of municipal solid waste landfill permitting requirements pursuant to Guyana Environmental Protection Agency requirements; [3];
- identification of potential recycling/reuse options for selected waste streams, and
- completion of a comprehensive *Waste Management Plan* for the major construction and operational phases of the Aurora Project.

This SOP supports Section 4.3.2 (“Management of Social and Environmental Impacts”) of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

[1] Prospectors & Developers Association of Canada (PDAC) “e3-Plus Excellence in Environmental Stewardship e-toolkit (EES)”, Version-01 (PDAC, 2009)

[2] “Environmental, Health and Safety Guidelines for Mining”, December 10, 2007” (IFC, 2007)

[3] “Criteria for the Identification and Approval of Landfill Sites for Solid Waste Disposal in Guyana”, (Guyana Environmental Protection Agency - Special Projects Unit, no date)

2.1 Municipal Solid Waste

Per the Guyana EPA landfill criteria document[3], ***municipal solid waste*** includes non-hazardous waste generated in households, commercial and business establishments, institutions, and light industrial process wastes, agricultural wastes, and sewage sludge.

2.2 Other Solid Waste

Per the Guyana EPA landfill criteria document[3], ***other*** (non-hazardous) ***solid waste*** may includes agricultural waste, commercial waste, debris, demolition waste, garbage, household waste, non-hazardous industrial waste, inert waste, putrescible solid waste, refuse, residential waste, and rubbish.

2.2 Special Waste

Per the Guyana EPA landfill criteria document[3], ***special wastes*** include hazardous wastes, ship-generated waste, clinical waste, and aircraft waste.

2.3 Hazardous Waste

Per Prospectors & Developers Association of Canada (PDAC) guidance[1], in the absence of definitive national guidance, the United Nations hazardous waste system classification should be applied. For the purposes of this SOP, ***hazardous wastes*** are therefore considered to be wastes that are highly ignitable, reactive, corrosive, radioactive, or toxic. It is also understood that hazardous wastes may be in solid, liquid (e.g., waste oil or coolant) or sludge (e.g., waste grease) form.

3.0 RESPONSIBILITIES

3.1 Environmental Officer

The Environmental Officer is responsible for monitoring overseeing the proper segregation, safe storage, and/or disposal of solid wastes (including hazardous liquids or sludges) at the various Aurora Project sites in accordance with this procedure, and for assisting the Environmental Manager in identifying any new waste streams and the development of appropriate updates to the waste segregation and disposal guidelines provided in **Table 4-1.**

3.2 Environmental Manager

The Environmental Manager is responsible for establishing appropriate solid waste management strategies, in keeping with applicable Guyanese regulations and international BMPs, and for documenting and, as necessary, updating such strategies in the waste segregation and disposal guidelines provided in **Table 4-1.** The Environmental Manager will also coordinate with the Construction Manager and key

contractors in the development and periodic update of a comprehensive *Waste Management Plan* to support the major construction and operational phases of the Project, and for assisting in efforts to site and permit appropriately designed sanitary and inert waste landfills, to locate appropriate recycling options for recyclable waste streams, and to identify acceptable hazardous waste storage and disposal options. The Environmental Management is also responsible for periodically conducting due-diligence assessments of medical waste incinerator to verify the adequacy of waste handling and disposal practices and facilities at the Georgetown hospital, and for conducting due-diligence assessments of any offsite commercial hazardous or non-hazardous waste disposal facilities prior to their inclusion as an element of the waste management strategy to be defined by the Project *Waste Management Plan.*

.

4.0 PROCEDURE

The following section describes the process to be followed for the segregation and disposal of E/EWC phase solid waste at the various sites that comprise the Aurora Project; the process is represented as a flowchart in **Figure 1**.

4.1 Segregation and Disposal of E/EWC Phase Solid Waste and Associated Staff Training

The Environmental Manager and Environmental Officer shall present the solid waste disposal scheme summarized in **Table 4-1** in training sessions to the Camp Managers and Area Supervisors stationed at the various work sites that comprise the Aurora Project. Training shall be documented in accordance with SOP GG-06, “ESMS Training Program.” Implementation of **Table 4-1** requirements shall be initiated upon completion of training.

4.2 Monitoring of Waste Segregation and Disposal Actions

Progress in the implementation of **Table 4-1** requirements shall be periodically monitored by the Environmental Officer and reported to the Environmental Manager on at least a monthly basis, through the completion of the E/EWC phase of the Project. Any observed non-conformances in the implementation of **Table 4-1** requirements shall be documented and resolved as required by GG-04, “Identification of Non-conformances and Corrective /Preventive Action.”

4.3 Records

Records associated with the implementation of this procedure include historical copes of all version of this procedure and **Table 4-1**; records of Project workforce training; and records of any Corrective and Preventive Action Request (CPAR) forms generated as a result of implementation monitoring.

Table 4-1: GGI – Aurora Project Solid Waste Inventory and Waste Disposal Guidelines (Exploration/Early Works Construction Phase)

Waste Category[4]	Waste Subcategory[1]	Lower-tier Waste Subcategory (Hazardous Waste Only)[5]	Aurora Project Wastes, by Subcategory	Disposal Method[6] (Exploration/Early Works Construction Phase)	Disposal Method Improvement Actions
Sanitary Landfill Waste	**Municipal solid waste:** includes non- hazardous waste generated in households, commercial and business establishments, institutions and light industrial process wastes, agricultural wastes, and sewage sludge	N/A	Junked all-terrain vehicles (ATVs) and scrap metal and plastic parts	Drain all fuel and oil into waste oil storage tanks; remove tires, segregate and store at Aurora Base boneyard, pending identification of recycling or disposal options in construction/operation phase *Waste Management Plan* or disposal in inert waste disposal cell to be constructed in waste rock stockpile	In order to minimize impact on sanitary landfill capacity, investigate potential for establishing special inert waste landfill cell in waste rock stockpile early in the operational phase of the Project; discuss with Guyana EPA and obtain permit if required.
		N/A	Construction waste	Segregate clean paper, cardboard, and unusable wood, and incinerate in controlled burn pit; segregate usable wood and metal and send to Aurora Base boneyard for storage pending re-use or identification of recycling options; route remaining waste to “dry” pit pending completion of inert waste disposal cell; cover with clean soil 2-3 times per week	In order to minimize impact on sanitary landfill capacity, investigate potential for establishing special inert waste landfill cell in waste rock stockpile early in the operational phase of the Project; discuss with Guyana EPA and obtain permit if required.
		N/A	General garbage from living quarters	Separate clean paper, cardboard, wood, and incinerate in controlled burn pit; route remaining garbage to “dry” pit pending completion of approved sanitary landfill; cover with clean soil 2-3 times per week	Disposal method assumes no food preparation or food waste will be permitted in living areas; finalize design and seek permit approval of lined sanitary landfills at Aurora Base and Buckhall[4]; construct landfill when permit is granted. Tapir Camp waste will be collected and disposed of at the Aurora landfill.
		N/A	Drained oil filters, containers, rags, other mechanical shop waste	Separate clean paper, cardboard, wood, and incinerate in controlled burn pit; route remaining garbage to “dry” pit pending completion of approved sanitary landfill; cover with clean soil 2-3 times per week	Controlled burning is permitted or volume reduction of clean combustible waste only; finalize design and seek permit approval of lined sanitary landfills at Aurora Base and Buckhall[4]; construct landfill when permit is granted. Tapir Camp waste will be collected and disposed of at the Aurora landfill.
		N/A	Grease rags from drilling operations	Route to “dry” pit pending completion of approved sanitary landfill or inert waste disposal cell; cover with clean soil 2-3 times per week	Investigate potential conversion to vegetable oil-based drilling grease

[4] Per “Criteria for the Identification and Approval of Landfill Sites for Solid Waste Disposal in Guyana”, Guyana Environmental Protection Agency, Special Projects Unit, no date.

[5] Per United Nations hazardous waste system classification, as recommended in Table 7 of Prospectors & Developers Association of Canada (PDAC) e”3-Plus Excellence in Environmental Stewardship e-toolkit (EES)”, Version-01 (PDAC, 2009)

[6] Disposal methods are based PDAC e3 and IFC, 2007 guidance and a subject to review when integrated into the comprehensive Project *Waste Management Plan*; see Section 4.4.

Waste Category[4]	Waste Subcategory[1]	Lower-tier Waste Subcategory (Hazardous Waste Only)[5]	Aurora Project Wastes, by Subcategory	Disposal Method[6] (Exploration/Early Works Construction Phase)	Disposal Method Improvement Actions
Sanitary Landfill Waste	**Municipal solid waste (cont.) :** includes non- hazardous waste generated in households, commercial and business establishments, institutions and light industrial process wastes, agricultural wastes, and sewage sludge	N/A	Used paint cans (non-aerosol)	Remove covers and let dry; crush all containers and route to "dry" pit pending completion of approved sanitary landfill; cover with clean soil 2-3 times per week	Finalize design and seek permit approval of lined sanitary landfills at Aurora Base and Buckhall[4]; construct landfill when permit is granted.
	Other Solid Waste: includes non-hazardous agricultural waste, commercial waste, debris, demolition waste, garbage, household waste, non-hazardous industrial waste, inert waste, putrescible solid waste, refuse, residential waste and rubbish	N/A	Canteen waste	Segregate clean paper and cardboard, and incinerate in controlled burn pit; bag all remaining garbage to reduce attractiveness to wild animals/insects, send to "wet" pit pending approval of sanitary landfill; puncture bags immediately prior to daily clean soil cover	Investigate availability of recycling options for glass and recyclable plastics, and institute segregation and recycling program when identified. Finalize design and seek permit approval of lined sanitary landfills at Aurora Base and Buckhall[4]; construct landfill when permit is granted.
		N/A	Used tires from all vehicles	Segregate and store in covered storage in Aurora Base boneyard pending identification of recycling or inert waste cell disposal options in construction/operation phase *Waste Management Plan*	Covered storage is to prevent accumulation of water and creation of mosquito habitat; investigate potential for in-country recycling or disposal as inert waste. In order to minimize impact on sanitary landfill capacity, investigate potential for establishing special inert waste landfill cell in waste rock stockpile early in the operational phase of the Project; discuss with Guyana EPA and obtain permit if required.
		N/A	Building construction or demolition waste	Separate clean paper, cardboard, wood, and incinerate in controlled burn pit; route remaining garbage to "dry" pit pending completion of inert waste cell; cover with clean soil 2-3 times per week	In order to minimize impact on sanitary landfill capacity, investigate potential for establishing special inert waste landfill cell in waste rock stockpile early in the operational phase of the Project; discuss with Guyana EPA and obtain permit if required.
Special waste	**Hazardous Waste:** includes recyclable and non-recyclable dangerous wastes	**Ignitable Hazardous Waste;** includes waste grease and oil	Waste oil and grease	Accumulate in covered steel or plastic barrels on covered, bermed concrete or high-density polyethylene (HDPE) lined pad or steel intermodal container with containment modifications, pending offsite shipment for recycling. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Identify options for in-country and regional waste oil/grease recycling

Waste Category[4]	Waste Subcategory[1]	Lower-tier Waste Subcategory (Hazardous Waste Only)[5]	Aurora Project Wastes, by Subcategory	Disposal Method[6] (Exploration/Early Works Construction Phase)	Disposal Method Improvement Actions
Special waste	**Hazardous Waste (cont.):** includes recyclable and non-recyclable dangerous wastes		Used grease rags from drill rigs	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate options for both in-country and regional hazardous waste disposal
			Fuel/oil spill clean-up waste, from mechanical shops, drill rigs, and other sources	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate options for both in-country and regional hazardous waste disposal
		Corrosive hazardous waste; includes Pb-acid and vehicle batteries	Used Pb-acid batteries (with battery acid)	Drain and neutralize acid with sodium bicarbonate in controlled drainage barrel; accumulate drained batteries on pallet pending offsite shipment for recycling. Let neutralized acid evaporate, route residual sludge to "dry" pit pending completion of approved sanitary landfill; cover with clean soil 2-3 times per week.	Identify options for in-country or regional Pb-acid battery recycling
		Reactive Hazardous Waste; includes explosives, compressed gases, or substances dangerous when wet	Used aerosols (paints, sprays, no insecticides or pesticides)	Remove covers and let dry; for aerosol cans, puncture in safe fixture prior to disposal; crush all containers and route to "dry" pit pending completion of approved sanitary landfill; cover with clean soil 2-3 times per week.	Finalize design and seek permit approval of lined sanitary landfills at Aurora Base and Buckhall[4]; construct landfill when permit is granted.
		Radioactive hazardous waste	None	N/A	None
		Toxic hazardous waste; includes all poisonous (toxic) materials	Waste insecticide/ fungicide/rodenticide/ herbicide containers	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. For aerosol cans, puncture in safe fixture prior to disposal. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate long-term options for both in-country and regional hazardous waste disposal.

Waste Category[4]	Waste Subcategory[1]	Lower-tier Waste Subcategory (Hazardous Waste Only)[5]	Aurora Project Wastes, by Subcategory	Disposal Method[6] (Exploration/Early Works Construction Phase)	Disposal Method Improvement Actions
Special waste	**Hazardous Waste (cont.):** includes recyclable and non-recyclable dangerous wastes	**Toxic hazardous waste (cont.);** includes all poisonous (toxic) materials	Waste Tyvek coveralls, gloves, and used respirator cartridges from mosquito fogging	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. For aerosol cans, puncture in safe fixture prior to disposal. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate long-term options for both in-country and regional hazardous waste disposal.
			Used/broken fluorescent tubes	Crush in controlled fixture, accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate long-term options for both in-country and regional hazardous waste disposal.
			Hg ballasts from fluorescent light fixtures	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate long-term options for both in-country and regional hazardous waste disposal.
			Non-lead acid batteries (all types)	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate long-term options for both in-country and regional hazardous waste disposal.
			Waste ethylene glycol coolant	Accumulate in covered steel or plastic barrels on covered, bermed concrete or HDPE lined pad or steel intermodal container with containment modifications, pending identification of approved hazardous waste disposal facility. Control access to storage areas and provide appropriate "Hazardous/Flammable Waste" warning signs and appropriately rated fire extinguishers. Maintain documented running inventory of type and volumes of materials stored.	Investigate long-term options for both in-country and regional hazardous waste disposal options.

Waste Category[4]	Waste Subcategory[1]	Lower-tier Waste Subcategory (Hazardous Waste Only)[5]	Aurora Project Wastes, by Subcategory	Disposal Method[6] (Exploration/Early Works Construction Phase)	Disposal Method Improvement Actions
Special Waste (cont.)	**Clinical waste**	N/A	Medical waste from Project clinics (includes sharps, examination gloves, and all medical treatment waste)	Collect in dedicated medical waste containers at the camp clinics, transport to licensed medical waste incinerator at the Georgetown hospital when full. Control access to storage containers and provide appropriate "Biohazardous Waste" warning signs. Maintain documented running inventory of type and volumes of materials sent for disposal.	Conduct due-diligence assessment of licensed medical waste incinerator at Georgetown hospital.
	Ship-generated waste	N/A	None; no ship-generated waste will be permitted to be offloaded a Buckhall.	N/A	N/A
	Aircraft waste	N/A	None; no onsite aircraft fuelling or maintenance will be permitted at the Aurora Base airstrip.	N/A	N/A

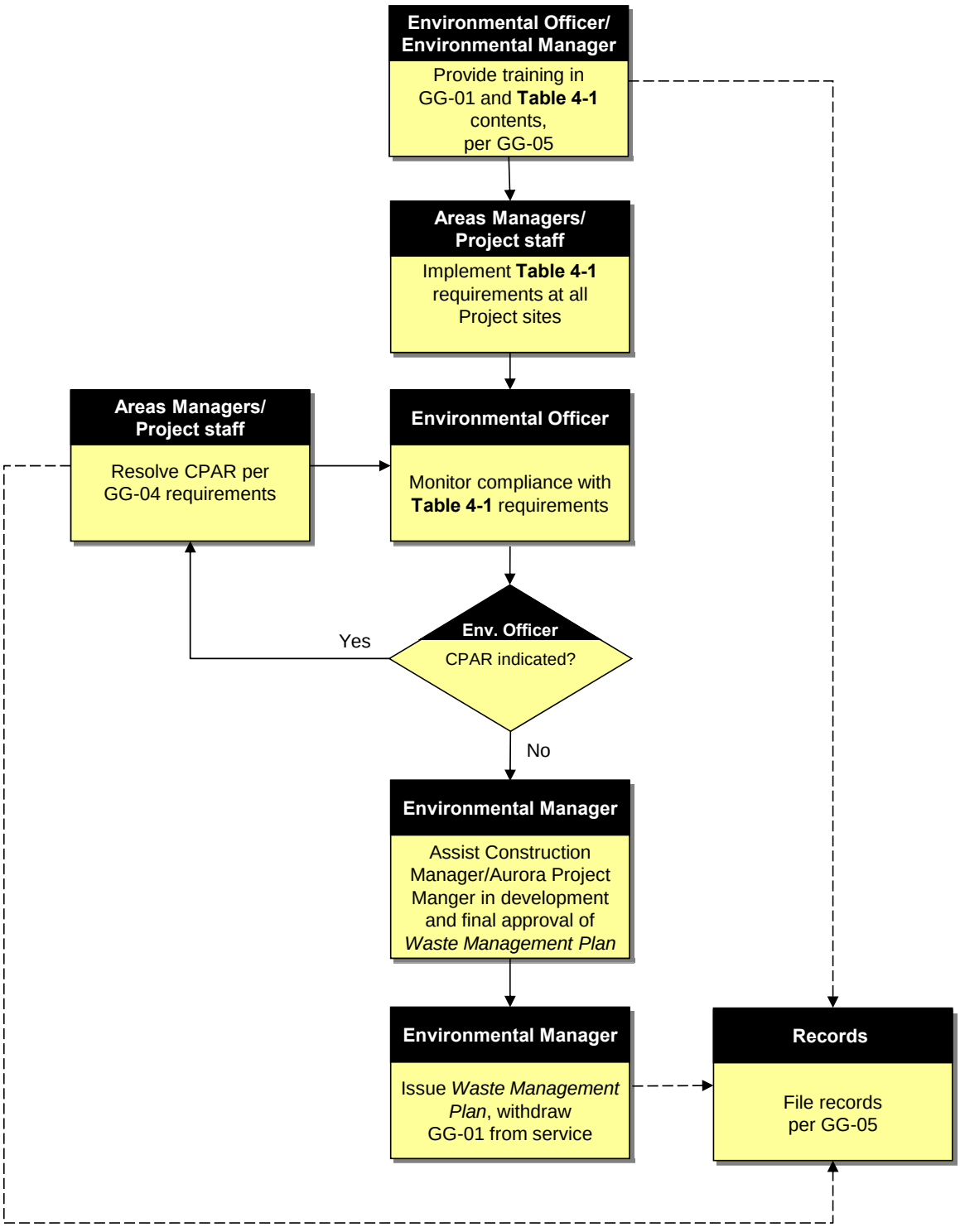
4.4 Withdrawal of SOP from Service

The Environmental Manager shall coordinate with the Construction Manager and Vice President, Aurora Project in the integration of the phase waste segregation and disposal requirements described in **Table 4-1** into the overall *Waste Management Plan* planned to be developed prior to the major construction and operations phases of the Project. This SOP shall be withdrawn from service after the final approval and issue of the comprehensive Project *Waste Management Plan*.

5.0 REFERENCES

- GG-04, “Identification of Non-conformances and Corrective /Preventive Action”
- GG-05, “Records Management”
- IFC, 2007; “Environmental, Health and Safety Guidelines for Mining”, December 10, 2007; http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_Mining/$FILE/Final+-+Mining.pdf ; World Bank Group/International Finance Corporation, Washington, DC. 2007.
- Guyana EPA, no date; “Criteria for the Identification and Approval of Landfill Sites for Solid Waste Disposal in Guyana”, Guyana Environmental Protection Agency, Special Projects Unit, no date.
- PDAC, 2009; “e3-Plus Excellence in Environmental Stewardship e-toolkit (EES)”, Version-01; http://www.pdac.ca/e3plus/English/toolkits/es/index.aspx ; Prospectors and Developers Association of Canada, Toronto, Ontario, Canada, 2009.

Figure 1: E/EWC Phase Waste Management and Segregation Process



	STANDARD OPERATING PROCEDURE GG-02: Preparation, Review, Approval, and Update of Standard Operating Procedures
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the methods that Guyana Goldfields, Inc. (Guyana Goldfields) will use to create or revise other SOPs for the Aurora Project. This SOP will apply over the life of the Project; it supports Section 1.2 ("ESMS Documentation") and Section 1.3 ("Change Management") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Standard Operating Procedure

Standard Operating Procedures (SOPs) describe the detailed processes that support individual Management Plans, the GGI *Environmental and Social Management System Plan* (*ESMS Plan*), or other Environmental, Social, and Health and Safety (ESHS) planning documents that may be developed and/or adopted by the Aurora Project.

3.0 RESPONSIBILITIES

3.1 Operations Managers

Aurora Project Operations Managers are responsible for assisting the Environmental Manager, as necessary, in the identification needs for SOPs or SOP modifications that relate to ESHS functions within their area of responsibility.

3.2 Environmental Manager

The Environmental Manager or his designee will:

- identify or confirm the need for the development or revision of an SOP;
- assign a proper document control number, title, and/or revision number;
- prepare or update the SOP, or delegate to a designated preparer;

- review and approve SOPs against relevant planning documents; and
- ensure that final review and approval by the VP, Aurora Project or their designee is obtained prior to issue of the SOP.

3.3 Vice President (VP), Aurora Project

The VP, Aurora Project will review and approve all new or updated SOPs prior to issue.

4.0 PROCEDURE

The general process for evaluating the need for creation or modification of an SOP is described in the following steps. This process is also summarized as a flowchart in **Figure 1**.

4.1 Prepare or Update an SOP

SOPs will be prepared by the Environmental Manager or a designated preparer. SOP formats shall follow the general format conventions (e.g., header style, font, justification) established by of this procedure.

All SOPs will contain a header that includes the names of the procedure, the revision level, and the effective date, following the example of this procedure. The Environmental Manager will assign a unique "GG-XX" format numerical designator to new SOPs.

General guidelines for SOP format and content are provided as follows:

1. ***Purpose and Scope***

   Describe the purpose that the procedure is attempting to fulfil. Provide a statement that describes the life-cycle applicability of the SOP, and cross-reference the specific section of the *ESMS Plan* that the SOP supports; see Section 1 of this SOP for an example of a typical statement.

2. ***Definitions***

   Define any terms that are unique or important for the end user to understand in the proper implementation of the SOP.

3. ***Responsibilities***

   List the different position titles or categories of personnel who have significant responsibilities for carrying out the procedure, and describe their specific duties.

4. ***Procedure***

Create a simple flowchart illustrating the process flow of the procedure, and in corresponding text briefly describe the activities that must take place during each step of the procedure, giving due consideration to the level of experience and other characteristics of the intended end users of the SOP. Note any specific regulatory requirements, voluntary standards, plans, other GGI SOPs, or other documents which support the procedure and play a significant role in its proper implementation. Provide for appropriate workforce training activities; specify training/refresher training frequency, as appropriate, and provide a cross-reference to GG-06, "ESMS Training Program." Discuss the keeping of appropriate records that will demonstrate that key steps in the process have been properly completed and documented; cross-reference GG-05, "Records Management." Include any specific internal or external reporting requirements.

5. References

List any regulatory requirements, voluntary standards, plans, procedures or other documents which are specifically cross-referenced in the procedure and must also be understood for the SOP to be properly implemented.

6. Figures, Tables, or Attachments.

Any diagrams, forms, photographs, or tables used to illustrate or support the process should be included in this section. **Figure 1** should be reserved for the procedural flowchart. Other appropriate types of figures could include examples of forms, checklists, labels, photographs of acceptable/unacceptable conditions, or logs that are necessary for documenting the implementation of the specified process.

4.2 Review and Approval

New or revised SOPs shall be reviewed and approved by the Environmental Manager and the VP, Aurora Project, or their designees. All comments shall be addressed to the satisfaction of the Environmental Manager and the VP, Aurora Project. Final approvals shall be indicated by the signatures in the title block on the first page of the SOP, and by assigning an effective date for the implementation of the SOP.

4.3 Controlled Distribution

Once the SOP or SOP update has been finalized with signatures and an effective date, the SOP will be subject to controlled distribution to individuals with a specific need to know, at the Environmental Manager's discretion. A list of individuals receiving controlled copies shall be maintained by the Environmental Manager.

4.4 Procedural Training

Any training required to implement a new or revised SOP shall be scheduled and coordinated by the Environmental Manager or his designee in accordance with GG-06, “ESMS Training Program.”

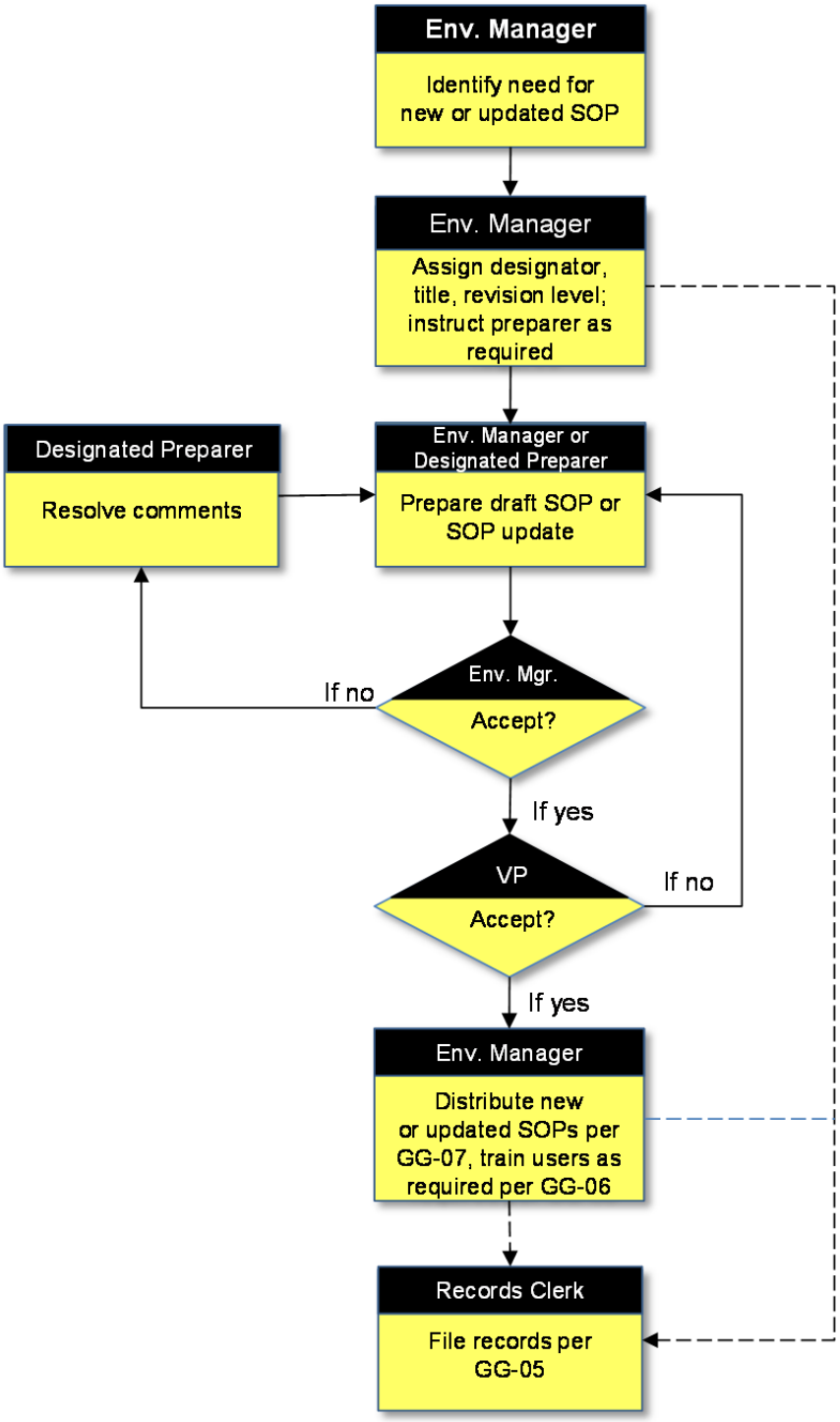
4.5 Project Records

Records produced as a result of the implementation of the SOP will include master copies of each version of the SOP and a list of recipients of controlled copies, which shall be retained as described by GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-07, “Distribution and Control of ESMS Documents”

Figure 1: Preparation, Review, Approval, and Issue of SOPs



1.0 PURPOSE

This Standard Operating Procedure (SOP) defines minimum requirements for conducting documented in-process or field inspections of the environmental, social, and health and safety (ESHS) aspects of the Aurora Project, when specifically requested by the Environmental Manager or other Guyana Goldfields, Inc. (GGI) management staff. This SOP will apply over the life of the Project; it supports Sections 7.2.1 ("ESMS Monitoring") and 7.3 ("Non-conformance Reporting and Corrective and Preventive Action") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*.

2.0 DEFINITIONS

2.1 Field Inspection

Field inspection is defined as the monitoring or witnessing the performance of field work in process by designated inspectors, in order to verify that it is being conducted in accordance with approved plans, procedures, methods, or other specified requirements. Field inspections are management tools that may be used to detect and correct observed or potential deficiencies in any phase of a mining project, in order to detect or minimize or eliminate the potential for non-conformances. Field inspection methods are applicable to a broad range of activities that may be conducted in all phases of the mining life cycle.

2.2 Non-conformances

Non-conformances are defined as conditions that the Aurora Project can reasonably control or substantially influence that:

- are contrary to the commitments of GGI's management policies or ESMS requirements;
- can be classified as accidents or significant near-misses;
- violate a legal or regulatory requirement, or represent a worsening condition that could result in a violation if not corrected;
- could potentially result in negative environmental or social impacts; or

- represent a lack of conformance with the GGI *ESMS Plan* or its supporting Management Plans or procedures.

Minor deficiencies that are not related to regulatory compliance issues, stakeholder complaints, or workforce health and safety that can be brought fully into conformance with immediate corrective action ***are not considered non-conformances*** as long as the circumstances and corrective action are documented in the inspection report required by this procedure. However, if the nature of such a deficiency precludes immediate correction, it must be formally documented and resolved as described in GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

2.3 Corrective Action

Corrective action refers to those measures taken to correct conditions adverse to quality and, where necessary, prevent repetition; this includes the action taken to eliminate the cause of a detected non-conformance.

2.4 Preventive Action

Preventive action refers to those actions that are focused on eliminating the cause of a potential non-conformance or other undesirable potential situation.

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager (or other GGI management staff) may request field inspections wherever deemed necessary to assess ESHS performance. Inspection responsibilities may be delegated to the Aurora Base Health and Safety or Environmental Officers or other designated inspectors as noted herein. The Environmental Manager shall review and approve inspection plans or checklists prior to the inspection activity, and will coordinate appropriate inspection schedules with affected area managers.

3.2 Designated Inspectors

Designated inspectors are responsible for: 1) preparing inspection plans or checklists prior to the inspection; 2) performing the inspection in accordance with the approved plan or checklist; 3) documenting inspection results on the form provided in **Figure 2**; 4) initiating Corrective/Preventive Action Requests (CPARs; see GG-04, "Identification of Non-conformances and Corrective/Preventive Action") for any non-conformances; and 5) identifying other appropriate action items that are recommended as a practice improvement or to prevent the worsening of an observed ESHS-related trend or condition.

4.0 PROCEDURE

The overall process for conducting a field inspection is presented in the following paragraphs, and summarized as a flowchart in **Figure 1**.

4.1 Initiation of Inspection Process

The Environmental Manager may (at his discretion or upon request from GGI management) use this procedure to conduct documented overchecks on the performance of specific tasks or areas of the project in order to minimize or eliminate the potential for adverse environmental, health and safety, or social impacts. Such inspections may be performed directly by the Environmental Manager, the Aurora Base Health and Safety or Environmental Officers, or other designees.

4.2 Selection and Qualification of Inspectors

Designated inspectors may be selected and qualified by the Environmental Manager on the basis of:

- relevant experience with the Aurora Project and prior inspection experience under the requirements of this procedure; or

- participation in a documented training session led by the Environmental Manager that presents the requirements of this procedure and SOP GG-04, “Identification of Non-conformances and Corrective/Preventive Action” ; any such training shall be documented in accordance with GG-06, “ESMS Training Program.”

4.3 Inspection Planning

After completion of any necessary training as noted in Section 4.2, the designated inspector shall prepare an appropriately detailed inspection plan or checklist using the form provided as **Figure 2**, based on the general inspection scope defined by the Environmental Manager. The inspection plan or checklist may be prepared in any convenient format, provided that it is designed to verify and document:

- conformance with the technical procedures, drawings, specifications, or other specified references;

- personnel contacted during the inspection;

- as applicable, conformance of operations and sequencing with the requirements of governing plans or procedures;

- completion of all required data sheets, logbook entries, or other records, to the extent appropriate for the type of activity observed; and

- environmental or other conditions that could affect the accuracy or completeness of the inspection.

The Environmental Manager will review and approve inspection plans or checklists prior to commencing the inspection. The Environmental Manager shall also coordinate appropriate inspection schedules with affected Operations Managers to minimize disruptions to work in progress.

4.4 Conduct Inspection

The designated inspector shall conduct the inspection in accordance with the plan or checklist developed under Section 4.3, and document the results on the inspection report (**Figure 2**). Photographs, sketches, or other information may be attached as necessary to illustrate a specific condition.

Any deviations from the plan or checklist shall be documented and explained or justified. If non-conformances are observed, the inspector shall initiate a CPAR in accordance with SOP-10, "Identification of Non-conformances and Corrective/Preventive Action." Any non-conformances involving emergency situations, accidents, endangerment of the workforce or a health or safety issue requiring an immediate response shall be brought to the immediate attention of the affected Operations Manager for initiation of an appropriate response action under the requirements of the GGI ESMS.

Noted deficiencies that are corrected immediately in the presence of the inspector (see Section 2.2) shall be fully described. CPAR control numbers shall be noted on the inspection record in the block provided. Other action items shall be noted that represent appropriate practice improvements or are deemed necessary to prevent the worsening of an observed trend or condition.

4.5 Review and Approval

The Environmental Manager shall review and approve the final inspection report. The completed report shall then be submitted to the affected Area Manager for resolution of any CPARs and Action Items. CPAR resolution shall be documented as noted in GG-04; resolution of action items shall be confirmed by the designated inspector and documented in the "Comments" block of the inspection report.

4.6 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, "Records Management" and include training records for designated inspectors and completed inspection plan and report forms, with all attachments.

5.0 REFERENCES

- GGI *ESMS Plan;*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”;
- GG-05, “Records Management”; and
- GG-06, “ESMS Training Program.”

Figure 1: Field Inspection Process

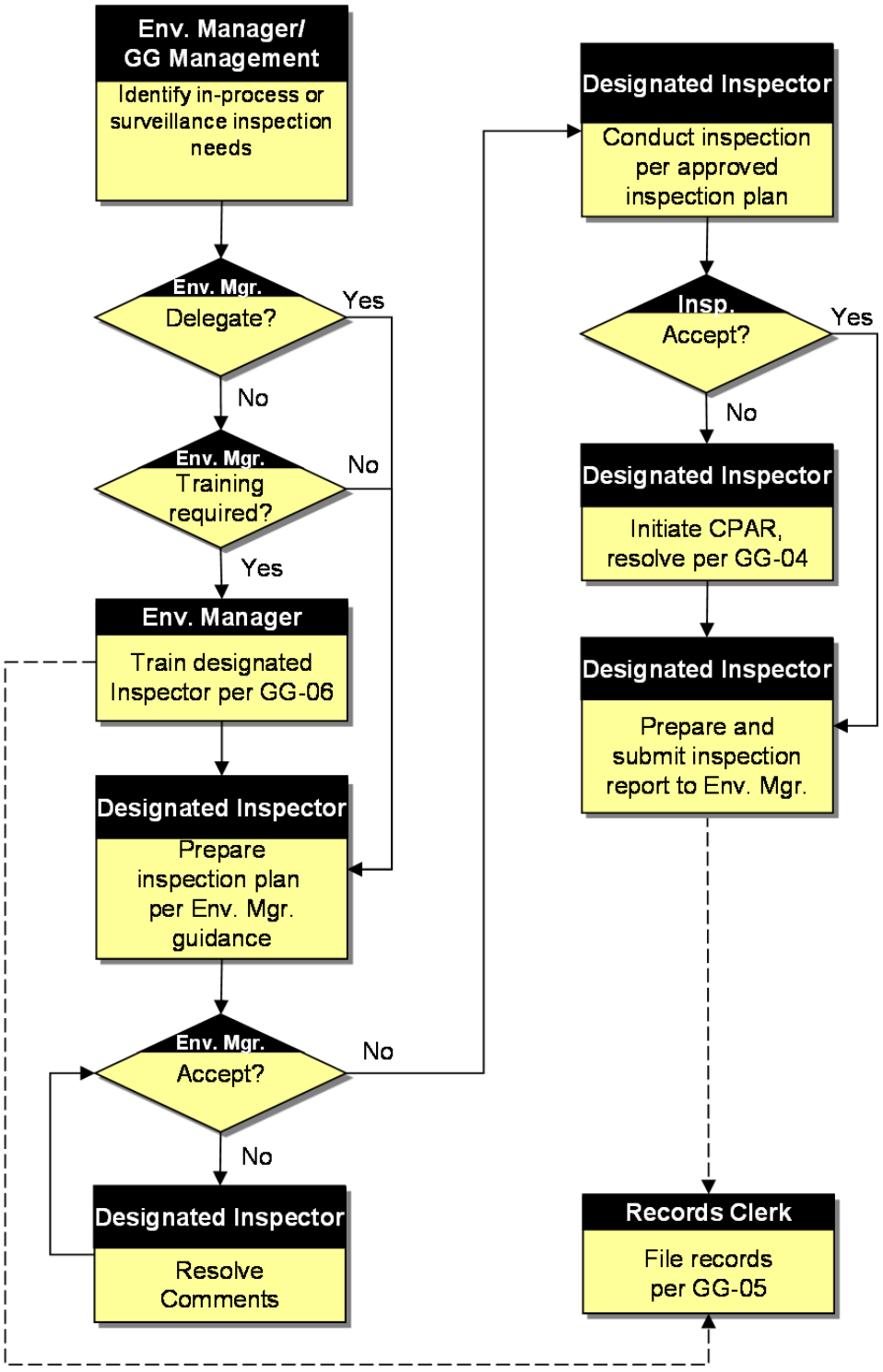


Figure 2: Inspection Plan and Report Form

	Field Inspection Plan/Report	**Page 1 of:__**

1. Inspection Location:	**2. Operations Manager/Supervisor:**

3. Inspection Plan/Checklist (attach extra sheets as required)**:**

Approval: _____ Date:_____
Environmental Manager

4. Inspection Date:_____ Start time: _____ End time: _____

5. Personnel Contacted:

6. Reference Procedures/Requirements:

7. Inspection Observations/Comments (attach extra sheets as required)**:**

8. CPAR references (if any)

9. Action Items (attach extra sheets as required):

Inspector: _____	**Date: _____**	**Approval: _____** Environmental Manager	**Date: _____**

15. Comments:

	STANDARD OPERATING PROCEDURE **GG-04: Identification of Non-conformances and Corrective/Preventive Action**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes a controlled process for initiating corrective and preventive actions in response to externally or internally reported non-conformances that relate to the environmental, social, and health and safety (ESHS) aspects of the Guyana Goldfields, Inc. (GGI) Aurora Project. This SOP will apply over the life of the Project; it supports Section 7.3 ("Non-conformance Reporting and Corrective and Preventive Action") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Non-conformances

Non-conformances are defined as conditions that the Aurora Project can reasonably control or substantially influence that:

- are contrary to the commitments of Guyana Gold's management policies or Environmental and Social Management System (ESMS) requirements;
- can be classified as accidents or significant near-misses;
- violate a legal or regulatory requirement, or represent a worsening condition that could result in a violation if not corrected;
- could potentially result in negative environmental or social impacts; or
- GGI *ESMS Plan* or supporting Management Plans and procedures.

Minor deficiencies that are not related to regulatory compliance issues, stakeholder complaints, or workforce health and safety that can be brought fully into conformance with immediate corrective action ***are not considered non-conformances*** as long as the circumstances and corrective action are documented in the inspection report required by

this procedure. However, if the nature of such a deficiency precludes immediate correction, it must be formally documented and resolved as described in this SOP.

2.2 Corrective/Preventive Action Request (CPAR) Forms

CPAR forms (see **Figure 2**) are documents prepared by the Environmental Manager or designee, in the event a non-conformance is identified, in order to facilitate investigation, the determination of fundamental or "root" causes, the immediate correction of nonconforming conditions, and the undertaking of specific preventive actions or tasks as necessary to reduce or preclude the possibility of recurrence.

3. RESPONSIBILITIES

3.1 All Personnel

All Aurora Project personnel should bring suspected ESHS non-conformances to the immediate attention of their supervisors, the Aurora Base Environmental or Health and Safety Officers, or the Environmental Manager.

3.2 Responsible Operations Managers

Operations Managers determined to have primary responsibility for a non-conformance shall assist the Environmental Manager in the evaluation of the non-conformance, the determination of appropriate measures to be taken to correct the immediate situation, and selection of appropriate preventive measures that can be reasonably taken to reduce or preclude the possibility of recurrence.

3.3 Environmental Manager

The Environmental Manager (or their designee) will evaluate reported conformance to determine whether or not a nonconforming condition actually exists, and for initiating the CPAR process when non-conformances are confirmed. The Environmental Manager will:

- actively engage responsible Operations Manager(s) in the resolution process for all applicable non-conformances;
- verify completion of all tasks requested as part of the agreed-upon corrective and preventive action;
- monitor the overall completion of CPAR closure actions via a departmental CPAR Status Tracking Log (see Figure 3); and
- Approve and formally close each CPAR when all required actions are completed.

4.0 PROCEDURE

The CPAR process consists of the following steps, which are also summarized as a flowchart (**Figure 1**).

4.1 Evaluation of Potential Non-conformances

The Environmental Manager will review all notifications of potentially nonconforming conditions to determine whether or not the criteria noted in Section 2.1 are actually met. If the Environmental Manager determines that a non-conformance does not exist, an e-mail message will be sent to the originator, with a hard copy sent to file. If the originator is external to Aurora Project, then appropriately documented communications shall be made through the processes described in GG-01, "Management of Environmental Complaints and Information Requests."

4.2 CPAR Documentation, Logging, and Distribution

The Environmental Manager or their designee will document the confirmed non-conformance on a CPAR form (see **Figure 2**), assign the CPAR a unique tracking number, and enter basic information in the CPAR Status Tracking Log (see **Figure 3**). The initiator of the CPAR will be identified, as well as the Operations Manager with primary responsibility for the circumstances resulting in the non-conformance. The non-conformance shall be briefly described, include details on location, frequency, and relative severity. Photographs, sketches, or other information may be attached as appropriate. A copy of the open CPAR shall be forwarded to the responsible Area Manager and a meeting scheduled within 10 working days for the joint development of appropriate corrective and preventive actions.

4.4 CPAR Disposition and Resolution

The Environmental Manager and responsible Operations Manager (or their designees) shall meet, discuss the observed condition and its root causes, and jointly develop appropriate measures that can be taken to correct the immediate condition as well as reduce or preclude the recurrence of similar non-conformances. Root causes and agreed-upon corrective and preventive actions shall be summarized, and due dates established for the completion of both types of action. Authorization to proceed with the recommended course of action will be indicated by the signatures of the Environmental Supervisor and the responsible Operations Manager. Approved target completion dates shall be entered into the appropriate line of the CPAR Status Tracking Log. If the Environmental Manager and Operations Manager are unable to agree on an appropriate course of action, the CPAR will be referred to the Vice President (VP), Aurora Project for resolution.

4.5 CPAR Completion Status Tracking and Closure

The corrective and preventive actions authorized by the approved CPAR shall be accomplished as stated, and progress tracked through completion by the Environmental Manager on the CPAR Status Tracking Log. Completion of all required tasks will be verified by the Environmental Manager or their designee; verification shall be documented by signature closure on the CPAR form and an appropriate note in the CPAR Status Tracking Log.

4.6 Records

Completed CPAR Status Tracking Log pages and hard copies of all completed CPARs (plus copies of notes to originators of issues that did not result in CPARs) shall be filed and maintained in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-01, “Management of ESHS Complaints and Information Requests.”
- GG-05, “Records Management”

Figure 1: CPAR Process

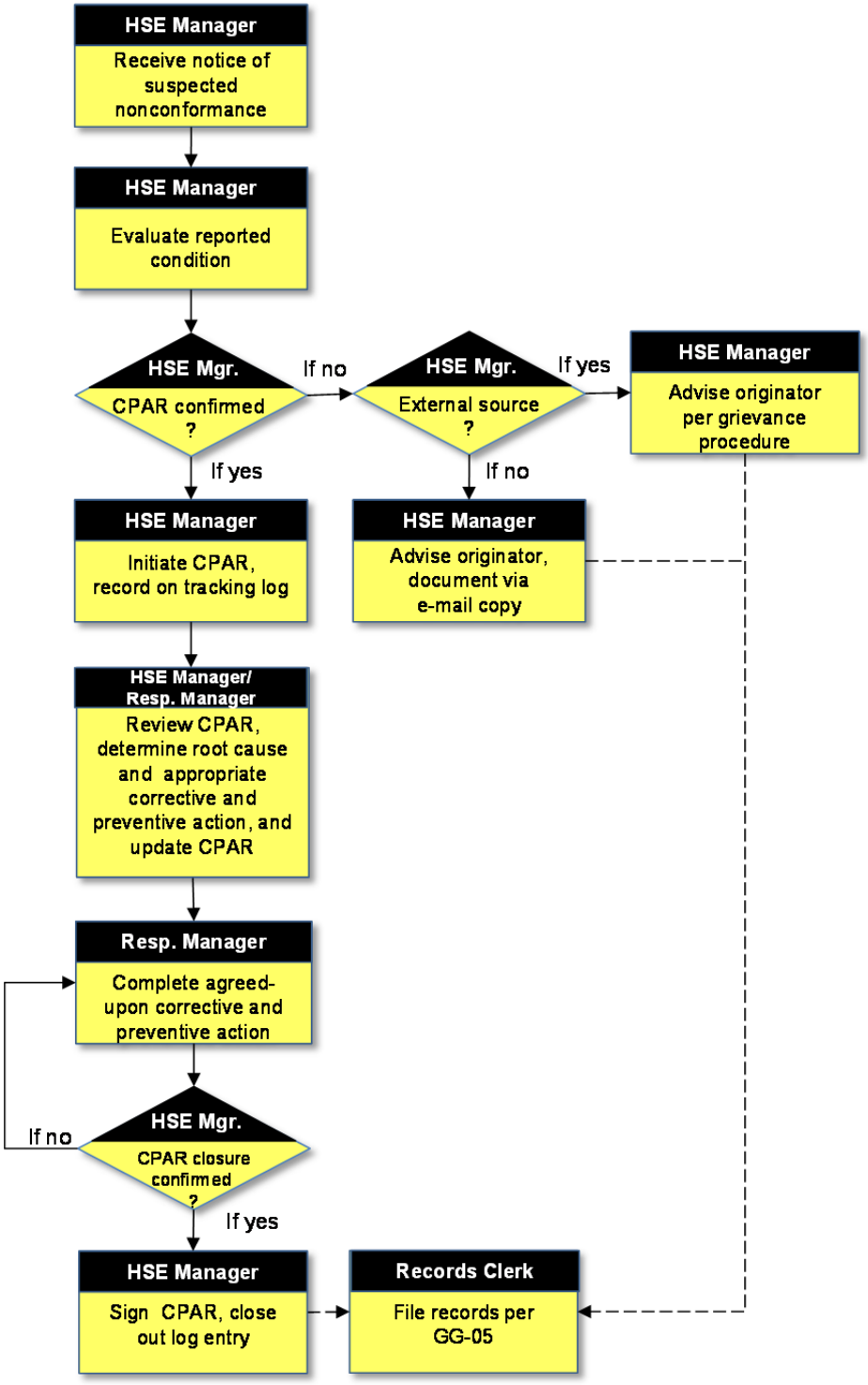


Figure 2: CPAR Form

CORRECTIVE/PREVENTIVE ACTION REQUEST (CPAR)	Control No._____ Date issued:_____ Assigned to: _____ (Responsible Area Manager) Initiated by:_____
Source/Reference Requirement:	
Description of non-conformance (attach additional infuriation as required)	
Root cause:	
Corrective Action (describe or attach additional information):	Complete by:
Corrective Action (describe or attach additional information):	Complete by:
Approved:_____ Date:___ Environmental Manager	Approved:_____ Date:___ Responsible Manager
Closure verified:_____ Date:___ Environmental Manager	Comments:

Figure 3: CPAR Status Tracking Log Form

CPAR STATUS TRACKING LOG						
CPAR No.	Date Issued	Subject	Responsible Manager	Corrective Action Due Date	Preventive Action Due Date	Verification/ Closure Date

	STANDARD OPERATING PROCEDURE **GG-05: Records Management**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides minimum requirements for the management of environmental, social, and health and safety (ESHS) records for the Guyana Goldfields, Inc. (GGI) Aurora Project. This SOP will apply over the life of the Project; it supports Section 7.1 ("ESMS Records") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and all other GGI Management Plans and SOPs as noted therein.

2.0 DEFINITIONS

2.1 Records

Records are defined as legible, completed documents, in hard-copy or electronic format, that provide objective evidence of the completion of required regulatory submittals and other recordkeeping needs defined by the GGI *Environmental and Social Management System Plan* (*ESMS Plan*) and supporting Management Plans or SOPs.

3.0 RESPONSIBILITIES

3.1 All Personnel

All personnel involved in activities that produce environmental records are responsible for the timely submittal of legible and complete copies (in hard copy or .pdf format) to the Environmental Manager or his designee.

3.2 Environmental Manager

The Environmental Manager or his designee shall maintain an ESMS Records Index and Filing Plan and establish appropriate records retention, archiving and disposal time requirements for the various categories of records identified. The Environmental Manager may also conduct an annual review of files to determine which files should be purged and archived or disposed of according to the latest version of the ESMS Records Index and Filing Plan.

4.0 PROCEDURE

The procedure consists of the following steps, which correspond to the general sequence of activities depicted in the flowchart provided as **Figure 1.**

4.1 Records Organization

The Environmental Manager or their designee shall prepare and maintain an EMS Records Index and Filing Plan based on the major regulatory areas governing mine operations, as well as other specific records requirements established by the GGI *ESMS Plan* and its supporting Management Plans and SOPs.

4.2 Records Preparation

Personnel responsible for completing ESHS records shall submit completed documents to the Environmental Manager or his designee. Completed records in electronic format shall be saved in .pdf format; original or best available copies of hard copy records shall be routed for filing wherever possible. Records shall contain sufficient identification to permit logical association of the document to the relevant regulatory agency or activity.

4.3 Records Identification, Filing, Storage, and Access Control

The Environmental Manager or his designee shall file received records in the locations specified in the ESHS Records Index and Filing Plan. Individual records may be accumulated chronologically within any specifically assigned hard copy or electronic folder. Direct access to hard-copy environmental records shall be restricted to the Vice President (VP), Aurora Project and Environmental and Health and Safety Department staff.

4.4 Record Copying and Checkout

Aurora Project personnel may request working copies of records may also check out file folders or individual hard copy records for review purposes only. Working copies of records shall be made whenever possible, and original documents shall be promptly returned to the files in their original condition.

4.5 Records Retention and Disposal or Archiving

All environmental records shall be retained for a minimum of 7 years unless a longer retention period is specifically directed by GGI management. They may be archived (i.e., placed in secure storage that need not be readily accessible) after 3 years at the Environmental Manager's discretion in order to make space for more recent and more frequently used records, and (unless specified otherwise) may be destroyed following the required 7 year retention period. The requirements for retention, disposal and

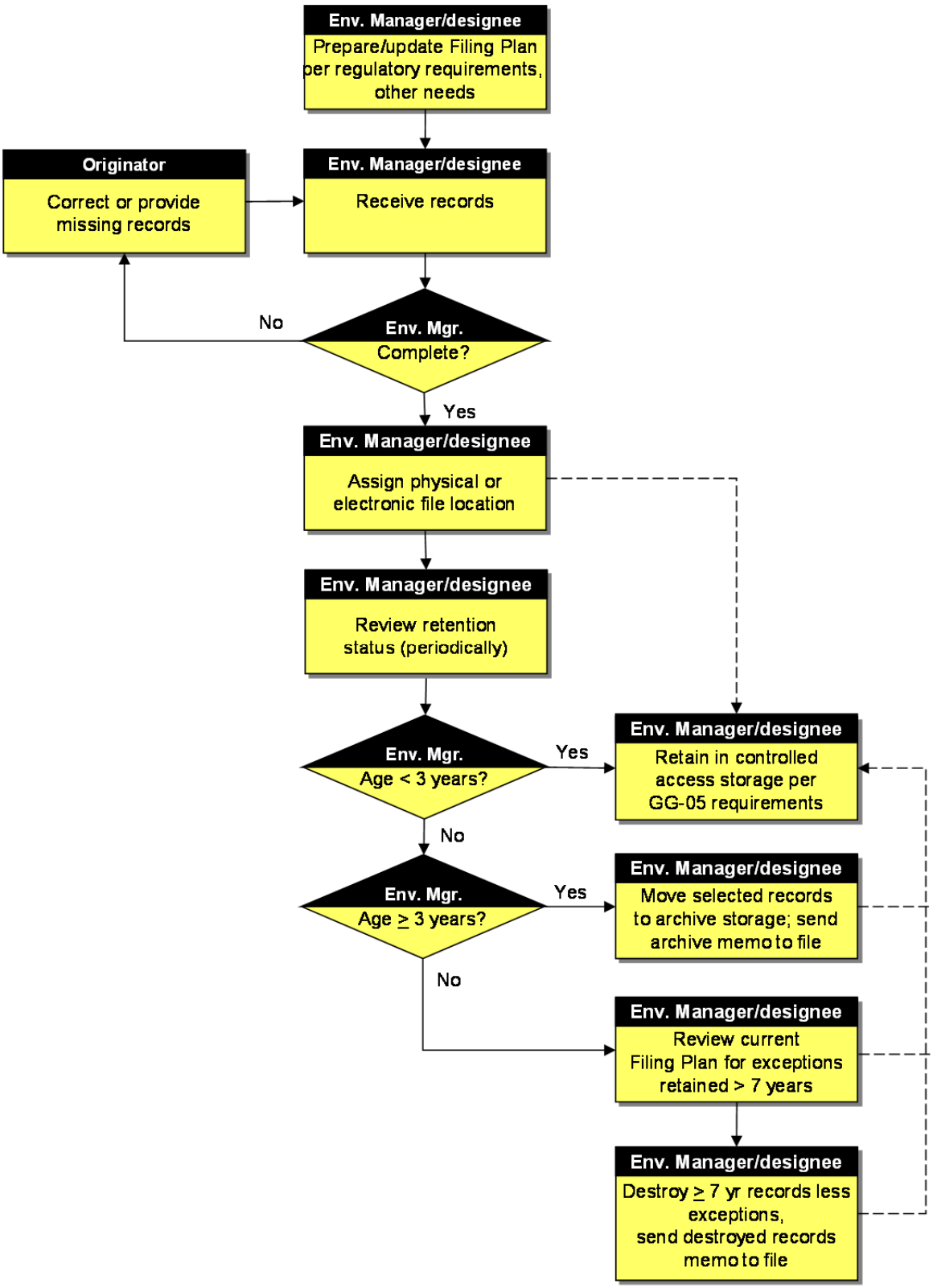
archiving for each record are included in the EMS Records Index and Filing Plan (see **Figure 2**). All updates to the Plan shall be approved by the Environmental Superintendent.

The Environmental Manager or his designee may periodically review retained records against the approved EMS Records Index and Filing Plan and may initiate appropriate archiving and disposal actions. A memo to file shall be prepared that documents which specific files were involved.

5.0 REFERENCES

- GGI *ESMS Plan*

Figure 1: Management of ESHS Records



	STANDARD OPERATING PROCEDURE **GG-06, ESMS Training Program**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 30, 2012	Revision Level: -0-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) provides minimum requirements for the Environmental and Social Management System (ESMS) training program established for the Guyana Goldfields, Inc. (GGI) Aurora Project. This SOP will apply over the life of the Project; it supports Section 5.2 ("Training, Awareness, and Competence") and 4.3.3 ("Control of Contractor Operations") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Introductory Training

Introductory Training (IT) is defined as the initial training of new hires in the general requirements of the GGI ESMS, with emphasis on safe work practices, vehicle safety, spill response, and waste management. Selected aspects of this employee IT can be applied to the training of contractors (see ESMS Plan Section 4.3.3 ("Control of Contractor Operations") and site visitors. Completion of all IT is documented via a standard GGI training record (see **Figure 2**).

2.2 Supervised On-the-Job Training

Supervised On-the Job Training (OJT) is defined as the practical demonstration of the requirements of a procedure by a senior, experienced staff member for the benefit of less experienced or newly hired staff. The trainee is expected to work closely with the OJT trainer until such time that the trainer is satisfied that work can be performed independently. Completion of OJT may be documented via a simple written or e-mailed memo to file from the OJT trainer that is communicated to the Training Clerk.

2.3 Self-Directed Training

Self-directed Training (SDT) is a training method that involves the self-directed reading and/or study of controlled documents. Each trainee assumes personal responsibility for

completing the requested reading assignments. Completion of training is acknowledged by a simple written or e-mail or verbal notification to the Training Clerk.

2.4 Class Room Training

Class Room Training (CRT) is a training method that involves the Environmental and Health and Safety Officers or other experienced GGI staff member instructing a group on a specific task or one or several of the requirements of the GGI *ESMS Management Plan* or its supporting Management Plans or SOPs. Completion of CRT may be documented through completion of a standard GGI training record (see **Figure 2**) that lists the key subjects covered.

2.5 Training Needs Assessment

Training needs assessment is defined as the process of identifying the minimum individual minimum levels of training and appropriate training frequencies (i.e., one-time, annual refresher, or other) required for GGI employees to properly implement the ESMS and conduct their work in compliance with the GGI policies and applicable regulations. Training needs assessments are performed by the Environmental and Health and Safety Officers with input from individual Area Supervisors as needed. Such assessments are documented in the Training Requirements Register spreadsheet (see **Figure 3**).

3.0 RESPONSIBILITIES

3.1 All Personnel

All GGI personnel are responsible for participating in the training program established by this procedure, and for seeking supplemental training or guidance from their Area Supervisors or the Environmental and Health and Safety Officers if procedural responsibilities are not well understood. Contractors and visitors are required to participate in a contractor/visitor training presentation (see Section 4.1). Contractors shall participate in such other training sessions as may be required by applicable Purchase Order or Contract requirements; see ESMS Plan Section 4.3.3, “Control of Contractor Operations.”

3.2 Environmental and Health and Safety Officers

The Environmental and Health and Safety Officers are jointly responsible for ensuring that GGI workers and management are trained in the applicable requirements of the *ESMS Plan* and its supporting Management Plans and SOPs, as appropriate for their work areas and job assignments and the frequency requirements that may be specified in the training needs assessment or by governing documents. The Environmental and Health and Safety Officers may be assisted by a designated Training Clerk who will

receive and maintain training records and keep the Training requirements Register up to date.

4.0 PROCEDURE

The general processes for the ESMS training program are described in the following steps, and summarized as a flowchart in **Figure 1**.

4.1 Contractor/Visitor Training

All contractors and site visitors shall attend a contractor/visitor training presentation prior to traveling to the Aurora Project site; contractors/visitors arriving by air shall participate in a presentation after clearing security as soon as possible after arrival. Contractors shall participate in such other training sessions as may be required by applicable Purchase Order or Contract requirements; see ESMS Plan Section 4.3.3, "Control of Contractor Operations." The training presentation and any addition contractor training shall be adapted from the IT presentation discussed in Section 4.3, and shall be delivered by the Environmental or Health and Safety Officers or their designees. Completion of all contractor/visitor training shall be documented on a standard GGI training record (see **Figure 2**).

4.2 Training Needs Assessment – GGI Staff

The Environmental and Health and Safety Officers, with the assistance of the Area Supervisors, shall conduct and periodically update a training needs assessment for all employees. Such assessments include an evaluation of typical or anticipated responsibilities, and identification of minimum training requirements appropriate for those responsibilities. Training methods and frequencies appropriate for each subject are then selected. Such decisions are documented by entering appropriate frequencies (one-time, annual refresher, or other) and training methods codes in the Training Requirements Register spreadsheet, for each required training subject and for each individual job position. See **Figure 3** for guidance on minimum fields and content for the Training Requirements Register spreadsheet. Training codes include:

- **IT -** Introductory Training
- **SDT** – Self Directed Training
- **OJT** – On-the-job Training
- **CRT** – Classroom Training

4.3 Introductory Training

The Environmental and Health and Safety Officers shall deliver a PowerPoint™-based IT presentation to all new hires that describes the general requirements of the GGI ESMS, with emphasis on safe work practices, vehicle safety, spill response, erosion

control, waste management, labour grievance procedures, and expected behaviour with respect to external stakeholders. Attendance and training materials shall be documented using the form provided in **Figure 2**.

4.3 Position-Specific ESMS Training

The Environmental and Health and Safety Officers and the Area Supervisors are responsible for ensuring each GGI employee is trained according to the requirements of their job position as specified in the current version of the Training Requirements Register, using one or more of the SDT, OJT, and CRT methods. Methods should be selected to be commensurate with the trainee's experience and the nature of their probable work assignments, as discussed in Section 2.

4.4 Training Status Updates/Re-training

All training records for GGI employees are received by a designated Training Clerk, who will enter the date of completion and training subject for each individual into the Training Requirements Register. Hard copies of the EMS training records will be retained as noted in Section 4.5. The Training Clerk and Environmental and Health and Safety Officers will monitor the frequency requirements of the Training Requirements Register, as well as any ESMS changes. In addition to any required refresher training or re-training noted on the Training Requirements Register, any substantial non-editorial changes to the *ESMS Plan* or its supporting Management Plans or SOPs will prompt re-training of affected project staff via one or more of the methods specified by this procedure.

4.5 Records

Records generated from the routine implementation of this procedure will include copies of e-mailed records for SDT or OJT, and completed training records from IT or CRT with copies of any materials disseminated during training. All records will be filed and retained in accordance with GG-05, "Records Management."

5.0 REFERENCES

- *ESMS Plan*
- GG-05, "Records Management"

Figure 1: Training Process

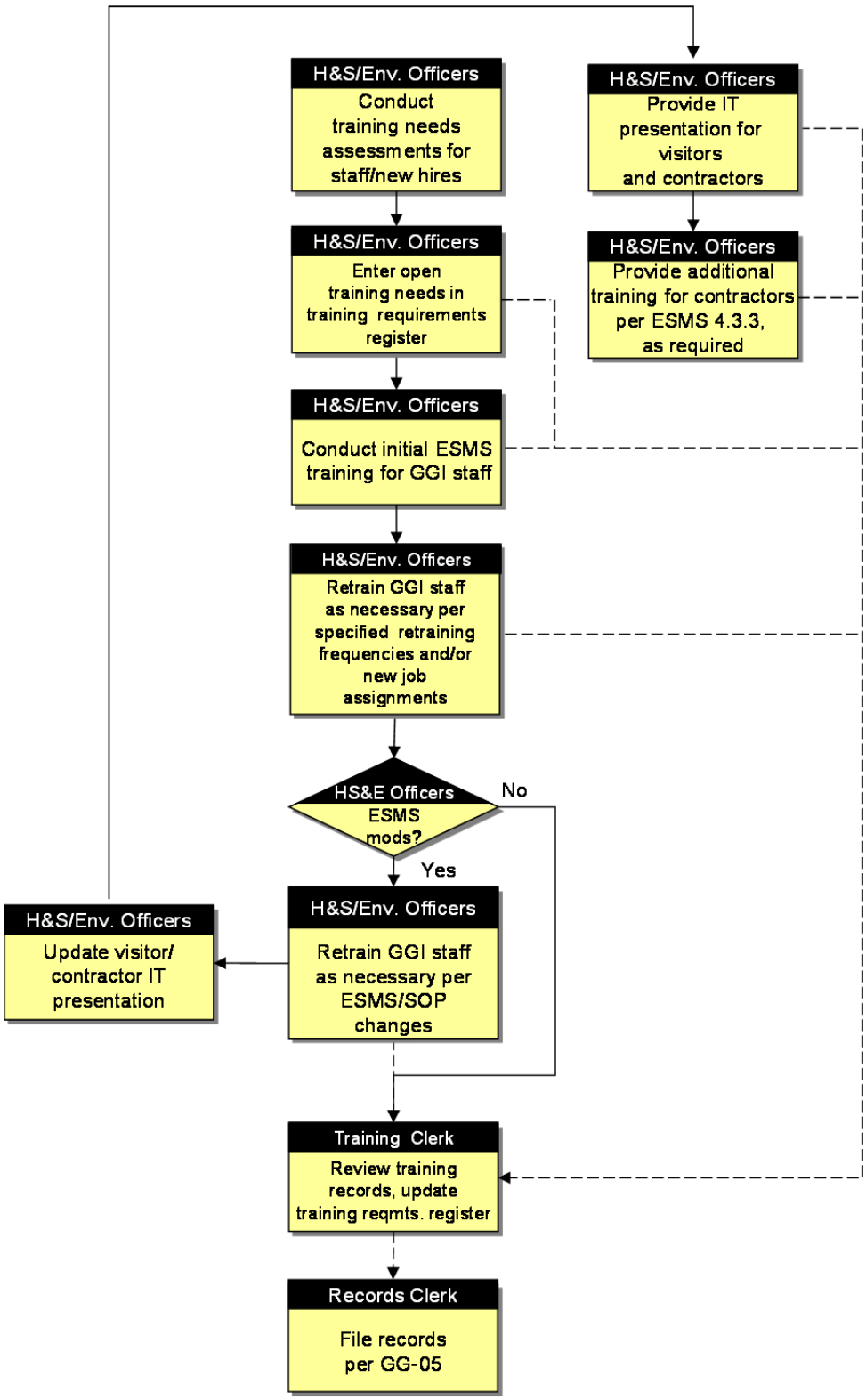


Figure 2: IT/CRT Training Session Attendance Record

Guyana Goldfields, Inc. – Aurora Project
TRAINING SESSION ATTENDANCE RECORD

Training subject(s): _____

Trainer(s) _____ Date: _____

Attendees:

_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature
_____	_____
Name (print)	Signature

Summary (attach copies of all hand-outs as appropriate)

Figure 3: Training Requirements Register – Spreadsheet Field and Content Guidelines

GGI Staff Member		GGI ESMS Documents – Training Requirements, Frequency, Methods, and Training Status, by Individual																
Name	Position/ Title	IT	ESMS Plan	GG-01	GG-02	GG-03	GG-04	GG-05	GG-06	GG-07	GG-08	GG-09	GG-10	GG-11	GG-12	GG-13	GG-14	(insert other SOPs) →	(Insert other Management Plans) →

Training Methods Codes

- **SDT – Self Directed Training**
- **OJT – On-the-job Training**
- **CRT – Classroom Training**

Frequency:

- **One-time**
- **Annual refresher**
- **Other (specify)**

	STANDARD OPERATING PROCEDURE **GG-07: Distribution and Control of ESMS Documents**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This procedure defines the methods that Guyana Goldfields, Inc. (GGI) will use to ensure that current approved versions of the GGI *Environmental and Social Management System Plan (ESMS Plan*) and all supporting Management Plans and Standard Operating Procedures (SOPs) are distributed for use; and to ensure that obsolete documents are removed from controlled circulation.

2.0 DEFINITIONS

2.1 Controlled ESMS Documents

Controlled ESMS documents have specific work-controlling functions, and include the:

- GGI *ESMS Plan*;
- GGI Management Plans, as identified in the current iteration of the *ESMS Plan*; and
- GGI SOPs.

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager is responsible for ensuring that ESMS documents are approved, issued, updated, and distributed to appropriate end users in a controlled manner.

3.2 Designated Records Clerk

The designated Records Clerk is responsible for monitoring receipt of reading training acknowledgements from recipients, maintaining the master Document Control Log (see Figure 2), and filing hard-copy records of all current and superseded ESMS documents.

3.2 All Employees

All GGI employees who receive copies of controlled documents are responsible for removing obsolete versions of documents from use, deleting or destroying any outdated copies, for reading the newly distributed document, and for returning e-mails that acknowledge receipt and completion of reading to the designated Records Clerk.

4.0 PROCEDURE

The procedure consists of the following steps, which are summarized as a flowchart in **Figure 1**.

4.1 Review and Approval Requirements

All controlled documents are to be reviewed and revised at the direction of the Environmental Manager; updated documents will be entered into a master Document Control Log (see **Figure 2**).

If revisions are made, the revision level in the text of the document will be updated as required, and the revised document submitted for review and approval in accordance with the requirements of Section 1.3 of the *ESMS Plan* (for Management Plans or the *ESMS Plan*) or GG-11, “Preparation, Review, Approval, and Update of Standard Operating Procedures” (for SOPs). All comments shall be resolved, and approval shall be indicated in the appropriate column of the Document Control Log.

4.2 Distribution

New or revised controlled ESMS documents shall be saved in read-only (.pdf) format and forwarded via e-mail to all recipients with a cc: to the designated Records Clerk.

4.3 Master Document Control Log

The designated Records Clerk shall update the Document Control Log to note all recipients, the revision level(s) of the document(s) distributed, and the distribution date.

4.4 Acknowledgement of Receipt and Reading Training

Recipients are expected to read all distributed documents and e-mail an acknowledgement of receipt and completion of reading back to the Records Clerk, who shall update the Document Control Log accordingly. Hard copies of ESMS documents may be made for the convenience of the recipient, but only the electronic copy is considered to be controlled. Recipients are expected to remove obsolete hard copies from service.

Copies of e-mails from all recipients shall be retained as reading training records, as noted in GG-06, “ESMS Training Program.” Additional levels of training may be required by the Environmental Manager as discussed in GG-06.

4.5 Records

Records resulting from this procedure include:

- current and superseded copies of controlled documents,
- file copies of e-mail acknowledgements from document recipients, and
- the Document Control Log.

Records shall be maintained in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”

Figure 1: Controlled Distribution and Update of ESMS Documents

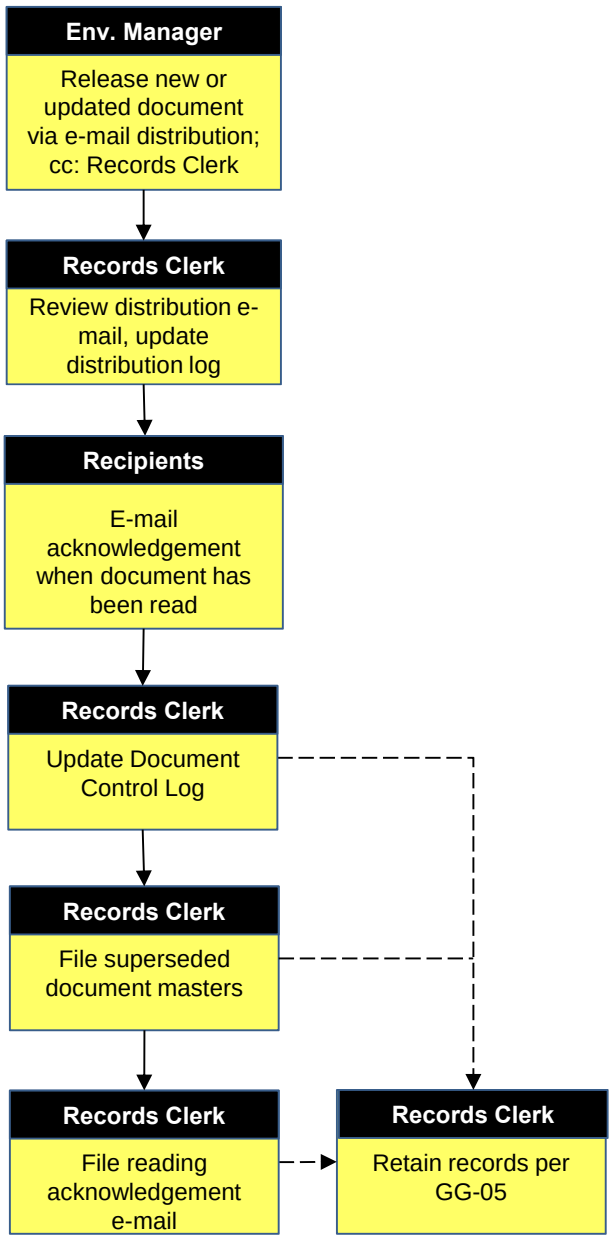


Figure 2:
ESMS Document Control Log

GGI ESMS Document Control Log			
No./Name of Document	**Date Distributed**	**Intended Recipient(s)**	**Receipt/ reading confirmed**

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the minimum requirements for conducting environmental and social "footprint" surveys within the boundaries of GGI's Aurora Project concession. Areas to be cleared may include prospecting/exploration trails; surface sampling areas; drill pad areas; surface trenches; roadway alignments; forested areas; and/or other undeveloped areas to be cleared for construction of facilities or supporting infrastructure for the Guyana Gold, Inc. (GGI) Aurora Project. Surveys will be performed by qualified field ecologists or biologists, who will identify potentially sensitive environmental features or habitats as well as note any evidence of current or historical human use, and provide guidance on appropriate realignments or setbacks.

This SOP will apply through the end of the operational phase of the Project (assuming no exploration activities will take place during decommissioning and closure), and supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Environmental and Social Footprint Survey

An Environmental and Social Footprint Survey is defined as a field examination of a proposed trail, roadway alignment, sampling area, or other clearance area within the Aurora Project concession, for purposes of identifying and protecting surface water features and other potentially sensitive environmental areas or habitats, as well as noting any evidence of current or historical human use.

2.2 Archaeological Find

An ***archaeological find*** is defined as the chance discovery, during an environmental and social footprint survey, of relics or human artefacts with potential archaeological or historical significance. Archaeological finds could include human remains, especially in association with artefacts or articles that indicate ritual burial; pottery or pottery shards; stone tools or implements; or metal, glass, or ceramic objects that could date to the colonial or pre-colonial era. Refuse from artisanal mining or other intrusive activities that are clearly dated later than 1900 will generally not be considered to be of archaeological or historical significance. Examples of potentially significant pre-colonial artefacts that

could be found in the Project area are depicted in Figure 2 of SOP GG-25, “Chance Archaeological Finds.” All such discoveries will be documented and reported to the GGI Environmental Manager for further evaluation and reporting, as appropriate, in accordance with GG-25. Evidence of current or recent human use or direct encounters with illegal/artisanal or small-scale miners (ASMs) during footprint surveys will be immediately referred to GGI security for their evaluation and further investigation if determined to be a potential breach in site security, as noted in GG-40, “Site Security.”

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager shall identify one or several qualified field ecologists or biologists, from GGI staff or contractor resources, to conduct documented environmental and social footprint surveys in accordance with this procedure. The Environmental Manager shall ensure that appropriate contract agreements are in place, if required, and provide the selected field ecologists or biologists. The Environmental Manager shall coordinate with the Environmental Officer and affected Area Supervisors or Construction Managers to schedule footprint surveys in advance of a specific clearance need, and shall review and approve all survey reports.

3.2 Environmental Officer

The Environmental Officer is responsible for training affected Area Supervisors or Construction Managers in the requirements of this procedure, as well as the designated field ecologists/biologists, prior to conducting any field activities. The Environmental Officer shall also assist in the scheduling of footprint surveys in advance of a specific clearance need, and shall monitor clearance activities to ensure that requested realignments or setbacks are properly implemented.

3.3 Area Supervisors/Construction Manager

Affected Area Supervisors or Construction Managers will coordinate with the Environmental Manager and Environmental Officer in scheduling footprint surveys in advance of a specific clearance need. They shall also enforce decisions on any required realignment or construction setback that may be required as a result of the footprint survey.

3.4 Site Security Personnel

By definition , all footprint surveys will be conducted within the boundaries of the Aurora Project concession, and any authorized ASM, logging, hunting, settlement, or other intrusive human activities encountered in preparation for site clearance represents a breach of security. Site security personnel are responsible for assessing the nature and

significance of the intrusive activities that may be reported as part of footprint surveys, and for negotiating with the individuals involved or otherwise resolving the incursion within the guidelines provided in GG-40, “Site Security” and the Project *Community Relations Management Plan.*

3.5 Designated Field Ecologists/Biologists

Designated GGI or contractor field ecologists/biologists shall conduct environmental and social footprint surveys in the manner specified in this SOP. Change archaeological finds shall be referred to the Environmental Officer for appropriate action per GG-25, “Chance Archaeological Finds.” Designated GGI or contractor Field Ecologists/Biologists shall immediately advise GGI security if ASMs, other unauthorized persons, or evidence of recent incursions by such individuals are observed in the clearance area.

4.0 PROCEDURE

The process to be used in the performance of environmental and social surveys is summarized in the following sections, and is depicted as a flowchart in **Figure 1**.

4.1 Selection and Training of Field Ecologists/Biologists

The Environmental Manager shall identify one or more qualified field ecologists or biologists from GGI staff or contractor resources, to conduct documented environmental and social footprint surveys. The Environmental Manager shall ensure that appropriate contract agreements are in place, if required, and provide current site-specific biological baseline studies or other appropriate reference information derived from the most current Project ESIA. The selected field ecologists/biologists shall be trained in the requirements of this procedure in accordance with GG-06, “ESMS Training Program”; copies of the field ecologist/biologist’s professional resumes shall be appended to the training record prior to filing as noted in Section 4.7.

4.2 Scheduling of Environmental and Social Footprint Surveys

The Environmental Manager shall coordinate with the Aurora Base Environmental Officer and affected Area Supervisors or Construction Managers to schedule environmental and social surveys sufficiently in advance of a specific clearance need to permit the completion of the field portion of the survey and documentation of results as described herein.

4.3 Establishment of Survey Boundaries

The nominal boundaries of the proposed survey shall be defined in advance by the affected Area Supervisors or Construction Managers using Geographic Positioning

System (GPS)-referenced maps, photos, and/or sketches; coloured stakes or signs or recognizable landscape features may be used as field reference points when appropriate. Field marking using coloured plastic flagging is not permitted due to the potential for ensnaring avian or terrestrial wildlife.

4.4 Conducting the Environmental and Social Footprint Survey

The survey may be conducted in daylight and/or at night, as directed by the field ecologist/biologist based on the habits of the species indicated by available baseline studies. The field ecologists/biologists shall be accompanied by GGI staff members who have participated in the initial site or alignment definition discussed in Section 4.3. All personnel participating in the survey shall wear appropriate personal protective equipment (e.g., hard hat, high boots or snake leggings, headlamp) in accordance with GG-11, "Personal Protective Equipment." Field ecologists/biologists shall carry a hand-held GPS device, camera, field notebook, a laminated copy of Figure 3 from GG-25, , "Chance Archaeological Finds," along with appropriately detailed habitat data sheets, species checklists, or other field references as necessary to support the survey.

Species and habitat observations shall be made visually and should be confirmatory in scope. The survey should not require field sampling, the intentional capture of any species, or the duplication of the level of effort that, for example, would typically be involved in a definitive baseline study. Appropriately detailed field notes and photographs shall be recorded, however, to facilitate the preparation of the report discussed in Section 4.5. If any chance archaeological finds are encountered, as noted in Section 2.2, they shall be photographed or marked with coloured stakes or signs, GPS coordinate recorded, and referred to the GGI Environmental Manager for further evaluation in accordance with GG-25. If ASMs, other unauthorized persons, or evidence of recent incursions by such individuals are observed in the clearance area, immediately leave the site and report the incursion to GGI security for their appropriate action pursuant to GG-40, "Site Security." The survey may not be resumed until cleared by Security and re-scheduled by the Environmental Manger and/or Construction Manager.

4.5 Environmental and Social Survey Report

The field ecologist/biologist shall prepare a brief letter report (or internal memorandum. If conducted by GGI staff) that documents the results of specific area or alignment surveys. At a minimum, the report shall include:

- the date of the survey;
- a simple map or sketch showing the approximate location of the survey,
- the precise GPS locations of survey points along an alignment, or the corners of any polygonal survey area;

- a general description of the alignment or area surveyed, including discussion of the relative level of current or prior human disturbance [i.e., evidence (or no evidence) of previous logging; evidence (or no evidence) of recent ASM activity)];

- a definition of the forest type (e.g., “white sand wallaba forest” or “floodplain mora forest”), if forested areas are included in the survey scope;

- discussion of any specific surface water features (e.g., seeps, springs, creeks, ponds, bogs, swamps) encountered in the survey;

- general discussion of the avian, terrestrial, and aquatic species encountered in the survey and any associated habitat issues;

- a note on the presence or absence of any chance archaeological finds, or any debris, garbage, or erosion damage or conditions from ASM activities;

- identification of any specific environmental features or species habitat requiring realignment or construction setbacks;

- recommendations on appropriate realignment locations and setback distances;

- sketch maps, photographs, and GPS coordinates of any recommended realignments or construction setbacks; and

- the names the GGI staff members accompanying the surveyor(s).

The report will be submitted to the Environmental Manager for review; all questions or comments will be resolved by the field ecologist/biologist and the report revised accordingly.

The approved report will then be discussed with the affected Area Supervisor or Construction Manager. Any technical adjustments in the recommended realignment or setback will be discussed with the field ecologist/biologist; any final adjustments resulting from this review will be noted in comments at the end of the report. Copies of the final report will then be released to the Area Supervisor or Construction Manager to guide construction activities, and to the Environmental Officer for monitoring purposes as noted in Section 4.6.

4.6 Monitoring of Realignments and Setbacks

At the Environmental Manager’s direction, the Environmental Officer shall periodically monitor the construction activities associated with a given environmental and social survey to ensure that any required realignments or setbacks are observed during construction. If discrepancies are noted, they will be documented as a non-conformance

on a Corrective and Preventive Action Request (CPAR) form and resolved as required by GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

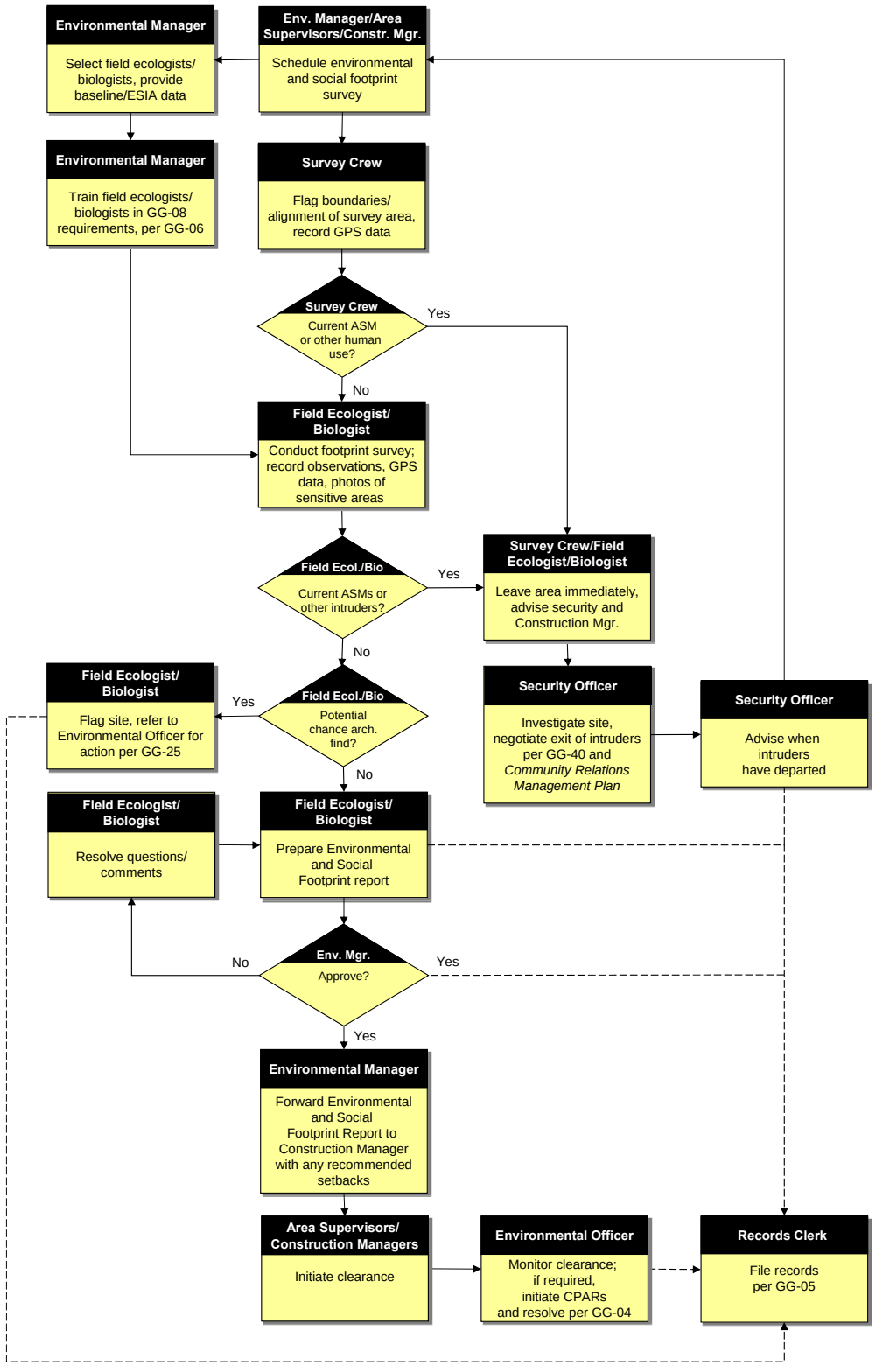
4.7 Records

Training records, copies of field ecologist/biologist resumes, copies of all final footprint survey reports, and copies of any required CPARs will be retained in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Community Relations Management Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-11, “Personal Protective Equipment”
- GG-25, “Chance Archaeological Finds”
- GG-40, “Site Security”

Figure 1: Environmental and Social Footprint Survey Process



	STANDARD OPERATING PROCEDURE GG-09: Identification of Project-related Safety Hazards and Assessment of Risks
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the minimum requirements for conducting occupational health and safety (OHS) risk assessments for the various work sites that comprise the Guyana Gold, Inc. (GGI) Aurora Project. Specifically, this SOP addresses requirements to identify hazards, assess the associated risks, and identify control measures to manage the risks so identified. This SOP also addresses requirements to record the outcome of the risk assessment in an annually updated risk register, and to inform and instruct employees on the nature of the assessed hazards and proper risk control measures. OHS risk assessments are to be carried out for each significant operation, process, and activity conducted by the GGI workforce, at all Aurora Project worksites.

This SOP will apply over the life of the Project; it supports Section 3.3 (Occupational Health and Safety Hazard Identification, Risk Assessment, and Risk Management Planning") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the GGI *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Accident

An ***accident*** is defined an unintended mishap that results in injury or other harm to a human being and/or damage to equipment or property.

2.2 Hazard

A ***hazard*** is a condition that could make an accident more likely or more severe.

2.3 Risk

For the purposes of this procedure, ***risk*** is an expression of the probability of incurring an accident, considering the likelihood that the potential mishap will occur, and the potential severity of the consequences.

2.4 Risk Assessment

A ***risk assessment*** is an exercise intended to identify hazards, evaluate the nature and extent of the risk posed by those hazards, and assist management in selecting and prioritizing effective control measures. The goal of the risk assessment is ultimately to prevent work-related injuries and illnesses, and unintended damage to the environment as well as GGI equipment or property.

A risk assessment may be considered sufficient if it:

- realistically identifies workplace hazards;
- reliably predicts the potential injury or harm related to those hazards;
- does not unduly emphasize insignificant or inconsequential risks;
- evaluates the severity of the potential consequences and the workers (and/or visitors, contractors, or members of the public) who would be affected; and
- provides sufficient information to enable management to select or develop appropriate control measures, taking into account available and appropriate methods or technologies.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

The Health and Safety Officer is responsible to the GGI Environmental Manager for:

- performing (and properly documenting risk assessments in accordance with the requirements of this SOP;
- ensuring that hazard analyses are performed for each significant process, operation, job, or task performed, at all Aurora Project sites;
- ensuring that appropriate control measures are selected, developed, and implemented in keeping with the findings of the risk assessment;
- providing information, instruction, and training to employees on the control measures to be used to prevent or mitigate risks; and
- ensuring that the risk assessments are reviewed and on at least an annual basis, revised as required, and preventive or mitigative measures adjusted as appropriate.

3.2 Area Supervisors

Area Supervisors have general responsibility for establishing and maintaining a safe working environment in their assigned areas of responsibility. Area supervisors or their designees should collaborate with the Health and Safety Officer in initial risk assessment exercises, and should notify the Health and Safety Officer about any potential hazards of which the supervisor may already be aware. Area Supervisors must remain vigilant with respect to changing workplace hazards, and must notify the Health and Safety Officer with respect to any previously unrecognized hazards and/or changes in operating conditions or practices. The supervisor is also responsible for monitoring employee performance to ensure that work is performed in accordance with applicable SOPs and information provided in training.

3.3 GGI Employees

All GGI employees are responsible for:

- attending OHS meetings (see GG-23, "Operational Safety Meetings") and participating in training exercises, as requested by their supervisors or the Health and Safety Officer;

- performing work safely in accordance with the SOPs provided and the training received; and

- informing their supervisor or the Health and Safety Officer with respect to any observations of dangerous or deteriorating situations, or any other perceived shortcoming in GGI's OHS practices.

3.4 Environmental Manager

The Environmental Manager shall review and approve each update for all Risk Registers and present the results to upper management for consideration in the authorization of additional risk reduction measures.

3.5 Vice President (VP), Aurora Project/GGI Management

GGI management shall consider the current OHS Risk Registers in the establishment of annual operational budgets and, where deemed practicable and appropriate, authorization of additional OHS risk reduction measures.

4.0 PROCEDURE

The general process for conducting OH&S risk assessments is described in the following steps. The process is also summarized as a flowchart in **Figure 1**.

4.1 Identify Hazard Category or Source

The Health and Safety Officer shall identify the various departments or areas that comprise a particular site (e.g., security, medical, stores, road transportation, geotechnical) and represent a general category or source of OHS hazards. The categories or sources so identifies will be recorded on the risk register.

4.2 Analyse Hazards and Identify Risks

The Health and Safety Officer shall evaluate the hazard source areas identified in Section 4.1, and identify the specific risks that are known to be, or could be associated with a given source. The Health and Safety Officer should identify as many credible risks as possible in each area; the risks so identified shall be record on the Risk Register form. For example, evaluation of the hazards associated with a camp kitchen would likely note the potential risk of foodborne illness; in the medical area, there are known risks associated with potentially serious illness; and in the area of transportation, risks of vehicle accidents are always present.

At a minimum, the Health and Safety Officer should consider the risks associated with work areas, departmental functions, and work activities that involve:

- working with or near boats, barges, ferries, or aircraft
- working with or near explosives
- lifting and chopping
- carrying materials or equipment
- sanding or grinding
- pushing/pulling
- drilling and sampling
- working with or near sources of electricity
- oxy/acetylene cutting
- working with compressed gases
- welding
- working with fuels or lubricants
- operating machinery
- driving ATVs and light trucks
- driving heavy equipment
- providing medical care to ill patients
- working with food
- working near or handling hot materials
- using chainsaws
- working near or handling toxic or corrosive chemicals including paints/solvents
- using hammers or jackhammers
- spraying insecticide
- demolition
- shovelling
- trenching/excavation
- working with hand tools
- working with power tools
- working at heights
- working with wheelbarrows
- climbing
- working in confined spaces
- working in forest areas

Potential hazards to be noted may also include:

- communicable diseases
- rotating equipment
- falling from heights
- slippery surfaces slips/trips/falls
- being struck by flying objects expelled from vehicles, machinery, or tools
- being struck by falling objects either from overhead or dropped on foot
- rolling objects (foot injury)
- being trapped under machinery or materials

- being impacted by a fixed (protruding) object
- getting caught in or between moving parts
- being burned by hot materials
- splashing fuel, lubricants, or chemicals
- electric shock
- electric arc flash
- heat stroke
- excessive noise, dust, or vibration
- sharp equipment or materials that could cause potential cuts or punctures
- oxygen deficient atmospheres (confined spaces)
- toxic atmospheres (gases or vapors)
- snakebite
- exposure to vectors of serious disease

4.3 Identify Current Preventive Measures

For each of the risks elaborated in Section 4.3, the Health and Safety Officer should accurately describe the current measures (preventive or mitigative) that are currently used to manage the risk. These should include any and all engineered measures, training programs, planning or other administrative controls, and/or Personal Protective Equipment (PPE; see GG-11, “Personal Protective Equipment”).

4.4 Identification of Persons at Risk

The Health and Safety Officer shall assess the extent of the potential impact of a given risk to determine the categories of persons at risk; these individuals could be GGI employees, as well as visitors to the Project sites, transient artisanal miners or members of local communities, and/or GGI contractors. Record this determination by a tick mark in the “persons at risk” columns on the Risk Register form.

4.5 Estimation of Risk Severity with Current Preventive Measures Applied

The Health and Safety Officer should estimate the relative severity (i.e., minor, moderate, or major) of the risk, taking into account all current preventive or mitigative measures, as discussed in Section 4.4. The next-to-last column of the Risk Register should be marked and colour-coded accordingly.

4.6 Identify Additional Preventive Measures

The Health and Safety Officer shall evaluate the relative severity of the risk, as determined in Section 4.6, and consider additional reasonable control measures that could potentially be implemented over the next planning year to further reduce the severity of the noted risk, especially for all risks identified as moderate or major. In identifying any such improvements, the Health and Safety Officer should ensure that each additional preventive measure:

- meets specific standards set by applicable legal requirements;
- complies with a recognized industry standard;
- represents a good industrial, engineering, or management practice;

- is consistent with GGI's corporate policies; and
- reduces risk to levels that are reasonably practicable.

Examples of potentially appropriate additional control measures could include:

- development of (or refinement of existing) Action Plans, as discussed in Section 1.2 of the GGI *Environmental and Social Management System Plan (ESMS Plan)*;

- management of new or inadequately controlled solid waste streams in accordance with the GGI *Waste Management Plan;*

- identification and use of appropriate additional PPE (see GG-11, "Personal Protective Equipment");

- additional staff training (see GG-23, "Operational Safety Meetings" and GG-06, "ESMS Training Program");

- installation/re-installation of appropriate machinery safeguards (see GG-18, "Machine Guards and Safety Barriers");

- improved fire prevention measures (see GG-22, "Fire Prevention Program," GG-20, "Electrical Safety," and GG-19, "Welding and Cutting Safety");

- implementation of special procedures for working in confined spaces (see GG-21, "Confined Space Work Safety"); or

- development and implementation of new SOPs in accordance with GG-02, "Preparation, Review, Approval, and Update of Standard Operating Procedures."

The proposed control measures shall be documented on the Risk Register and submitted to the Environmental Manager for review and approval.

4.7 Review, Approval, and Update

The Environmental Manager shall review the completed Risk Register; all comments shall be resolved, and the completed Risk Register submitted to the VP, Aurora Project and GGI's upper management for consideration in the annual budgeting process, and for the evaluation and potential authorization of specific risk reduction improvements. The approved Risk Register will also be used as a key reference by the Health and Safety Officer in providing annual OHS refresher training to Project staff.

4.8 Risk Assessment Records

Once the Risk Register is approved, a master copy shall be routed to the designated Records Clerk for retention in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Waste Management Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-02, “Preparation, Review, Approval, and Update of Standard Operating Procedures”
- GG-05, “Records Management.”
- GG-06, “ESMS Training Program”
- GG-11, “Personal Protective Equipment”
- GG-18, “Machine Guards and Safety Barriers”
- GG-19, “Welding and Cutting Safety”
- GG-20, “Electrical Safety”
- GG-21, “Confined Space Work Safety”
- GG-22, “Fire Prevention Program”; and
- GG-24, “Operational Safety Meetings.”

Figure 1: Risk Assessment Process

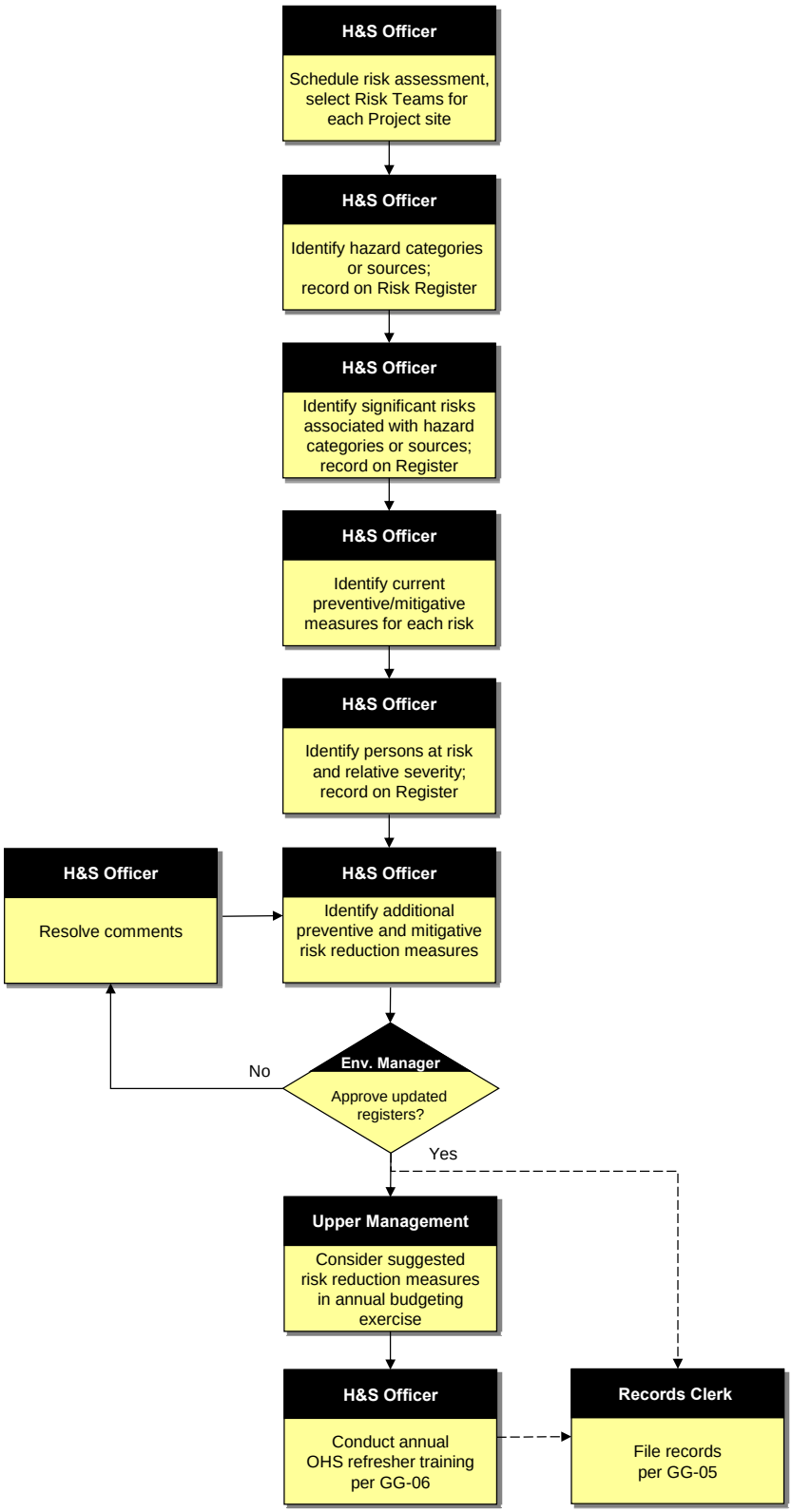


Figure 2: Risk Register Form

Guyana Goldfields, Inc. OHS Risk Register		Date: [insert date]							
Prepared by: [insert name]			Severity	Minor	Moderate	Major			
Site: [insert site name]		Approved By:							
Hazard category or source	Risks	Current preventive measures	Persons at Risk				Severity of risk with current preventative measures applied	Additional preventive measures to be considered in next year
			Employees	Visitors	Community	Contractors		

1.0 PURPOSE AND SCOPE

The protection of the health of Guyana Goldfields, Inc. (GGI) employees, contractors, and visitors is vital to the success of the Aurora Project. This Standard Operating Procedure (SOP) establishes minimum requirements for the prevention, detection, minimization of exposure to, and treatment of communicable diseases in temporary prospecting and exploration camps, as well as the semi-permanent man camp established for the construction and operational phases of the Project.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts') of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Blood-borne Diseases

Blood-borne diseases are spread by direct contact with blood; examples include hepatitis and human immunodeficiency virus (HIV)/ acquired immune deficiency syndrome (AIDs).

2.2 Communicable or Contagious Diseases

Communicable or contagious diseases are generally defined as diseases that are readily transmitted from person to person by direct contact with an infected individual or indirectly through a vector (e.g., insects or rodents). Such diseases (e.g., malaria, dengue fever, HIV/AIDS) may be contracted as a result of insect or rodent bites; direct contact with blood from an infected patient; by inhaling or ingesting contaminants or pathogens through the respiratory or gastrointestinal systems, respectively; by skin-to-skin contact; or from sexual activity.

2.3 Dermatological Diseases

Contagious ***dermatological diseases*** are conditions related to skin or hair (e.g., body lice) that can be spread through direct contact, or through shared clothing, or from shared use of combs or razors. Although not life-threatening, such diseases may cause substantial discomfort and can create significant tension in a camp living situation.

2.4 Gastrointestinal Diseases

Contagious ***gastrointestinal diseases*** affect the stomach or intestines and may be caused by contamination of food or water supplies; examples include dysentery, salmonella, trichinosis, and diarrhea.

2.5 Respiratory Diseases

Respiratory diseases affect the organs that are involved in breathing (i.e., the nose, throat, larynx, trachea, bronchial tubes, and lungs). These diseases are typically spread by airborne contaminants or pathogens; examples include common colds, influenza, and pneumonia.

2.6 Sexually Transmitted Diseases (STDs)

STDs are typically spread from person to person by sexual activity and include such diseases as genital herpes, gonorrhea, syphilis, and HIV/AIDS. Without treatment, many STDs can lead to major health problems such as infertility, permanent brain damage, heart disease, cancer, or death.

3.0 RESPONSIBILITIES

3.1 Site Medics

Site medics are trained and qualified medical professionals assigned to the medical clinics at individual Project camp sites, and are responsible to the Health and Safety Officer and the Environmental Manager for providing communicable disease prevention training to Project staff and contractors. Site medics will ensure that monitoring and treatment guidelines are followed, and that all employees and visitors to the mine receive appropriate instruction on preventive hygiene. Medics are also responsible for monitoring the health of the workforce and investigating any potential outbreaks of communicable diseases, as well as for treating patients and/or arranging for transport and treatment at an appropriately staffed and equipped offsite clinic or hospital. Medics are also responsible for reporting such incidents to the Health and Safety Officer and the Environmental Manager, and for initiating appropriate corrective and preventive action. Medics may also initiate emergency evacuation of workers or visitors when, in their professional judgment, such evacuation is a medical necessity [e.g., traumatic injury or inability to walk (see GG-12, “First Aid and Emergency Medical Response”)] or if symptoms of serious communicable diseases are observed.

3.2 Area Managers and Supervisors

Area Managers and Supervisors are responsible for ensuring that employees in their assigned areas of responsibility have undergone communicable disease prevention training as outlined in this SOP. Supervisors shall immediately advise the Safety Health

and Safety Officer and the Environmental Manager if they observe potential symptoms of communicable diseases, or are advised by workers about any observed incidences of communicable diseases, and ensure that proper steps are taken to treat those afflicted. See GG-12, “First Aid and Emergency Medical Response.”

3.3 Project Workforce

The Aurora Project workforce shall implement proper personal and industrial hygiene and communicable disease prevention practices, and shall immediately bring any concerns to the attention of their Supervisor or camp medics should they notice symptoms of a potentially communicable disease.

4.0 PROCEDURE

The process for preventing, detecting, minimizing exposure to, and treating communicable diseases is presented in the following paragraphs and is summarized as a flowchart in **Figure 1**.

4.1 Physical Examinations

All potential GGI employees shall pass a physical and medical examination administered by a GGI medic or another licensed medical professional, as a condition of employment. Any applicants who exhibit symptoms of a communicable disease in this examination shall be required to seek treatment prior to completing the application process. Interim treatment may be provided in keeping with the professional judgment of the site medics, and the applicant will be referred to local or regional clinics or hospitals for completion of medical treatment.

4.2 Communicable Disease Prevention Training

The Health and Safety Officer and/or site medics shall provide periodic disease prevention training to project staff (and contractors, as appropriate) using one or more of the methods specified in GG-06, “ESMS Training Program.”

4.3 Code of Conduct Review

Trainees shall be reminded of several key elements of the GGI “Labour Grievance Policy” that are related directly to the prevention of communicable diseases. These include:

- **Use of alcohol or illegal drugs:** Use of alcohol or illegal drugs is expressly forbidden within the boundaries of the Project concession and by any contractors or employees traveling to any Project site.

- **Waste collection and disposal:** All workers shall ensure that hazardous waste and medical, canteen, and other wastes that could attract dangerous animals or animal or insect disease vectors (e.g., snakes, rats, mice, flies, mosquitoes) is disposed of in proper collection bins or containers as described by the Project *Waste Management Plan*. Littering is prohibited within the boundaries of the Project concession and by any contractors or employees traveling to any Project site.

- **Minimization of interactions with the local population:** Project employees shall not visit local artisanal miner encampments or local community residents except as part of their Project work assignments. Project employees shall not allow local residents to ride in Project vehicles except in case of an extreme medical or humanitarian emergency. Project or contractor vehicles shall not stop at any location along the transportation corridor to the mine site except where required to show travel passes at established Barama or police checkpoints

- **Harboring of animals or plants:** No indoor pets, wild animals, or gardens may be kept by any Project employees who are quartered in exploration camps or the semi-permanent man camp.

4.3.1 General Requirements – Personal and Industrial Hygiene

Because of the close proximity of workers in a camp-based living situation, outbreaks of communicable disease at any level could have serious operational consequences for the Project. However, much of the risk associated with such outbreaks can be substantially minimized by relatively simple methods, e.g., by paying close and consistent attention to basic personal and industrial hygiene. The following points should therefore be emphasized in training:

- All staff shall be instructed regarding the importance of personal cleanliness in preventing disease, especially the importance of washing hands with soap and water before any activity that brings hands in contact with the mouth (e.g., eating, drinking, smoking), and after using the toilet.

- All staff are expected to practice appropriate cough or sneeze etiquette (e.g., covering coughs or sneezes, washing hands).

- Staff shall not share eating or drinking utensils, towels, washcloths, clothing, hats, Personal Protective Equipment (PPE), or personal items such as combs, soap, or razors.

- All workers are expected to wash or shower regularly.

- Clothing and bed linens shall be washed regularly.

- All staff shall immediately report any cuts, burns, abrasions, wounds, or other illness to the medic (see GG-12, “First Aid and Emergency Medical Response”). First Aid Providers are immediately recognizable by the “red cross” decals on their hard hats and identification badges.

- Minor wounds shall be kept clean and covered with clean, dry bandages until healed, in accordance with the medic’s instructions.

Areas such as kitchens, dining areas, bathrooms, First Aid stations, and medical clinics all have potentially high concentrations of germs, and must be periodically disinfected to minimize the possibility that germs will spread. Janitorial workers shall therefore comply with the following guidelines:

- Clean working surfaces thoroughly with soap and water, a chlorine-based disinfectant, or a solution of 5 milliliters (mL) chlorine bleach in 1 liter of water. Let disinfected areas stand for a few minutes before wiping the excess with clean cloths or paper towels; collect and properly dispose of cleaning waste.

- When cleaning areas such as bathrooms or clinic areas that may have been contaminated by excreta, blood, or other bodily fluids, wear disposable rubber gloves; this is especially important if janitorial staff have any cuts or scratches on their hands, or if patients with communicable disease symptoms have used the areas being cleaned.

4.3.2 Minimum Requirements for Food Preparation and Handling

Careless food handling and improper cooking are often the source of disease-causing organisms. Cooks and canteen workers shall therefore observe the following minimum requirements:

- Frozen meat, fish, and poultry shall be inspected upon receipt at the camp to ensure that it has not thawed in transit.

- Cutting boards and kitchen utensils used to prepare meat, fish, or poultry must be cleaned with a scrub brush, soap, and hot water before being used for another food, in order to prevent potential cross-contamination.

- Personnel with symptoms of diarrhea, respiratory or gastrointestinal infections, or other communicable diseases shall not be permitted to work as food handlers until they have recovered and are cleared to return to work by the camp medic.

- Kitchen areas shall be cleaned and putrescible wastes removed and properly disposed of at least daily. Grease traps should be cleaned at least monthly, with waste grease collected and properly disposed.

- Food handlers shall wash hands before starting to prepare a meal, and after handling raw meat, fish, or poultry. Servers and kitchen helpers shall use disposable polyethylene gloves.

- Lids of canned foods shall be washed before opening to keep dirt from getting into the food, and the blade of the can opener shall be washed after each use.

- Fresh fruits and vegetables shall be washed thoroughly and rinsed in potable water.

- Food preparation machinery such as mixers or meat grinders shall be disassembled and cleaned with soap and water as soon as possible after they are used.

- Countertops shall be washed at least daily with a solution of 5 mL chlorine bleach in 1 liter of water or with a commercial kitchen cleaning agent.

- Dishcloths and kitchen sponges shall be washed in the canteen's automatic dishwashing machine at least daily.

- Meat thermometers and recipe temperature references shall be used to ensure that pork, poultry, and other meats are not served in a raw or underdone condition.

4.3.3 Recognition of Symptoms of Communicable Diseases

Trainees shall be provided general information on symptoms and appropriate precautions associated with major communicable diseases. **Attachment 1** is a table summarizing current World Health Organization (WHO) profiles for communicable diseases of potential concern in the area of the Aurora Project.[1] Informational copies of **Attachment 1** may be provided to trainees or other interested parties at the discretion of the Health and Safety Officer.

4.4 Planning of Sanitary Facilities and Hygienic Considerations in Man Camp/Canteen Construction

The Procurement Manager shall ensure that procurement specifications for the design and construction of new man camp and canteen facilities are routed to the Environmental Manager and Health and Safety Officer and for review and comment prior to issue, in order to ensure that appropriate hygienic measures are properly considered. At a minimum, the following features should be evaluated for adequacy relative to the maximum expected occupancy of any new camp:

[1] See World Health Organization, 2011; *International Travel and Health*, http://www.who.int/ith/en/, Chapters 5 and 7.

- potable water arrangements;
- provisions for toilets, showers, and sinks in bathroom areas;
- laundry facilities;
- grey water and sanitary effluent collection and treatment systems, septic systems, drain fields, and/or backflow prevention systems;
- garbage/solid waste collection containers and accumulation areas;
- cooling/ventilation arrangements in living spaces and canteen areas;
- refrigeration systems;
- ranges, ovens, grease traps, exhaust fans, dishwashers, and other kitchen equipment;
- backup generator arrangements;
- first aid station locations;
- fire suppression systems/extinguishers in living spaces and canteen/kitchen areas; and
- vector control considerations.

4.5 Field Inspections

On at least an annual basis the Health and Safety Officer shall perform an inspection of the sanitary/hygienic conditions and related infrastructure in the man camp and canteen areas. The inspection shall be documented as noted in GG-03, "Field Inspection," and a copy of the inspection report shall be forwarded to the site medic and the Health and Safety Officer. Any observed non-conformances shall be separately documented and resolved in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action." Similar inspections shall be scheduled for evaluating the sanitary/hygienic conditions of any temporary exploration camps with overnight accommodations and cooking facilities; such inspections shall be conducted as soon as possible after the camp is considered operational.

4.6 Monitoring of Workforce Health

Camp medics shall monitor trends in staff health through the routine provision of medical care, in response to specific staff requests or as prompted by First Aid or emergency response requirements (see GG-12, "First Aid and Emergency Medical Response"). Incidents or observations requiring reporting or other actions under applicable national l regulations shall be acted on and submittals prepared as required; any such submittals shall be forwarded to the Environmental Manager and Health and Safety Officer for review prior to submittal, with copies retained in the project records as noted in Section 4.8. Any detected conditions that could represent an outbreak of a communicable disease shall be addressed as noted in Section 4.7.

4.7 Provision of Medical Services to Transients, Groups, or Local Communities

Although the Project is located in a very remote area, the Health and Safety Officer or Medics may be called upon to provide emergency medical assistance to transient individuals or groups of artisanal miners. Responses to such requests shall be discussed

with the Camp Manager and Health and Safety Officer prior to taking any action, as noted in the Project *Influx Management Plan.*

4.8 Actions in Event of Suspected Outbreak of Communicable Disease

In the event of a suspected outbreak of a communicable disease, site medics shall take the following actions:

- ***Notify:*** Immediately notify the Health and Safety Officer, Camp Manager, Environmental Manager, and Aurora Project Manager. National health authorities shall also be notified as specified in governing regulations.

- ***Isolate:*** The patient shall be immediately isolated and emergency treatment provided. Isolation shall be maintained for the minimum period of time required for the specific disease in accordance with national regulations or WHO guidelines, whichever are more stringent. Isolation required for the specific disease may be terminated only with the approval of the medic in order to minimize the possibility for transmission of the disease.

- ***Quarantine:*** Potential carriers or individuals who may have been in close contact with the patient shall be identified, examined, and, if indicated, quarantined from contacts with other staff and monitored for the development of disease symptoms. Quarantine times shall be maintained for the minimum period of time required for the specific disease in accordance with national regulations or WHO guidelines, whichever are more stringent. Quarantines required for the specific disease may be terminated only with the approval the medic in order to minimize the possibility for transmission of the disease.

- ***Control Wastes and Disinfect:*** Medical waste from the treatment of isolated or quarantined patients shall be collected in biohazard containers and accumulated for safe disposal in a licensed medical waste incinerator in Georgetown. Solid food wastes from the patient's room shall be bagged separately and disposed of as putrescible waste. Liquid food waste may be emptied into dishwashing sinks; utensils used by isolation patients shall be washed independently, through two separate dishwashing cycles.

  At the end of the period of isolation, bed frames, chairs, and other parts of the room likely to come in contact with patients' secretions shall be thoroughly cleaned with water, soap or detergent, and chlorine-based disinfectant. Cleaning personnel shall wear rubber gloves. Laundry shall be collected and washed independently, through two separate automatic washing cycles using hot water.

- ***Investigate.*** Each communicable disease case shall be documented on a Corrective/Preventive Action Request (CPAR) form by the medic in accordance with an incident report and investigated to determine the source or vector, where

feasible. Other potentially affected individuals shall be identified and quarantined, as appropriate. Vector controls shall be examined for integrity and effectiveness, and other corrective/preventive actions taken as warranted, including the preparation of additional reports or communication with national health authorities.

If food-borne illness is suspected, an appropriate sample of affected patients with similar symptoms or diagnostic results should be interviewed. Case histories should be developed that include:

- date and time of onset of each person's illness;
- a comprehensive list of signs and symptoms of each ill person, along with their duration; and
- a list of the food and drinks ingested (and their probable sources) during the 72 hours prior to onset of illness.

If supported by diagnostic observations and the available data, a hypothesis should be developed regarding a suspect common source; the hypothesis should be used to guide the selection of preventive and corrective action. In addition, samples of implicated foods should be collected and tested, when practical, to confirm the probable source.

4.9 Records

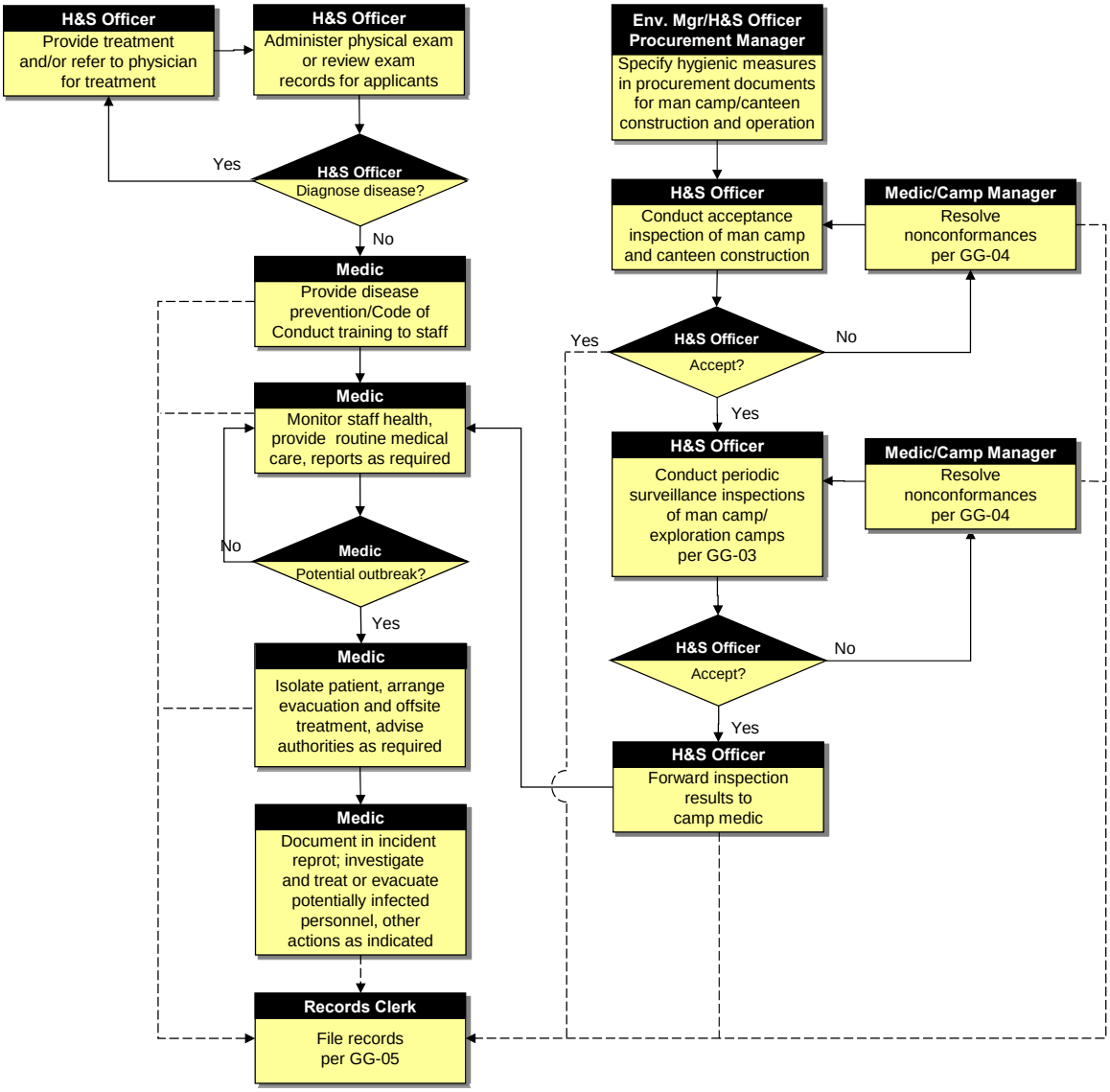
Records shall be retained from any initial medical examination; from each visit made by an employee, contractor, or visitor to the company medical clinic; and from any referrals for treatment at an offsite clinic or hospital. Copies of all incident reports or CPARs shall also be retained. Copies should be forwarded to human resources personnel files (for workers) or the Health and Safety Officer (for visitors and contractors); records shall be retained in accordance with GG-05, "ESMS Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Waste Management Plan*
- GGI *Influx Management Plan*
- GGI "Labour Grievance Procedure"
- GG-06, "ESMS Training Program"
- GG-03, "Field Inspection"
- GG-04, "Identification of Non-conformances and Corrective/Preventive Action"
- GG-05, "Records Management"
- GG-12, "First Aid and Emergency Medical Response"

- World Health Organization, 2011; *International Travel and Health*, http://www.who.int/ith/en/, Chapters 5 and 7.

Figure 1: Communicable Diseases – Prevention and Monitoring Process



Attachment 1: Profiles for Major Communicable Diseases of Potential Concern in the Locale of the Aurora Project[2]

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Cholera	*Vibrio cholerae* bacteria	Infection occurs through ingestion of food or water contaminated directly or indirectly by feces or vomitus of infected persons. Cholera affects only humans; there is no insect vector or animal reservoir host.	An acute enteric disease varying in severity. Most infections are asymptomatic (i.e., do not cause any noticeable illness). In mild cases, diarrhea occurs without other symptoms. In severe cases, there is sudden onset of profuse watery diarrhea with nausea and vomiting and rapid development of dehydration. In severe cases that go untreated, death may occur within a few hours due to dehydration leading to circulatory collapse.	Vaccines are available.	As for other diarrhea diseases. All precautions should be taken to avoid consumption of potentially contaminated food, drinks, and drinking water. Oral dehydration salts should be taken to combat dehydration in case of severe diarrhea.
Dengue	Virus (4 serotypes)	Dengue is mostly transmitted by the *Aedes aegypti* mosquito, which bites during daylight hours. There is no direct person-to-person transmission.	Dengue occurs in three main clinical forms: • Dengue fever is an acute febrile illness with sudden onset of fever, followed by development of generalized symptoms and sometimes a macular skin rash. It is known as "breakbone fever" because of severe muscle, joint, and bone pains. Pain behind the eyes (retro-orbital pain) may be present. The fever may be biphasic (i.e., two separate episodes or waves of fever). Most patients recover after a few days. • Dengue haemorrhagic fever has an acute onset of fever followed by other symptoms resulting from thrombocytopenia, increased vascular permeability, and haemorrhagic manifestations. • Dengue shock syndrome supervenes in a small proportion of cases. Severe hypotension develops, requiring urgent medical treatment to correct hypovolemia. Without appropriate treatment, 40–50% of cases are fatal; with timely therapy, the mortality rate is 1% or less.	None.	Take precautions to avoid mosquito bites both during the day and evening in areas where dengue occurs (primarily altitudes <400m).

[2] Primary source: World Health Organization, 2011; *International Travel and Health*, http://www.who.int/ith/en/, Chapters 5 and 7.

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Hepatitis A	Hepatitis A virus	Acquired directly from infected persons by the fecal–oral route, or by close contact, or by consumption of contaminated food or drinking water. There is no insect vector or animal reservoir.	An acute viral hepatitis with abrupt onset of fever, malaise, nausea, and abdominal discomfort, followed by the development of jaundice a few days later. Infection in very young children is usually mild or asymptomatic; older children are at risk of symptomatic disease. The disease is more severe in adults, with illness lasting several weeks and recovery taking several months; case fatality is greater than 2% for those over 40 years of age and 4% for those over 60.	Vaccine available.	Controlled sanitation and prevention of cross-contamination of potable water supplies.
Hepatitis B	Hepatitis B virus (HBV)	Infection is transmitted via contact with infected body fluids. Sexual contact is an important mode of transmission, but infection is also transmitted by transfusion of contaminated blood or blood products, or by use of contaminated needles or syringes for injections. There is also a potential risk of transmission through other skin-penetrating procedures, including acupuncture and tattooing. Perinatal transmission may occur from mother to baby. There is no insect vector or animal reservoir.	Many HBV infections are asymptomatic or cause mild symptoms, which are often unrecognized in adults. When clinical hepatitis results from infection, it has a gradual onset, with anorexia, abdominal discomfort, nausea, vomiting, arthralgia, and rash, followed by the development of jaundice in some cases. In adults, about 1% of cases are fatal. Chronic HBV infection persists in a proportion of adults, some of whom later develop cirrhosis and/or liver cancer.	Vaccine available.	Implement safe sexual practices and avoid the use of any potentially contaminated instruments for injection or other skin-piercing activity.
Hepatitis C	Hepatitis C virus (HCV)	The virus is acquired through person-to-person transmission by parenteral routes. Before screening for HCV became available, infection was mainly transmitted by transfusion of contaminated blood or blood products. Nowadays, transmission frequently occurs through use of contaminated needles, syringes, and other instruments used for injections and other skin-piercing procedures. Sexual transmission of hepatitis C occurs rarely. There is no insect vector or animal reservoir for HCV.	Most HCV infections are asymptomatic. In cases where infection leads to clinical hepatitis, the onset of symptoms is usually gradual, with anorexia, abdominal discomfort, nausea, and vomiting, followed by the development of jaundice in some cases (less commonly than in hepatitis B). Most clinically affected patients will develop a long-lasting chronic infection, which may lead to cirrhosis and/or liver cancer.	Vaccine available.	Implement safe sexual practices and avoid the use of any potentially contaminated instruments for injection or other skin-piercing activity.
Hepatitis E	Hepatitis E virus	Hepatitis E is a waterborne disease usually acquired from contaminated drinking water. Direct fecal–oral transmission from person to person is also possible. There is no insect vector. It is suspected, but not proved, that hepatitis E may have a domestic animal reservoir host, such as pigs.	The clinical features and course of the disease are generally similar to those of hepatitis A. As with hepatitis A, there is no chronic phase. Young adults are most commonly affected. In pregnant women, there is an important difference between hepatitis E and hepatitis A: during the third trimester of pregnancy, hepatitis E takes a much more severe form with a case-fatality rate reaching 20%.	Protection of food and water supply from contamination.	Controlled sanitation and food storage, and prevention of contamination of potable water supplies.

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
STDs • **HIV/AIDS** • **syphilis** • **gonorrhea** • **genital herpes** • **genital warts**	• human immunodeficiency virus • *Treponema pallidum* • *Neisseria gonorrhoeae* • herpes simplex virus • human papillomavirus	Infection occurs during unprotected sexual intercourse. HIV and syphilis may also be transmitted in contaminated blood and blood products, by contaminated syringes and needles used for injection, and potentially by unsterilized instruments used for skin-penetrating procedures such as acupuncture, piercing, and tattooing.	Most of the clinical manifestations are included in the following syndromes: genital ulcer, pelvic inflammatory disease, urethral discharge, and vaginal discharge. However, many infections are asymptomatic. Sexually transmitted infections are a major cause of acute illness, infertility, long-term disability, and death, with severe medical and psychological consequences for millions of men, women, and children. Apart from being serious diseases in their own right, sexually transmitted infections increase the risk of HIV infection. The presence of an untreated disease (ulcerative or non-ulcerative) can increase by a factor of up to 10 the risk of becoming infected with HIV and transmitting the infection. On the other hand, early diagnosis and improved management of other sexually transmitted infections can reduce the incidence of HIV infection by up to 40%. Prevention and treatment of all sexually transmitted infections are therefore important for the prevention of HIV infection.	Avoid unprotected sexual intimacy with casual partners.	Male or female condoms, when used properly and consistently, have proved to be effective in preventing the transmission of HIV and other sexually transmitted infections. Unsterile dental and surgical instruments, needles used in acupuncture and tattooing, ear-piercing devices, and other skin-piercing instruments can likewise transmit infection and should be avoided.
Influenza	Influenza viruses (A, B, C strains)	Respiratory transmission occurs mainly by droplets disseminated by unprotected coughs and sneezes. Short-distance airborne transmission of influenza viruses may occur, particularly in crowded enclosed spaces. Hand contamination and direct inoculation of virus is another potential route of spread.	An acute respiratory infection of varying severity, ranging from asymptomatic infection to fatal disease. Classic influenza symptoms include fever with rapid onset, sore throat, cough, and chills, often accompanied by headache, coryza, myalgia, and prostration. Influenza may be complicated by viral or more often bacterial pneumonia. Illness tends to be most severe in the elderly and in infants and young children, and in immunocompromised hosts. Death resulting from seasonal influenza occurs mainly in the elderly and in individuals with pre-existing chronic diseases. Influenza viruses are of types A, B, and C; type A viruses cause most of the widespread influenza epidemics; type B viruses generally cause regional or sporadic outbreaks; and type C viruses cause mild disease in the form of common colds and bronchitis in children. Influenza viruses evolve rapidly, changing their antigenic characteristics, so that vaccines need to be modified each year to be effective against currently circulating influenza strains. Other subtypes of influenza A viruses occur in animals, and all subtypes are found in birds (mainly water fowl). Inter-species transmission (such as the 1918 pandemic) and viral reassortment (1957, 1968 pandemics) may give rise to new subtypes able to infect humans.	Vaccination before the start of the influenza season; note that influenza viruses evolve rapidly, changing their antigenic characteristics, so that vaccines need to be modified each year to be effective against currently circulating influenza strains.	Whenever possible, avoid crowded enclosed spaces and close contact with people suffering from acute respiratory infections. Hand-washing after direct contact with ill persons or their environment may reduce the risk of illness. Ill persons should be encouraged to practice cough etiquette (i.e., maintain distance, cover coughs and sneezes with disposable tissues or clothing, wash hands).

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Malaria	Human malaria is caused by four different species of the protozoan parasite *plasmodium: p. falciparum, p. vivax, p. ovale,* and *p. malariae*.	The malaria parasite is transmitted by female *Anopheles* mosquitoes, which bite mainly between dusk and dawn.	Malaria is an acute febrile illness with incubation period of 7 days or longer. The most severe form is caused by *P. falciparum*, in which variable clinical features include fever, chills, headache, muscular aching and weakness, vomiting, cough, diarrhea, and abdominal pain; other symptoms related to organ failure may supervene, such as acute renal failure, generalized convulsions, and circulatory collapse, followed by coma and death. In endemic areas, it is estimated that about 1% of patients with *P. falciparum* infection die of the disease; mortality in non-immune patients with falciparum infection is significantly higher. Initial symptoms, which may be mild, may not be easy to recognize as being due to malaria. It is important to consider the possibility of falciparum malaria in all cases of unexplained fever starting at any time between 7 days after the first possible exposure to malaria and 3 months (or, rarely, later) after the last possible exposure. Any individual who experiences a fever in this interval should immediately seek diagnosis and effective treatment, and inform medical personnel of the possible exposure to malaria infection. Falciparum malaria may be fatal if treatment is delayed beyond 24 hours after the onset of clinical symptoms. Young children, pregnant women, people living with HIV/AIDS, people who are immunosuppressed and the elderly are particularly at risk. Malaria, particularly *P. falciparum*, in non-immune pregnant women increases the risk of maternal death, miscarriage, stillbirth, and neonatal death. The forms of malaria caused by other *Plasmodium* species cause significant morbidity but are rarely life-threatening. *P. vivax* and *P. ovale* can remain dormant in the liver. Relapses caused by these persistent liver forms (“hypnozoites”) may appear months, and rarely several years, after exposure. They are not prevented by current chemoprophylactic regimens, with the exception of primaquine. Latent blood infection with *P. malariae* may be present for many years, but it is very rarely life-threatening. Chemoprophylaxis and treatment of falciparum malaria are becoming more complex because *P. falciparum* is increasingly resistant to various antimalarial drugs. Chloroquine resistance of *P. vivax* is rare but increasing. Focal chloroquine resistance or prophylactic and/or treatment failure have been observed in some areas of South America.	Take antimalarial drugs (Chemoprophylaxis) when appropriate, to prevent infection from developing into clinical disease.	Use repellents, netting, long-sleeved clothing, or other methods to avoid being bitten by mosquitoes, especially between dusk and dawn.

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Leishmaniasis (cutaneous)	Several species of the protozoan parasite *Leishmania*.	Infection is transmitted by the bite of female phlebotomine sandflies. Dogs, rodents, and other mammals are reservoir hosts for leishmaniasis. Sandflies acquire the parasites by biting infected humans or animals. Transmission from person to person by injected blood or contaminated syringes and needles is also possible.	Cutaneous and mucosal leishmaniasis (espundia) causes skin sores and chronic ulcers of the mucosae. Cutaneous leishmaniasis is a chronic, progressive, disabling, and often mutilating disease. Espundia (mucocutaneous manifestation) usually is occupationally associated (forestry) and does not occur at elevations above 800 meters.	None.	Minimize potential for contact with sand flies from dusk to dawn. Use protective clothing and DEET-based insect repellent. Contact with sand flies can be reduced by using bed nets and screens on doors and windows, but sand flies are so small that they can pass through the holes in ordinary bed nets. The effectiveness of bed nets is enhanced by treatment with a pyrethroid-containing insecticide (permethrin or deltamethrin). The same treatment can be applied to window screens, curtains, bed sheets, and clothing, which should be retreated after five washings. In addition, spraying the room or dwelling with insecticide may provide some protection.[3]
Measles	Rubeola virus.	Highly communicable by direct or airborne contact with infectious droplets.	Measles is an acute, highly communicable rash illness caused by a virus transmitted by direct contact with infectious droplets or, less commonly, by airborne spread. The incubation period of measles from exposure to rash onset is generally 14 days (range 7-18). Patients are usually contagious from 4 days before until 4 days after the onset of the rash. Onset of illness is characterized by fever, cough, runny nose, conjunctivitis, and rash. The disease can be severe, and the most frequent complications include diarrhea (8%), middle ear infection (7%-9%), and pneumonia (1-6%). Encephalitis, frequently resulting in permanent brain damage, occurs in approximately 1 per 1,000-2,000 cases of measles. The risk of severe complications and death is higher among children younger than 5 and adults older than 20 years of age.[4]	Combined measles, mumps, rubella (MMR) or MMR plus varicella (MMRV) vaccines are available. There is no specific antiviral therapy; basic treatment consists of providing hydration and antipyretics and treating complications such as pneumonia. Vitamin A supplement may be appropriate in children.	Patients should be isolated for at least 4 days after the onset of the rash.

[3]Source: *CDC Health Information for International Travel 2008;* Chapter 4 – Leishmaniasis; http://wwwn.cdc.gov/travel/yellowBookCh4-Leishmaniasis.aspx ; US Department for Health and Human Services, Centers for Disease Control and Prevention, Atlanta, GA.
[4] Source: *CDC Health Information for International Travel 2008;* Chapter 4 – Measles; http://wwwn.cdc.gov/travel/yellowBookCh4-Measles.aspx ; US Department for Health and Human Services, Centers for Disease Control and Prevention, Atlanta, GA.

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Plague	Plague bacillus, *Yersinia pestis*.	Plague is a zoonotic disease affecting rodents and transmitted by fleas from rodents to other animals and to humans. Direct person-to-person transmission does not occur except in the case of pneumonic plague, when respiratory droplets may transfer the infection from the patient to others in close contact.	Plague occurs in three main clinical forms: • Bubonic plague is the form that usually results from the bite of infected fleas. Lymphadenitis develops in the drainage lymph nodes, with the regional lymph nodes most commonly affected. Swelling, pain, and suppuration of the lymph nodes produce the characteristic plague buboes. • Septicemic plague may develop from bubonic plague or occur in the absence of lymphadenitis. Dissemination of the infection in the bloodstream results in meningitis, endotoxic shock and disseminated intravascular coagulation. • Pneumonic plague may result from secondary infection of the lungs following dissemination of plague bacilli from other body sites. It produces severe pneumonia. Direct infection of others may result from transfer of infection by respiratory droplets, causing primary pulmonary plague in the recipients.	A vaccine effective against bubonic plague is available exclusively for persons with a high occupational exposure to plague; it is not commercially available.	Avoid any contact with live or dead rodents.
Rabies	Rabies virus	Rabies is a zoonotic disease affecting a wide range of domestic and wild mammals, including bats. Infection of humans usually occurs through the bite of an infected animal as the virus is present in the saliva. Any other contact with a rabies-susceptible species, such as a penetrating scratch with bleeding and licking of broken skin and mucosa in an area where rabies is present, should be treated with caution. Transmission through dog bites is common in developing countries. Person-to-person transmission has not been laboratory confirmed.	Rabies is an acute viral encephalomyelitis, which is almost invariably fatal. The initial signs include a sense of apprehension, headache, fever, malaise, and sensory changes around the site of the animal bite. Excitability, hallucinations, and aerophobia are common, followed in some cases by fear of water (hydrophobia) due to spasms of the swallowing muscles, progressing to delirium, convulsions, and death a few days after onset. A less common form, paralytic rabies, is characterized by loss of sensation, weakness, pain, and paralysis.	A vaccine is available.	Obey Project prohibitions on harboring pets or wild animals; avoid contact with wild animals and stray domestic animals, particularly bats, dogs, and cats. If bitten by an animal that is potentially infected with rabies, immediately clean the wound thoroughly with disinfectant or with soap or detergent and water. Medical assistance should be sought immediately and post-exposure prophylaxis initiated if indicated.

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Trypanosomiasis (Chagas disease)	Protozoan parasite *Trypanosoma cruzi (T. cruzi)*	Infection is transmitted by blood-sucking triatomine insects. Transmission by ingestion of unprocessed, freshly squeezed sugar cane in areas where the vector is present has also been reported. During feeding, infected insects excrete trypanosomes, which can then contaminate the conjunctiva, mucous membranes, abrasions, and skin wounds including the bite wound. Transmission also occurs by blood transfusion when blood has been obtained from an infected donor. Congenital infection is possible, due to parasites crossing the placenta during pregnancy. *T. cruzi* infects many species of wild and domestic animals as well as humans. The vector is found mainly in rural areas where it lives in the walls of poorly-constructed housing.	In adults, *T. cruzi* causes a chronic illness with progressive myocardial damage leading to cardiac arrhythmias and cardiac dilatation, and gastrointestinal involvement leading to mega-esophagus and megacolon. *T. cruzi* causes acute illness in children, which is followed by chronic manifestations later in life.	Avoid exposure to blood-sucking bugs.	Insecticides can be used to treat housing. Exposure can be reduced by the use of bed nets in houses and camps.
Tuberculosis	*Mycobacterium tuberculosis*, the tubercle bacillus. Humans can also become infected by bovine tuberculosis, caused by *M. bovis*.	Infection is usually by direct airborne transmission from person to person.	Exposure to *M. tuberculosis* may lead to infection, but most infections do not normally lead to disease. The risk of developing disease following infection is generally 5–10% during the lifetime, but may be increased by various factors, notably immunosuppression (e.g., advanced HIV infection). Multidrug resistance refers to strains of *M. tuberculosis* that are resistant to at least isoniazid and rifampicin (MDR-TB). The resistant strains do not differ from other strains in infectiousness, likelihood of causing disease, or general clinical effects; however, if they do cause disease, treatment is more difficult and the risk of death will be higher. Extensively drug-resistant TB (XDR-TB) is TB that is resistant to at least isoniazid and rifampin, to any fluoroquinolone, and to at least one of the injectable second-line anti-TB drugs capreomycin, kanamycin, and amikacin.	Bacillus of Calmette and Guerin (BCG) vaccine may be advised for infants and young children in some situations.	Avoid close contact with known tuberculosis patients. For employees from low-incidence countries who may be exposed to infection, a baseline tuberculin skin test is advisable in order to compare with retesting after return. If the skin reaction to tuberculin suggests recent infection, the patient should receive treatment for latent infection. Patients under treatment for tuberculosis should not travel until the treating physician has documented, by laboratory examination of sputum, that the patient is not infectious and therefore of no risk to others. The importance of completing the prescribed course of treatment should be stressed.

Disease	Cause	Mode of Transmission	Description/Symptoms	Prevention or Prophylaxis	Precautions
Typhoid fever	*Salmonella typhi*, the typhoid bacillus	Infection is transmitted by consumption of contaminated food or water. Occasionally, direct fecal–oral transmission may occur. Shellfish taken from sewage-polluted beds are an important source of infection. Infection occurs through eating fruit and vegetables fertilized by night soil and eaten raw, and milk and milk products that have been contaminated by those in contact with them. Flies may transfer infection to foods, resulting in contamination that may be sufficient to cause human infection.	A systemic disease of varying severity. Severe cases are characterized by gradual onset of fever, headache, malaise, anorexia, and insomnia. Constipation is more common than diarrhea in adults and older children. Without treatment, the disease progresses with sustained fever, bradycardia, hepatosplenomegaly, abdominal symptoms, and, in some cases, pneumonia. In white-skinned patients, pink spots (papules), which fade on pressure, appear on the skin of the trunk in up to 50% of cases. In the third week, untreated cases develop additional gastrointestinal and other complications, which may prove fatal. Around 2–5% of those who contract typhoid fever become chronic carriers, because bacteria persist in the biliary tract after symptoms have resolved.	Vaccine available.	Prevent fecal contamination of food and potable water supplies; regular, controlled collection and disposal of putrescible wastes.
Typhus fever	*Rickettsia prowazekii*	The disease is transmitted by the human body louse, which becomes infected by feeding on the blood of patients with acute typhus fever. Infected lice excrete rickettsia onto the skin while feeding on a second host, who becomes infected by rubbing louse fecal matter or crushed lice into the bite wound. There is no animal reservoir.	The onset is variable but often sudden, with headache, chills, high fever, prostration, coughing, and severe muscular pain. After 5–6 days, a macular skin eruption (dark spots) develops first on the upper trunk and spreads to the rest of the body but usually not to the face, palms of the hands, or soles of the feet. The case-fatality rate is up to 40% in the absence of specific treatment. Louse-borne typhus fever is the only rickettsial disease that can cause explosive epidemics. Typhus fever occurs in colder, mountainous regions of South America and other international locations. It typically occurs in conditions of overcrowding and poor hygiene.	None.	Cleanliness is important in preventing infestation by body lice. Insecticidal powders are available for body-louse control and treatment of clothing for those at high risk of exposure.
Yellow fever	Yellow fever virus	Yellow fever in urban and some rural areas is transmitted by the bite of infective *Aedes aegypti* mosquitoes and by other mosquitoes in the forests of South America. The mosquitoes bite during daylight hours. Transmission occurs at altitudes up to 2500 meters. Yellow fever virus infects humans and monkeys. In jungle and forest areas, monkeys are the main reservoir of infection, with transmission from monkey to monkey carried out by mosquitoes. The infective mosquitoes may bite humans who enter the forest area, usually causing sporadic cases or small outbreaks. In urban areas, monkeys are not involved, and infection is transmitted among humans by mosquitoes.	Although some infections are asymptomatic, most lead to an acute illness characterized by two phases. Initially, there is fever, muscular pain, headache, chills, anorexia, nausea, and/or vomiting, often with bradycardia. About 15% of patients progress to a second phase after a few days, with resurgence of fever, development of jaundice, abdominal pain, vomiting, and haemorrhagic manifestations; half of these patients die 10–14 days after onset of illness. The yellow fever virus is endemic in some tropical areas in central and South America, and the number of epidemics has increased since the early 1980s.	Vaccine available.	Take precautions against mosquito bites in the day and evening.

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes minimum requirements for the use of Personal Protective Equipment (PPE) for Guyana Goldfields, Inc. (GGI) employees working on the Aurora Project. It contains an Appendix that addresses specific respiratory protection needs, which may require updating in response to any modifications to the occupational health and safety risk register (see GG-09, "Identification of Project-related Safety Hazards and Assessment of Risks) that identify new respiratory hazards that may be encountered in the major construction or operational phases of Aurora Project operations.

This SOP will apply over the life of the Project; it supports Section 4.3.2, ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Affected Employee

For the purposes of this SOP, an ***affected employee*** is defined as any GGI employee whose work assignment requires them to use PPE.

2.2 Contractor

Contractor refers to any worker retained by GGI to undertake work on a contract basis, and whose work may require them to be exposed to workplace hazards that warrant the use of PPE.

2.3 Visitor

Visitor refers to other GGI employees or representatives of other organizations who may visit Aurora Project operations, but are not part of the regular workforce.

2.4 Personal Protective Equipment (PPE)

PPE refers to an item or items used by an individual to protect the eyes, face, head, body, arms, hands, legs, and/or feet such as safety glasses, goggles, protective face shields, hard hats, helmets, head covers, gloves, protective aprons or chaps, disposable coveralls, life vests (for river transport), and steel-toed safety boots. Ear

protectors or earplugs used to reduce exposure to noise and respirators that protect the wearer from airborne hazards are also considered PPE.

2.5 Approved PPE

Approved PPE refers to PPE approved by a recognized authority such as the European Standards Organization (ESO), Canadian Standards Organization (CSA), American National Standards Institute (ANSI), or the National Institute of Occupational Safety and Health (NIOSH), and authorized for distribution to GGI employees or contractors.

3.0 RESPONSIBILITIES

3.1 Affected Employees

Affected employees are responsible for using, properly caring for, cleaning, and inspecting PPE issued for their personal use, as directed, and for reporting any loss, damage, or other problems to the site medic(s) or the Health and Safety Officer. Affected employees shall return all issued equipment to the side medic for safe storage when they leave the site on regularly scheduled rotations, and for retrieving their issued PPE from the site medic upon their return to work.

3.2 Health and Safety Officer

The Health and Safety Officer is responsible for:

- Evaluating the hazards associated with each Project job category as discussed in GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”, and identifying those situations where the use of PPE will be required in order to control an identified hazard;

- selecting and purchasing suitable approved PPE;

- ensuring that PPE requirements are clearly posted in all areas where PPE is required;

- ensuring that employees who are required to use air purifying respirators to control exposure to potentially hazardous atmospheres are included in the respiratory protection program described in Appendix A;

- updating the respiratory protection program as necessary to address new respiratory hazards that may be encountered in major construction or operation (e.g., working with cyanide and other mineral extraction process reagents);

- evaluating, and as necessary updating or repeating the safety hazard assessment required by under GG-09, whenever job requirements undergo significant changes, new equipment is introduced, or an accident occurs;

- maintaining the risk register required by GG-09, PPE training records, and ensuring that medics maintain well as records of PPE distribution;

- providing training, guidance, and assistance to GGI and contractor employees regarding the proper use, care, and cleaning of approved PPE;

.

- periodically evaluating PPE use and the overall effectiveness of PPE training, in actual practice, through the process described in GG-03, "Field Inspections" and GG-04, Identification of Non-conformances and Corrective/Preventive Action"; and

- ensuring that all contractors or visitors to the site are provided with any required PPE and instructions on its use.

3.3 Area Managers and Supervisors

Area Managers and Supervisors are responsible for coordinating with the Health and Safety Manager and site medics to implement and enforce PPE requirements that apply to their assigned work areas. This responsibility includes:

- ensuring that required PPE is made available to employees;

- verifying that employees properly use and care for assigned PPE;

- notifying the Health and Safety Manager of any PPE issues resulting from the recognition of new hazards, or if work processes are changed;

- ensuring that defective or damaged PPE is immediately replaced, and that damaged PPE is either repaired or discarded as appropriate; and

- ensuring that visitors to their work areas comply with all applicable PPE requirements.

3.4 Contractors

Contractors may be contractually requested to provide PPE for their onsite workers and for assuring its adequacy and proper maintenance; in some cases, PPE may be provided for temporary use by GGI.

3.5 Site Medic(s)

Site medics are responsible for maintaining a simple spreadsheet (see **Figure 2** for an example) that tracks PPE issue, as well as PPE return for safe storage when an employee rotates off site, and re-issue when the employee returns.

4.0 PROCEDURE

The selection, distribution, and use of PPE at the Aurora Project shall be accomplished in accordance with the flowcharts depicted in **Figures 1A and 1B**, and as described in the following paragraphs.

4.1 PPE Hazard Assessment

The Health and Safety Officer shall conduct an initial PPE hazard assessment as part of establishing the risk register for a given Project site, as described in GG-09, "Identification of Project-related Safety Hazards, and Assessment of Risks." If potential respiratory hazards are noted [e.g., exposure to rock dust (free silica); exposure to irritating or toxic gases or vapors (mosquito fogging with a diesel oil/malathion mixture); exposure to oxygen-deficient atmospheres (confined spaces)], see Appendix A, "Respiratory Protection Program" for specific guidance.

The GG-09 risk register entries and PPE needs for a particular work area must be re-evaluated whenever the job or a procedure changes, new equipment is introduced, or a PPE-related accident or injury occurs.

4.2 Selection of Suitable PPE

PPE should be considered only if, in the judgment of the Health and Safety Officer, identified hazards cannot be effectively managed using engineering, administrative, or work-practice controls. PPE shall be of a safe design and construction with respect to the type of work that must be performed, and must provide an appropriate level of protection for the identified hazards.

Gloves, safety glasses, face shields, hard hats, safety shoes or boots, and protective clothing may be selected and distributed to all employees based on a subjective evaluation of the hazard. However, as previously noted, the actual working environment must be evaluated using appropriate test equipment to characterize the hazards and quantify the exposure levels prior to selecting appropriate respiratory protection. See **Appendix A**.

The Health and Safety Officer shall arrange for the purchase of appropriate PPE for all affected employees, and shall ensure that an adequate stock of the required PPE is maintained in onsite stores. The Health and Safety Officer shall also provide for adequate signage that clearly identifies specific PPE requirements in a given work area.

4.3 Use of PPE

All affected employees shall be trained in the proper use of PPE; the Health and Safety Officer shall provide or arrange for appropriate the PPE training. Training shall be conducted and documented using one or more of the methods specified in GG-06, "ESMS Training Program" and the training form provided as **Figure 3**. Selected PPE must be used in accordance with training received and shall be used to protect the affected employee from only the intended hazards under the conditions for which it was selected.

Training topics shall include:

- discussion of the specific hazard(s) that the issued PPE is intended to control;
- when (and under what circumstances) the employee must wear or use the assigned PPE;

- how the assigned PPE will protect the employee;
- the limitations of PPE effectiveness;
- how to use the PPE properly, including how to put it on or take it off, and making adjustments for a comfortable and effective fit;
- warning signs that indicate that the assigned PPE is not providing the intended level of protection;
- how to properly care for and maintain the PPE, e.g., how to detect signs of wear, clean and disinfect, and/or properly dispose of PPE; and
- PPE replacement schedule and procedures.

Documented PPE refresher training (see **Figure 3**) must be performed annually in accordance with GG-06.

4.4 Maintenance, Storage, and Return/Reissue of PPE

Affected employees shall clean and maintain the PPE issued for their use in accordance with training received, and shall store PPE in a manner that protects it from damage, using storage areas or containers provided by the site medics. Employees shall notify their Area Supervisor or EHS Coordinator if their PPE is damaged, ineffective, or lost. When rotating off site for break, employees shall return their PPE to the site medics for safe keeping, and for re-issue when the employee rotates back to work.

4.5 Periodic Inspection

On at least an annual basis, the Health and Safety Officer shall conduct a focused inspection of PPE use in accordance with GG-03, “Field Inspections.” Any observed non-conformances shall be documented and resolved as required by GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

4.6 Disciplinary Policy

PPE is required control a recognized hazard. Consequently, the identified hazard is controlled ***only if the designated PPE is used and used properly,*** which is dependent upon employee compliance. Misuse of PPE or not using PPE in required situations is a serious breach of policy (see the GGI” Labour Grievance Policy” for a discussion of consequences) that must be remedied both to protect the employee’s health and well-being as well as protect GGI’s interests.

4.7 PPE for Visitors and Employees

The Health and Safety Officer and/or site medics shall ensure that all visitors to any Aurora Project site are aware of the health and safety risks associated with the site, prior to being permitted onsite; this information may be imparted in a short meeting or by a video presentation approved by the Health and Safety Officer and

Environmental Manager. GGI will provide visitors with suitable PPE throughout the length of their visit, and retrieve the PPE when the visitors depart

Site medics shall maintain records of PPE issued to all employees and visitors to the site on the PPE Issue Log shown in **Figure 2**.

4.8 Records

Records related to the proper implementation of this SOP include:

- The current risk registers for specific Project sites, as required by GG-09, "Identification of Project-related Safety Hazards and Assessment of Risks";
- documentation of the PPE Risk Assessment and selection of appropriate PPE;
- air quality monitoring datasheets (see **Appendix A**);
- documentation of permanently issued PPE (see **Figure 2**); and
- documentation of employee PPE training (see **Figure 3**).

These documents shall be retained in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI "Labour Grievance Policy";
- GG-03, "Field Inspections";
- GG-04, Identification of Non-conformances and Corrective/Preventive Action";
- GG-05, "Records Management"
- GG-06, "ESMS Training Program"; and
- GG-09, "Identification of Project-related Safety Hazards, and Assessment of Risks."

Figure 1A: PPE Selection, Training, and Monitoring Process

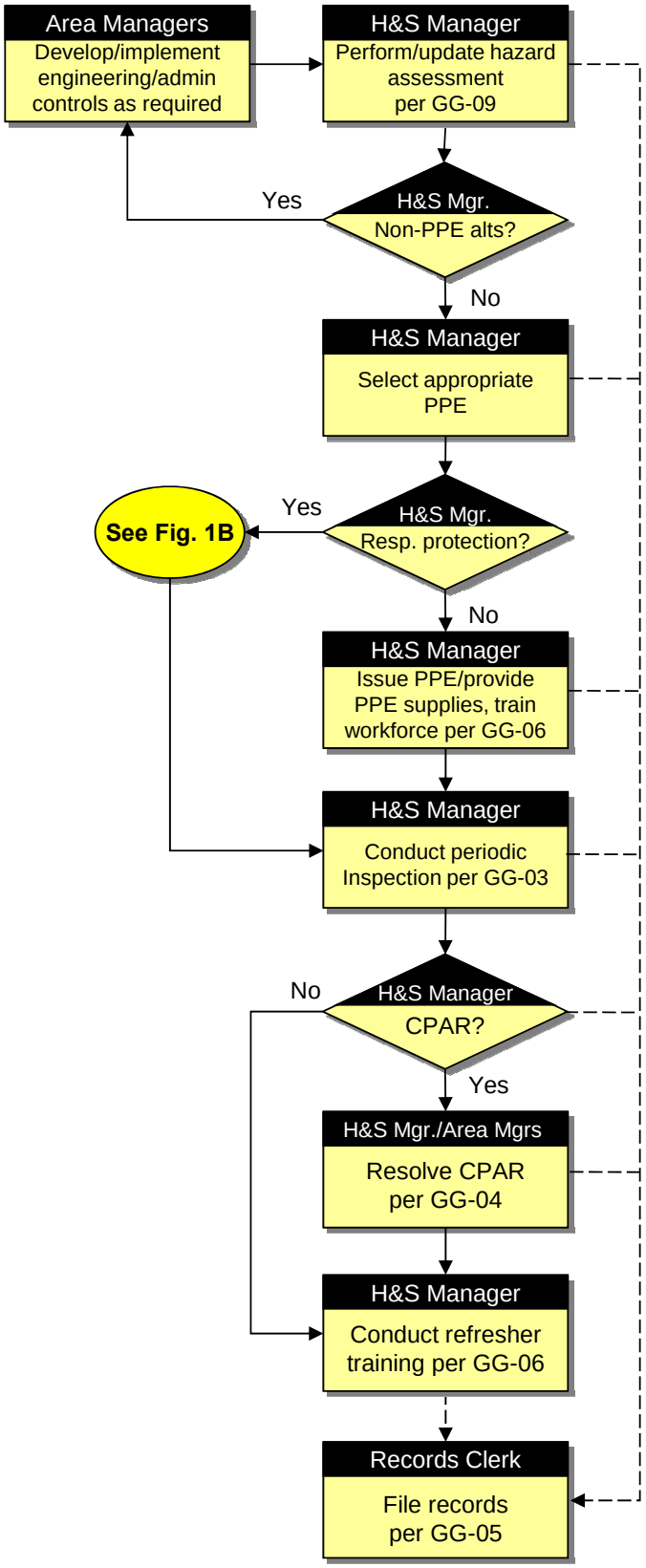


Figure 1B: PPE Selection, Training, and Monitoring Process: Respiratory Protection Program

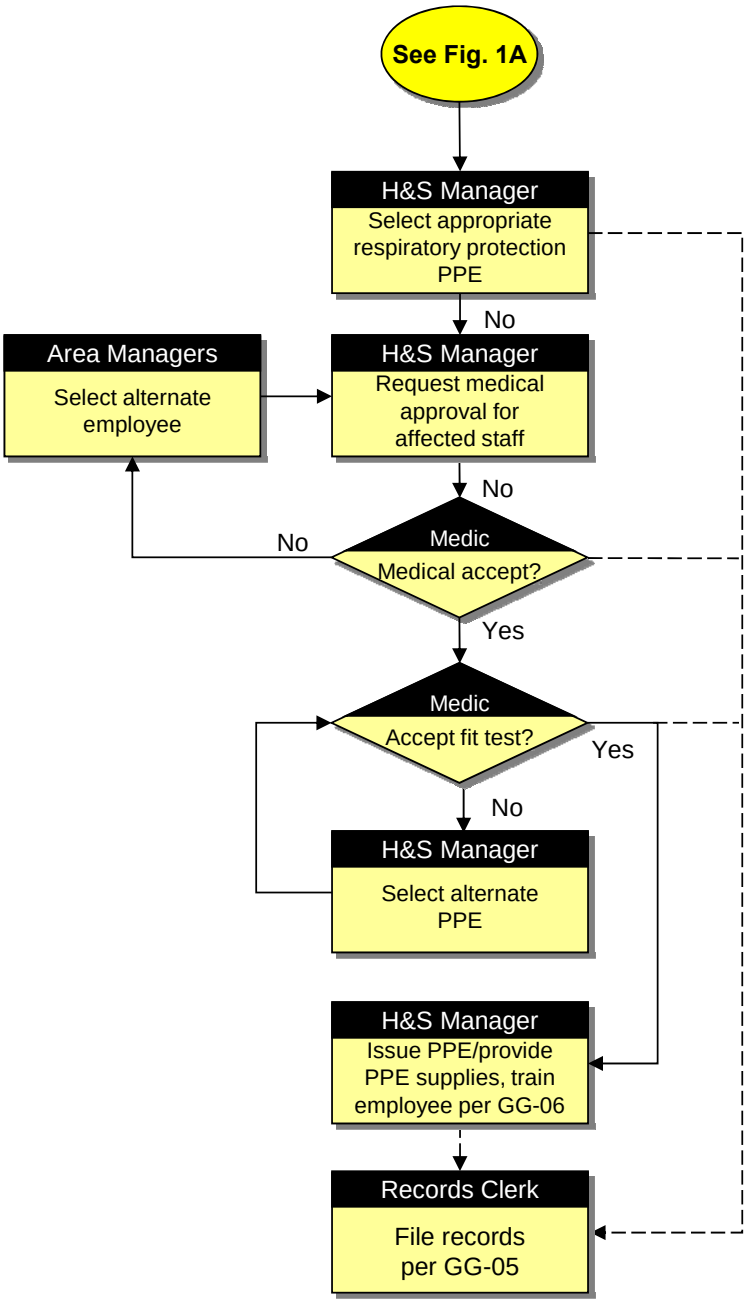


Figure 2: PPE Issue Log

Aurora Project PERSONAL PROTECTIVE EQUIPMENT ISSUE/REISSUE LOG					
Name (Print)	**Dep't**	**PPE Issued (list)**	**PPE Returned**	**PPE Re-issued?**	**Date**

Figure 3: PPE Training Record Form

Aurora Project
PERSONAL PROTECTIVE EQUIPMENT
TRAINING RECORD

Employee Name: _____ ID No. _____

Job Title/Work area: _____

Trainer's Name (person completing this form):_____ Date:_____

Types of PPE employee is being trained to use:

_____ _____
_____ _____
_____ _____

The following items were addressed in the training session:

_____ The limitations of PPE; PPE alone cannot protect the employee from all on-the-job hazards.
_____ What workplace hazards the employee faces, the types of PPE that the employee must use to be protected from these hazards, and how the PPE will protect the employee while working.
_____ When the employee must wear or use the PPE.
_____ How to use the PPE properly on-the-job, including putting it on, taking it off, and wearing and adjusting it (if applicable) for a comfortable and effective fit.
_____ How to properly care for and maintain the PPE: look for signs of wear, clean and disinfect, and dispose of certain types PPE (e.g., nitrile gloves, used respirator cartridges.

Note to employee: *This form will be made a part of your personal file. Please read and verify that you understand its contents before signing.*

I understand the training I have received, and I can use all required PPE properly.

_____ _____
Employee's signature Date

(Trainer must verify)
_____ Employee has shown an understanding of the training.
_____ Employee has shown the ability to use the PPE properly.

_____ _____
Trainer's signature Date

Appendix A:

RESPIRATORY PROTECTION PROGRAM
Exploration/Early Works Construction (E/EWC) Phase

1.0 PURPOSE AND SCOPE

This Appendix to GG-11 establishes requirements and procedures for a respiratory protection program during the Exploration/Early Works Construction (E/EWC) phase of the Aurora Project. This program is limited to dust masks and air-purifying respirators; it applies to all Aurora Project employees who must rely on personal respiratory protection to work safely in otherwise potentially hazardous atmospheres, and *must be updated prior to the commencement of major construction.*

2.0 DEFINITIONS

2.1 Air-purifying Respirator

An ***air-purifying respirator*** is a respirator equipped with an air-purifying element such as a filter, cartridge, or canister, or having a filtering facepiece such as a dust mask. The element or filtering facepiece is designed to remove specific contaminants, such as particles, vapors, or gases, from air in the existing atmosphere that passes through it.

2.2 Canister or Cartridge (air-purifying)

The air-purifying ***canister or cartridge*** refers to the part of an air-purifying respirator that consists of a container holding materials such as a filter element, treated charcoal, or a combination of the two, that removes contaminants from the air passing through the cartridge or canister.

2.3 Dust Mask

Dust mask refers to a simple filtering-facepiece respirator.

2.4 Fit Test

A ***fit test*** is a procedure by which the facepiece seal of a half- or full-face respirator is challenged, using an approved process, to determine if the respirator facepiece provides an adequate seal.

2.5 Full-Facepiece Respirator

A ***full-facepiece respirator*** is a tight-fitting respirator that covers the wearer's nose, mouth, and eyes.

2.6 Half-face Respirator

A ***half-face respirator*** is a tight-fitting respirator that covers only the wearer's nose and mouth.

2.7 Immediately Dangerous to Life or Health (IDLH)

IDLH refers to any atmospheric condition that could cause an immediate threat to life, cause permanent or delayed adverse health effects, or interfere with an employee's ability to escape a dangerous working atmosphere. Air purifying respirators may not be used in an IDLH atmosphere.

2.8 Oxygen Deficient

Oxygen deficient refers to an atmosphere with oxygen content below 19.5% by volume.

2.9 Permissible Exposure Limit

Permissible exposure limit (PEL) refers to the airborne concentrations of a toxic substance or harmful agent, established by a recognized standards organization or equivalent authority, which must not be exceeded. For the purpose of this Respiratory Protection Program, the applicable PELs shall be those specified by the national authority having jurisdiction, or in the absence of such standards, the current Threshold Limit Values established by the American Conference of Governmental Industrial Hygienists (ACGIH).

2.10 Positive and Negative Pressure Seal Check

The ***positive and negative pressure seal check*** is a procedure performed by the respirator user each time the respirator is put on, to determine if the respirator is properly seated on the face.

2.11 Qualitative Fit Test

Qualitative fit test refers to a respirator fit test that relies on the employee's ability to detect a test substance in order to determine the adequacy of respirator fit. Test results are either "passing" or "fail."

2.12 Respirator

Respirator refers to a type of PPE designed to protect the wearer from harmful airborne hazards, oxygen deficiency, or both.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

In addition to the responsibilities established in Section 3.5 of GG-11, the Health and Safety Officer shall be responsible for:

- performing or directing respiratory hazard assessment as part of the process described in GG-09, "Identification of Project-related Safety Hazards and Assessment of Risks";

- performing or directing air monitoring, where appropriate, based on the results of the PPE hazard assessment in order to characterize airborne hazards and evaluate employees' exposure levels;

- selecting and distributing appropriate personal respiratory protective devices;

- scheduling medical evaluations for affected employees;

- performing or arranging respirator fit testing for affected employees;

- restricting the use of respirators to those employees who have received medical clearance and been properly fit tested (except in the case of voluntary use of dust masks);

- ensuring that employees receive appropriate training; and

- monitoring the proper use, sanitation and maintenance of respirators.

4.0 PROCEDURE

The Aurora Project Respiratory Protection Program shall be administered in accordance with the following steps and as depicted in **Figures 1A and 1B**.

4.1 Hazard Evaluation and Respirator Selection

The Health and Safety Officer shall conduct a respiratory hazard evaluation for each job/task identified in site risk registers (see GG-09) as involving potentially significant exposure to respiratory hazards. At a minimum, the respiratory hazard evaluation must include the following elements:

- evaluation of the physical, chemical, biological, and temporal characteristics of the hazard;

- evaluation of the physical and temporal characteristics of the task itself;

- evaluation of the physical surroundings;

- a semi-quantitative assessment of the nature and extent of exposure based on professional judgment; and

- where indicated, a quantitative assessment using appropriate air sampling methodologies.

Where a respiratory hazard is confirmed, alternative control measures must be considered to reduce the affected employees' exposure. If alternative control measures are not feasible or cannot be immediately implemented, respiratory protection shall be employed to control the hazard.

The Health and Safety Officer shall select the specific type of respirator for each application based on a thorough assessment of the hazard, task characteristics, and the limitations and level of protection offered by various respirator options.

The Health and Safety Officer shall revise and update the hazard evaluation whenever work process changes may potentially affect employee exposure. If an employee feels that respiratory protection is needed in order to perform a particular task safely, the employee must notify the Health and Safety Officer, who will evaluate the potential hazard and will then communicate the results of that assessment back to the affected employee.

4.2 Medical Evaluation

Medical evaluation is required to determine if employees have any physical condition that may put them at risk, or limit or restrict their use of respiratory protection equipment. Employees who are or may be required to wear respirators (voluntary use of dust masks is exempt) must be examined by a camp medic or a licensed medical professional.

The Health and Safety Officer shall provide the medic or other medical examiner with the following information:

- nature of anticipated respiratory hazard(s);
- type and weight of the respirator to be used by the employee;
- duration and frequency of use;
- the nature of the physical work being performed;
- additional PPE to be worn;
- temperature and humidity extremes; and
- a copy of this SOP.

The medic or medical examiner must provide a written recommendation to the Health and Safety Officer that stipulates any limitations or restrictions on an employee's respirator use, and the need for any follow-up medical evaluation.

4.3 Respirator Fit Tests

The Health and Safety Officer shall either perform or arrange respirator fit tests for employees who are required to use half- or full-face air purifying respirators.

Fit testing must be performed prior to initial use in a hazardous atmosphere and at least annually thereafter. In addition, fit testing is required whenever a different respirator facepiece is used or whenever there are changes in the employee's facial characteristics due to dental work, surgery, or extreme weight gain or loss.

The fit test must be administered using procedures specified in ANSI/AIHA Standard Z88.10-2001 or an equivalent standard.

Fit test records will be maintained by the Health and Safety Officer and shall include the following information:

- type of respirator fit test used;
- manufacturer, model, and size of respirator tested;
- name of person tested, test operator, and date of test; and the
- fit test method used.

4.4 Training

All respirator users must be given appropriate training before using any type of respiratory protection in a potentially hazardous atmosphere. Each user should be able to demonstrate competency in the following areas:

- the nature of the respiratory hazards associated with routine and non-routine situations that they may encounter in the course of their job duties, and the appropriate respirator for each situation;
- limitations and capabilities of the respirator used;
- inspecting, fitting, donning, and wearing respirators;
- medical signs and symptoms that may limit the use of respirators;
- emergency situations and indications of respirator failure during use; and
- routine respirator maintenance (cleaning and sanitizing, inspection, repair and storage).

Respiratory protection training must be repeated annually. Records of initial and annual respiratory protection training must be maintained in accordance with GG-05, "Records Management."

4.5 Respirator Procurement and Distribution

GGI shall procure adequate quantities and sizes of appropriate respirators based on the findings of the respiratory hazard assessment described in this Appendix. All respirators must be approved by a recognized national or international authority.

The Health and Safety Officer shall provide employees with the proper brand and model of respirator for which they have been fitted, and will instruct employees regarding the specific tasks where they are to be used, and, if applicable, the cartridge replacement frequency.

The camp medic(s) shall document each employee's name and the make, model, and size of the respirator issued (see **Figure 2**).

4.6 Respirator Use

4.6.1 Facial Seal and Valve

No person may use any half- or full-face air purifying respirator, or undergo fit testing if any of the following conditions apply:

- the user has facial hair including stubble, sideburns, mustache, or beard, or other hair such as a low hairline or bangs which interferes with the sealing surface of the facepiece of the respirator, or a mustache or beard that may interfere with the functioning of the respirator valves;

- the user is wearing a head covering which interferes with the sealing surface of the respirator facepiece and the wearer's face;

- the user is wearing eyeglasses, goggles, a face shield, welding helmet, or other eye and face protective device that interferes with the seal of the respirator; or

- the user has any facial deformities or missing teeth or dentures that could prevent a respirator from sealing properly.

.

4.6.2 Positive and Negative Pressure Fit Check

Prior to entering any hazardous atmosphere while wearing an air-purifying respirator, the user must perform a positive and negative pressure fit check.

The fit check is performed by first covering the exhalation valve with the palm of the hand and exhaling gently into the mask to perform the positive pressure check. The mask should expand and "balloon out" slightly without any perceptible leaks until the facial seal finally leaks. The negative pressure fit check is performed by covering the inlet of the canister or cartridges with the palm of the hand, or a flattened rubber glove or plastic bag to form an air tight seal and then gently *inhaling.* The mask should collapse slightly and hold that position as long as the negative pressure is maintained without any perceptible leaks.

4.6.3 Maximum Allowable Concentrations for Air-Purifying Respirators

A tight-fitting air-purifying respirator may not be used to protect an individual from exposures exceeding 10 times the applicable PEL of a contaminant unless a protection factor greater than 10 has been demonstrated using *quantitative* fit testing methods.

Other than for purposes of emergency escape, the maximum allowable concentration of an airborne contaminant for which the use of an air-purifying respirator is permitted shall be the PEL of the contaminant times the fit factor as determined by *quantitative* fit testing methods, 100 times the PEL, or the maximum allowable concentration specified on the respirator cartridge or canister, whichever is lowest.

4.6.4 Cartridge Change-Out Frequency

If a chemical cartridge respirator is selected, the cartridge must either have an end-of-service-life indicator, or a replacement (change-out) frequency must be specified. The change-out schedule must be determined based on a review of data on the breakthrough time of the contaminant at the concentrations anticipated. Such data are deemed reliable if published in a peer-reviewed journal or by established research agencies. The change-out frequency of particulate filters must also be specified, but may be based on more subjective concerns such as general hygiene and breathing resistance.

4.7 Respirator Inspection, Care, and Maintenance

4.7.1 Inspection

Each employee who wears an air-purifying respirator in a hazardous atmosphere must inspect the device before and after each use. Routine respirator inspection must include a check of the tightness of connections and the condition of the facepiece, headbands, valves, air-lines, canisters, and cartridges. Rubber or elastomer parts must be inspected for pliability and signs of deterioration.

Any malfunction or defect shall be reported to the immediate supervisor, who will supply replacement parts. Respirators in need of parts and/or repair beyond the users' capability must be appropriately tagged and removed from the work area until they can be properly repaired.

4.7.2 Cleaning and Disinfecting

Respirators issued for the exclusive use of a single worker should be cleaned after each day's use. Respirators used by more than one worker must be cleaned and disinfected after each use. Respirators that are shared among employees shall be completely cleaned and disinfected after each use by carrying out the following procedures:

- Remove and set aside the filters or cartridges from the respirator. Disassemble valves and head strap.

- Immerse the respirator and parts (other than the cartridges/filter) in a warm aqueous solution of a germicidal detergent (available from the respirator supplier). The respirator facepiece and parts may be scrubbed gently with a cloth or soft brush. Make sure that all foreign matter is removed from all surfaces.

- After washing and disinfecting the respirator, rinse it with clean, warm water and then allow it to dry.

- After the respirator is dry, attach the air-purifying cartridges, replacing cartridges if necessary.

4.7.3 Repair

Minor part replacement (such as valves, cartridges, and canisters) can be made to negative pressure respirators following manufacturer's instructions. All parts, couplings, hoses, cartridges, and canisters must be from the same manufacturer as the respirator.

4.7.4 Storage

After inspection, cleaning, and maintenance, respirators must be stored in a plastic bags or containers to protect against dust, sunlight, heat, excessive moisture, or damaging chemicals. Respirators should not be put into lockers, trunks, or toolboxes unless they are in a hard storage container.

Respirators, cartridges, or canisters must not be stored where chemicals may contaminate them. Emergency respirators must be stored in special storage compartments, clearly marked and accessible at all times.

5.0 REFERENCES

- ANSI/AIHA Standard Z88.10-2001;
- GG-05, “Records Management”; and
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks.”

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes minimum requirements for training and qualifying selected Guyana Goldfields, Inc. (GGI) employees to serve as First Aid Providers. This SOP also establishes the process that will be followed in delivering First Aid and emergency medical treatment to employees and visitors to Aurora Project sites and facilities.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 First Aid

First Aid is defined as treatment of minor injuries or illnesses that do not require immediate attention by a medic, as well as those emergency measures that may be taken for preserving life or minimizing the consequences of severe injury or illness until treatment by a doctor or other trained medic can be obtained.

3.0 RESPONSIBILITIES

3.1 Upper Management

Upper management will ensure that sufficient resources are allocated to provide:

- adequate quantities of First Aid supplies appropriate for the routine work hazards associated with the Aurora Project;
- medical clinics at each Project site that are staffed with at least one trained medic (i.e., doctor, nurse, or medical technician) and equipped to provide emergency medical treatment;
- a permanently stationed emergency evacuation vehicle/ambulance;

- contracted emergency airborne medical evacuation (“medevac”) services that can be called upon to transport patients in the event of extreme, life-threatening emergencies;

- contracted arrangements with offsite hospitals, clinics, or trauma centers to receive and treat Project personnel or visitors who may become ill or injured; and

- training and qualification of a sufficient number of personnel to provide First Aid [including cardiopulmonary resuscitation (CPR)] support to the workforce, as described in Section 4.1.

3.2 Health and Safety Officer

The Health and Safety Officer will serve as the Project’s primary point of contact with the First Aid course provider and any contracted emergency response, medical, and medevac services. The Health and Safety Officer is responsible for ensuring that training is provided to adequate numbers of personnel to provide the level of First Aid Provider coverage required by this SOP, and that refresher training is provided at least once every 5 years. The Health and Safety Officer will also monitor the frequency and type of First Aid provided in order to detect potential trends or other health and safety issues requiring corrective and preventive action, and will participate in all accident/incident investigations that may be prompted by routine or emergency First Aid actions.

3.3 Medics

The Medics assigned to Project sites are responsible to the Health and Safety Officer and Environmental Manager for ensuring that:

- adequately stocked First Aid kits or lockers are provided in all Project vehicles and at appropriate locations throughout their assigned work areas;

- First Aid stations are located in clean, well-lighted areas;

- all employees are trained in the requirements of this procedure, the roles and responsibilities of the First Aid Providers and trained medic(s), and the location and general contents of the First Aid supplies provided at the site; and

- all designated First Aid Providers have received advanced First Aid and CPR training as described in this procedure, have successfully passed a qualification examination as described herein, and have been issued qualification cards and readily visible hard hat decals that identify them to the workforce.

3.4 Supervisors

Supervisors shall ensure that work schedules are arranged so that First Aid Provider coverage meets the minimum requirements of this procedure, for all shifts and all operational locations. Supervisors shall ensure that workers are aware of the identity of the designated First Aid Providers in their work group or work unit, and that workers are familiar with the procedures for obtaining First Aid.

3.5 First Aid Providers

Designated First Aid Providers are responsible for successfully completing documented First Aid training as specified by this SOP, and for:

- administering First Aid for minor injuries,
- determining if an injury requires further immediate medical attention beyond minor First Aid, and if so, for escorting injured employees to the onsite or (if the injury occurs at the port site) offsite medical clinic;
- administering emergency First Aid in the event of serious injury or illness, and tending to the patient until the medic is available; and
- notifying the Health and Safety Officer about all situations in which First Aid was administered.

4.0 PROCEDURE

The exploration plan development, review, approval, and implementation process is described in the following steps, and is summarized in the flowchart shown in Figure 1.

4.1 Acquisition, Placement, and Maintenance of First Aid Kits and First Aid Supply Lockers

The Health and Safety Officer shall work with Area Managers and Supervisors to ensure that appropriate quantities of First Aid supplies are made readily available at all major Project sites and facilities. The following minimum requirements apply:

- **Vehicles:** All Project vehicles (e.g., crew trucks, mine site ambulance/emergency response vehicle, haul trucks, water trucks, excavators, bulldozers, ATVs) will contain at least one American National Standards Institute (ANSI) Z308.1[1] Type III or equivalent 10-package First Aid kit. In addition, the

[1] ANSI Z308.1-2003, *American National Standard – Minimum Requirements for Workplace First Aid Kits*; International Safety Equipment Association, Arlington, Virginia, 2003.

designated emergency evacuation vehicle/ambulance shall carry at least two sets of splints, a transfer board, and an emergency stretcher.

- **Exploration operations:** At least one 16-package Type III First Aid kit shall be made available at each exploration site and/or temporary exploration camp.

- **Man camp:** One set of emergency splints, transfer board, an emergency stretcher, and at least two 36-package Type I First Aid kits shall be kept at the man camp.

- **Administrative offices:** Apart from the supplies maintained at the medical clinic at the mine site, at least one 24-package Type I First Aid kit shall each be maintained in the Project's administrative offices.

- **Security guardhouses:** At least one 10-package Type I First Aid kit shall be maintained at each of the security guardhouses.

4.2 Selection and Training of First Aid Providers

As a general rule, sufficient numbers of First Aid Providers should be designated to permit access to an injured worker at any location on the Project concession within minutes of an accident or incident.

All designated First Aid Providers shall complete an advanced First Aid course that complies with current International Red Cross or equivalent national standards.

Trainees who pass the course examination shall be issued qualified First Aid Provider cards that can be clipped to their identification badges, as well as Red Cross decals to be displayed on their hard hats (see **Figure 2**). These items shall be issued by the medics or Health and Safety Officer. Examination records shall be retained as noted in Section 4.6.

Refresher training shall be provided to all First Aid Providers at least every 5 years at the direction of the Health and Safety Officer.

4.3 First Aid Responses in Potentially Life-threatening Situations

If accidents or incidents are observed by any Project employee which are obviously life-threatening, or for any reason result in the employee or visitor not being able to walk, the observer shall immediately summon a First Aid Provider and medic. First Aid Providers will be readily identifiable by a Red Cross decal on their hard hats and a qualified First Aid Provider card clipped to their identification badges (see **Figure 2**). An ambulance shall also be requested, because the patient's condition may be time-critical. Contact numbers for the medic and ambulance services shall be posted in the administrative offices and other public locations in major operational areas. The patient's immediate Supervisor shall also be notified.

The First Aid Provider shall provide emergency First Aid as soon as possible in an effort to stabilize the patient's condition. When the medic arrives, the patient's condition shall be evaluated and a decision made whether or not ambulance evacuation to an offsite hospital or medical trauma facility is required. In serious cases, the medic may request evacuation via medevac aircraft in accordance with a prearranged contract. If the need to evacuate is confirmed, the medic shall accompany the patient and render assistance until such time as medical custody can be transferred to the offsite hospital or trauma facility. The medic shall advise the affected Supervisor, Area Manager, Camp Manager, and Health and Safety Officer with respect to the patient's status after releasing custody, which will be documented as part of the investigation discussed in Section 4.5.

4.4 First Aid Responses in Non-Life-threatening Situations

Personnel suffering (or workers observing) minor accidents or illness may contact any First Aid Provider for assistance. The First Aid Provider shall evaluate the patient. If the patient requires only minor First Aid (e.g., a small bandage, antiseptic ointment, analgesic tablets, or eyewash), the patient may be permitted to return to work. If the patient has injuries or illnesses requiring more substantial First Aid (e.g., broken bones, third-degree burns, wounds requiring compresses, or symptoms that include blurred vision, dizziness, diarrhea, or vomiting) or has suffered exposure to hazardous chemicals, the First Aid Provider shall escort the patient to the onsite medical clinic for examination by the medic. If the medic determines that evacuation is necessary, appropriate ambulance support shall be requested as discussed in Section 4.3. Otherwise, after diagnosis and treatment, the patient may be released to return to work or directed to return to their living quarters to rest and recuperate. The medic shall advise the patient's Supervisor or Area Manager and the Health and Safety Officer regarding the patient's medical status after treatment.

4.5 Documentation of First Aid Actions and Accident/Incident Reporting

Medics are responsible for logging the general details of all accidents or incidents requiring more than minor First Aid as described in Section 4.4, using area-specific log forms as illustrated in **Figure 3**. Of these logged accidents or incidents, the following categories will also require that the medic initiate formal documentation on a Corrective/Preventive Action Request (CPAR) form, in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action":

- all instances of illnesses demonstrating symptoms of one or more of the conditions monitored under GG-10, "Prevention and Monitoring of Communicable Diseases";

- all injuries related to improper use or lack of Personal Protective Equipment (see GG11, "Personal Protective Equipment");

- all injuries related to improper use of mechanical equipment;

- all injuries related to the handling, storage, or use of hazardous materials;
- all injuries related to all-terrain vehicle (ATV) or other vehicular accidents; and
- all other injuries or illness requiring ambulance evacuation, regardless of cause.

Medics shall ensure that all First Aid-related CPARs are immediately routed to the Health and Safety Officer and copies of area-specific log sheets are distributed to the Health and Safety Officer on at least a monthly basis. The Health and Safety Officer will monitor the frequency and type of First Aid provided in order to detect potential trends or other health and safety issues requiring corrective and preventive action, and will participate in all accident/incident investigations that may be prompted by routine or emergency First Aid actions. The Health and Safety Officer will also ensure that all such CPARs are resolved and closed as required by GG-04.

4.6 Records

The Health and Safety Officer of his designee shall ensure that copies of completed First Aid Provider training records, area-specific First Aid log sheets, and completed CPAR forms are forwarded to the Environmental Manager or designated Records Clerk for retention in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Management Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-10, “Prevention and Monitoring of Communicable Diseases”
- GG-11, “Personal Protective Equipment”

Figure 1: First Aid and Emergency Medical Care Process

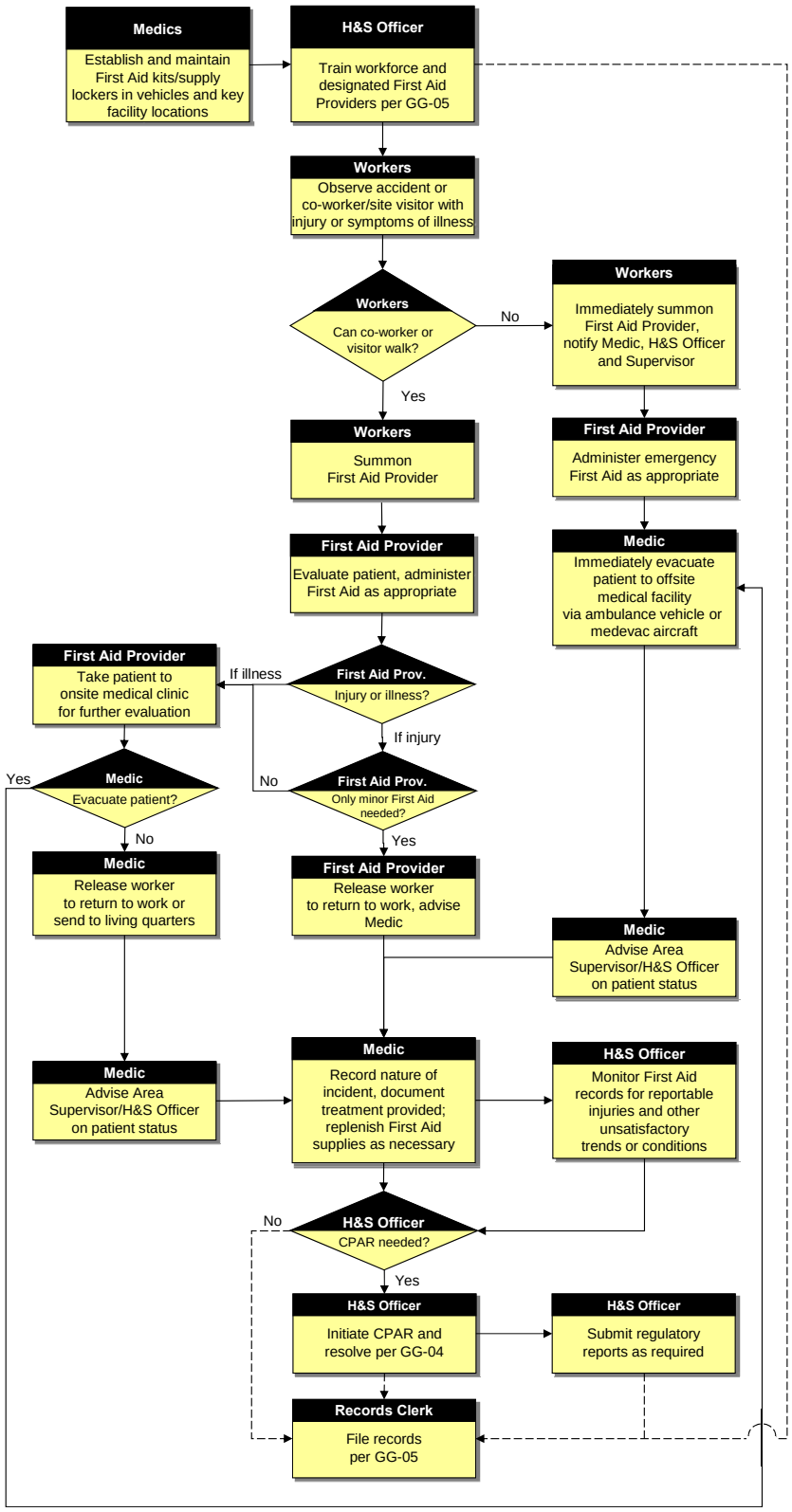


Figure 2: First Aid Provider Qualification Card and Identification Decal
(Not to scale)

First Aid Provider qualification card

First Aid Provider qualification card - reverse

Hard hat decal

Figure 3: First Aid Log Form

Aurora Project – First Aid Log, [insert operational area or facility name]							
Date	**Patient's Name**	**Patient's Job**	**First Aid Provider**	**Area in which injury or illness occurred**	**Description of condition**	**Description of First Aid provided**	**CPAR number** (N/A if not required)

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes minimum requirements for the safe operation of light vehicles or trucks at the Guyana Goldfields, Inc. (GGI) Aurora Project. Requirements for the operation of heavy equipment and truck/trailer rigs, industrial forklifts, and all-terrain vehicles (ATVs) are separately addressed, respectively, in GG-16, “Safe Operation of Heavy Equipment”; GG-15, “Forklift Safety”, and GG-26, “Safe Use of All-Terrain Vehicles.”

This SOP will apply over the life of the Project; it supports Section 4.3.2 (“Management of Social and Environmental Impacts”) of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Chocks

Chocks are wedges of wood or plastic composite placed on the downhill or traffic side of at least one tire, in order to prevent inadvertent movement of a parked vehicle. GGI requires all light vehicles to be chocked when parked, regardless of grade, unless parking areas are fitted with wheel barriers or trenches that serve the same purpose.

2.2 Light Vehicle

Light vehicles include 4-wheel drive pickup or crew cab trucks, vans, maintenance vehicles, ambulances, pilot vehicles, or specialty vehicles rated at 1 ton or less.

2.3 Operator

The ***operator*** is defined as a legally licensed driver with the skills and experience that permit them to be authorized to operate light vehicles owned or leased by GGI.

2.4 Operator Training

Operator training is defined as completion of training and a practical hands-on skills review by a qualified supervisor or manager, as described in this SOP.

2.5 Vehicle Accident

A ***vehicle accident*** is an unplanned vehicular event that results in injury, death, vehicle or property damage, trip interruption, or other loss.

3.0 RESPONSIBILITIES

3.1 Procurement Manager

The Aurora Project Procurement Manager is responsible for purchasing or leasing light vehicles that conform to international (and applicable national) automotive safety standards, with appropriate options suitable for hard use in remote mining operations.

3.2 Construction Manager

The Construction Manager is responsible for ensuring that all designated light vehicle operators are trained and qualified in accordance with this procedure.

3.3 Chief Mechanic

The Chief Mechanic is responsible for ensuring that light vehicles are regularly maintained and serviced to ensure their safe operating condition.

3.4 Vehicle Operator

The vehicle operator is responsible for successfully completing operator training as specified herein. Operators shall complete pre-shift safety inspections of their assigned vehicles, and report any problems to the Mechanical Shop for resolution. Operators are also responsible for operating vehicles in accordance with the guidance provided in Section 4.4.

3.5 GGI Security

Designated GGI Security personnel are responsible for contacting the Barama Dispatcher when vehicles or convoys begin any journey between Buckhall and the Project site, and for coordinating towing assistance if any light vehicles should become stuck or suffer a mechanical breakdown en route.

4.0 PROCEDURES

4.1 Procurement of Light Vehicles and Entry into Maintenance Tracking System

Light vehicles shall be purchased or leased that conform to international (and applicable national) automotive standards. At a minimum, all light vehicles must be fitted with seat belts, bumpers, a bumper- or body-mounted flexible safety wand and high-visibility flag, first aid kits (see GG-12, "First Aid and Emergency Medical Response"), fire extinguishers, rotating beacons, radios, sirens, backup alarms, and wheel chocks. In addition ambulances shall be fitted with all required emergency medical care equipment. Pilot vehicles shall be provided appropriate warning signs (e.g., "Long/Wide Load" or "Convoy Following."

After receipt and acceptance of each vehicle, the Procurement Manager or designee shall ensure that the vehicle is properly licensed in accordance with applicable Guyanese vehicle licensing regulations. Each vehicle shall also be assigned an Aurora Project control number. Once licensed and numbered, all light vehicles shall be entered into the Aurora Project's maintenance tracking system.

4.2 Selection, Training, and Qualification of Operators

Area Managers shall nominate experienced drivers to serve as light vehicle operators who have current Guyanese and/or international drivers' licenses.

The Construction Manager shall ensure that nominated vehicle operators attend a training session on the contents of this SOP, in accordance with GG-05, "ESMS Training Program." The training session shall emphasize the minimum requirements for safe operation described in Section 4.4. Candidates shall also demonstrate their driving skills to the trainer by way of a practical driving test under real conditions. Successful candidates shall receive a vehicle operator's qualification card from the Construction Manager (see **Figure 2**) to be carried with their Aurora Project identification at all times.

GGI reserves the right to rescind an employee's Aurora Project vehicle operator's qualification card in the event of an at-fault accident or if unsafe behaviour is observed; see the GGI "Labour Grievance Policy."

4.3 Pre-Mission Safety Checks

Each light vehicle operator shall complete a brief visual inspection of their assigned vehicle before starting out on a mission or travel assignment. The inspection shall include the following:

- Check tires for proper inflation, flaws, and excessive wear;

Good

Bad

- Check for excessive windshield damage (damage must be confined to minor cracks or chips, and may not interfere with the driver's field of vision);

Good

Bad

- Check that windshield wipers are functional, and clean the windshield, mirrors, and headlights if necessary;

Good

Bad

Good

- Check fuel, oil, coolant, and wiper fluid levels; if levels are not adequate to allow the vehicle to travel to the intended destination, go to the vehicle fuelling station before leaving the site and replenish as necessary (see GG-17 “Vehicle Fuelling and Spill Prevention”);

- Check that radios are working, and set to the proper channel;

- Ensure that all running lights, brake lights, turn signals, and hazard lights or rotating beacons are functional;

- Check brake and power steering function;

- If being used as a pilot vehicle (see GG-16, “Safe Operation of Heavy Equipment”), ensure that rotating beacons are functional and that a legible “Convoy” or Long/Wide Load” sign is securely attached to the front bumper;

- Check to ensure jack is in place and operable;

- Ensure that a small shovel or spade is packed in the vehicle, as well as an appropriate supply of potable water (at least one 1 litre bottle per passenger);

- Make sure that a first aid kit is available and supplies are complete[1];

- Check to see if the winch is operable (if fitted on vehicle; if no winch is provided, a tow chain must be kept with the vehicle); and

[1] See GG-12, “First Aid and Medical Response”; all Project vehicles will contain at least one American National Standards Institute (ANSI) Z308.1[1] Type III or equivalent 10-package First Aid kit.

- Check that vehicle seats and mirrors are adjusted so that the driver has optimum visibility, and ensure that seat belts are available for all passengers.

Good

Any noted discrepancies shall be referred to the Mechanical Shop for correction prior to vehicle use.

4.4 General Rules for Safe Operation

At a minimum, the operator must observe the following rules when operating a light vehicle. These rules must be addressed in operator training and shall be implemented in actual practice. *Failure to follow these rules may result in revocation of the operator's qualification card or other appropriate action;* see the GGI "Labour Grievance Policy."

General Rules for the Safe Operation of Light Vehicles

- ***Only qualified operators are permitted to drive vehicles – the are NO EXCEPTIONS!*** Operators will be required to present their driver's license and qualification card in order to receive vehicle keys from the operations office.

- Careless or reckless driving or driving under the influence of alcohol or drugs will not be tolerated and are grounds for immediate dismissal; see the GGI "Labour Grievance Policy."

- Pickup beds or trays are designed for carrying cargo only; riding in the bed or tray of a pickup truck is specifically prohibited, as is riding on a vehicle's hood, fenders, bumpers, or cab roof .

- Vehicles shall be chocked when parked regardless of grade, unless parking areas are fitted with positive wheel stops or trenches that serve the same function.

- Use of seatbelts by the driver and all passengers is mandatory.

- Sound the horn once prior to putting a parked vehicle in gear, twice prior to traveling in reverse, and three times when overtaking.

- When on developed roadways, observe all traffic regulations, including stopping at stop signs and traffic lights and slowing down for caution signs.

- Obey all posted speed limits, and maintain a safe following distance (at least 3 vehicle lengths).

- When the vehicle is being used as a pilot vehicle, stay within 100 m of the following vehicle or the lead vehicle in a convoy. When oncoming traffic or overtaking traffic is encountered, alert the driver of the following or lead vehicle, as appropriate. Speak to the driver of the oncoming vehicle (by radio if possible), advise them about the size of the load on the attended vehicle or the number of vehicles in the convoy, and determine the safest manner for the vehicles to pass. As a general rule, unless the oncoming vehicle is safely parked on a siding or pull-out, it is preferable to stop the convoy and allow the oncoming vehicle to pass. Overtaking vehicles should be advised not to pass until they can clearly see the oncoming lane and know it to be clear of traffic or obstructions. On the Barama portion of the road, give way to logging trucks wherever possible.

- Pedestrians and heavy equipment (except in a convoy situation involving oncoming traffic as described above) always have the right of way; yield to foot traffic and use extreme caution when passing children or domestic animals.

- Vehicles shall generally not be stopped at any place between the Buckhall site and the mine, unless 1) an emergency situation exists (e.g., mechanical failure or flat tire); 2) if specifically requested to stop for weather or road-safety reasons at any of the Barama-operated checkpoints on the Barama portion of the access road to the Aurora Project site; 3) if specifically requested to stop by uniformed police or military authorities; or 4) if conducting activities authorized or directly related to the work or security of the Project.

- Journeys to and from Buckhall and the Project site shall be planned to ensure arrival in daylight hours (typically an 0600-0800 departure); GGI Security shall advise the Barama Dispatcher by radio whenever GGI vehicles leave for Buckhall or the Project site. Drivers shall check in with GGI Security by radio at least once every two hours and upon reaching their destination. Drivers and passengers shall be provided potable water and emergency rations in case the

journey is interrupted at the Barama checkpoint or Tapir crossing due to weather or other emergency conditions. Unless accommodations are provided at the checkpoint or crossing, drivers must stay with their vehicles until daylight and permission is received to continue to travel.

- Extreme caution shall be used when passing a stopped or slow-moving vehicle; pass only on straight sections of road with full visibility of the oncoming lane. Sound the vehicle's horn three times prior to passing.

- Never offer rides to hitchhikers or non-employees. Stay on designated roadways and haul routes at all times.

- Steep roads shall be ascended/descended slowly and carefully. Under all conditions, operate the vehicle at a speed that will allow safe stopping. Reduce speed for wet and slippery or muddy road conditions, and engage 4-wheel drive prior to ascending of descending steep sections of road.

- Drive slowly and cautiously when exiting or entering site entry gates and loading and fuelling areas.

- Never leave a running vehicle unattended. The driver must take the keys and chock the tires whenever leaving the vehicle.

- If a vehicle becomes stuck, immediately advise GGI Security Personnel by radio and request assistance from other light vehicles with winches or tow chains; vehicles may be sent from Tapir Crossing, Buckhall, or the Project site, depending on conditions and availability.

- Immediately report all accidents involving GGI or contractor vehicles (and other accidents that may be observed by GGI vehicle operators) to the Health and Safety Officer via radio or cellular telephone, no matter how minor. If there are any injuries, follow the procedures outlined in GG-12, "First Aid and Emergency Medical Response." Other emergency actions (i.e., used of tow trucks and/or ambulances) shall be as directed by the Health and Safety Officer in coordination with GGI Security personnel.

4.5 Vehicle Maintenance Considerations

The Mechanical Shop shall ensure that all light vehicles are maintained in accordance with the manufacturer's recommendations, adjusted for the heavy use typically associated with remote mining operations. Maintenance actions shall emphasize the mechanical integrity of the engine, transmission, drive train, and braking and steering systems; the adequacy of the tire tread; and the functionality of all safety equipment.

4.6 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and include hard copies of all training session attendance sheets and any distributed hand-out materials (see GG-06, “ESMS Training Program”

5.0 REFERENCES

- GGI “Labour Grievance Procedure”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-12, “First Aid and Emergency Medical Response”
- GG-15, “Forklift Safety”
- GG-16, “Safe Operation of Heavy Equipment”
- GG-17 “Vehicle Fuelling and Spill Prevention”

Figure 1: Vehicle Procurement, Operation, and Maintenance Process

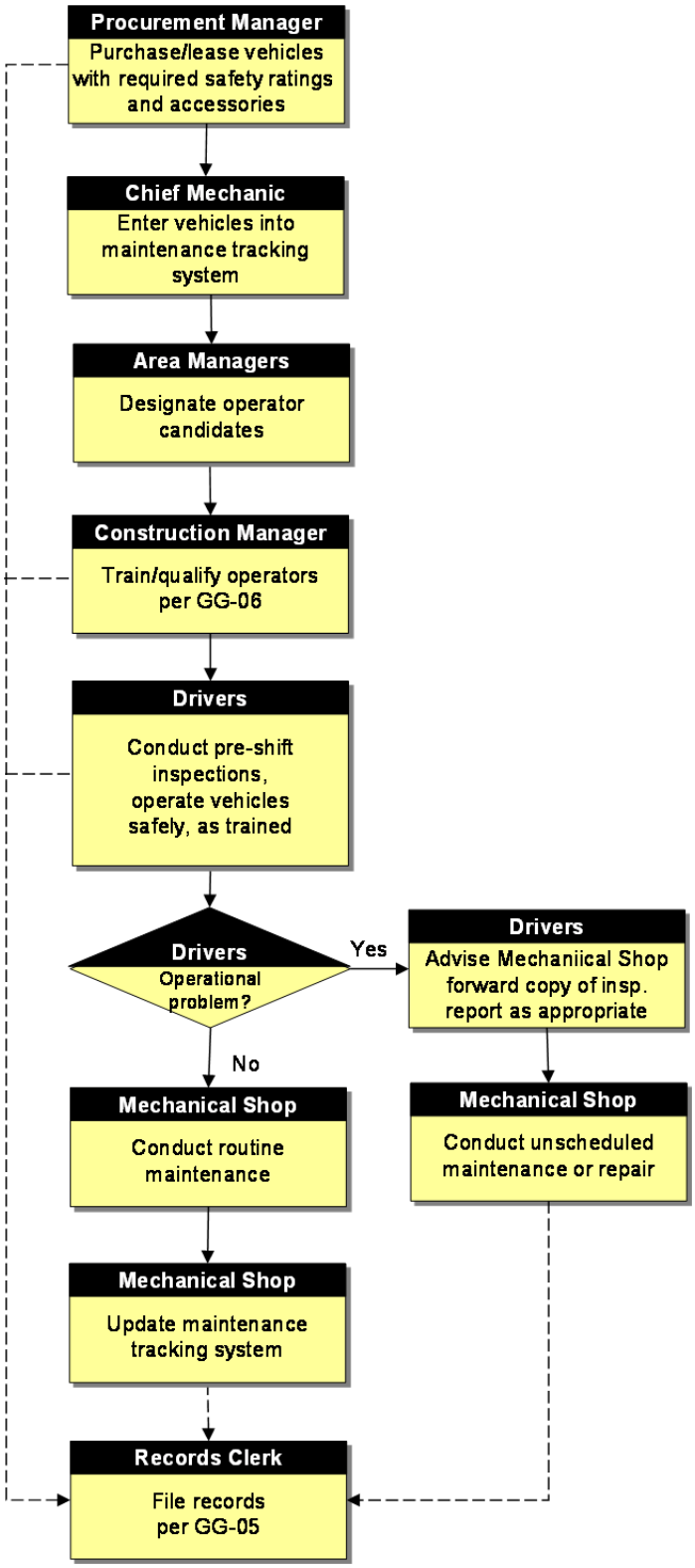


Figure 2: Vehicle Operator Qualification Card
(not to scale)

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the methods that the Guyana Goldfields, Inc. (GGI) Aurora Project shall use to manage the handling and storage of hazardous materials on site. This SOP supports the Project *Hazardous Materials Management Plan* and focuses on the handling and storage of hazardous materials (primarily consumables). Staging and offloading requirements for containers of cyanide are separately addressed in the Project *Cyanide Management Plan*.[1] Requirements for safe and secure storage of ammonium nitrate/fuel oil (ANFO) explosives and primer/detonator materials are separately addressed in the Project *Blasting Management Plan.* Procedures for the identification, segregation, and safe disposal of hazardous wastes are addressed separately in the Project *Waste Management Plan*.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Container

The term ***container*** is defined as any bag, barrel, bottle, box, can, cylinder, drum, vessel, storage tank, or similar receptacle that is used to store a hazardous material.

2.2 Hazardous Material

Hazardous material is defined as any substance (biological, chemical, physical) that has the potential to cause harm to humans, animals, or the environment. Such materials

[1] Cyanide will be purchased exclusively as solid briquettes, delivered in fully welded, certified intermodal stainless steel ISO transportation/ mixing containers. ISO containers are sized for intermodal (truck, rail, ship) transport, and are highly protective of the dry cyanide briquettes during transportation and delivery. This material form/delivery system eliminates the need for separate warehousing.

may include substances or chemical that constitutes a health hazard or physical hazard, and includes chemicals that are carcinogens, toxic agents, irritants, corrosives, or sensitizers; agents that damage the lungs, skin, eyes, or mucous membranes; chemicals that are combustible, explosive, flammable, or oxidizers; and chemicals that (n the course of normal handling, use, or storage) may produce toxic dusts, gases, fumes, or vapours. At the Aurora Project, hazardous wastes are considered a special subset of hazardous materials, and they require special, separate consideration under the *Waste Management Plan*.
Hazardous materials may include:

- fuel, lubricants, and automotive coolants;
- hydraulic oil, brake fluid, and transmission fluid;
- paints and solvents;
- cleaning compounds and sanitizing chemicals;
- insecticides, rodenticides, or herbicides; and
- laboratory chemicals.

3.0 RESPONSIBILITIES

3.1 Environmental and Health and Safety Officers

The Environmental and Health and Safety Officers are responsible to the Environmental Manager for coordinating proper hazardous materials handling and storage practices with the Stores Manager at each Aurora Project site. The Environmental and Health and Safety Officers are jointly responsible for seeing that the general handling and storage requirements of this SOP are followed on a day-to-day basis. The Health and Safety Officer is also responsible for ensuring that affected employees receive training in appropriate hazardous materials handling and storage methods, and that appropriate Material Safety Data Sheet (MSDS) information for hazardous materials stored on site is collected, maintained, and made available to support training activities or reference purposes.

3.2 Area Managers

Area Managers are responsible for ensuring that all employees in their assigned areas of responsibility have undergone appropriate training in the handling and storage of hazardous materials in their work areas, in accordance with GG-06, “ESMS Training Program”, and that employees follow such training in day-to-day activities involving hazardous materials. Area Managers shall immediately advise the Health and Safety Officer or Environmental Officer if they observe or are advised of any potentially harmful or hazardous actions or conditions involving hazardous materials.

3.3 Aurora Project Workforce

GGI workers shall receive training on the handling and storage of hazardous materials onsite, as well as procedures and actions for identifying potentially unsafe conditions, and are responsible for handling and storing hazardous materials as trained. Workers shall inform their immediate supervisor, the Camp Manager, the Health and Safety Officer, or the Environmental Officer if they observe or are advised of any potentially harmful or risky actions or conditions involving hazardous materials.

3.4 Procurement Manager

The GGI Procurement Manager shall ensure that the Environmental Manager is advised of all hazardous materials procurements, and that all such materials are purchased with international MSDS information from the distributor or manufacturer. The Procurement Manager shall route copies of all MSDSs to the Health and Safety Officer.

4.0 PROCEDURE

The general process to be followed for the handling and storage of hazardous materials is presented in the following paragraphs and summarized as a flowchart in **Figure 1**.

4.1 MSDSs

The GGI Procurement Manager will ensure that all hazardous materials are purchased with international MSDS information from the distributor or manufacturer, and that such information is routed to the Health and Safety Officer.

4.2 Training

The Health and Safety Officer shall ensure that all mine employees involved in the use and handling of hazardous materials undergo training addressing the general requirements of hazardous material management, as described in this SOP, as well as material-specific information as described in currently available international MSDSs. Training sessions shall be organized and documented as noted in GG-06, “ESMS Training Program.”

4.3 Preparation of Storage Areas

The Environmental Manager shall coordinate with the Camp Managers and Construction Manager to ensure that secondary containment systems are functional and that spill response equipment is pre-positioned in close proximity to fuel and lubricant offloading and storage areas, in accordance with GG-17, “Vehicle Fuelling and Spill Prevention.” Locking cabinets or storerooms will be provides for separate storage of stocks of engine oil, paint, solvent, brake fluid, cleaners, and solvents. A separate locking cabinet under the control of the camp medics will be provided for all insecticides, rodenticides, or

biocides. Appropriate spill containment and cleanup kits will also be provided near each storage area. Personal protective equipment (PPE; see GG-11, “Personal Protective Equipment”) shall be selected based on the current risk register (see GG-09, “Identification of Project-related Safety Hazards and Assessment of Risks”) and made available in clean, dedicated storage areas adjacent to all hazardous material storage areas.

4.4 Receipt and Unloading of Hazardous Materials

Security personnel checking in deliveries of hazardous materials at the Buckhall site that will be delivered by road to the Project site will provide drivers specific directions on the final delivery location, and shall alert the Environmental Officer and/or Health and Safety Officer, one of whom shall supervise the offloading. Hazardous materials or containers may be moved or transferred within the site only by qualified, trained vehicle operators, using appropriate industrial forklifts or other vehicles (see GG-13, “Transportation Safety”; GG-15, “Forklift Safety”; and GG-16, “Safe Operation of Heavy Equipment”).

4.5 Storage Area Management

Hazardous material storage areas shall be organized as follows:

- Hazardous materials shall be stored and handled in accordance with applicable MSDS requirements. Chemically incompatible materials shall not be stored in adjacent areas, and secondary containment shall be provided for all bulk materials (e.g., fuel, lubricants) consisting of an impermeable high-density polyethylene (HDPE) or concrete floor and containment walls, dikes, or berms, with a volume sufficient to contain any reasonably possible scenario of spills or discharges that may harm personnel or the environment.

- Containments should be generally designed to accept 110% of the largest stored volume, including the volume of any piping system component that could drain back to the containment. Containment areas should also be covered to prevent accumulation of precipitation. Where roofing cannot be reasonably provided, monitoring shall be conducted to ensure that accumulated precipitation is routinely drained or removed from the containment.

- Valves between containment areas or on containment drains shall be designed to be lockable in the closed position.

- All containers and storage tanks must be clearly labeled with the correct chemical name. Pipelines carrying hazardous chemicals or fuel shall be labeled with the contents and direction of flow.

- Hazardous material containers must be labeled to describe contents and any expiration date or shelf life limitations. Containers shall be organized to facilitate use of oldest stock first. Empty containers shall be accumulated and returned to

the vendor for re-use or crushed and properly disposed of in accordance with the *Waste Management Plan.*

- Hazardous materials shall be stored within security fencing or barriers, away from high traffic areas, and posted with appropriate signage. Access to storage shall be controlled, and limited to authorized personnel only.

- Hazardous material storage areas shall be inspected for integrity or evidence of leakage on at least a weekly basis; any observed leaks or container damage shall be responded to as noted in Section 4.6.

4.6 Spill Response

GGI staff shall immediately report evidence of leakage or container damage to their immediate supervisor, the Camp Manager, or the Environmental or Health and Safety Officers and initiate evacuation if necessary in compliance with the Project *Emergency Preparedness and Response Plan.* Staff members shall secure the site and remain in a safe location where they can provide additional information to the Environmental or Health and Safety Officers or emergency responders when they arrive, but shall not attempt to stop, contain, or clean up chemical or fuel spills unless they have had specific training in applicable cleanup methods.

Control and containment of spilled materials, cleanup, and disposal of cleanup waste shall comply with the requirements of the *Waste Management Plan*, as appropriate for the type of spill involved. Material-specific cleanup information shall be as described in currently available international MSDSs.

All spills involving hazardous materials are categorically considered to be non-conformances, subject to documentation, cooperative investigation, and systematic corrective and preventive action, in accordance with GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

4.7 Records

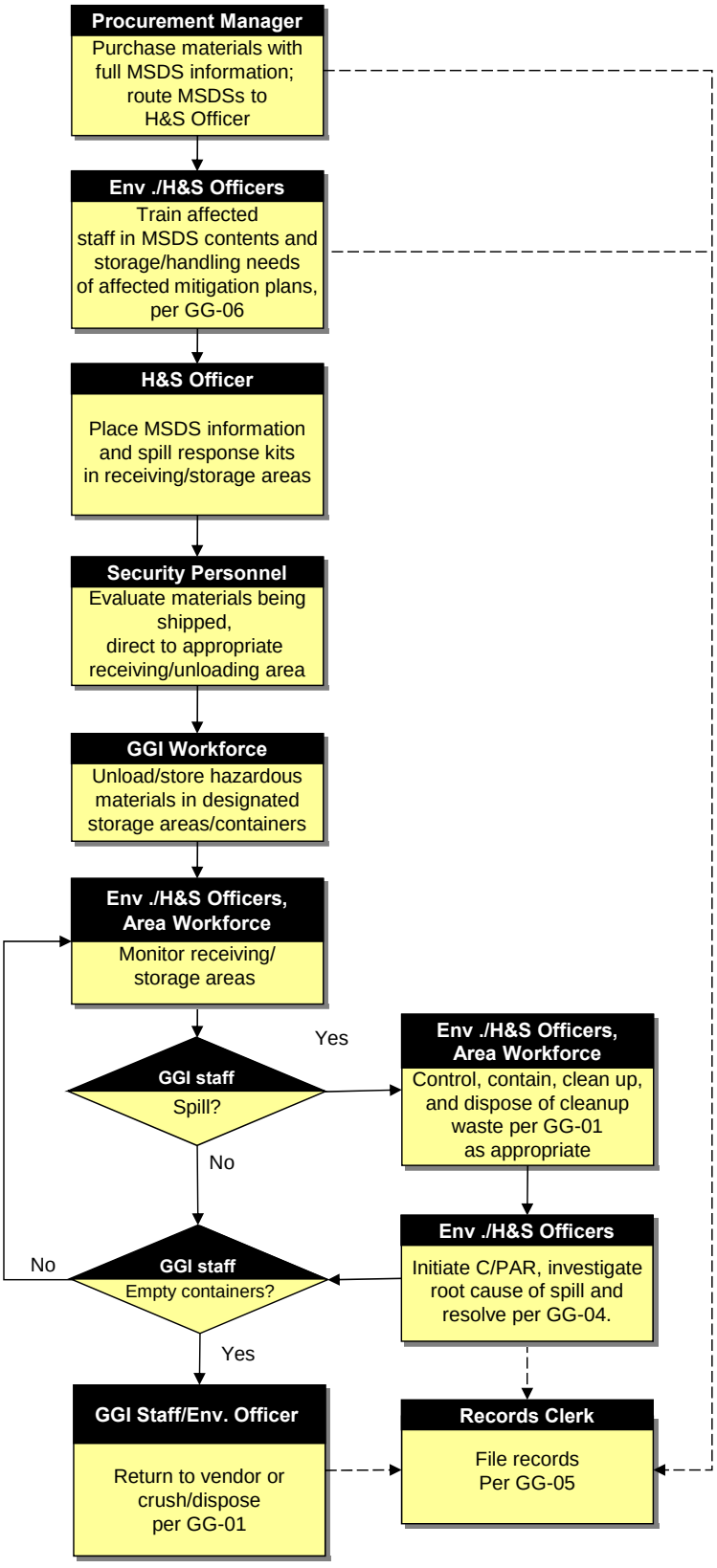
Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and will include hard copies of all MSDS information; training session attendance sheets and any distributed handout materials; and any completed Corrective/Preventive Action Request (C/PAR) forms related to spill response investigations.

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GGI *Waste Management Plan*

- GGI *Cyanide Management Plan*
- GGI *Blasting Management Plan*
- GGI *Emergency Preparedness and Response Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”
- GG-11, “Personal Protective Equipment”
- GG-13, “Transportation Safety”
- GG-15, “Forklift Safety”
- GG-16, “Safe Operation of Heavy Equipment”

Figure 1: Hazardous Materials Storage and Handling



	STANDARD OPERATING PROCEDURE **GG-15: Forklift Safety**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes minimum requirements for the safe operation of industrial forklifts at the Guyana Goldfield, Inc. (GGI) Aurora Project. This SOP will apply through the end of the operational phase of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Forklift Operator

The ***forklift operator*** is a worker who has the skills and training that permit them to be authorized to operate a forklift.

2.3 Operator Training

Operator training is defined as completion of an approved training course, including practical hands-on training in the proper operation use of a forklift by a qualified supervisor or manager or other experienced staff.

3.0 RESPONSIBILITIES

3.1 Procurement Manager

The GGI Procurement Manager is responsible for purchasing forklifts that conform to relevant national or international standards.

3.2 Chief Mechanic

The Chief Mechanic is responsible for ensuring that forklifts are maintained in a safe operating condition in accordance with manufacturer's recommendations.

3.3 Area Managers

Area Managers responsible for Project operations that require the routine use of forklifts are responsible for ensuring that operators are trained in accordance with procedure.

3.4 Chief Mechanic

The Chief Mechanic is responsible for ensuring that: 1) forklift ratings and identification markings are legibly maintained on the forklift; 2) suitable warning signs are posted in areas where forklifts are routinely used; 3) maintenance is conducted at intervals established by the manufacturer; 4) forklift tires are maintained with acceptable tread thickness; and 5) backup alarms and rotating beacons remain functional.

3.5 Forklift Operator

The forklift operator is responsible for successfully completing operator training as specified herein (see Section 4.2). Operators shall complete pre-shift safety inspections of their assigned forklift, and report any problems to their immediate supervisor or to the Mechanical Shop. Operators are also responsible for operating forklifts in accordance with the guidelines established in Section 4.4.

4.0 PROCEDURE

4.1 Procurement of Forklifts and Entry into Maintenance Tracking System

Forklifts should be purchased that conform to the requirements of ANSI B56.6, “Safety Standard for Rough Terrain Forklift Trucks” or equivalent national or international standards. At a minimum, all forklifts must be equipped with an overhead guard, backup alarm, rotating amber beacon, horn, and fire extinguisher. Other major accessories (e.g., drum forks, barrel clamps, or approved work platforms) shall be designed specifically for use with the make and model of forklift purchased.

After receipt and acceptance, the Chief Mechanic or his designee shall ensure that all forklifts are entered into the Aurora Project’s maintenance tracking system. The following information shall be legibly displayed on each unit:

- GGI vehicle number;
- tire inflation pressure;
- unloaded weight;
- load capacity;
- load center distance; and
- maximum lift height.

4.2 Selection, Training, and Qualification of Operators

Area Managers shall select personnel to serve as forklift operators and ensure that they attend a training session on the contents of this SOP, in accordance with GG-06, "ESMS Training Program." The training session shall emphasize the minimum requirements for safe operation described in Section 4.4. Candidates shall also complete on-the-job training (OJT) under the direction of a skilled operator selected by the Area Manager, and shall satisfactorily demonstrate their driving skills. Successful drivers shall receive a qualification card (see **Figure 2**) to be carried with their Aurora Project identification at all times.

GGI reserves the right to rescind a forklift operator's qualification card in the event of an at-fault accident or if unsafe behavior is observed; see the GGI "Labour Grievance Procedure."

4.3 Pre-Shift Safety Checks

The EHS Coordinator shall ensure that signs are posted to identify areas in which forklifts are commonly used.

Each operator shall complete a documented inspection of his or her assigned forklift before starting work, using the Operator's Weekly Forklift Inspection Report (Figure 3). Any noted discrepancies shall be referred to maintenance for correction prior to use. Copies of the daily inspection report shall be forwarded to maintenance and to the Project files as noted in Section 4.6.

4.4 General Rules for Safe Operation

At a minimum, the operator must observe the following rules when operating a forklift. These rules must be addressed in operator training and shall be implemented in actual practice. Failure to follow these rules may result in revocation of the operator's qualification card and driver's license, or other appropriate action.

General Rules for the Safe Operation of Forklifts

- ***Only qualified operators are permitted to drive forklifts – NO EXCEPTIONS!*** Operators will be required to present their qualification card in order to receive vehicle keys from the operations office.
- Passengers shall not be carried on the forklift at any time.
- Backup alarms/rotating safety beacons may not be disconnected.
- ***Use caution when driving where pedestrians are present.***

- Sound the horn in dangerous locations, but remember that this does not mean that the forklift has the right of way.

- Stop before traveling through doorways – sound the horn, look for pedestrians, and travel through slowly.

- Never run over cables or flexible pipes unless they are suitably protected.

- Do not pick up a load if someone is standing close to it, and do not permit people to stand or walk underneath a load when the forklift is stationary.

- ***Under no circumstances shall employees ever stand beside or walk along with the forklift to steady or support the load.***

- Do not travel with the load raised high; the forks should be raised only high enough to clear all floor- or ground-level obstacles.

- Be extremely careful when braking, especially when loaded, as uneven or violent braking may cause the load to fall off the forks or the forklift to tip over.

- ***Under no circumstances shall a forklift be used to elevate workers unless it is equipped with an approved work platform***. When using a forklift to elevate personnel, be sure it is on firm, level ground. The forklift transmission must be in neutral, with the parking brake engaged and the wheels chocked.

- Always lower the work platform to the travel position before moving the forklift and ***never travel with personnel on the platform.***

- When a high load restricts forward vision, drive in reverse, except if traveling up an incline.

- Always space forks as widely as possible while first fitting or adjusting the load. If a load appears to be top-heavy or unstable, or if the supporting pallet appears to be unsound, it should be rearranged appropriately.

- When forklift is loaded, always travel down slopes with the forks facing uphill, and up slopes with the load in front, taking extra care if vision is obstructed. Never turn sideways when on a slope.

- When forklift is unloaded, travel down slopes with forks facing downhill.

- ***Travel slowly when descending slopes.***

- When working to unload a truck or trailer, verify that the floor of the truck will support the combined weight of the forklift and load.

- In normal conditions, forklifts shall not be left unattended on a grade. If in an emergency a forklift must be parked on a grade, the forks must be lowered to the ground, the engine turned off, and the transmission engaged; the emergency brake must also be applied and the wheels chocked.

- When leaving the forklift for a short interval, make sure that the transmission is in neutral, the parking brake applied, and the forks lowered to the ground.

- Chock the wheels and turn off the engine if the forklift is going to be left for any length of time.

4.5 Maintenance Considerations

The Chief Mechanic or designee shall ensure that all forklifts are maintained in accordance with the manufacturer's recommendations for scope and frequency. Forklift maintenance shall be performed only by properly trained and authorized maintenance staff or contractor personnel. The Chief Mechanic must obtain written approval from the manufacturer before allowing any modification to the forklift that will:

- change the relative position of the various parts of the forklift from the original configuration;
- add extra parts not provided by the manufacturer;
- eliminate any parts; or
- in any way affect load capacity or safe operation.

4.6 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, "Records Management" and include hard copies of all training session attendance sheets and any distributed handout materials (see SOP-05, "Social, Environmental, and Health and Safety Training Program"). Copies of pre-shift safety inspection reports and repair records shall also be retained.

5.0 REFERENCES

- GGI ESMS *Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GGI “Labour Grievance Procedure”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- ANSI B56.6, “Safety Standard for Rough Terrain Forklift Trucks”

Figure 1: Forklift Procurement, Operation, and Maintenance Process

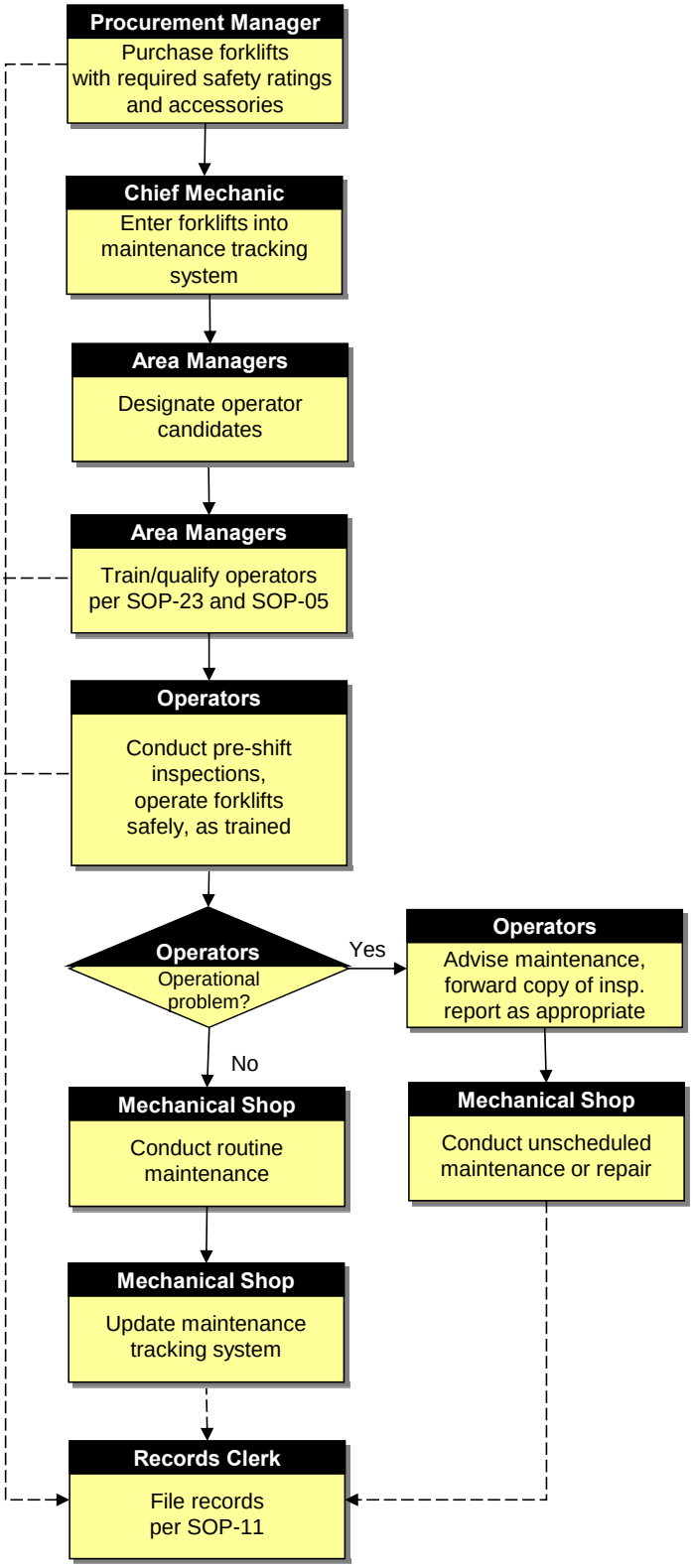


Figure 2: Forklift Operator Qualification Card
(not to scale)

Figure 3: Operator's Weekly Forklift Inspection Report

OPERATOR'S WEEKLY FORKLIFT INSPECTION REPORT			
Forklift Make/Model/Identification Number:			
Note: Any deficiencies noted must be repaired before the forklift can be used.			
Inspection items	**Comments**	**Inspection items**	**Comments**
1. Forks, locking pins, carriage, mast		10. Oil pressure	
2. Foot brake		11. Fire extinguisher	
3. Hand brake		12. Exhaust system	
4. Steering		13. Hydraulic system	
5. Fuel, oil, and coolant levels		14. Hoses	
6. Horn		15. Backup alarm	
7. Operational/ warning lights		16. Hour meter reading	
8. Gauges		17. Seat Belt	
9. Tire inflation/ condition		18. Chains (as req'd)	
Other Comments:			
Operator	Date	Time	
cc: Maintenance Records Clerk			

	STANDARD OPERATING PROCEDURE **GG-16: Safe Operation of Heavy Equipment**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes minimum requirements for the safe operation of heavy equipment at the Guyana Goldfields, Inc. (GGI) Aurora Project, including truck/trailer rigs delivering materials and equipment over the Buckhall-to-Aurora access road. Key aspects of this SOP will also apply to the operation of contractor-owned vehicles. Requirements for the operation of light vehicles, industrial forklifts, and all-terrain vehicles (ATVs) are separately addressed, respectively, in GG-13, “Transportation Safety”, GG-15, “Forklift Safety”, and GG-26, “Safe Use of All-Terrain Vehicles.”

This SOP will apply over the life of the Project; it supports Section 4.3.2 (“Management of Social and Environmental Impacts”) of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Transportation Management Plan* and *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Heavy Equipment

For the purposes of this SOP, the term ***heavy equipment*** includes major items of motorized equipment owned or leased by GGI or its contractors, and intended primarily for construction and mine operations use (e.g., hydraulic excavators, graders, loaders, bulldozers, backhoes, crawler-mounted cranes or drill rigs, water trucks, haul trucks) as well as truck/trailer rigs used to transport materials and equipment to the mine site from the Buckhall landing and logistics support centre.

2.2 Heavy Equipment Operator

The ***heavy equipment operator*** is defined as a GGI worker who has the specific skills and training that permit them to be authorized to operate heavy equipment.

2.3 Operator Training

Operator training is defined as completion of an approved training course or practical hands-on training in the use of heavy equipment under the supervision of qualified operators or manufacturers' representatives.

3.0 RESPONSIBILITIES

3.1 Procurement Manager

The Aurora Project Procurement Manager is responsible for purchasing or leasing heavy equipment that conform to applicable international and national safety standards and that are specifically designed for heavy construction and/or mining use. The Procurement Manager is also responsible for the procurement of transportation services from licensed trucking contractors; selected elements of this SOP may be invoked as contract requirements.

3.2 Mechanical Shop Manager

The Mechanical Shop Manager is responsible for monitoring manufacturers' onsite maintenance contracts to ensure that GGI-owned heavy equipment items are maintained in a safe operating condition.

3.3 Construction Manager

The Construction Manager is responsible for ensuring that heavy equipment operators receive appropriate classroom and hands-on training from authorized equipment manufacturer representatives and/or experienced operators as described by this SOP. Construction Manager is also responsible for issuing vehicle operator qualification cards (see **Figure 2**) to operators who successfully complete training, and for routing training records to file as noted in Section 4.6.

3.4 Heavy Equipment Operator

The GGI heavy equipment operator is responsible for successfully completing all required operator training sessions and examinations as specified herein. GGI operators shall complete pre-shift safety inspections of their assigned vehicles, and shall report any problems to the Mechanical Shop for resolution. GGI operators are also responsible for safely operating their equipment in accordance with manufacturers' instructions and the general guidance provided in Section 4.4.

3.5 Delivery Contractors/Truckers

Delivery contractors and truckers using heavy truck/trailer rigs or lowboys for oversize equipment transport are responsible for safely maintaining and operating their vehicles, and for complying with applicable portions of the general guidance provided in Section 4.4.

4.0 PROCEDURE

4.1 Procurement of Heavy Equipment and Entry into Maintenance Tracking System

Heavy equipment shall be purchased or leased for GGI operation/ Aurora Project use that is specifically designed for construction, mining, or transport, and that conforms to applicable international national safety standards. Contracts shall include appropriate provisions for long-term, onsite maintenance and onsite operator training support. Safety equipment included with or installed on such equipment shall be consistent with the needs and practices of the international mining industry and, as appropriate, shall include or consider:

- vehicle operating/running lights;
- redundant braking capabilities;
- wide-angle rear view mirrors;
- duty meters, pressure/temperature sensors, and alarms for hydraulics and other major systems and subsystems;
- amplified warning horns;
- backup alarms;
- tire chocks and tire pressure indicators (for rubber-tired vehicles);
- permanently installed fire suppression systems;
- portable fire extinguishers and spill kits;
- slip-resistant surfaces and guard rails on access ladders;
- secondary emergency egress ladders for large haul trucks and excavators;
- separation of steering hydraulics from main hydraulic systems;
- engine kill switches that permit immediate shutdown;
- electrical system lockout switches accessible from outside the battery compartment;
- dump bed-raised indicators and reverse gear neutralizers, for haul and dump trucks;
- low-noise and well-ventilated cab interior designs; and
- load tie down straps and chain arrangements, for trailers and lowboys

After receipt and acceptance of heavy equipment, the Chief Mechanic or designee shall ensure that each unit is assigned an Aurora Project control number, which shall be

prominently marked on the side of the vehicle. Once identified, all heavy equipment and items shall be entered into the Project maintenance tracking system.

4.2 Selection, Training, and Qualification of Heavy Equipment Operators

The Construction Manager or responsible Area Managers shall nominate personnel to serve as heavy equipment operators who have appropriate experience and training.

The Construction Manager shall ensure that all operator candidates attend a training presented by the Construction Manager or responsible Area Managers. The training shall emphasize the minimum requirements for safe equipment operation as described in applicable operator's manuals that may be provided by the manufacturer, as well as the general requirements presented in Section 4.4. Operator candidates shall also complete on-the-job training (OJT) under the direction of an experienced operator, selected by the responsible Construction Manager or Area Manager. OJT sessions shall be conducted until the operator satisfactorily demonstrates the adequacy of their driving/operating skills to the trainer. Successful candidates shall receive a qualification card from the Construction Manager (see **Figure 2**) marked with the specific equipment items that they are authorized to operate, to be carried with their Aurora Project identification badge at all times.

GGI reserves the right to rescind an employee's qualification card at any time in the event of an at-fault accident or if unsafe behaviour is observed; see the GGI "Labour Grievance Procedure."

4.3 Pre-Shift Safety Checks

Each GGI operator shall complete a documented inspection of their assigned equipment before starting work, using the Operator's Daily Inspection Report (**Figure 3**). Any noted discrepancies shall be referred to mechanical shop personnel for correction prior to use. Copies of the daily inspection report shall be forwarded to Mechanical Shop Manager and to the Project files as noted in Section 4.6.

4.4 General Rules for Safe Operation

At a minimum, GGI and contractor operators must observe the following rules when operating heavy equipment on the Buckhall to Aurora road, at Tapir Crossing, and at the Aurora mine site. These rules must be specifically addressed in the training of GGI operators and shall be implemented in actual practice. *Failure to follow these rules may result in cancellation of contracts (if contractor operators are involved) or (if GGI operators are involved) revocation of the operator's qualification card or other appropriate disciplinary action;* see the GGI "Labour Grievance Procedure."

General Rules for the Safe Operation of Heavy Equipment

- ***Only qualified operators (or trainees and qualified trainers) are permitted to drive or ride in or on heavy equipment – NO EXCEPTIONS!*** GGI operators will be required to present their driver's license and qualification card in order to receive vehicle keys from the operations office.

- Careless or reckless driving or driving under the influence of alcohol or drugs will not be tolerated and are grounds for immediate dismissal per the GGI "Labour Grievance Procedure", or contract termination, if contractor operators are involved.

- Trailer or lowboy loads shall be centred and securely tied down with locking straps or chains; tie-down security shall be re-checked prior to starting the vehicle.

- Heavy equipment shall always be put in gear (and chocked, if wheeled) when powered down and parked.

- Sound the horn once prior to putting a parked vehicle in gear.

- Obey all posted speed limits and slowdown in response to caution signs.

- If traveling in the transportation corridor to the mine site (i.e., the Buckhall to Aurora access road), obey traffic laws and be extremely cautious in traveling through any inhabited areas; do not use engine brakes, give way to pedestrians, and be careful when passing domestic animals on the roadway. If traveling in a convoy, or if carrying an oversize load, the Barama dispatcher must be notified a day in advance. A pilot car must also be provided (see GG-13, "Transportation Safety"). As a general rule, when traveling in convoy or transporting an oversize load, unless oncoming vehicles are safely parked on a siding or pull-out, it is preferable to stop the convoy or lowboy and allow the oncoming vehicle to pass. On the Barama portion of the road, give way to logging trucks wherever possible.

- Vehicles shall generally not be stopped at any place between the Buckhall site and the mine, *unless* 1) an emergency situation exists (e.g., mechanical failure or flat tire); 2) if specifically requested to stop for weather or road-safety reasons at any of the Barama-operated checkpoints on the Barama portion of the access road; or 3) if specifically requested to stop by uniformed police or military authorities.

- No driving is permitted at night on the Buckhall to Aurora road; trips to and from the Project site shall be planned to ensure arrival at the destination in daylight

hours (typically requiring a 0600-0800 departure). Drivers should be provided potable water and emergency rations in case the journey is interrupted at the Barama checkpoint or Tapir crossing due to impending nightfall, weather, or emergency conditions.

- Unless accommodations are provided at the Barama checkpoints or Tapir Crossing, drivers should be prepared to stay with their vehicles until daylight and permission is received to continue to travel.
- Always maintain a safe following distance (at least 3 vehicle lengths).
- Steep roads shall be ascended and descended slowly and carefully.
- Under all conditions, operate the vehicle at a speed that will allow for safe stopping; reduce speed for wet and slippery road conditions.
- Be aware of overhead hazards, especially power lines that could be struck by an extended mast or boom, or raised dump bed.
- Be extremely cautious in backing/dumping operations; ensure backup alarms are operational and use spotters (with 2-way radios, if hand signals cannot be seen clearly) in areas of poor visibility.
- Maintain awareness of other major equipment operations and the location of pilot vehicles or other light vehicle traffic.
- Do not leave a running vehicle unattended. The driver shall take the keys and chock the tires, as appropriate, whenever leaving the vehicle.
- Immediately report all accidents involving GGI or contractor vehicles (and other vehicular accidents that may be observed by vehicle operators) to the Health and Safety Officer via radio or cellular telephone, no matter how minor. If there are any injuries, follow the procedures outlined in GG-12, “First Aid and Emergency Medical Response.”

4.5 Maintenance Monitoring Considerations

Maintenance for GGI heavy equipment items is typically provided as a contracted service by the equipment provider or an authorized licensee. However, the Aurora Project Mechanical Shop Manager or designee shall nevertheless ensure that each heavy equipment item is assigned an Aurora Project control number and entered into the Aurora Project’s maintenance tracking system. The Mechanical Shop Manager or designee shall monitor the status of subcontracted maintenance items and may request

the Health and safety Officer to periodically evaluate the adequacy of subcontracted maintenance functions via the processes described in GG-03, “Field Inspection.”

4.6 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and include hard copies of all training session attendance sheets and any distributed handout materials (see GG-06, “ESMS Training Program”). Copies of pre-shift safety inspection reports and repair records shall also be retained, along with surveillance inspection reports and associated Corrective/ Preventive Action Requests (CPARs); see GG-03, “Field Inspection” and GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GGI “Labour Grievance Procedure”
- GG-03, “Field Inspection”
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-12, “First Aid and Emergency Medical Response”
- GG-13, “Transportation Safety”
- GG-15, “Forklift Safety”
- GG-26, “Safe Use of All-Terrain Vehicles”

Figure 1: Heavy Equipment Procurement, Operation, and Maintenance Process

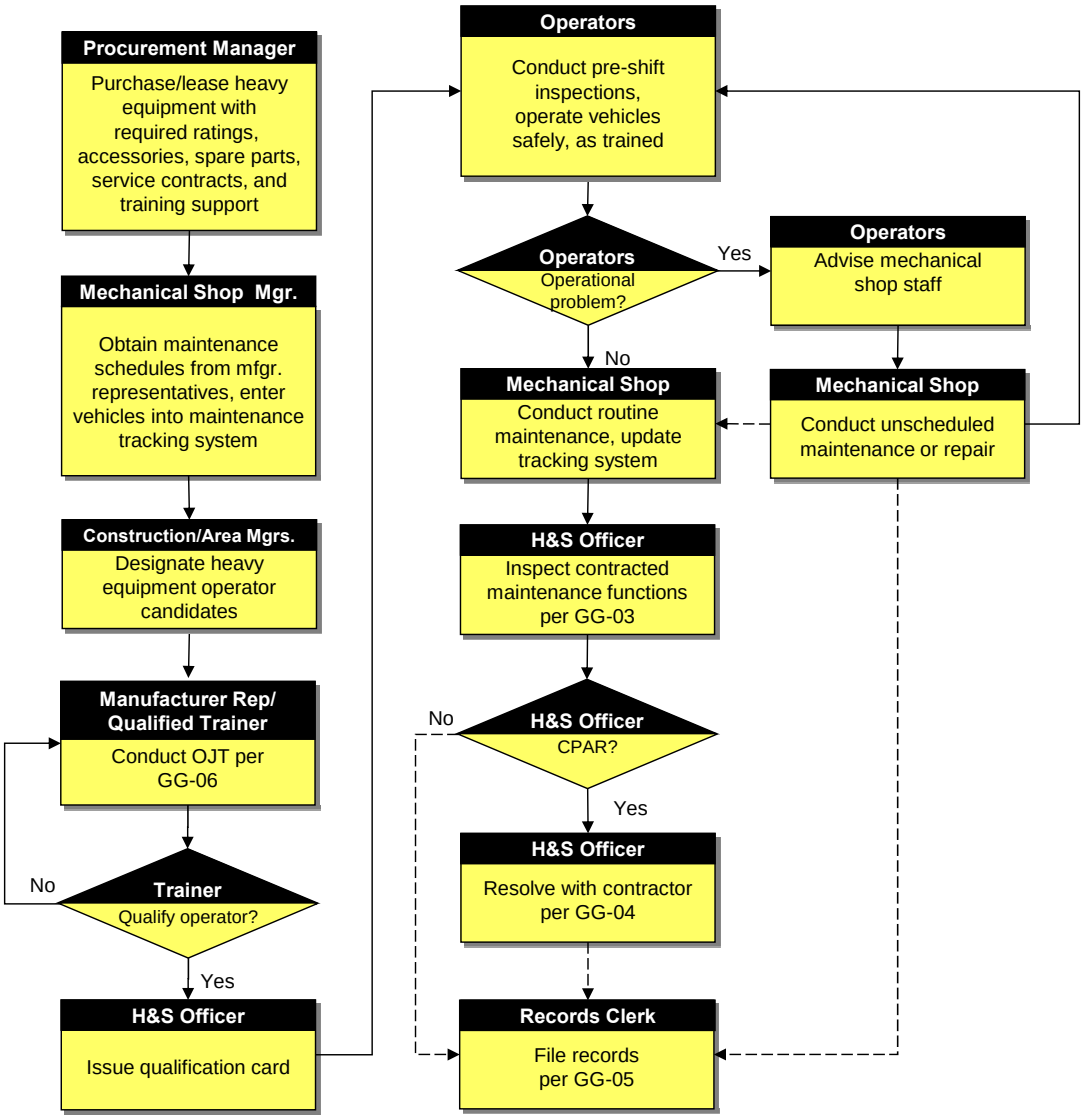


Figure 2: GGI Heavy Equipment Operator Qualification Card
(not to scale)

Figure 3: GGI Heavy Equipment Operator's Daily Inspection Report

OPERATOR'S DAILY INSPECTION REPORT		
Equipment Make/Model/Identification Number:		
Note: Any deficiencies noted must be repaired before the equipment can be used.		
Inspection items	**Comments**	
1. Headlights/running lights – operability		
2. Ride cylinders – missing bolts or obvious leaks		
3. Brakes – operability		
4. Tires – hub cracks, missing lug nuts		
5. Tires – inflation pressure		
6. Crawler tracks/tires – lodged rocks		
7. Hydraulic hoses – obvious cracks or leaks		
8. Tie rod/bell crank connections – integrity		
9. Fuel tank – cracks, leaks, adequate fuel level		
10. Bed cylinders/hydraulic actuators – leaks		
11. Rock ejectors (haul trucks only) – functional		
12. Pivot joints – cracks or missing pins		
13. Rear lights – functional		
14. Hydraulic oil reservoir – cracks/leaks		
15. Horn/backup alarms - functional		
16. Backup mirrors/windscreens – minimal damage, no interference with operator vision		
17. Wiper systems – reservoirs full, functional		
Other Comments:		
Operator	Date	Time
cc: Mechanical Shop Records		

	STANDARD OPERATING PROCEDURE **GG-17: Vehicle Fuelling and Spill Prevention**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes minimum requirements for receiving fuel and managing station-based or remote fuelling of vehicles and motorized equipment at Guyana Goldfields, Inc. (GGI) Aurora Project sites. Onsite fuel tanks, vehicle fuelling stations, remote fuelling equipment, and their associated mechanical maintenance programs will be designed to minimize the possibility that employees and the environment will be exposed to pollutants associated with maintenance and fuelling activities [e.g., petroleum hydrocarbons, heavy metals, and volatile organic compounds (VOCs)]. Such exposures may be caused by human errors, such as topping off fuel tanks, using fuelling nozzles without functional automatic cutoffs, not being attentive during loading and unloading procedures, not using drip trays in field fuelling operations, improper cleanup if a spill occurs, and improperly storing or disposing of materials associated with fuel spill cleanup or maintenance activities. Implementation of this SOP is intended to eliminate or minimize the potential for both occupational health and safety (OHS) exposures and the potential for environmental contamination.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan* and *Spill Prevention, Control, and Contingency Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Tank Overfill Protection

Tank overfill protection refers to any combination of procedures, tank level indicators, automatic shutoff devices, or other methods designed prevent the overfilling of a tank system from the delivery of fuel from trucks or tanks, or transfers from other tanks via pumps and piping systems.

3.0 RESPONSIBILITIES

3.1 Mechanical Shop Manager

The Mechanical Shop Manager at each Project site is responsible for a maintenance program that ensures the physical integrity, cleanliness, and proper functioning of fuel tanks and secondary containments, vehicle fuelling station equipment, remote fuelling equipment, and associated spill prevention programs. The Mechanical Shop Manager will ensure that proper fuel transfer, vehicle fuelling, and tank overfill and spill prevention requirements are followed by mechanical shop staff.

3.2 Vehicle Drivers/Equipment Operators

Vehicle drivers and equipment operators shall observe all rules and procedures regarding vehicle fuelling and spill prevention. They shall bring any observed hazards, spills, or other concerns to the immediate attention of the Health and Safety or Environmental Officers, or the Mechanical Shop Manager. Driver and operators shall participate in all required vehicle fuelling and spill prevention meetings and training sessions, and fuel their vehicles in accordance with the training received.

3.3 Health and Safety or Environmental Officers

The Health and Safety or Environmental Officers are responsible for checking the available capacity of stationary or truck-mounted fuel tanks prior to fuel transfer from a bulk carrier, as well as for checking the integrity of the receiving tanks and any associated secondary containment. The Health and Safety or Environmental Officers are also responsible for witnessing the entire offloading operation.

4.0 PROCEDURE

4.1 Training

Vehicle drivers/equipment operators and mechanical shop staff assigned to fuel storage or fuelling operations shall be trained in the requirements of this SOP at the direction of the Mechanical Shop Manager and Health and Safety or Environmental Officers. Training methods and documentation shall comply with the alternatives permitted by GG-06, “ESMS Training Program.”

4.2 Maintenance Considerations

The diesel storage tank, fuel pipelines, pumps, and delivery systems shall be subject to a routine maintenance program administered by the site Mechanical Shop that includes:

- functional checks of visual or electronic tank level indicators;
- periodic visual inspections of the tank, berm, piping, pumps, sumps, concrete or high-density polyethylene (HDPE)-lined aprons, hoses, and delivery systems for corrosion and any physical damage;

- checks for the visibility and good condition of **DANGER – FLAMMABLE** and **NO SMOKING** signs;

- availability of an appropriately sized spill kit;

- functional checks of nozzles with automatic shutoff features; and

- periodic ultrasonic shell testing of large steel tanks, at the multiple-year intervals specified by applicable American Petroleum Institute (API) standards.

Fuel trucks used for remote fuelling operations will be periodically inspected for the integrity of the tank and delivery hoses, the availability of portable metal drip trays and portable spill kits, the visibility and good condition of **DANGER – FLAMMABLE** and **NO SMOKING** markings, and the functionality of level indicators and nozzles with automatic shutoff features.

4.3 Receipt of Fuel for Onsite Storage or Transfer

Diesel fuel will be delivered primarily in bulk by barge to the Buckhall river terminal (or by tanker truck to the temporarily place tanks at Auroroa Base) and stored in a covered aboveground steel bulk storage tank farm. The storage tank and associated pumps, piping, and delivery systems will be constructed to conform to applicable API standards, and will incorporate concrete or HDPE-lined earth bermed secondary containments capable of storing at least 110 percent of the total volume of the tank as well as any portion of the supply pipeline that could drain back to the impoundment. The berm will be fitted with valved drains that permit discharge of accumulated stormwater or routing of contaminat4ed water through an oily water separator; valves shall be normally locked in the closed position. Transfer pipelines will be pressure tested and subject to regular inspection for potential leakage or corrosion. The tanks will be fitted with visual or electronic tank level indicators.

If fuel or lubricants is delivered in barrels, covered and bermed secondary containments (concrete or HDPE as previously noted) shall be provided at each major Project site, along with appropriate **DANGER – FLAMMABLE** and **NO SMOKING** signage

Health and Safety or Environmental Officers shall periodically inspect the storage tank area to ensure that stormwater is drained out of the tank containment, that containment valves are locked in the closed position, and, by examination of the tank level indicators, that the tank is capable of receiving the full volume of fuel carried by the bulk carrier. If a

fuel transfer is being made to an onsite fuelling vehicle, available capacity shall be verified before the transfer, and the vehicles shall be parked on an impermeable, bunded fuelling apron as previously noted. If the Health and Safety or Environmental Officers detect maintenance issue that must be completed before accepting a load of fuel, the Mechanical Shop Manager shall be immediately advised. The Health and Safety or Environmental Officer shall observe the entire fuel offloading operation.

4.4 Fuelling Vehicles at GGI Fuelling Stations

Drivers/operators or mechanical shop staff shall fuel their assigned vehicles in accordance with the following guidelines:

- Comply with the prohibition of smoking or open flames in the vehicle or within 200 meters of the vehicle fuelling area.

- Slowly drive the vehicle onto the sloped concrete apron adjacent to the pumping stations; if no apron is available, use a portable metal drip tray. Place the vehicle in neutral or park, set the hand brake, and shut off the motor. Place a chock under one of the rear wheels.

- Open the vehicle fuel cap, securely insert the nozzle with the automatic shutoff, and begin fuelling. Do not leave the vehicle.

- When automatic shut-off occurs, stop fuelling. **DO NOT TOP OFF THE TANK**. Withdraw the nozzle, secure it in its standby bracket, and replace the fuel tank cap.

- Record the volume of fuel pumped in the vehicle's usage log and the station logbook.

- If the fuel supply system requires maintenance or repair, notify the Mechanical Shop Manager immediately.

- Remove and stow the wheel chock, start the vehicle, remove and stow the drip tray (if used) release the handbrake, and ***slowly*** drive away.

The Supervisor of the fuelling station shall:

- Ensure that highly visible **NO SMOKING** and **DANGER – FLAMMABLE** signs are posted;

- Ensure all valves and hoses are properly labeled to reduce human error while fuelling;

- Immediately clean up any fuel spills after discovery with the pre-positioned spill kit, in accordance with the Project *Waste Management Plan* and properly dispose of any contaminated cleanup materials as noted therein.

- Clean the fuelling apron or drip trays with dry cleaning methods only (e.g., absorbent pads, diatomaceous earth); and

- Keep the fuelling station clean of debris and trash; dispose of all waste items properly, and keep all vehicle lanes clear.

- If a significant spill occurs, contain and notify the Environmental Officer and the reporting chain required by the *Buckhall Spill Contingency Plan* or the *Spill Prevention, Control, and Contingency Plan* for the Aurora and Tapir sites. The spill will be documented and corrective/preventive action initiated per GG-04, Identification of Non-conformances and Corrective/Preventive Action."

4.5 Fuelling Vehicles Remotely

Fuel truck drivers/mechanical shop staff responsible for remote fuelling operations shall dispense fuel in accordance with the following guidelines:

- Comply with the prohibition of smoking or open flames in the vehicle or within 200 meters of the vehicle or diesel-powered equipment item being fuelled.

- Slowly drive the fuel truck close enough to the receiving vehicle or equipment for the dispensing hose to fit into the receiving fuel tank without stretching.

- Place the vehicle in neutral or park, set the hand brake, shut off the motor, and put the vehicle in gear. Place chocks under the rear wheels.

- Place the metal drip tray under the fill area, open the vehicle fuel cap, and securely insert the nozzle with the automatic shutoff.

- Open the main valve on the bulk fuel tank and begin fuelling; pay close attention and do not leave the vehicle;

- When automatic shut-off occurs, stop fuelling immediately. **DO NOT TOP OFF THE TANK**. Withdraw the nozzle, secure it in its standby bracket, and replace the fuel tank cap on the receiving vehicle.

- Close the main valve on the delivery truck.

- Record the volume of fuel pumped in the usage log.

- Advise the operator of the receiving vehicle or equipment item that fuelling is complete.

- If the fuel delivery truck requires maintenance or repair, notify the truck shop Supervisor or Mechanical Shop Manager.

- Remove and stow the wheel chock, start the delivery vehicle, release the hand brake, and slowly drive away.

- Clean up any fuel spills (including any drips in the drip tray) in accordance with the Project *Waste Management Plan*, and properly dispose of any contaminated cleanup materials as noted therein.

- If a significant spill occurs, contain and notify the Environmental Officer and the reporting chain required by the *Buckhall Spill Contingency Plan* or the *Spill Prevention, Control, and Contingency Plan* for the Aurora and Tapir sites.

- The spill will be documented and corrective/preventive action initiated per GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

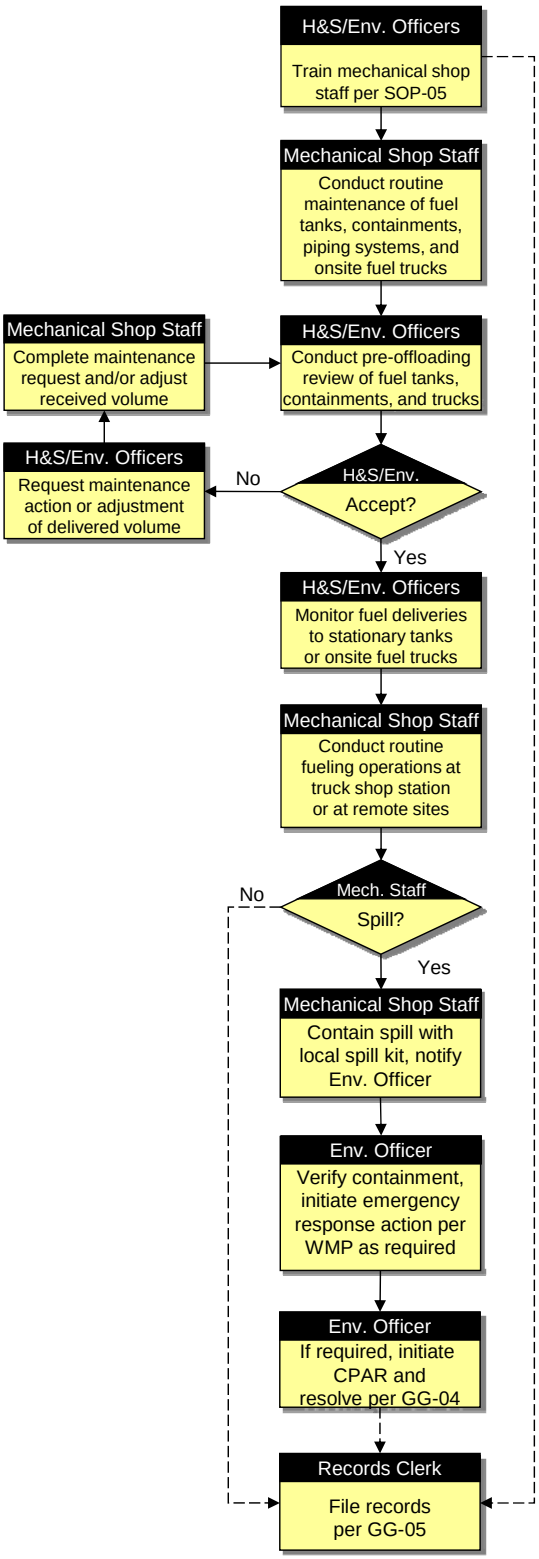
4.6 Records

Copies of completed training records and any spill-related CPAR documents shall be forwarded to the designated Records Clerk for retention in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*,
- GGI *Waste Management Plan*
- GGI *Buckhall Spill Contingency Plan*
- GGI *Spill Prevention, Control, and Contingency Plan*
- GG-04, "Identification of Non-conformances and Corrective/Preventive Action"
- GG-05, "Records Management"
- GG-06, "ESMS Training Program"

Figure 1: Fuel Offloading and Fuelling Process



	STANDARD OPERATING PROCEDURE GG-18: Machine Guards and Safety Barriers
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes the minimum requirements for machine guards and safety barriers at the Guyana Goldfields, Inc. (GGI) Aurora Project. Moving or rotating machinery is intrinsically hazardous, and installation and proper use of effective safeguards has proven to be an effective method for mitigating these hazards and preventing associated workplace injuries and fatalities.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

This SOP applies to all permanently installed or portable machinery. It does not apply to the operation of vehicles or hand tools, except for establishing a basic rule that factory-installed safety guards on specific types of powered hand tools (e.g., chainsaws, rotary grinders) may not be removed or tampered with.

2.0 DEFINITIONS

2.1 Affected Employee

For the purpose of this procedure, ***affected employee*** refers to any GGI employee or contractor, whose assigned duties include operating machinery or equipment, or whose job involves working on or in the immediate vicinity of machinery or equipment involving one or more hazard areas.

2.2 Barricade

A ***barricade*** refers to a barrier such as a guardrail, fence, or other fabricated structure designed to physically prevent employee access and hence prevent exposure to a hazard.

2.3 Barrier

A ***barrier*** is a machine guard that offers protection by establishing a physical shield on or around a machinery item; the shield is designed specifically to mitigate hazards to users or bystanders.

2.4 Belt Conveyor

Belt conveyor refers to a powered, continuous belt of rubber, fabric, composite, or other flexible material, operating over pulleys or rollers to transport ore, waste rock, or other materials.

2.5 Hazard

A ***hazard*** is condition that could result in physical harm to a human being.

2.6 Hazard Area

For the purposes of this SOP, ***hazard area*** refers to an area or space on or around operating machinery or equipment that poses an immediate or impending machine-related physical hazard. Such hazards may be associated with the point of operation, mechanical power transmission apparatus, or any other moving parts, including feed mechanisms and auxiliary machinery items.

2.7 Idler

An ***idler*** is a pulley or roller on a shaft that guides or takes up slack on a drive belt.

2.8 Machine Guard

A ***machine guard*** is a type of barrier that prevents the hands or other body parts from reaching through, over, under, or around the guard into the hazard area, and/or physically prevents objects or debris from falling onto or being ejected towards an employee or bystander.

2.9 Machine Safeguarding

Machine safeguarding refers to the practice of using guards, barriers, barricades, or other devices to protect persons from contacting, becoming caught by, or falling into moving machine parts, or to prevent objects or debris from falling onto or being ejected towards an employee or bystander.

2.10 Mechanical Power Transmission Apparatus

Mechanical power transmission apparatus refers to the mechanical device that provides power to a machinery item, and may include shafting, belts, pulleys, flywheels, couplings, chain/sprocket drives, cranks, or gears.

2.11 "Nip" or "Pinch" Point

A "***nip" or "pinch" point*** refers to any point where rotating parts may catch or draw clothing or a body part into the works of a machine. Such points typically exist: 1) between parallel rollers rotating in opposite directions; 2) between intermeshing gears; 3) near rotating and tangentially moving parts such as a belt and pulley, chain and sprocket, or rack and pinion; or 4) between rotating machinery and a fixed surface (e.g., between a stationary abrasive grinder and a work rest).

2.12 Point of Operation

The ***point of operation*** is defined as the location at which the machinery performs the desired work on the material being processed (e.g., the location of actual cutting, boring, shearing, or crushing operations).

2.13 Prime Mover

A ***prime mover*** is defined as an engine or motor, the main function of which is to drive or power other mechanical equipment.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

The Health and Safety Officer is responsible for either performing or directing machine safeguarding risk assessments at appropriate points in the construction process (or if facility expansions or modifications take place in the operational phase of the project) in order to ensure that potential hazard areas are identified and equipped with effective safeguards.

The Health and Safety Officer shall also ensure that employees in their assigned facility areas receive appropriate machine safeguard training as described in this procedure, and are responsible for reviewing and acting upon machine safeguarding issues brought to their attention through the hazard recognition and reporting process (see GG-24, "Recognition and Reporting of Safety Hazards").

The Health and Safety Officer is also responsible for performing periodic inspections and reviews of machine safeguards and associated employee work practices, in accordance with GG-03, "Field Inspections." The Health and Safety Officer shall ensure that any identified deficiencies are resolved in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

3.2 Area Supervisors

Area supervisors have overall responsibility for safety within their work groups and/or work areas, and shall:

- ensure that all installed machine guarding devices remain in place and in good repair;

- ensure that employees do not remove or defeat machine guarding, either in the course of routine operations or maintenance activities; and

- ensure that all machinery is operated only by authorized, properly trained employees.

3.3 Affected Employees

All affected employees are responsible for complying with the requirements of this SOP, as applicable to their individual work assignments, and for performing their operational functions as trained. Affected employees are also responsible for reporting any new or previously unrecognized machine hazards in accordance with GG-24, "Recognition and Reporting of Safety Hazards," as well as for bringing suggestions for improving existing safeguards to management's attention.

4.0 PROCEDURE

General considerations for the design, installation, and use of machine guarding are described in the following paragraphs, along with the process for ensuring that appropriate machine guards are designed, installed, and properly maintained. This process is also summarized as a flowchart in Figure 1.

4.1 General Considerations

Moving machine parts must be guarded to protect personnel from contacting gears, sprockets, chains, propeller shafts, connecting shafts, pulleys, flywheels, couplings, fan blades, and other moving parts. Appropriate railings, barricades, fall-restraint systems, and/or emergency stopping devices must also be installed to prevent falls or injuries.

A range of control methods is available to serve these purposes; however, the preferred hierarchy of methods is as follows, with the lower number corresponding to a greater level of preferability:

1) Eliminate the hazard by including appropriate engineering controls in the facility or machinery design;

2) Control the hazard by the use of guarding, barriers, or other safety devices;

3) Control hazards by the use of warning signs or visual/audible alarms;

4) Control hazards by the use of personal protective equipment (PPE; see GG-11, "Personal Protective Equipment"); and

5) Control hazards through the training of operations personnel.

Eliminating hazards at the design stage by instituting effective engineering controls is by far the most desirable strategy for safeguarding machinery. Controls that rely solely on training, warnings, and subsequent workers' behavior to prevent accidents and injuries have much uncertainty with respect to effectiveness, and are the least desirable. Practical machine safeguarding methods typically involve an appropriate combination of the five methods listed above.

4.1.1 Purchasing/Installing Safe Equipment

New facilities, equipment, or machinery must be reviewed in the design engineering /purchasing process. Facilities, equipment, or machinery must meet applicable regulatory requirements and industry consensus standards, whichever provides the greater level of protection. The design of machine safeguarding is sometimes complicated, however, by the number and complexity of machinery items in a facility, and other customer-specific considerations. As a consequence, it may not be possible to address all machine hazards at the design stage. Moreover, not all machinery builders provide point of operation safeguards on their products. In many cases, the only available solution is an appropriate point of operation guard or barrier that can only be made and installed by the end user after a thorough analysis of the work process and the hazards involved. In any event, a concerted effort should be made to control machine-related hazards during the design engineering/purchasing phase of the Project.

4.1.2 General Considerations for Machine Guard Design

Every machinery item has its own unique hazards, or potentially hazardous situations. However, machine hazards can generally be grouped into a number of common hazard areas:

- The ***point of operation*** typically represents the greatest hazard because it represents the greatest opportunity for injuries to occur. The point of operation is by definition the point where the intended work is performed on the material being processed and often requires the worker to perform some task either within or very close to the hazard area. Safeguarding at the point of operation is typically complicated because it must prevent all or any part of a worker's body from entering the hazard area, but must also allow access for introducing material to be processed.

- ***Mechanical power transmission apparatus*** such as rotating shafts, pulleys, belts, gears, flywheels, connecting rods, and couplings constitute another major area of concern. A major difference between power transmission guards and point of operation guards is that power transmission guards do not have to accommodate openings or mechanisms for feeding material to be processed. The only openings that are typically necessary for power transmission apparatus guards are those that are made to accommodate

lubrication, adjustment, inspection, and repair. These openings should be provided with covers that cannot be easily removed.

- Any ***hazardous mechanical actions or moving parts*** that may cause injury must be considered and safeguarded. Where the operation of a machine or accidental contact with any part can injure the operator or bystanders, the hazard must be controlled or eliminated. Reciprocating, rotating, or transverse mechanical actions or motion must be considered, as well as feed mechanisms and auxiliary machinery parts. Examples include:

  - rotating wheels or rollers;
  - reciprocating arms;
  - moving belts, drive chains, or conveyor systems;
  - meshing gears;
  - cutting teeth; or
  - mechanical hammers or other devices designed to impact, crush, or shear.

  Rollers, meshing gears, and moving belts or drive chains as well as reciprocating and transverse motion can create “nip” or “pinch” points; virtually any moving parts having protruding bolts, fasteners, set screws, teeth, or jaws can create pinch points for clothing, hair, feet, or fingers.

- All ***power sources for machinery*** contain potential hazards. Electrical systems must be considered and properly guarded to prevent workers from contacting live electrical components as noted in GG-20, “Electrical Safety.” The primary power switch for all electrically energized equipment shall be designed to be locked or tagged out for maintenance or repair purposes.

- ***High pressure steam or compressed gas*** systems may warrant guarding to offer protection from inadvertent damage, leakage, or potential rupture. Compressed gas cylinders used in welding or cutting operations shall be stored and handled to prevent cylinders from falling and potentially damaging inlet/outlet valves, as noted in GG-19, “Welding and Cutting Safety.”

- In some circumstances, guarding may also be appropriate to protect workers from exposure to ***excessive noise or hazardous chemical substances.***

4.1.3 Machine-Specific Safeguarding Requirements

- **Rock Crushers:** All wheels, gears, belts, pulleys, and exposed shafts should be guarded in accordance with American National Standards Institute (ANSI) Standard B15.1-2000, “Safety Standards for Mechanical Power Transmission Apparatus” (ANSI B15.1) or appropriate national equivalent. All walkways and stairs must be equipped with handrails and kick plates. At a minimum, the operator of the crusher shall be protected by guardrails and toe boards when operating or working on the equipment. Rapid shutdown switches shall

be provided at the operator's station and other appropriate locations. Primer movers shall be fitted with devices that facilitate positive lockout during machinery maintenance. Employees shall not be permitted to stand in the crusher hopper while attempting to free jammed material. Employees working at a crusher location shall be protected from accidental falls into the crusher by one of the following means:

- by adequately guarding the mouth or entrance to the crusher; if this is not practical, a safety belt and fall restraint system shall be worn by affected employees with the restraint system sized to physically prevent the wearer entering the entrance to the crusher;

- by the use of a work platform with a standard railing located in such a manner that jammed material can be safely dislodged;

- by other equally safe means that have been reviewed and approved by the Health and Safety Officer as a result of a hazard analysis conducted under GG-09, "Identification of Project-related Safety Hazards, and Assessment of Risks."

Crushers designed to receive loads of ore or rock in haul trucks shall be fitted with permanent chocks or stops that prevent the haul truck from backing into the hopper.

- **Conveyors:** Conveyors should be constructed and maintained in accordance with ANSI B20.1-2000, "Safety Standards for Conveyors and Related Equipment" (ANSI B20.1) or appropriate national equivalent.

  Most injuries related to conveyor systems are the result of a worker falling on or against the conveyor, or attempting to clean or clear a pulley or roller, or re-align the belt while the conveyor is operating. This may result in the worker getting caught between the conveyor belt and an idler or pulley; getting caught in the drive chain or gear drive; or getting trapped between major components of the system. Other common causes of injury related to conveyor operations include materials or other objects falling from the conveyor; other slips, trips and falls; fire; and electrocution.

  Conveyors should be fitted with portable or other appropriate emergency stop controllers that can be operated by workers at key stations or locations on the conveyor route. Unguarded conveyors with adjacent travelways shall be equipped with emergency stop devices which are located such that a person falling on or against the conveyor can readily deactivate the conveyor drive motor. Alternatively, conveyors shall be provided with railings that are: 1) positioned to prevent persons from falling on or against the conveyor; 2) sufficient to withstand the vibration, shock, and general wear and tear to which they will be subjected during operation; and 3) constructed and maintained in a manner that does not create a new hazard. All conveyor crossover steps and walkways must be equipped with hand rails.

- **Other Machine-specific Guarding Methods:** Other acceptable machine guarding techniques for a wide variety of common machinery may be found in Occupational Safety and Health Administration (OSHA) Publication 3067, "Concepts and Techniques of Machine Guarding" or equivalent national standards.

4.1.4 Warning Signs or Alarms

Where machine guards, barriers, or barricades are used to control an identified hazard, warning signs shall be posted in close proximity to the hazard area to identify the hazard and present clear directions or prohibitions, as in the following example.

In addition, major equipment (e.g., rotary or gyratory crushers, screens, overhead cranes, or conveyor systems) should be fitted with audible and/or visual alarms, horns, or sirens that alert workers that the equipment is about to be energized.

4.1.5 Personal Protective Equipment

All employees working on or around heavy machinery shall wear hard hats, steel-toed safety shoes, and safety glasses ***at all times***. When appropriate, leather or other work gloves may be worn to protect the hands from cuts, abrasions, or impacts from rough-edged materials. See GG-11, "Personal Protective Equipment." It is important that protective clothing and equipment do not create any additional hazards, as protective gloves or loose fitting coveralls may be susceptible to being caught in "nip" or "pinch" points. Wristwatches, bracelets, rings, and necklaces can also be caught by machinery, and shall not be worn by affected employees; long hair must be securely tied back or placed in a cap that does not interfere with the fit or function of the hard hat.

4.2 Machine Guarding Risk Assessment

The Health and Safety Officer or a qualified designee shall perform a pre-commissioning risk assessment of installed machinery and equipment in accordance with GG-09, "Identification of Project-related Safety Hazards, and Assessment of

Risks" in order to ensure that safeguarding is adequate for machinery items installed in the constructed facility. A safeguard is considered adequate if it:

- prevents workers from falling against or into major machinery (e.g., rotary or gyratory crushers, conveyor systems, thickener tanks);
- prevents all other potentially hazardous contact;
- is complete, undamaged, secure, and not easily removed;
- protects workers from falling or ejected objects or materials;
- creates no new hazards;
- does not interfere with machine operation/job functions; and
- allows for safe lubrication actions and other routine minor adjustments and maintenance.

The risk assessment inspection must consider ***all phases or modes of machine operation*** including:

- startup of process or operation;
- routine operation;
- operation during shift changes;
- routine and emergency shutdown scenarios;
- routine minor maintenance activities;
- anticipated major maintenance activities; and
- reasonably foreseeable non-routine, unusual, or emergency situations.

Serious injuries and fatal accidents are often associated with maintenance actions and non-routine, unusual, and emergency situations, and the risk assessment should emphasize these conditions in particular, especially if the situation could inadvertently or deliberately defeat the protection offered by the normal safeguards.

4.3 Training

The Health and Safety Officer shall arrange for all affected employees to receive machine guarding awareness training in accordance with GG-06, "ESMS Training Program" prior to starting work, and at least annually thereafter. At a minimum, such training shall include:

- general information on the types of equipment and the associated hazards that account for the most serious injuries and fatalities at mines, including mobile equipment (e.g., drill rigs, haul trucks and other service trucks, front-end loaders, bulldozers) and stationary equipment (e.g., conveyor systems, cranes, crushers, excavators), and safe work practices including the use of associated safeguards;

- identification and description of hazards associated with the particular machinery items the employees work with or are close to;

- information on types and use of machine guards, including the hazards that they are intended to mitigate;

- the importance of safeguards and how to use or work with them;

- procedures for safely removing and reinstalling safeguards; and

- lockout/tag-out requirements.

Training must emphasize that ***defeating machine safeguards for the sake of expediency is highly dangerous and unacceptable behavior that may potentially result in termination*** (see the GGI "Labour Grievance Procedure"). It is imperative that employees understand what to do if safeguards do not offer an adequate level of protection or are perceived as an impediment to doing their jobs. If a machine cannot be operated effectively due to the type of safeguards in use, employees shall immediately bring the problem to the attention of their supervisors or the Health and Safety Officer so that the problem can be evaluated and corrected. Training shall specify the methods to be used for reporting problems (see GG-24, "Recognizing and Reporting Safety Hazards"). Problems meeting the criteria of nonconformances shall be documented and resolved as described in GG-04, "Identification of Non-conformances and Corrective/Preventive Action." Other appropriate action shall be taken for minor problems at the Health and Safety Officer's discretion; in all cases, however, the employee originating the observation shall be contacted and advised of the outcome.

4.4 Periodic Surveillance Inspections

The Health and Safety Officer shall periodically perform an inspection and review of machine safeguards in all Project facilities, in accordance with GG-03, "Field Inspections." Inspection criteria shall be based on the general considerations described above. Any identified nonconformances shall be resolved in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

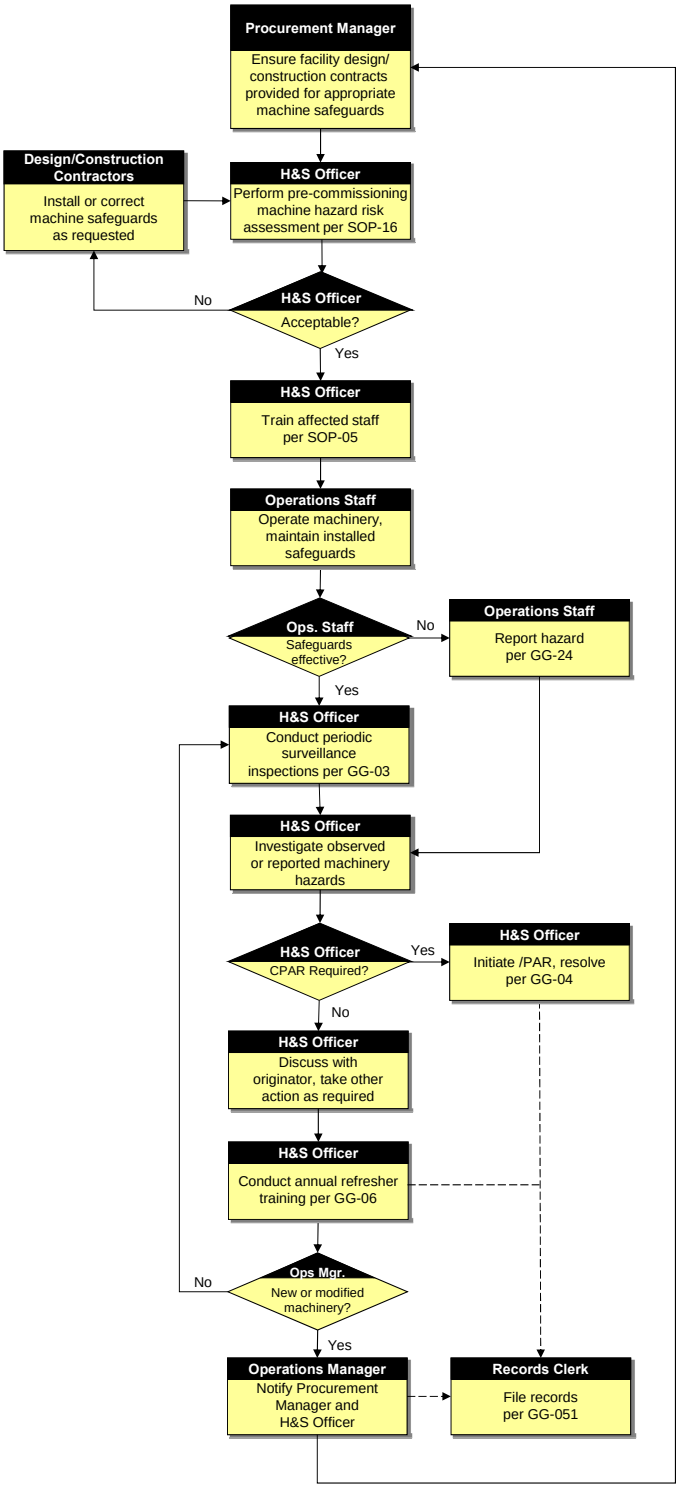
4.5 Records

Record copies of all machine hazard risk assessments, training activities, surveillance inspections, and corrective and preventive actions shall be filed and maintained in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GGI “Labour Grievance Procedure”
- GG-05, “ESMS Training Program”
- GG-03, “Field inspection”
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”
- GG-11, “Personal Protective Equipment”
- GG-19, “Welding and Cutting Safety”
- GG-20 “Electrical Safety”
- GG-24, “Recognition and Reporting of Safety Hazards”
- ANSI B15.1-2000, “Safety Standards for Mechanical Power Transmission Apparatus”
- ANSI B20.1-2000, “Safety Standards for Conveyors and Related Equipment”
- OSHA Publication 3067, “Concepts and Techniques of Machine Guarding”

Figure 1: Machine Guarding Hazard Assessment and Monitoring Process



1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the minimum requirements for preventing injury and illness to Guyana Gold, Inc. (GGI) Aurora Project workers or contractors, or property loss due to hazards arising from welding and cutting processes. This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Confined Space

Confined space refers to any relatively small or constricted space such as a tank, boiler, pressure vessel, or small compartment. Working in confined spaces must be carefully controlled in order to protect the health and safety of workers, as noted in GG-21, "Confined Space Work Safety."

2.2 Designated Welding/Cutting Area

A ***designated welding/cutting area*** is an area such as a corner of a mechanical shop where hot work is routinely performed. Areas so established will use effective measures to control common hazards inherent in welding and cutting operations (e.g., welding booths, flash screens or partitions, good cross-ventilation).

2.3 Hot Work

Hot work refers to any activity that has the potential to produce electric arcs, open flames, hot particles or sparks, or other potential ignition sources. Hot work includes welding, arc or torch cutting, brazing, heating, or metal grinding.

2.4 Personal Protective Equipment

Personal Protective Equipment (PPE) refers to items used to protect the eyes, face, head, body, arms, hands, legs, and/or feet, such as welding helmets or goggles, hard hats, gloves, coveralls, safety boots, and respirators; see GG-11, "Personal Protective Equipment."

2.5 Welder

Welder is defined as a qualified operator of electric or gas (torch) welding or cutting equipment.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

The Health and Safety Officer shall ensure that the Chief Mechanic and all welders are properly trained in the safe use of welding and cutting equipment, and all applicable GGI safety and emergency procedures. The Health and Safety Officer shall collaborate with the Chief Mechanic to ensure that appropriate facilities, equipment, and training are provided, and all welding equipment and welding gas cylinders are properly handled and stored.

The Health and Safety Officer is also responsible for assessing potential respiratory hazards associated with welding and cutting operations and ensuring that they are effectively controlled by employing general ventilation, local exhaust ventilation, and/or appropriate respiratory protection methods; see GG-11, “Personal Protective Equipment.”

3.2 Chief Mechanic

The Chief Mechanic shall ensure that all welding and cutting equipment is inspected, operated, and maintained in accordance with manufacturers’ recommendations and instructions, and if found to be incapable of safe and reliable operation, is either repaired by a qualified person or withdrawn from service.

The Chief Mechanic shall also ensure that all welders are qualified and trained in the safe practices for users of specific welding and cutting equipment, as described in ANSI Z.49.1:2005 Section 10, “Oxy-fuel Gas Welding and Cutting Safety” and Section 11, “Arc Welding and Cutting Equipment Safety,” or equivalent national or international standards.

The Chief Mechanic shall also ensure that all required fire protection and fire extinguishing equipment is available and functional, and that fire watchers are available and posted as required when welding in areas in which fire hazards are a particular concern (e.g., welding near machinery or in a wooden building under construction).

3.3 Welders

Welders are responsible for understanding the hazards of welding and cutting operations, and the procedures used to control such hazards. The welder is also responsible for:

- safe handling and operation of all welding and cutting equipment;

- securing the Chief Mechanic's permission for conducting welding or cutting operations in the field or outside of a designated welding area; and

- using appropriate PPE, including respiratory protection where required.

3.4 Fire Watchers

If a fire watch is required either during or following welding or cutting operations, the designated fire watcher is responsible for detecting and preventing the ignition and spread of fires. Fire watchers shall be trained in the use of fire extinguishing equipment and must know how to sound an alarm in the event of a fire. They are responsible for watching for fires in exposed areas near welding or cutting operation, and either extinguishing them if obviously within the capacity of available equipment, or otherwise sounding an emergency alarm.

4.0 PROCEDURE

4.1 General Hazards

The following hazards must be considered and effectively controlled prior to any welding or cutting operation at any Aurora Project facilities:

- fire and explosion due to hot work sources of ignition;
- burns from welding arc, torch flame, welding spatter, or hot items;
- ultraviolet (UV) radiation burns of the eyes or skin;
- electrical hazards from arc welding power sources, or other energized electrical systems (see GG-20, "Electrical Safety");
- unanticipated or accidental activation or startup of machinery or equipment or other energy releases while work is in progress;
- mechanical hazards;
- falling objects;
- trips, slips, and falls due to slippery surfaces, hoses, leads, and other tripping hazards, or from working on ladders or heights;
- hazardous atmospheres, either pre-existing or from the result of welding fumes and gases; or
- confined space entry concerns (see GG-21, "Confined Space Work Safety>"

4.2 General Requirements

The following requirements apply to all welding and cutting operations performed anywhere on GGI properties, including designated welding areas:

- Welding equipment must be suitable for the environment in which it is to be used.

- Welding and cutting equipment, machines, cables, and other apparatus must be located such that it does not present a hazard to welders or other personnel.

- Gas cylinders must be secured to and transported on a wheeled metal handcart that is stable in an upright position, or must be securely chained or strapped in an upright position.

- All machinery, equipment, vehicles, and combustible materials must be moved away from the welding/cutting area, or otherwise protected from sources of ignition with non-combustible barriers (e.g., portable metal shields).

- If welding or cutting must performed on machinery, equipment, or a vehicle, then open gearcases, engine compartments, fuel tanks, and any other components with exposed grease, oil, or hydraulic fluids must be adequately protected from sparks and other sources of ignition, by non-combustible covers or barriers.

- Drums or tanks containing flammable or combustible liquids must be thoroughly cleaned and purged prior to welding or cutting.

- The general area around or adjacent to a welding or cutting operation must be kept free of combustible debris and tripping hazards. *Good housekeeping practices must be observed at all times.*

- Fire extinguishers or sources of fire fighting water or sand must be readily available to the welding or cutting operation.

- Signs must be posted warning passers-by regarding potential hazards and indicating that eye protection and other applicable PPE must be worn.

- Welders must wear appropriate PPE selected to minimize the potential for ignition, burning, trapping hot sparks, electric shock, and/or eye damage. Clothing shall provide sufficient coverage and be made of suitable materials such as treated cotton (no synthetic or combustible fabrics) to minimize the potential for burns. Other protective clothing items such as gloves, aprons, and welder's capes or sleeves shall be made of leather or other flame-resistant materials. Cape or sleeves that cover the shoulders and arms shall always be worn during overhead welding or cutting operations. See GG-11, "Personal Protective Equipment."

- Appropriate eye and face protection must be worn for all welding and cutting operations. Eye and face protection including filter lenses shall comply with ANSI Z87.1 or an equivalent national or international standard The shade value of filter lenses for welding goggles or helmets shall be selected in accordance with the guidance of **Table 1**.

Table 1: Guide for Lens Shade Numbers
(from American Welding Society F2.2, Lens Shade Selector)

Filter Lenses for Protection Against Radiant Energy			
Welding operation	**Electrode Size (millimeters)**	**Arc Current (amps)**	**Minimum Protective Shade Number***
Shielded metal arc welding	Less than 0.8	Less than 60	10
	2.5-4.0	60-160	10
	4.0- 6.4	160-250	12
	More than 6.4	250-500	14
Gas shielded arc welding (nonferrous)	1.6, 2.4 ,3.2, 4.0	--	11
Gas shielded arc welding (ferrous)	1.6, 2.4 ,3.2, 4.0	--	12
Gas metal arc welding		Less than 60	7
		60-160	10
		160-250	10
		250-500	10
Flux cored arc welding		Less than 60	7
		60-160	10
		160-250	10
		250-500	10
Gas tungsten arc welding		Less than 50	8
		50-150	8
		150-500	10
Air carbon – light		Less than 500	10
Arc cutting – heavy		500-1000	11
Carbon arc welding			14
Plasma arc welding		Less than 20	6
		20-100	8
		100-400	10
		400-800	11
		Less than 300 (light)	8
		300-400 (medium)	9
		400-800 (heavy)	10
Torch soldering			2
Torch brazing			3 or 4

Table 1 (continued):
Guide for Shade Numbers

Gas Welding and Cutting	Plate Thickness (inches)	Plate Thickness (millimeters)	Suggested Shade Number*
Oxy-fuel Gas Welding – Light	Under 1/8	Under 3	4 or 5
Oxy-fuel Gas Welding – Medium	1/8 to 1/2	3 to 13	5 or 6
Oxy-fuel Gas Welding – Heavy	Over 1/2	Over 13	6 or 8
Oxygen Cutting – Light	Under 1	Under 25	3 or 4
Oxygen Cutting – Medium	1 to 6	25 to 150	4 or 5
Oxygen Cutting – Heavy	Over 6	Over 150	5 or 6

* Shade numbers are given as a guide only and may be varied to suit individual needs. As a rule of thumb, start with a shade that is too dark to see the weld zone. Then go to a lighter shade which gives sufficient view of the weld zone without going below the minimum.

4.3 Ventilation for General Welding and Cutting

Natural ventilation is considered sufficient for welding or cutting operations outdoors or in open areas. To the extent possible, the welder shall position the work in such a manner as to keep his head out of the plume of welding fumes.

Appropriately designed mechanical exhaust fans or suitable respiratory protection must be provided when welding or cutting operations are performed in:

- a space of less than 280 cubic meters (m^3) [10,000 cubic feet ($feet^3$)] per welder;
- a room having a ceiling height of less than 16 feet (4.87 meters); or
- confined spaces or where the welding space contains partitions, balconies, or other structural barriers that significantly obstruct cross ventilation.

4.4 Ventilation in Confined Spaces

All welding and cutting operations carried out in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. Supplied air shall be clean and respirable; oxygen must never be used for ventilation purposes.

In circumstances in which it is impossible to provide such ventilation, approved air-line respirators must be used, a full-facepiece, pressure-demand, self-contained breathing apparatus (SCBA) or a combination full-facepiece, pressure-demand supplied-air respirator with an auxiliary, self-contained air supply must be used. If welding operations are conducted in confined spaces where welders and helpers are provided with any of these types of respirators, a worker shall be stationed on the outside of such spaces to monitor the safety of those working within, as discussed in GG-21, "Confined Space Work Safety."

4.5 Welding and Cutting Operations Outside of Designated Welding/Cutting Areas Designated Safe Areas

Prior to engaging in welding or cutting operations anywhere other than in a designated welding/cutting area, the Chief Mechanic or designated welding supervisor shall complete the process depicted in **Figure 1** and described in the following paragraphs.

4.5.1 Welding or Cutting in Confined Spaces

The first step in the process is to determine whether the intended welding or cutting operation is to be performed in a confined space (see GG-21, "Confined Space Work Safety"). If this is the case, the Chief Mechanic or designated welding supervisor must follow the procedures established in GG-21 and submit a confined-space entry permit to the Health and Safety Officer for review and approval. The confined-space entry permit must consider the potential for oxygen deficient or flammable atmospheres in addition to all of the hazards addressed above and designate specific procedures to control identified hazards.

Ventilation and/or respiratory protection must be provided as described above. All gas cylinders, tanks, and welding power sources must be located outside of the confined space.

All remaining hot-work criteria and, where applicable, lockout/tag-out requirements must be addressed. The intended work must be completed in strict compliance with the procedures established in the confined-space entry permit, following the pre-entry meeting stipulated in GG-21, "Confined Space Work Safety."

4.5.2 Other Hazardous Atmospheres

When welding or cutting operations are to be performed in a small or restricted space that does not otherwise meet the definition of a “confined space,” or where any of the special ventilation concerns addressed above apply, it is still necessary to consider the potential for a hazardous atmosphere as a result of the accumulation of welding fumes and to implement appropriate control procedures such as general ventilation, local exhaust ventilation, and/or appropriate respiratory protection.

4.5.3 Lockout/Tag-out

If the welding or cutting operations are to be performed on machinery or motorized equipment, appropriate lockout/tag-out devices must be installed to prevent inadvertent operation or energizing while welding/cutting is in progress.

4.5.4 Equipment Check and Initiation of Work

Immediately prior to beginning work, the welder shall don all required PPE and inspect all equipment including gas cylinders, valves, regulators, hoses, connections, torches, power sources, electrical connections and grounding, cables and leads, and electrode holders, as applicable. Any equipment that is found to be defective must be either repaired or replaced prior to beginning work.

4.5.5 Fire Watch

Fire watchers shall be designated by the Chief Mechanic or responsible Area Supervisor whenever welding or cutting operations are performed in locations where anything other than very a minor fire might develop. When required, fire watches shall be maintained for at least one-half hour following the completion of welding and cutting operations, in order to detect and extinguish possible smouldering fires. Fire extinguishing materials such as appropriate fire extinguishers, or supplies of water or sand must be readily available.

4.5.6 Clean-up

Whenever there is a possibility that other persons may unknowingly come in contact with hot materials or items following a welding or cutting task, the welder shall mark the item “DANGER – HOT!” with a soapstone marker or crayon. Upon completion of the welding or cutting tasks, the welder or welder’s helper shall clean up all debris and restore the area to its original condition, and notify the affected Area Supervisor that the welding or cutting operation has been completed.

4.6 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and include hard copies of all training session attendance sheets and any distributed handout materials (see GG-06, “ESMS, Training Program”).

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-06, “ESMS Training Program”
- GG-11, “Personal Protective Equipment”
- GG-20, “Electrical Safety”
- GG-21, “Confined Space Work Safety”
- American National Standards Institute (ANSI) Standard Z49.1:2005, “Safety in Welding, Cutting, and Allied Processes”

Figure 1: Welding and Cutting Process Flowchart (Non-designated Welding Areas)

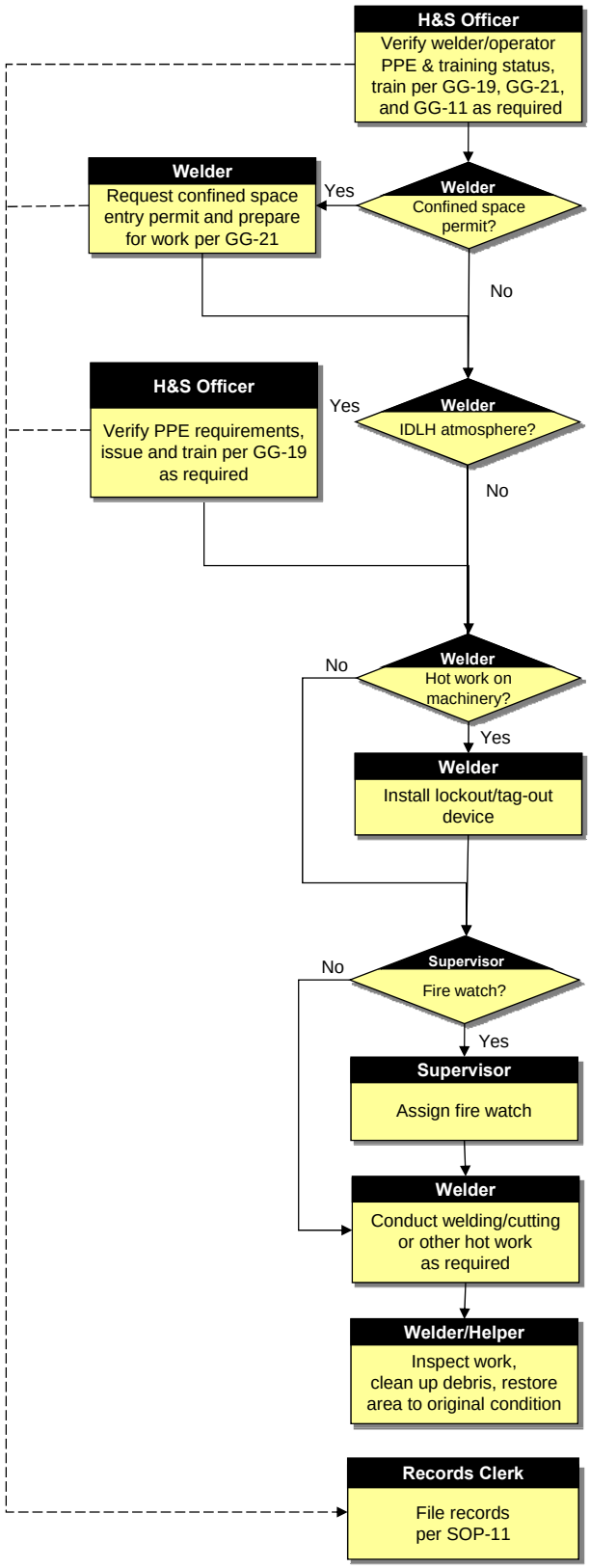


Figure 2: Precautionary Information for Arc Welding Processes and Equipment

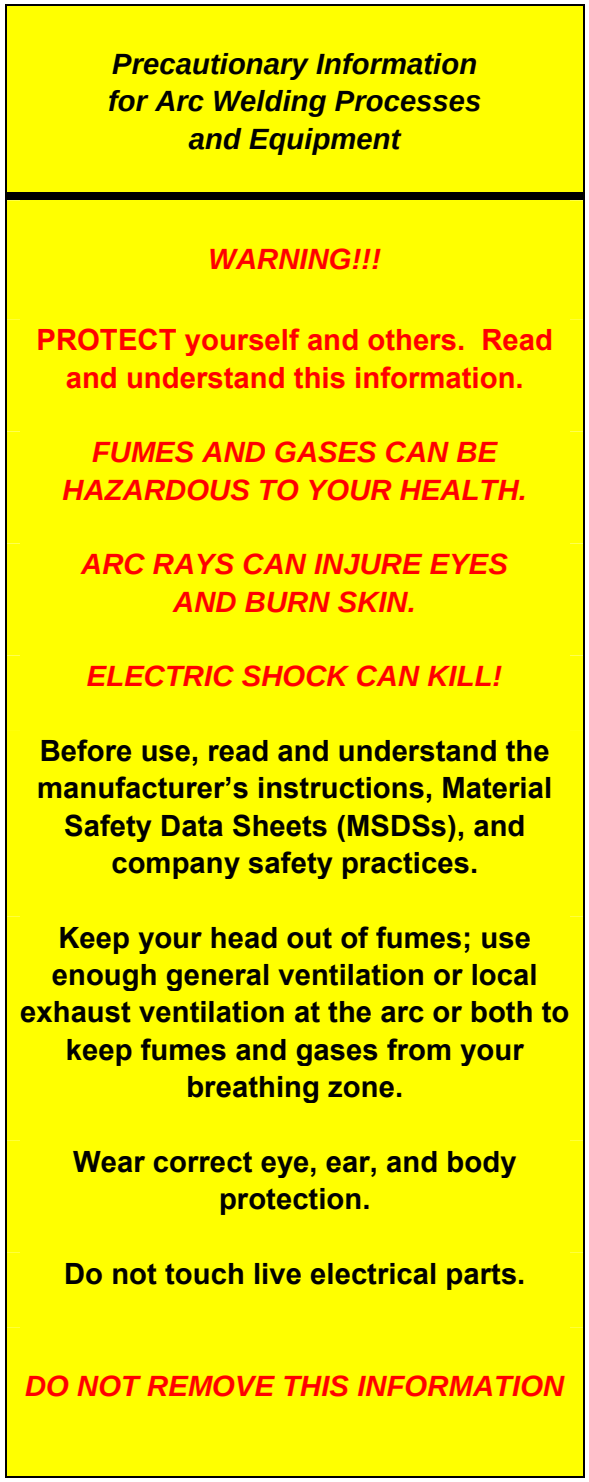
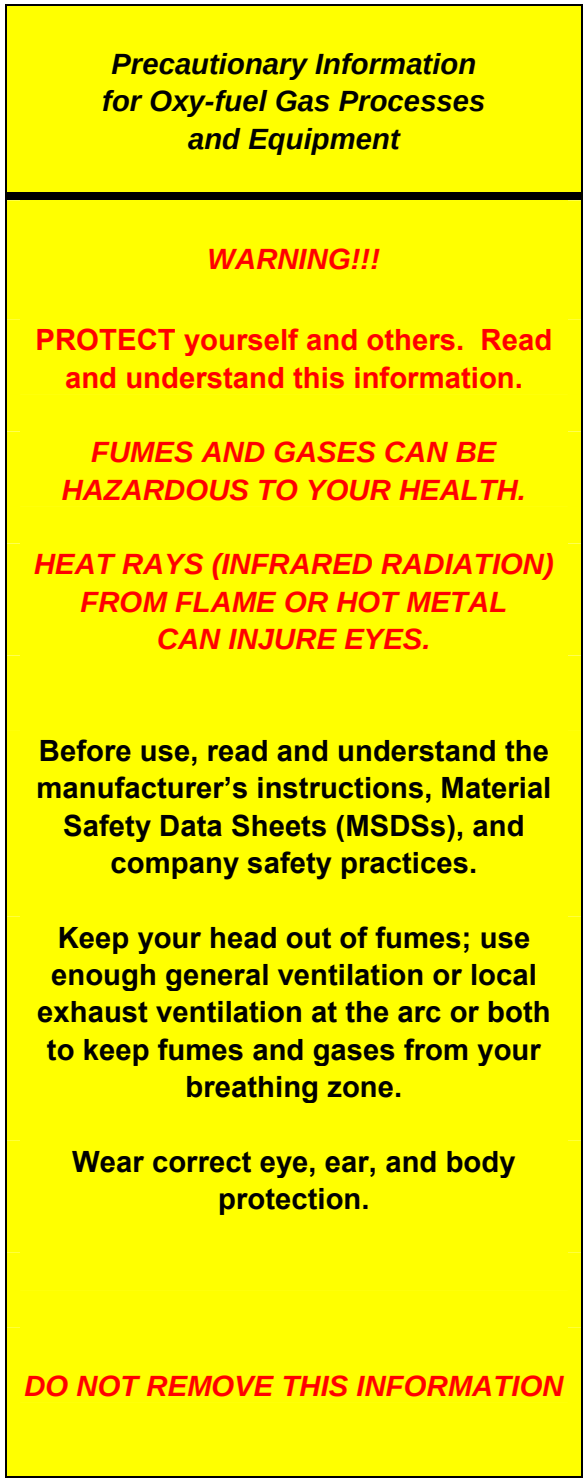


Figure 3: Precautionary Information for Oxy-fuel Gas Processes and Equipment



1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) addresses general electrical safety considerations to be implemented at the Guyana Goldfields, Inc. (GGI) Aurora Project. This SOP establishes minimum requirements to be verified in the design, construction, and installation of safe electrical systems, and for establishing and maintaining safe electrical work practices in day-to-day operations and constructed facilities. This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Affected employee

An ***affected employee*** is defined as any employee whose duties directly or indirectly involve working on or with electrical systems or electrical equipment.

2.2 Conductor

Conductor is a general term referring to any object, device, solution, or other item capable of carrying an electrical current, whether intentionally designed for such purposes or not.

2.3 Electrical Equipment

Electrical equipment refers to all electrical devices, regardless of power source or rating.

2.4 Electrical Hazard

Electrical hazard is defined as a condition or situation having the potential to cause injury or other loss due to a defect or flaw an electrical system or electrical equipment, or an unsafe work practice involving such systems or equipment. Electrical hazards have the potential to cause electric shocks, electrocution, burns, electrical fires or arcing, or explosions.

2.5 Electrical System

Electrical system is defined as the functional circuit as well as the components connected to or affected by electrical energy, and all exposed conductive parts.

2.5 Competent Person

The term ***competent person*** refers to a licensed electrician or other individual who has adequate technical knowledge or experience to identify existing or predictable electric hazards in the workplace or working environment, and who also has the authority to take prompt corrective measures to eliminate them. For the purposes of this procedure, a competent person's technical experience should include: a functional understanding of electrical theory and practice; experience in electrical work; a general understanding of the overall electrical systems used at the Aurora Project; practical experience in one or more classes of electrical systems; and the experience to understand and recognize associated electrical hazards.

2.6 Ground

Ground refers to an intentional or accidental conducting connection between an electric circuit or equipment and the earth or to another conducting body.

2.7 Grounded

Grounded means connected to earth or to some other conducting body.

2.8 Grounded System

Grounded System refers to a system of conductors in which at least one conductor or point (usually the middle wire, or neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting (not a current-interrupting) device.

2.9 Isolation

Isolation refers to the secure disconnection and separation of electrical equipment from all sources of electrical energy.

2.10 Lockout

Lockout refers to the placement of a lock on an energy-isolating device in order to ensure the machine or equipment cannot be operated until the lock is removed.

2.11 Lockout/Tag-out

Lockout/tag-out refers to the implementation of a procedure to make sure that a machine cannot and will not be energized or operated until the lockout/tag-out device is disabled or removed by an authorized worker.

2.12 Tag-out

Tag-out refers to the act of placement of a warning tag to indicate that the energy-isolating device and the machine or equipment being controlled may not be operated until the tag is removed. Tag-out can also mean placing a warning tag on a piece of equipment clearly indicating that it has been taken out of service pending repair.

3.0 RESPONSIBILITIES

3.1 Construction Manager

The Construction Manager is responsible for coordinating with all construction contractor(s) with respect to the correction of any requested action items resulting from the hazard analysis/commissioning inspection discussed in Section 4.1.

3.2 Employees

GGI employees are responsible for using electrical equipment and observing electrical safety provisions in accordance with the training received, and for immediately reporting defective or malfunctioning equipment to their supervisor.

3.3 Health and Safety Officer

The Health and Safety Officer is responsible for:

- taking appropriate measures to reduce the risks associated with electrical systems, as described in this SOP;
- ensuring that only competent persons (i.e., licensed electricians) perform technical work on electrical systems;
- ensuring that all affected employees including licensed electricians receive training on GGI electrical safety procedures and expectations;
- conducting or arranging for a hazard analysis/risk assessment in accordance with GG-09, “Identification of Project-related Safety Hazards and Assessment of Risks” prior to the commissioning of any major facilities or prior to any major modifications to electrical systems; and
- Performing or directing periodic surveillance inspections of the Project ground protection program and electrical work practices, as described in this SOP.

3.4 Area Supervisors

It is the responsibility of Area Supervisors to be alert for potential electrical hazards in their assigned work areas and to either safely correct them or bring them to the immediate attention of the Health and Safety Officer (see GG-24, “Recognition and Reporting of Safety Hazards”). Supervisors are also responsible for ensuring that electrical equipment used by employees is in good working order and safe, and for taking defective or malfunctioning electrical equipment immediately out of service.

4.0 PROCEDURE

The overall process for establishing and monitoring safe electrical work practices at the Aurora Project is presented in the following paragraphs, and summarized as a flowchart in **Figure 1**.

4.1 Hazard Analysis and Commissioning Inspection

The Health and Safety Officer shall complete an initial electrical hazards analysis and risk assessment as described in GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks” as the initial step in a pre-operational commissioning inspection of a constructed facility. The Health and Safety Officer shall seek the assistance of a licensed electrician in the identification of potential electrical hazards and the evaluation of the adequacy of associated safety measures. The inspection shall be planned and documented using the methodology described in GG-03, “FIeld Inspections” and the inspection criteria defined in this Section.

The inspection shall consider facility-related issues such as the design, installation, condition, and configuration of electrical systems, as well as operational issues such as the nature of the electrical equipment used by employees, the purposes for which it will be used, and how and under what conditions it will be routinely operated. More specifically, constructed facilities shall be evaluated to:

- ensure that designs for new or modified electrical systems meet the requirements of governing permits and regulatory requirements;
- ensure that manufacturers’ ratings on all electrical components are appropriate for their intended service;
- ensure that electrical system components are effectively isolated or guarded to protect workers from potential contact with energized parts, including location of electrical equipment in special rooms or secured areas in which access will be limited to authorized personnel only;
- ensure that an appropriate maintenance program has been planned and documented for all installed portions of the electrical system; and
- ensure that employees or contractors working with or on electrical system components use appropriate personal protective equipment (PPE; see GG-11, “Personal Protective Equipment”).

Identified hazards shall be assessed and appropriate control measures recommended and prioritized on a risk register in accordance with GG-09 requirements. The complete inspection report will be reviewed as required by GG-03 and forwarded for contractor action as required; completion of all action items will be verified prior to closure of the inspection report. The Construction Manager will coordinate with the affected construction contractor and the Health and Safety Officer as necessary to resolve all open action items.

4.2 Employee Training

The Health and Safety Officer shall ensure that all affected employees are trained in the basics of electrical safety in the workplace, as well as the results of the facility-specific hazard analyses conducted as noted in Section 4.1. Training shall be documented and delivered in accordance with one or more of the methods specified in GG-06, “ESMS Training Program.” Records of employee training shall be kept as noted in Section 4.4.

At a minimum, electrical safety training shall address:

- basic electrical fundamentals, e.g., the concepts of voltage, current, resistance, and grounding;

- the potential sources and characteristics of electrical hazards and related injuries, such as electrical fires, electrocution, burns, and arc flash;

- GGI electrical safety rules and safe work practices, as defined by this SOP;

- facility-specific hazard analysis results; and

- lockout/tag-out procedures that must be implemented prior to performing any maintenance or repair on any electrically powered machinery.

4.3 Periodic Inspections of Grounding Program/Safe Electrical Work Practices

The Health and Safety Officer shall periodically conduct facility-specific surveillance inspections to verify the adequacy of the Project's equipment grounding program and general electrical work practices. Such inspections shall be planned and documented in accordance with GG-03, "Field Inspections," using the inspection criteria defined herein. Any observed nonconformances shall be documented and resolved in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

4.3.1 Inspection of Grounding Program

The Health and Safety Officer shall verify that a licensed electrician or other competent person is currently assigned in each facility who is capable of identifying hazards related to electrical grounding and who has the authority to take appropriate corrective actions. This individual shall ensure that all cord sets, all receptacles which are not part of the permanent wiring of the building or structure, and equipment connected by cord and plug (with the exception of "double insulated" rated tools or equipment) that is available for use or used by workers is properly grounded and that the grounding circuit is tested for continuity on a regular basis. Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor, and the equipment grounding conductor shall be connected to its proper terminal.

These ground fault tests shall be performed before the equipment's first use, before equipment is returned to service following repairs, before equipment is used after any potentially damaging incident, and at quarterly intervals. Cord sets and receptacles that are fixed and not exposed to damage shall be tested at intervals not exceeding six months. A dated tag shall be affixed to each piece of equipment to identify when it was last successfully tested. Test results shall be recorded and shall identify each receptacle, cord set, and cord- and plug-connected equipment that passes the test and shall indicate the last date it was tested. Records of equipment grounding tests shall be kept in compliance with Section 4.4.

4.3.2 Inspection of Electrical Work Practices

The Health and Safety Officer or designated inspector shall also:

- ensure that electrical equipment in use is suitable for its working environment;

- verify that equipment is safely installed and operated, and maintained in a safe condition;

- ensure that maintenance checklists are prepared for all areas of the electrical system, and that records of maintenance activities are kept in compliance with Section 4.4;

- ensure that an accessible and clearly identified method is provided to disconnect power and isolate electrical systems for fixed machinery and systems in an emergency;

- ensure that employees are aware of the location of such disconnects and how to operate them;

- ensure that ends of flexible cables or extension cords have the outer sheath of the cable firmly clamped to prevent the wires from pulling out of the terminals (particularly at the ground connection);

- ensure that only appropriate, heavy duty, or extra heavy duty flexible extension cords are used where needed, and that flexible extension cords are never used in place of permanent wiring;

- ensure that damaged sections of electrical cables are completely removed and replaced using proper connectors or cable couplers to join lengths of cable;

- provide protective cages or fixtures for light bulbs and other electrical devices or equipment that could easily be broken or damaged in use;

- ensure that electrical equipment used in flammable/explosive atmospheres are specifically designed to prevent a source of ignition;

- ensure that grounding, insulation, or other protective devices are provided as necessary to ensure that cables and conductors that are not an intended part of a circuit do not become accidentally energized;

- ensure that all cord sets, receptacles which are not part of the permanent wiring of the building or structure, and equipment connected by cord and plug which are available for use or used by workers are visually inspected for damage or defects before each day's use;

- instruct employees and supervisors to immediately take damaged or defective electrical tools or equipment out of service and ensure that such tools or equipment are promptly repaired or replaced;

- ensure that faulty electrical equipment or tools are be tagged to clearly identify that it is out of service, in need of repair, and not to be used;

- ensure that appropriate lockout/tag-out procedures are followed when maintenance is performed on electric-powered machinery;

.

- ensure that contractors or employees working on the electrical system are licensed electricians; and

- for the Buckhall site, ensure that the local power supply authority has been notified when work must be performed near overhead power lines, and ensure that such lines are de-energized and grounded, or protected by other appropriate means prior to commencing work.

4.4 Records

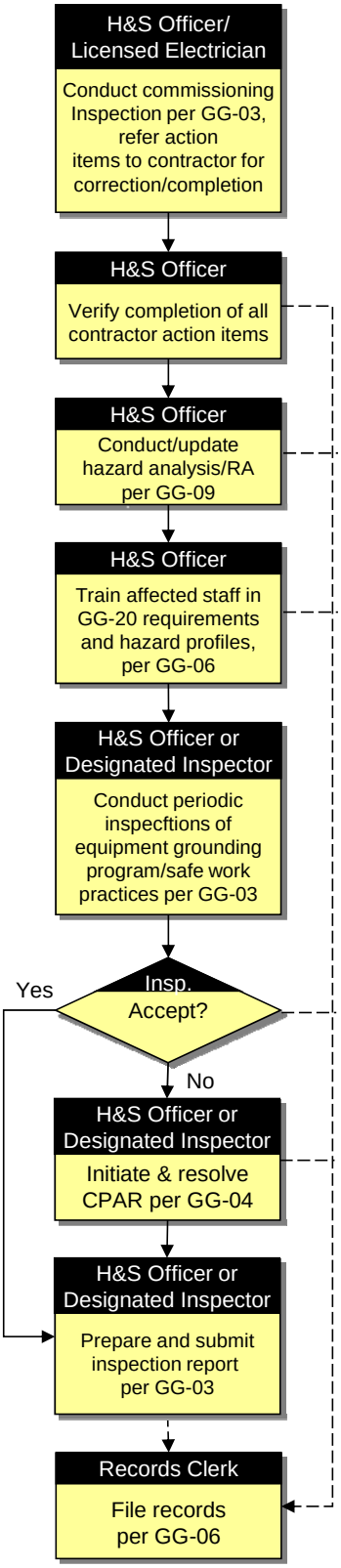
Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and include:

- risk registers with completed electrical hazard profiles;
- training records for designated inspectors, and affected workers; and
- completed inspection plan and report forms from commissioning inspections and periodic field inspections.

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-03, “Field Inspection”
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”
- GG-11, “Personal Protective Equipment”
- GG-24, “Recognition and Reporting of Safety Hazards”

Figure 1: Electrical Safety Monitoring Process



	STANDARD OPERATING PROCEDURE **GG-21: Confined Space Work Safety**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the methods that the Guyana Goldfields, Inc. (GGI) Aurora Project shall use to manage entry to confined work spaces at various facility locations. This SOP applies in addition to the general assessment of safety hazards addressed by GG-09, "Identification of Project-related Safety Hazards, and Assessment of Risks."

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Confined Space

A ***confined space*** is defined any workspace that is large enough to permit a worker to fully enter, but has limited or restricted openings for entry and exit and is not designed or intended for periodic, routine, or continuous worker occupancy. Confined spaces represent a significant, potentially life-threatening, and often unanticipated workplace hazard for workers as well as rescuers, and typically exhibit one or more of the following characteristics:

- contain granular or powdered materials (e.g., crushed ore, lime) that have the potential to engulf or trap a worker entering the space;
- have inwardly converging walls or a sloping or tapering floor that could trap a worker;
- have potential mechanical hazards (e.g., conveyors or mixing devices) with the potential for sudden, unexpected releases of energy if not properly locked out;

- have the potential for sudden, unexpected flooding with gases, water, or other fluids;

- have limited ventilation, and hence have the potential for oxygen-deficient, flammable, or toxic atmospheres; or

- have the potential for oxygen-deficient, flammable, or toxic atmospheres as a result of the work to be performed (e.g., painting, welding, or cutting).

Examples of confined spaces include closed and open-top tanks, pressure vessels, mixing vessels, vaults or sumps, oil/water separators, septic tanks, vats, silos, ducts, tunnels, or pipelines.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

The Health and Safety Officer is responsible for:

- assisting the Camp Managers and Area Supervisors in identifying and marking (see **Figure 2**) facility areas that meet the confined space criteria defined in Section 2.1;

- preparing a written confined space entry assessment (see **Figure 3**) for each space so identified;

- ensuring that all employees who may be confronted with a potential confined space entry situation receive appropriate training in recognizing confined space hazards;

- ensuring that only those employees who have received confined space entry training engage in confined space work;

- with the Area Supervisor or Construction Manager, jointly assessing the potential for alternative work schemes that do not require entry into a confined space;

- where confined space entry needs are confirmed, preparing written permits (see **Figure 3**) that address the potential confined space hazards noted in the assessment, and ensuring that appropriate safe work practices and rescue procedures have been established;

- monitor confined space entry activities to verify that employees follow established safe work practices; and

- providing and operating appropriate workspace air-monitoring instruments when such monitoring is required as a condition of entry, and for ensuring that such instruments are properly calibrated and in good working order.

3.2 Area Supervisors

Area Supervisors are responsible for:

- confirming that no practical non-confined space alternative exists for proposed confined space work;

- verifying that the confined space permit has been reviewed and approved prior to proceeding with the intended operation;

- ensuring that all tests or air monitoring specified in the confined space entry permit have been performed prior to entry; and

- terminating confined space operations if hazardous conditions are observed, or when specifically requested by the Health and Safety Officer.

3.3 Confined Space Entry Attendant

The confined space entry attendant may be the Area Supervisor or the Health and Safety Officer, and is responsible for:

- monitoring activities and conditions inside and outside of the confined space;

- remaining in communication with workers inside the space;

- ordering withdrawals from the confined space if hazardous are detected or if workers exhibit any unusual behaviour or signs of stress; and

- Initiating and coordinating rescue procedures as defined in the entry permit in event of an emergency.

3.4 Confined Space Workers

Confined space workers are responsible for:

- notifying the Health and Safety Officer with respect to any unidentified risks or concerns they may have prior to entering the confined space;

- performing all tasks in accordance with the training received and the procedures specified in the confined space entry permit; and

- if problems are noted, immediately advising the attendant and safely exiting the work space.

4.0 PROCEDURE

The general process to be followed for managing confined space entry needs is presented in the following paragraphs, and summarized as a flowchart in **Figure 1**.

4.1 Identification of Confined Spaces

The Health and Safety Officer shall evaluate all Aurora Project facility areas and identify specific areas or spaces that meet the confined space criteria defined in Section 2.1. Each discrete area or space shall be assigned a unique designator. A designator list shall be developed for each facility, and the location of each space marked on a current facility layout drawing. The Health and Safety Officer shall permanently post a confined space warning sign (see **Figure 2**) in a highly visible area adjacent to the confined space, and permanently mark the sign with the assigned designator. Other measures shall be established with the concurrence and participation of the Camp Manager and responsible Security Manager to prevent or physically inhibit unauthorized entrance to the space. Such measures may include the placement of yellow-painted barriers or chains, bolted manhole covers, cover bolting or fasteners requiring special removal equipment, and/or padlocks, in combination with warning signs.

4.2 Confined Space Assessment

The Health and Safety Officer will prepare a brief, concise, written assessment of each confined space identified as noted in Section 4.2, using the assessment section of the combined Confined Space Assessment/Entry Permit form (see **Figure 3**). The assessment shall be updated during permit preparation (see Section 4.5) if the process, equipment, or other operating or environmental conditions have undergone any significant change or modification.

As noted in **Figure 3**, the written assessment must uniquely identify the space or category using the same designator marked on the associated warning sign. The written assessment shall describe the source and nature of any inherent hazards and establish the specific procedures to control hazards so identified, prior to entering the space. Hazards to be considered include:

- oxygen deprivation (e.g., from welding, oxidation, breathing);

- potential for toxic atmospheres (e.g., welding, cutting, brazing, H_2S, CO, CO_2, petroleum chemicals);

- flammable or explosive atmospheres (e.g., fuel, solvents, H_2S, hydrogen);

- hostile environments (e.g., electrical and mechanical hazards, excessive heat, potential infestation with bats or venomous snakes);
- entrapment due to the configuration of the space, and potential complications from the need for tools and safety equipment in the space interior;

- entrapment from granular materials (e.g., powdered lime, crushed gravel);

- entrapment from sudden releases of gases or fluids; and

- inadequate lighting.

The written assessment should identify appropriate pre-entry monitoring and ventilation procedures and requirements for personal protective equipment (PPE) and respiratory protection, if any (see GG-11, "Personal Protective Equipment"). Specific requirements for lockout or tag-out of electrical or mechanical equipment shall be identified. The written assessment should also define appropriate entry procedures, specify whether or not an attendant is required, and describe the nature and extent of any predetermined rescue provisions (e.g., use of life safety lines and harnesses).

4.3 Training

The Health and Safety Officer will arrange training sessions in the contents of this SOP on at least an annual basis for those specific employees or contractors who may potentially be confronted with unanticipated confined space entry situations (e.g., need to enter a confined space briefly in the course of completing an otherwise unrelated task, or recovering a dropped tool), or who will be expected to routinely perform maintenance or operational tasks in confined spaces. Such training shall be documented in accordance with GG-06, "ESMS Training Program." Training session focus and content shall be designed to ensure that all affected employees:

- are able to recognize a potential confined space by applying the general criteria presented in Section 2.1;

- understand the potential life hazards associated with entering a confined space, and typical monitoring and mitigation processes (e.g., lockout/tag-out procedures, atmosphere monitoring equipment, portable lighting and ventilation systems, respiratory protection, use of attendants, assisted rescue processes);

- are properly fitted and trained in the use of all potentially required PPE [e.g., supplied-air respirators or self-contained breathing apparatus (SCBA)];

- understand the confined space assessment/entry permit system described in this SOP; and

- will under no circumstances enter any confined space unless (and until) they have determined that it is safe to do so.

Although a concerted effort will have been made to identify and post all confined spaces early in the life of the facility, employees shall be encouraged to always request guidance from the Health and Safety Officer before entering any unposted space that appears to meet Section 2.1 criteria. Observations of apparently confined spaces within which work will need to be performed but that have not been posted with warning signs shall be reported as noted in GG-24, "Recognition and Reporting of Safety Hazards."

Training sessions shall include demonstrations, practical examples, and hands-on experience with monitoring instruments, portable ventilation equipment, applicable PPE, safety harnesses, and rescue devices such as tripods and winches. In addition, all personnel who may have attendant responsibilities shall be trained in basic first-aid and cardio-pulmonary resuscitation (CPR) in accordance with GG-12, "First Aid and Emergency Medical Response."

Refresher training shall be provided on at least an annual basis.

4.4 Assessment of Alternatives/Preparation of Confined Space Entry Permit

The Area Supervisor shall advise the Health and Safety Officer prior to scheduling any work activity in a confined space. Alternatives shall be evaluated to be certain that no other practical options exist for conducting the required work.

If evaluation of alternatives confirms that a confined space must be entered, the Health and Safety Officer and Area Supervisor shall complete the entry permit portion of the combined Confined Space Assessment/Entry Permit form (see **Figure 3**) previously prepared for that space (see Section 4.3). The Area Supervisor and maintenance staff shall be consulted to determine if any facility modifications have been made since the assessment was first conducted. The effect of any modifications on the adequacy of the original assessment shall be evaluated, and the assessment updated accordingly, with a description of the changes made inserted in the "comments" block of the Confined Space Assessment/Entry Permit form.

As noted in **Figure 3**, the permit shall identify the date, and planned duration of the planned entry, and the nature of work to be performed. The permit shall describe the specific mitigation measures that will be implemented to address the hazards noted in the assessment, and shall assign responsibilities to specific individuals, at the direction of the Area Manager. Mitigation measures and precautions to be described may include:

- definition of ingress/egress points;
- direct supervision of work or the assignment of an attendant to monitor safety considerations;
- prohibition of smoking in or near a confined space;
- methods of communications with attendants or fire watchers;
- testing/monitoring of confined space atmosphere, including definition of the test equipment required;
- gas purging routines;
- security of compressed gas cylinders and flexible lines into the work space;
- removal of toxic/flammable wastes or residues;
- ventilation or supplied air/SCBA needs;
- other PPE requirements;
- temporary lighting needs;
- electrical grounding protocols/elimination of static electricity;
- limitation of working time in the confined space; and
- emergency preparedness and rescue procedures.

The Health and Safety Officer and Area Supervisor will sign the draft Confined Space Assessment/Entry Permit. The approved permit shall be valid only for the designated entry performed by the personnel identified in the permit on the date and time specified.

4.5 Pre-entry Safety Meeting

Once entry into a confined space has been approved, the Health and Safety Officer shall hold a safety meeting with the personnel assigned to perform the confined space work. The requirements of the permit shall be reviewed in detail, and a copy of the permit posted next to the applicable confined space warning sign. The primary objective of this meeting is to ensure that permit requirements have been met, and to review specific roles and responsibilities, communication lines, and emergency response procedures. The preliminary meeting is also an appropriate forum to review the operation of any

required air monitoring instruments.[1] All such instruments shall be calibrated prior to use and tested to ensure that they are in proper working order before relying on them in a confined space entry situation.

After the conclusion of the safety meeting, work may proceed in accordance with permit requirements.

4.6 Records

Records generated from the routine implementation of this procedure shall be routed to the Records Clerk and retained in accordance with GG-05, "Records Management." Records include:

- confined space lists and marked-up facility layout drawings;
- training session/permit review meeting attendance sheets and any distributed handout materials; and
- copies of all completed Confined Space Assessment/Entry Permit forms.

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-05, "Records Management"
- GG-06, "ESMS Safety Training Program"
- GG-09, "Identification of Project-related Safety Hazards, and Assessment of Risks"
- GG-11, "Personal Protective Equipment"
- GG-12, "First Aid and Emergency Medical Response"
- GG-19, "Welding and Cutting Safety"
- GG-22, "Fire Prevention Program"
- GG-24, "Recognition and Reporting of Safety Hazards"

[1] NOTE: *It is imperative to recognize that oxygen detectors, hydrogen sulfide detectors, and carbon monoxide detectors - all of which are used to evaluate atmospheres that are potentially immediately dangerous to life and health - have a finite shelf-life of approximately one year*

Figure 1: Confined Space Entry Process Flowchart

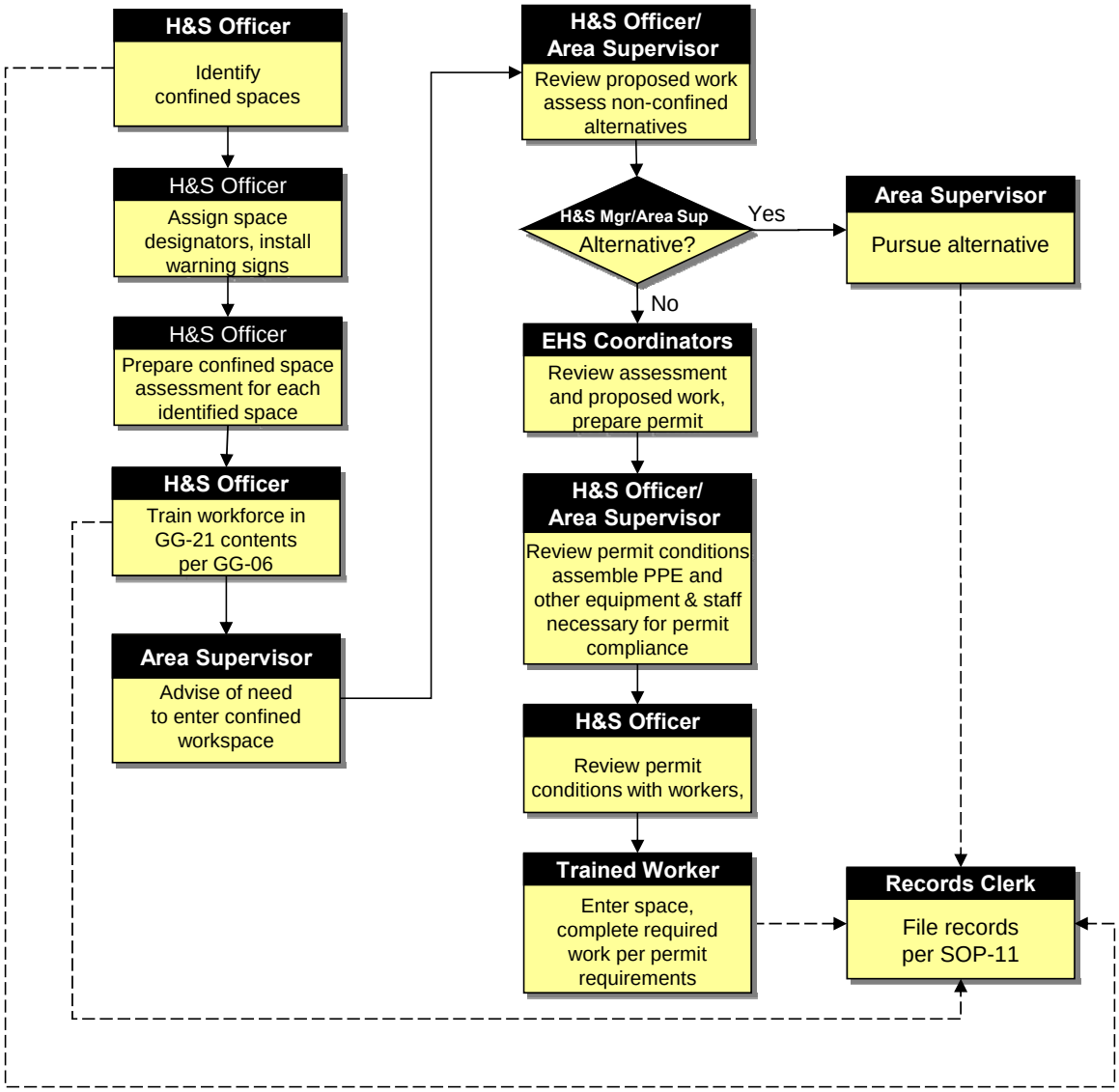


Figure 2: Confined Space Warning Sign

Figure 3: Confined Space Assessment/Entry Permit Form

GGI – Aurora Project **Confined Space Assessment/Entry Permit**		
Assessment		
Confined Space Designator:	**Location:**	
Descriptions of inherent hazards:		
Pre-entry Atmosphere Monitoring/Ventilation/Purging Requirements:		
Attendant Requirements:		
PPE Requirements:		
Lockout/Tag-out Requirements:		
Other Hazard Mitigation/Control Procedures:		
Prepared by:	**Approved By:**	**Date:**
Comments:		

GGI – Aurora Project

Confined Space Assessment/Entry Permit

Entry Permit

Date of Entry:	**Proposed Duration of Work:**

Requirements (describe)	**Responsible Employee**
Ingress/egress point:	
Confined space entry attendant:	
Hot work permit:	
Communication methods:	
Atmosphere testing/monitoring (include equipment description):	
Secure gas cylinders and lines:	
Removal of toxic/flammable wastes or residues:	
Ventilation or supplied air/SCBA:	
PPE:	
Lighting:	
Electrical grounding:	
Lockout/tag-out:	
Emergency preparedness and rescue procedures:	

Prepared by:	**Approved by:**

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the minimum requirements for preventing injury and loss due to fire at Guyana Goldfields, Inc. (GGI) Aurora Project facilities. This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Fire Brigade

A ***fire brigade*** is an organized group of employees who may have other responsibilities but have been trained in fire-fighting operations, commensurate with the needs of the Aurora Project and assessment of site-specific fire hazards.

2.2 Hot Work

Hot work refers to any activity that has the potential to produce electric arcs, open flames, hot particles or sparks, or other potential ignition sources. Hot work includes welding, arc or torch cutting, brazing, heating, or metal grinding.

2.3 Incipient Fire

An ***incipient fire*** is a fire in its initial or early stage that can be readily controlled or extinguished without placing the responder at risk of injury by using portable fire extinguishers or small-diameter water hoses, without the need for protective clothing, breathing apparatus, or high-pressure fire hoses.

3.0 RESPONSIBILITIES

3.1 Procurement Manager

The Procurement Manager is responsible for ensuring that NFPA 122 or equivalent standards are incorporated in the procurement contracts for design and construction services for Aurora Project facilities.

3.2 Health and Safety Officer

The Health and Safety Officer is responsible for:

- performing a fire risk assessment for each Aurora Project facility in keeping with GG-09 “Identification of Project-related Safety Hazards, and Assessment of Risks” and NFPA 122, Annex B, “Fire Risk Assessment”;

- working with the Environmental Manager and Aurora Project Manager to ensure that fire extinguishers and appropriate fire suppression or sprinkler systems are installed in major facilities, and supplied with a reliable source of fire-fighting water in all seasonal conditions;

- preparing area-specific Fire Plans for Buckhall, Aurora Base, Tapir Crossing, other semi-permanent camps, and other major constructed facilities, and for ensuring that such plans are regularly tested in fire drills, updated as necessary in response to facility changes, and implemented in the event of an actual fire;

- appointing and providing appropriate training for fire wardens and appropriately staffed fire brigades at Buckhall, Aurora Base, other semi-permanent camp ;

- ensuring that fire brigades are properly equipped, and that fire-fighting equipment is operational and properly maintained;

- ensuring that all employees are trained in fire prevention and incipient stage fire suppression, and are familiar with appropriate fire reporting/alarm procedures;

- ensuring that portable fire extinguishers appropriate for the types of fires most likely to be encountered are available and properly maintained in every Aurora Project vehicle, and at permanent, well- marked locations in each major location;

- ensuring that flammable, combustible, and/or explosive materials are properly handled and stored as noted in GG-14, “Handling and Storage of Hazardous Materials”;

- ensuring that fire hazard assessments are performed as part of periodic safety inspections; and

- ensuring that smoking is prohibited in all fire hazard areas.

3.3 Camp Managers, Area Supervisors, and Construction Manager

GGI Camp Managers, Area Supervisors, and the Construction Manager have ultimate responsibility for ensuring that the facilities and work areas under their supervision are

kept free of recognized fire hazards and for ensuring that employees are trained to address the fire prevention needs described by this SOP.

3.4 Mechanical Shop Staff

Nearly one out of four industrial fires are of electrical origin, and one out of ten are due to mechanical failure such as overheated bearings or friction from jammed or broken machinery. Mechanical shop and other maintenance staff therefore have the opportunity to identify and take action to eliminate or mitigate potential fire hazards associated with mechanical equipment and processes. Mechanical shop staff are responsible for remaining alert for unsafe conditions, for maintaining equipment in good working order, and for reporting all potential fire hazards to the Health and Safety Officer for investigation and appropriate preventive and corrective action (see GG-04, “Identification of Non-conformances and Corrective/Preventive Action”).

3.5 All GGI Employees

It is the responsibility of all Aurora Project employees to:

- observe “NO SMOKING” signs;
- ensure that no open fire, open flames, or other sources of ignition are used or allowed where they may pose a risk of fire;
- understand fire alarm procedures and take action to sound the alarm and report any fire that cannot be controlled in the incipient stage;
- take immediate action to suppress any incipient fire, if it is safe to do so;
- take immediate action to move (and move others) to safety in the event of a fire;
- immediately correct or report spills of fuels (see GG-17, Vehicle Fuelling and Spill Prevention” or other recognized fire hazards (see GG-24, “Recognition and Reporting of Safety Hazards”);
- observe good housekeeping practices and keep work areas free of combustible debris, spill clean-up residue, or other fire hazards;
- remain aware of potential fire hazards and immediately correct or report recognized hazards to fire wardens, fire brigade members, or the Health and Safety Officer in accordance with GG-24.

3.6 Fire Warden

Fire wardens will be designated for each major facility by the Health and Safety Officer (in consultation with the Environmental Manager and Camp Managers) and assigned responsibility for ensuring that the currently approved Fire Plan is properly implemented when the fire alarm is sounded or when a fire is observed.

4.0 PROCEDURE

The overall process for establishing and maintaining the fire protection program at the Aurora Project is presented in the following paragraphs and summarized as a flowchart in **Figure 1**.

4.1 Fire Risk Assessments

The Health and Safety Officer is responsible for performing a fire risk assessment in accordance with GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks” and NFPA 122, Annex B, “Fire Risk Assessment” for all Aurora Project facilities. The risk assessment shall include consideration of facility-specific design, installation, condition, and configuration of mechanical, electrical, and fire suppression systems, as well as potential operational issues such as storage and handling of flammable liquids, backup generator systems, and general housekeeping.

The Health and Safety Officer may seek the assistance of a fire safety engineer or other individuals with special skills in fire protection in order to identify potential fire hazards and determine the adequacy of fire detection and fire suppression systems. The latter may include portable fire extinguishers, hand-held fire hose systems, exterior fire hydrants, fixed sprinklers or deluge systems, and other appropriate devices. Where facility-specific fire suppression needs are indicated, the risk assessment shall include an evaluation of the water capacity and availability requirements for fire-fighting purposes, including hose and sprinkler systems, for a minimum duration of 2 hours.

The risk assessment shall identify potential fire and explosion hazards, assess the consequences of loss (risk), prioritize the need for corrective actions, and serve as the basis for confirming the adequacy of existing controls or selecting appropriate improvements. Measures to reduce risk shall emphasize control of ignition sources, reducing exposure of combustible materials to ignition sources, and rapid and effective control or suppression of fire. Risk assessment results shall be forwarded to designated fire wardens for use in planning periodic inspections (see Section 4.6).

4.2 Fire Plans

The Health and Safety Officer, with the assistance of the designated fire wardens, will develop a Fire Plan for the each major Aurora Project facility that considers the relevant

findings of the risk assessment and provides specific directions for responding to a facility fire. Each facility Fire Plan shall, as appropriate:

- list major workplace fire hazards (see GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”);
- describe how to recognize and activate fire alarm actuators and/or audible emergency evacuation signals;
- emphasize that the responsible fire warden and fire brigade must be called immediately if any fire occurs, irrespective of the size of the fire;
- identify specific control points and general instructions for emergency electrical system and process equipment shutdown;
- identify facility evacuation plans, evacuee assembly points, and evacuee roll-call and reporting requirements;
- identify the location of all portable fire extinguishers, hose reels, fire hydrants, and all permanently plumbed fire suppression/sprinkler systems, and provide general instructions for their use;
- summarize specific fire response/fire-fighting procedures and suppression options that are applicable to specific facility areas;
- address contingency actions to be taken if fires cannot be readily controlled without putting fire-fighting personnel in unacceptably dangerous situations;
- identify the Personal Protective Equipment (PPE) requirements for firefighters for specific facility areas (see GG-11, “Personal Protective Equipment”;
- address potential environmental issues associated with firefighting, including the control of fire-fighting run-off water.

Fire Plans shall also provide names and contact numbers for proposed fire wardens and fire brigade members for each affected facility, as well as the Aurora Project Manager, the Environmental Manager, and all required regulatory agency or stakeholder contacts. Fire warden and fire brigade responsibilities shall be assigned to staff who are willing and physically able to assume these additional duties.

Draft Fire Plans shall be distributed to the Environmental Manager for review and approval. Comments shall be resolved prior to release to the Records Clerk for controlled distribution in accordance with GG-07, “Distribution and Control of ESMS Documents.”

The Health and Safety Officer and Environmental Manager shall contact the Procurement Manager and initiate any required procurements to fulfill the PPE and fire-fighting equipment requirements established by approved Fire Plans. The Health and Safety Officer shall also issue hard hat decals (see **Figure 3**) to the fire wardens and fire brigade members listed in approved Fire Plans after they complete the training described in Section 4.4, in order that they may be readily identified by the workforce in the event of a fire emergency.

4.3 Training

All Aurora Project staff shall receive training in fire prevention program requirements, commensurate with their responsibilities. Training methodology and documentation requirements shall be in accordance with GG-06, "ESMS Training Program."

At a minimum, employee training shall explain or emphasize:

- the requirements of area-specific Fire Plans;
- general smoking policies, especially restrictions on smoking within 20 meters of combustible or flammable materials;
- Controls on welding and cutting activities, as noted in GG-19, "Welding and Cutting Safety";
- potential fire hazards, their recognition, and reporting procedures;
- safe work practices appropriate to assigned duties;
- different types of fires and appropriate use of fire extinguishers and fire suppression systems; and
- fire alarm recognition, emergency evacuation procedures, and other fire-safety considerations.

Additional training requirements for fire wardens and fire brigade members are summarized in **Table 1**.

Table 1: Minimum Fire Protection Program Training Requirements for Fire Wardens and Fire Brigade Members

Personnel	Training Scope	Methods	Frequency
Fire wardens and all fire brigade members identified in approved Fire Plans	• GG-22 contents • Contents of applicable approved Fire Plans • GG-28, "Emergency Response Process-Exploration/Early Works Construction Phase Activities • GG-14, "Handling and Storage of Hazardous Materials" • GG-19, "Welding and Cutting Safety	Classroom training conducted by Health and Safety Officer or designee; includes hands-on training in assigned PPE per GG-11, "Personal Protective Equipment"	Within 30 days of appointment, annually thereafter
Fire brigade members assigned to perform interior structural fire fighting	• All of the above plus specific training in interior structural firefighting, including inspection, maintenance, and use of SCBA equipment	Classroom training conducted by Health and Safety Officer or designee; includes hands-on training in assigned PPE per GG-11, "Personal Protective Equipment"	As above for fire wardens, plus active participation as responders in biannual fire drills

4.4 Routine Inspections

The fire wardens and/or designated fire brigade members shall inspect their assigned work areas on at least a quarterly basis for the following:

- no open fires and no smoking except in designated areas;
- all fire exit doors can be easily and immediately opened from the inside without use of a key;
- no obstructions, apparent defects, or damage exist to fire detection or alarm activation equipment;
- fire-fighting equipment is available, in good working order, and unobstructed and in place;

- the minimum practices of the following SOPs are being followed: GG-17, “Vehicle Fuelling and Spill Prevention”; GG-19, “Welding and Cutting Safety; and GG-20, “Electrical Safety”;

- good housekeeping practices are being followed, with emphasis on ensuring that combustible materials are not left near potential ignition sources;

- flammable or combustible materials are properly stored in accordance with GG-14, “Handling and Storage of Hazardous Materials”;

- adequate facilities are provided for the disposal of smoking materials; and

- rubbish and waste is properly contained or removed.

In addition, fire extinguishers shall be inspected at least quarterly to verify that they are in their proper position and have not been discharged, lost pressure, or suffered obvious damage. Any observed non-conformances shall be documented on Corrective/ Preventive Action Request (CPAR) forms and investigated and resolved as described in GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

4.5 Fire Drills

It is essential that all Aurora Project employees be familiar with evacuation routes and procedures to follow in the event of a fire emergency. The fire wardens/fire brigades will therefore conduct fire drill exercises (i.e., evacuation of premises) in each major facility at least annually. Results shall be documented and presented to the Health and Safety Officer for evaluation; affected Fire Plans shall be updated at the Health and Safety Officer’s direction, and additional training scheduled as appropriate.

4.6 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and include:

- copies of all area-specific Fire Plans;

- copies of all training session attendance sheets and any distributed handout materials;

- closed CPARs generated from site inspections; and

- reports documenting the results of annual fire drills.

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program
- GG-07, “Distribution and Control of ESMS Documents”
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”
- GG-11, “Personal Protective Equipment”
- GG-14, “Handling and Storage of Hazardous Materials”
- GG-17, “Vehicle Fuelling and Spill Prevention”
- GG-19, “Welding and Cutting Safety”
- GG-20, “Electrical Safety”
- GG-21, “Confined Space Work Safety”
- GG-24, “Recognition and Reporting of Safety Hazards”
- National Fire Protection Association Standard NFPA 122, “Standard for Fire Prevention and Control in Metal/Nonmetal Mining and Metal Mineral Processing Facilities”; United States National Fire Protection Association, Quincy, Massachusetts, 2010

Figure 1: Fire Prevention Program Development and Implementation Process

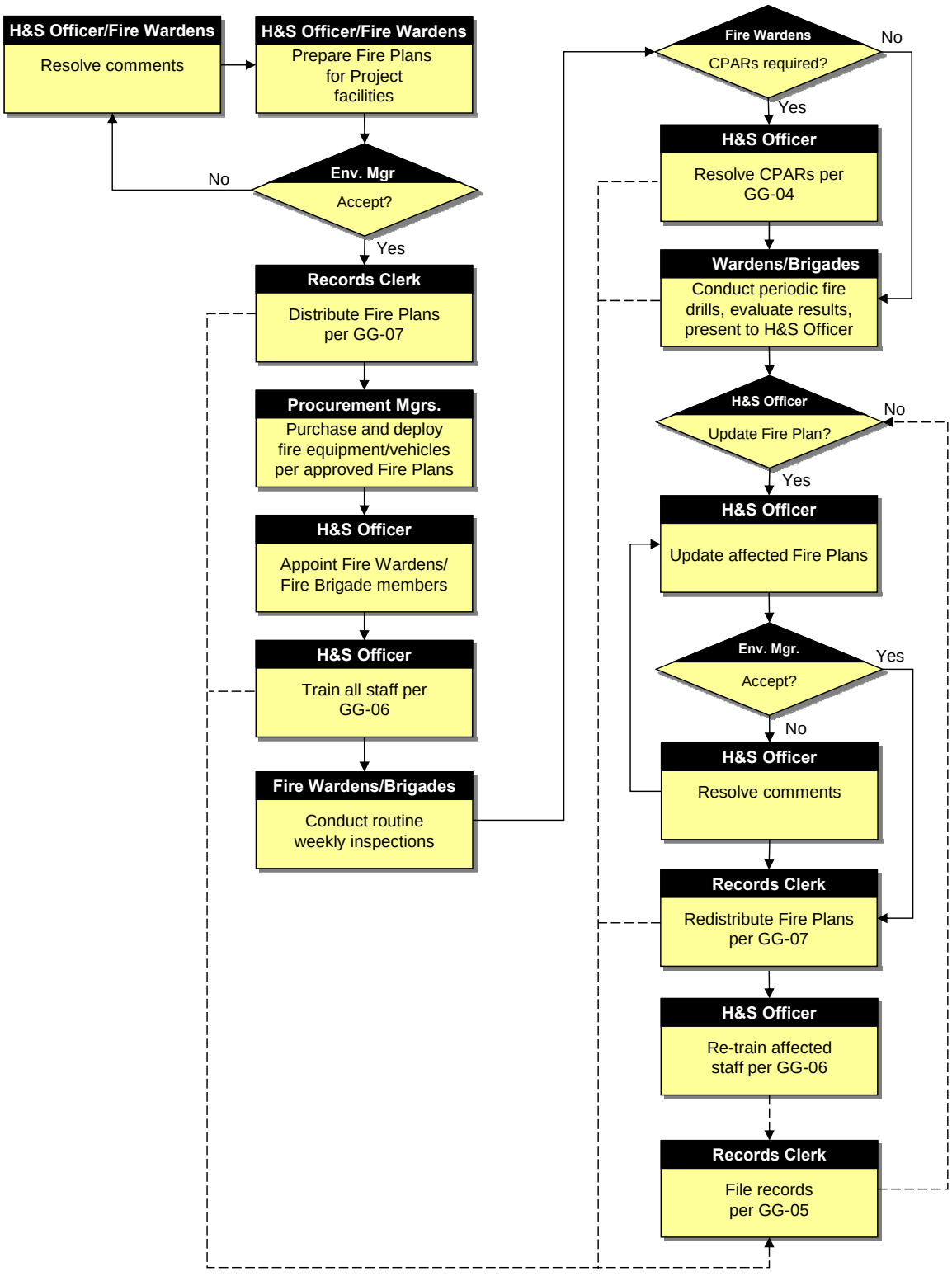


Figure 3: Fire Warden/Fire Brigade Member
Hard Hat Identification Decals

	STANDARD OPERATING PROCEDURE **GG-23: Operational Safety Meetings**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes minimum requirements for establishing and maintaining an active, effective Safety Committee and for conducting different types of safety meetings at the Guyana Goldfields, Inc. (GGI) Aurora Project. It will apply over the life of the Project; it supports Section 5.2 of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Safety Meeting

A ***safety meeting*** is defined as a scheduled meeting of available employees at a specific work location, convened by the Health and Safety Officer or other management representatives, in order to share important safety information, discuss safety issues, or provide safety training.

2.2 "Toolbox" Safety Meeting

A ***"toolbox" safety meeting*** is a less formal gathering of an individual work group, shift crew, or team. "Toolbox" safety meetings are usually conducted at the work site and are convened under the direction of a supervisor to encourage safety awareness, review specific safety-related procedures, answer safety questions, resolve safety problems, or provide safety training relevant to the work to be performed.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

The Health and Safety Officer is responsible for collaborating with the Camp Manager and Construction Manager in establishing an effective employee Safety Committee for the Aurora Project. The Health and Safety Officer is also responsible for ensuring that line supervisors and

GGI staff participate in regular “toolbox” safety meetings and other special meetings that may be convened to discuss specific issues.

3.2 Safety Committee

The Aurora Project Safety Committee is responsible for:

- providing a safe, dependable forum for regular, two-way communications between GGI management and the workforce in order to address specific OHS issues and requirements;

- evaluating any identified OHS issues or reported non-conformances, and effectively resolving those issues and correcting the unsafe or unhealthy conditions or practices that may have been identified;

- reviewing all work-related accidents, injuries, and/or illnesses, including identification of the cause(s) and the actions necessary to correct the situation and/or prevent recurrence; and

- Identifying any weaknesses in the Aurora Project OHS program, and for providing recommendations for improvement.

3.3 Area Managers

Area Managers are responsible for promoting and supporting Safety Committee activities and for conducting “toolbox” safety meetings with their assigned crew at least once a week. Where specific work activities do not readily offer a topic for a toolbox safety meeting, the supervisor shall discuss other safety issues of more general interest (see **Attachment 1** for potential topics) or consult with the Health and Safety Officer.

3.4 GGI Staff Members

GGI staff members shall:

- participate as Safety Committee members, when so requested;

- bring any observed workplace hazards or other OHS questions or concerns to the immediate attention of their supervisor or the Health and Safety Officer;

- participate in all required safety meetings and training sessions; and

- perform all work in a safe manner, in accordance with the training received.

4.0 PROCEDURE

The overall process for establishing a Safety Committee and for conducting safety meetings is described in the following sections and summarized as a flowchart in **Figure 1**.

4.1 Safety Committee

The Health and Safety Officer shall work with the Camp Managers and the Construction Manager to establish an Aurora Project Safety Committee, with participants selected on a rotating basis. The Safety Committee should attempt to fairly represent all of the individual work units or crews working at each major Project work area. Committee members shall be appointed for a term of one year. There are no limits to the number of terms a member may serve. One committee member will be elected chairperson.

4.2 Safety Committee Meetings

The Safety Committee may determine the frequency of its meetings, but should meet a minimum of once every three months. The chairperson may call a meeting of the Safety Committee any time, as circumstances demand. With the exception of the elected chairperson's role in being in charge of the meeting, all members have equal status and are expected to be mutually respectful of one another's' opinions and concerns

The Safety Committee shall elect a secretary for a term of one year. Minutes should be written accurately, concisely, and objectively, as soon as possible after the meeting has adjourned. Specific issues should be discussed as well as the action taken. Both the secretary and the chairperson should review the final safety meeting minutes for accuracy, and final versions should be posted on the Camp bulletin boards.

4.3 "Toolbox" Safety Meetings

The purpose of a "toolbox" safety meeting is to convey specific information relevant to an immediate task at hand, or to provide general information that can be applied to everyday activities. Regardless of the specific topics discussed, the intent should always be to reinforce both the worker's understanding of management's commitment to safety and the worker's own safety awareness.

The Health and Safety Officer and Area Managers will hold toolbox safety meetings at least monthly and at the start of any significant new task or operation. In the latter case, the affected Area Manager and the Health and Safety Officer should assemble the work crew involved, and discuss the nature of the operation, proper work procedures, known or potential hazards (see GG-09, "Identification of Project-related Safety Hazards and Assessment of Risks"), appropriate methods to control the identified hazards, and proper use of any required personal protective equipment (PPE; see GG-11 "Personal Protective Equipment"). A toolbox safety meeting should be held any time that changing conditions warrant a change in safe work practices or PPE requirements.

In the event that work activities do not offer a ready topic for a Safety Committee meeting, the supervisor shall discuss other general safety issues in order to help maintain safety awareness on the part of the workforce. There are many possible topics that are appropriate for toolbox discussions; several examples are provided for information in **Attachment 1**.

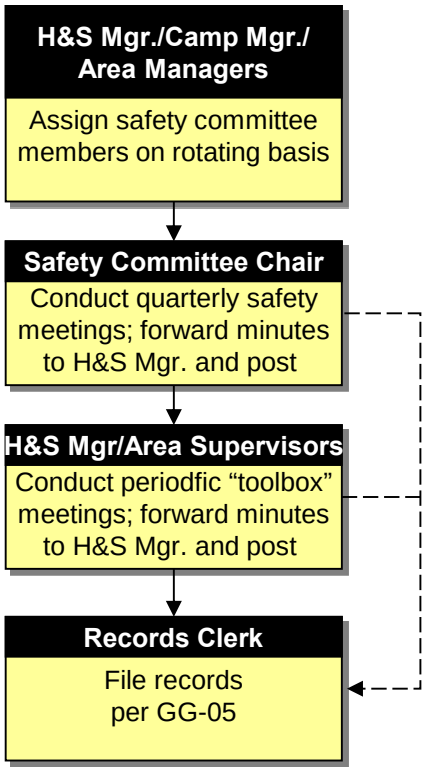
4.4 Records

Records include minutes of all safety meetings, which shall be forwarded to the designated Records Clerk for filing in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-09, “Identification of Project-related Safety Hazards and Assessment of Risks”
- GG-11, “Personal Protective Equipment”

Figure 1: Operational Safety Meeting Process



Attachment 1:

Suggested Topics for Periodic "Toolbox" Safety Meetings

1. Safety – Whose Responsibility Is It?

- Top Management?
- The Health and Safety Officer?
- The Safety Committee?
- Crew supervisors/foremen?
- ***Every employee!***

2. Common Unsafe Acts and Unsafe Conditions

Unsafe Acts	Unsafe Conditions
• Removing machinery guards	• Lack of proper machinery guards
• Failure to adequately secure or tie-down materials	• Unexpected vehicle movement due to poorly secured loads, un-chocked wheels, or improper rigging
• Failure to use signals or warnings as required	• Poor housekeeping
• Using defective tools or equipment	• Lack of proper warning systems
• Unauthorized use or operation of equipment	• Protruding nails, wires, or rebar
• Using tools or equipment improperly	• Improper placement or storage of materials
• Servicing energized/operating equipment	• Hazardous tools, equipment, or materials
• Riding on vehicles or equipment not designed for passengers	• Cluttered aisles or passageways, inadequate clearance
• Failure to wear or use appropriate personal protective equipment (PPE)	• Inadequate lighting, excessive noise
• Standing in an unsafe place	• Improper attire/loose clothing
• Not paying attention to work environment	• Hazardous atmospheres, or confined spaces with low oxygen content

3. Why Accidents Occur

Reasons Employees Commit Unsafe Acts	Reasons Unsafe Conditions Exist
• Insufficient motivation to work safely	• Failure to identify/recognize unsafe conditions (don't know, don't care)
• Too much motivation to cut corners (in a hurry, behind schedule, over budget)	• Failure to report unsafe conditions (afraid or don't care)
• Lack of knowledge (how to do it right) or proper skills (ability to do it right)	• Failure to correct unsafe conditions (don't care, too much trouble, too expensive)
• Poor workplace attitude (don't care)	
• Reduced mental or physical abilities due to fatigue or illness	

4. EVERYONE CAN PREVENT ACCIDENTS!

- Be sure that you know the correct (safe) way to do your job, and then do it!

- Recognize that you are more likely to be involved in a serious accident:
  - When you are working with sources of high energy – such as moving or rotating machinery, high voltage, hot materials, high-pressure compressed air, or flammable or explosive materials;
  - When you are working with hazardous or toxic materials;
  - When you are in a hurry or under stress; or
  - When you are performing an unusual, unplanned procedure such as emergency maintenance or repair.

- Think about what you are doing, and think about doing it <u>safely.</u>

- Maintain safe working conditions for yourself and your co-workers.

5. Common Worksite Hazards – "The Big Four"

- Slips, trips, and falls
- Being struck by a falling or suspended object
- Being caught "in, in between, or under" moving machinery
- Electricity

6. Recognizing and Reporting Unsafe Conditions

- Recognizing and reporting unsafe conditions is EVERYONE'S responsibility!

- Report unsafe conditions immediately to your supervisor, or the Health and Safety Officer, or any Safety Committee member, or to any Manager. If possible to do so without endangering yourself or others, correct the unsafe condition yourself immediately. If the situation constitutes an emergency, follow the guidance of the Project *Emergency Preparedness and Response Plan.*

- *Follow up!* Report the condition again if it is not corrected.

7. Housekeeping

Poor housekeeping can result in:

- Minor injuries such as cuts, puncture wounds, slivers;
- Serious injuries/accidents such as slips, trips, falls, striking or being struck by an object, and fires; and/or
- Decrease in job productivity by slowing the actions of workers, access to equipment, and movement of materials.

Employees should observe the following housekeeping rules:

- Keep scrap lumber with protruding nails separate from other debris;
- Bend protruding nails over or remove from scrap lumber;
- Keep all waste and debris in neat piles and away from the immediate work area;
- Remove debris from the site on a regular basis;
- Keep aisles, stairways, and walkways clear;
- Store materials properly in their designated area;
- Keep tools and equipment stored neatly; and
- Keep extension cords and hoses from spanning walkways.

8. Near-Misses/Close calls

- A “near-miss” is a potentially deadly accident without any negative outcome. The workforce must understand that sooner or later, if the situation that resulted in the near-miss once is allowed to continue, it will eventually have a deadly outcome.

- Near-misses are a warning that something is wrong; they must be documented as a nonconformance and resolved in accordance with GG-04, “Identification of Non-conformances and Corrective/Preventive Action”

- Don’t be thankful that nothing bad happened and then move on. Be thankful for the warning! *Always report a near-miss* and take immediate action to prevent any recurrence.

- If you did not cause the near-miss or were not even involved in a near-miss but saw it, discuss it with those involved and your supervisor. Do not “let it go” until you are certain that the problem has been recognized. You may be saving someone’s life – maybe your own.

- Obey safety rules and always “think before you act.”

9. Worksite Safety Inspection

Supervisors may direct employees to perform brief self-inspection of a work area, drawing upon the information provided in previous “toolbox” safety meetings; results are then discussed with affected employees. Issues may include housekeeping, identified hazards, good points, bad points, recent near-misses, or other incidents or problems. Supervisors may use the opportunity to review relevant safety issues such as PPE requirements and emergency procedures, and to remind employees that safety performance is a key part of their overall job performance.

10. Other potential topics for toolbox safety meetings:

- First aid (see GG-12, “First Aid and Emergency Medical Response);
- vehicle operations;
- signalling techniques;
- use of spotters;
- traffic control;
- barricades and warning devices;
- heat stress;
- PPE/use of respirators;
- material handling;

- material storage;
- tool use and care;
- slips, trips, and falls;
- machinery hazards;
- electrical hazards;
- fire protection;
- fire extinguishers;
- refuelling vehicles; and
- handling gasoline and diesel fuel.

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes minimum requirements for recognizing and reporting potential safety hazards associated with any aspect or facility location associated with the Guyana Gold Inc. (GGI) Aurora Project. This SOP does not address the reporting of accidents or near-misses, which are considered serious non-conformances and are reported and resolved in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Accidents and Near-misses

An ***accident*** is an unintended mishap that results in harm to a human being or damage to equipment or property. A ***near-miss*** is an unintended situation that did not result, but could have easily resulted, in an accident. Both situations are unacceptable, are contrary to GGI policy, and require evaluation and appropriate corrective and preventive action to reduce the likelihood of recurrence.

2.2 Hazard

A ***hazard*** is a condition or circumstance that makes an accident more likely and/or more severe.

3.0 RESPONSIBILITIES

3.1 Upper Management

GGI's upper management has ultimate responsibility for safety at the Aurora Project, and shall ensure that employees receive training that enables them to recognize unsafe

conditions. Perhaps more importantly, upper management is responsible for establishing a working environment in which employees are confident that reporting recognized safety hazards to management is both appropriate and expected behaviour.

3.2 Health and Safety Officer

The Health and Safety Officer is responsible to the Environmental Manager and the affected Camp Managers for:

- ensuring that all employees receive sufficient health and safety training to enable them to recognize and properly report potential safety hazards;
- ensuring that all employees understand the nature of their safety hazard recognition and reporting responsibilities, and are confident that they have the authority to take appropriate immediate action when called for;
- ensuring that all employees are aware of the health and safety communication procedures established for the Project;
- participating in employee health and safety committee meetings; and
- participating in corrective and preventive action processes, as described by this procedure.

3.3 Area Supervisors

It is the responsibility of Area Supervisors (e.g., geotechnical, mechanical, or stores supervisors) to be alert for potential hazards and to either correct them on the spot, if correction can be accomplished without endangerment, or initiate corrective and preventive action processes, as described by this procedure and GG-04, “Identification of Non-conformances and Corrective/Preventive Action.” Area Supervisors shall also collaborate with the Health and safety Officer and conduct periodic “toolbox” safety meetings (see GG-23, “Operational Safety Meetings”) to provide an opportunity for the discussion of perceived hazards, along with potential solutions and the status of any pending corrective/preventive actions.

3.4 All Employees

The unsafe action(s) of one employee may result in injuries not only to themselves, but also to other workers or visitors. It is therefore the responsibility of every Aurora Project employee to be mindful of surrounding activities, and to never overlook unsafe acts by a co-worker. Aurora Project employees are expected to be alert to hazards that may injure or harm themselves or others, and to the extent that they are authorized to do so, to correct the hazard immediately. Any unsafe condition that the employee is not

authorized to correct shall be immediately reported to the responsible Area Supervisor, Camp Manager, or the Health and Safety Officer.

.

4.0 PROCEDURE

The overall process for recognizing and reporting safety hazards is described in the following sections and summarized as a flowchart in Figure 1.

4.1 Training

Training is essential to provide employees with sufficient knowledge to recognize unsafe conditions and work practices, and to be confident in their ability to do so. Training plays an even more important role in forming workers' *attitudes* toward safety. Training that conveys not only knowledge, but also management's determined commitment to safety. It is an important method for influencing employees' attitudes and behaviour, and is a key element in any effort to manage hazards in the workplace.

The Health and Safety Officer shall provide hazard recognition training to Area Managers, Area Supervisors, and all affected staff. The goal of such training is to ensure that all employees:

- recognize and accept a personal role in preventing accidents involving themselves or their co-workers;

- understand the general properties and specific health and safety hazards of any materials stored, handled, or used in the affected work area, and the proper and safe way to handle such materials;

- understand the physical and general workplace hazards associated with their assigned work areas;

- understand the nature of any unsafe conditions in their work area that require special procedures, functional machine guards (see GG-18, "Machine Guards and Safety Barriers"), or personal protective equipment (PPE; see GG-11 "Personal Protective Equipment");

- recognize significant deviations from established safe conditions or proscribed work practices; this could include improper use of PPE, missing PPE, reckless driving, failure to lock or tag out machinery under repair, working in confined spaces without proper controls, failure to chock vehicle wheels, or possession of firearms or alcohol); and

- recognize a duty to immediately correct any such deviations personally, where authorized to do so and such corrections can be made without risking

endangerment, or to report the situation to the affected Area Supervisor, Camp Manager, and/or Health and Safety Officer.

The responsible Area Supervisors and the Health and Safety Officer are ultimately responsible for maintaining safe working conditions and safe work practices and are key contact points in the process of hazard recognition and reporting. They should continuously examine the work area for existing or worsening unsafe conditions, and routinely observe the actions of employees with particular emphasis on inexperienced employees, employees involved in previous accidents, and chronically unsafe workers. The training provided should empower employees to personally correct minor hazards on a routine basis, but also to recognize unsafe conditions that most employees are not authorized to correct or that cannot be completely resolved in a safe manner. The latter conditions must be immediately reported to the Area Supervisor and Health and Safety Officer as discussed in Section 4.2.

4.2 Hazard Reporting and Corrective /Preventative Action

Whenever an employee identifies a hazard that poses an immediate risk of serious injury or loss, the employee shall discontinue any activity that could contribute to the severity of the hazard, take immediate action to prevent access to the hazardous situation or area, and notify the affected Area Supervisor and the Health and Safety Officer. The Area Supervisor and the Health and Safety Officer shall assess the situation and either immediately correct the unsafe condition, or initiate a Corrective /Preventive Action Request (CPAR) in accordance with GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

Where a potentially significant risk is noticed, the affected Area Supervisor and Health and Safety Officer shall take immediate action to reduce the risk to an acceptable level, or immediately stop the risky activity operation. In either case, CPARs shall be initiated for a systematic evaluation of how to determine the cause of the situation and how to prevent similar situations in the future.

Otherwise, recognized hazards shall be reported as follows:

- Any hazard beyond a minor housekeeping issue, even if it can be corrected on the spot without incurring personal endangerment, or is beyond the ability of the employee to correct, shall be reported to the Health and Safety Officer and Safety Committee using the form provided in **Figure 2**.

- The Health and Safety Officer shall evaluate the hazard and determine whether or not CPAR action will be required. If a CPAR is required, the situation shall be thoroughly investigated and resolved as noted in GG-04. If not, the Health and Safety Officer shall correct or stabilize the situation as required. In both cases, the originator shall be advised of the final resolution of the hazard report, and the

issue shall be discussed in the next available “toolbox” safety meeting as noted in GG-23, “Operational Safety Meetings.”

4.3 Records

Health and Safety Officers shall ensure that copies of “toolbox” meeting minutes, completed Safety Hazard Report forms, and associate CPAR documentation are forwarded to the Environmental Manager or designated Records Clerk for retention in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”
- GG-11, “Personal Protective Equipment”
- GG-18, “Machine Guards and Safety Barriers”
- GG-23, “Operational Safety Meetings”

Figure 1: Hazard Recognition, Reporting, and Corrective/ Preventive Action Process

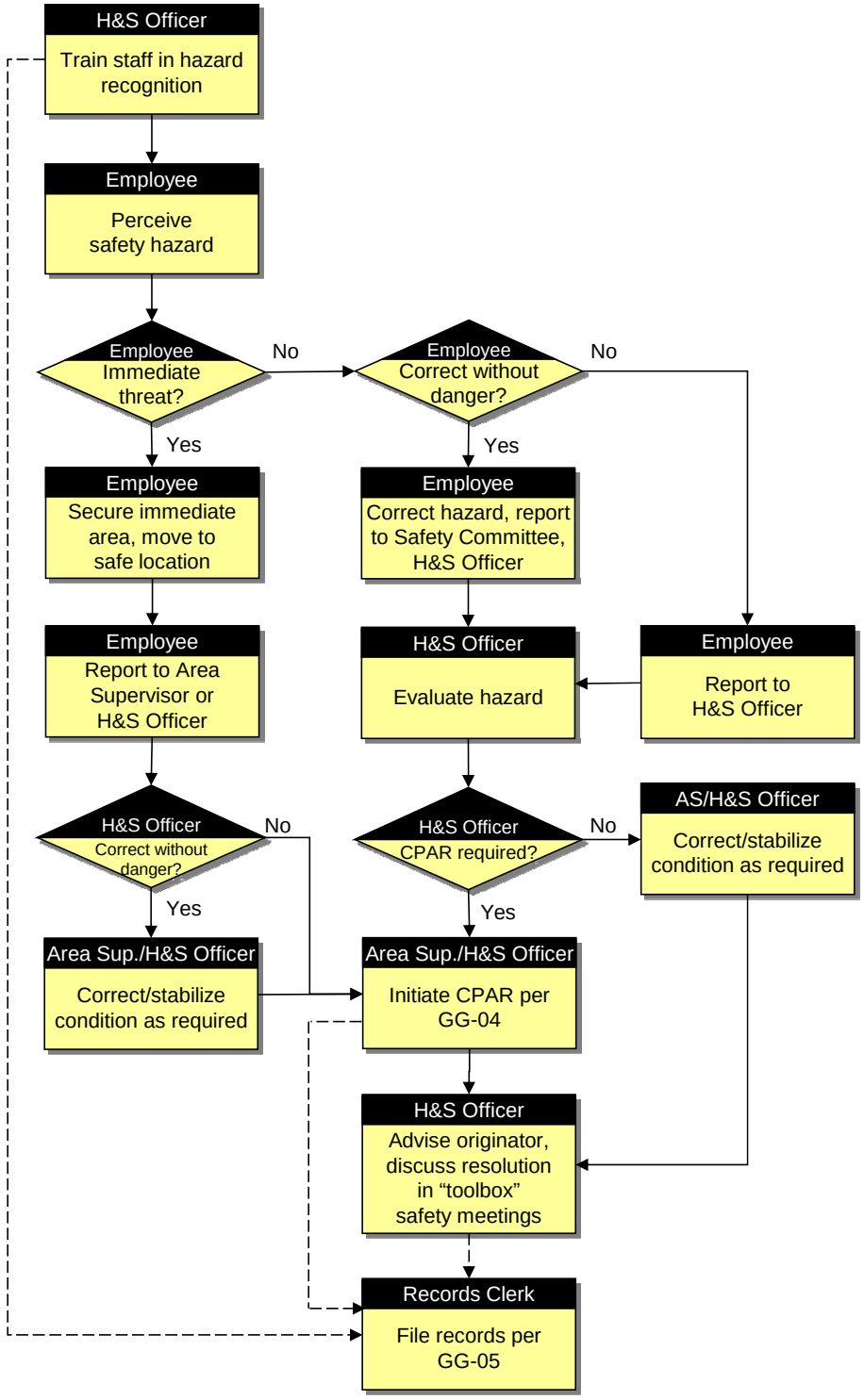


Figure 2: Safety Hazard Report Form

Aurora Project

Safety Hazard Report

Reported by: _____ Date:_____

Job Title: _____

Department:_____

Location:_____

Hazard Description: _____

_____

_____

Where is the hazard located? _____

Has this been reported to your Area Supervisor? What action has been taken?

_____

The Safety Committee and area Health and Safety Officer will review your report, take appropriate action, and advise you of the results.

Comments: _____

_____

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure's (SOP) provides guidance on the actions that shall be taken by Guyana Goldfields, Inc. (GGI) staff who may encounter relics or artefacts with potential archaeological or cultural significance when conducting environmental footprint surveys (see SOP GG-08, "Environmental Footprint Surveys") or land clearance activities at any Aurora Project sites. Environmental and Social Impact Assessment (ESIA) studies[1] indicate that although rare, some potential exists for certain types of archaeological finds to be encountered in the Project area, particularly near Tapir Crossing. The National Trust of Guyana (National Trust) has expressed an interest in preserving Guyana's historical heritage, and has requested to be notified if archaeological deposits or potentially historic objects are discovered.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Archaeological Find

An ***archaeological* find** is defined as the discovery of relics or human artefacts with potential archaeological or historical significance that may be encountered in survey or land clearance actions. Such finds could include human remains, especially in association with artefacts or articles that indicate ritual burial; pottery or pottery shards; stone tools or implements; or metal, glass, or ceramic objects that could date to the pre-colonial or colonial era. Examples of potentially significant artifacts that could be found in the Project area are depicted in **Figure 2**. Garbage or abandoned objects from past decades of uncontrolled artisanal mining activities are generally not considered to have historical significance unless there are clear indications (e.g., dated materials pre-1900, glass or pottery shards, flintlock weapons) that could link the find to colonial or pre-colonial times.

[1] See "Technical Report Identifying the Potential Range of Cultural Resources with the Aurora Gold Mining Project Area, Guyana" (Plew, 2012)

3.0 RESPONSIBILITIES

3.1 Project Staff

Project staff engaged in field work (e.g., surveying, road construction, drilling) shall remain alert to the possibility of an archaeological find, shall not permit any further disturbance to the area if a find is encountered, and shall report any potentially significant observations to their supervisor and the Environmental Officer.

3.2 Environmental Officer

The Environmental Officer shall investigate all reported finds and mark the area of the find with warning tape, record the GPS coordinates, take several descriptive photographs, and forward the information to the Environmental Manager.

3.3 Environmental Manager

The Environmental Manager shall review the information provided by the Environmental Officer on each find and determine [by physical examination at the field location, if necessary and or by consultation of (Plew, 2012) or others recent archaeological studies] if the find is sufficiently credible to notify the National Trust, and shall prepare a memo summarizing the nature of the find. If, based on this evaluation the find is determined not to meet the definition provided in Section 2.1, then the Environmental Manager shall notify the affected areas supervisor or construction manager that the protected area can be released.

3.4 Vice President (VP), Aurora Project

The VP, Aurora Project shall coordinate any necessary contacts and meetings with the National Trust that relate to the discovery of a potentially significant archaeological find.

3.5 Area Supervisors/Construction Managers

Affected area supervisors or construction managers will enforce a 10 m setback for any clearance or construction activities near any confirmed potential find while it is under investigation.

4.0 PROCEDURE

The process to be used to manage the investigation and disposition of chance archaeological finds is summarized in the following sections, and is depicted as a flowchart in **Figure 1**.

4.1 Training of Project Staff

All Project staff with responsibilities that require working in undeveloped forest or land areas shall be trained in the requirements of this procedure, in accordance with GG-05, "ESMS Training Program." At the completion of training, laminated copies of **Figure 2** shall be provided to field team leaders as a ready reference for the identification of several kinds of more significant artefacts.

4.2 Discovery and Protection of Potential Find

If Project staff engaged in field work (e.g., surveying, road construction, drilling) discover a potential archaeological find, they shall cease land disturbance in the area of the find, temporarily mark the location with flagging, and report their observations to their supervisor and the Environmental Officer. The Environmental Officer shall examine the find and delineate the area of the find with yellow plastic caution tape. The find shall be photographed and the geological position system (GPS) coordinates recorded. The Environmental Officer will also contact the affected area supervisor or construction manager so that setbacks from the area under investigation can be properly established.

4.3 Confirmation of Potential Find

The Environmental Officer shall forward copies of the site photographs to the Environmental Manager and discuss the observations made to date. The Environmental Manager may, at his discretion, elect to visit the site and make a personal examination. If the Environmental Manager determines that the find does not really meet the definition of an archaeological find as noted in Section 2.1, the site may be released from any further investigation, and the affected area supervisor or construction manager advised accordingly. However, if the potential significance of the site is confirmed, the Environmental Manager shall generate an Archaeological Find Report.

4.4 Archaeological Find Report

The Archaeological Find Report shall contain the following minimum information:

- Location (general description plus GPS coordinates;
- Staff member reporting the find, and date reported;
- Area supervisor/construction manager notified, and notification date;
- Physical description of artefacts or articles observed;
- Site photographs; and
- Environmental Manager's signature and date
- Comment area (to document final action with National Trust)

4.5 Presentation of Find to National Trust

The Environmental Manager will present the Archaeological Find Report to the VP, Aurora Project, who shall contact the appropriate National Trust representative and

arrange for one or meetings as necessary to review and discuss the find. These meeting(s) should be attended by the VP, Aurora Project and Environmental Manager, at a minimum. Options for further investigation and disposition of the find shall be discussed, and the specific roles of GGI and the National Trust defined with respect to the final disposition of the find. Meeting notes shall be retained and attached to the Archaeological Find Report along with a summary of all required disposition actions agreed upon with the National Trust.

4.6 Final Disposition

GGI will support the National Trust in the final disposition of the find as agreed upon in the meetings described in Section 4.5. The Environmental Manager will send a final memo to file documenting the completion of all required actions.

4.7 Records

Records required from the implementation of this procedure include all memos to file, the final Archaeological Find Report and all meeting notes or correspondence from the National Trust regarding disposition of the find. All records will be filed in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GG-05, “Records Management”
- GG-08, “Environmental Footprint Surveys”
- “Technical Report Identifying the Potential Range of Cultural Resources with the Aurora Gold Mining Project Area, Guyana” (Plew, 2012)

Figure 1: Chance Archaeological Find Investigation and Disposition Process

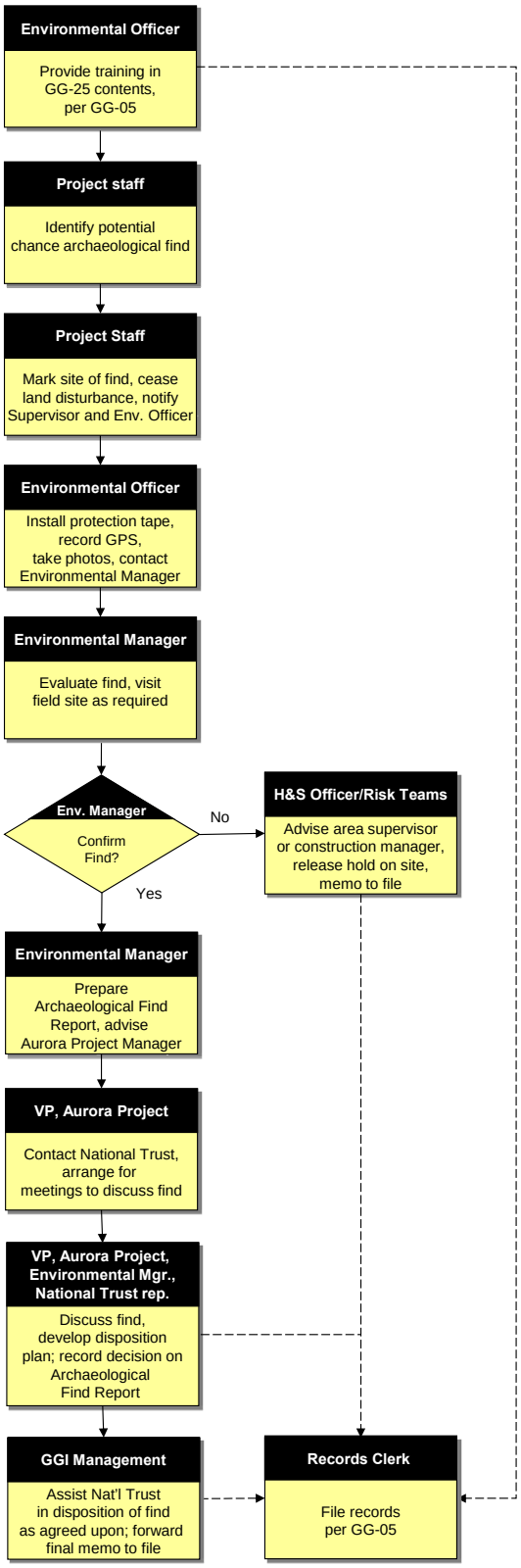
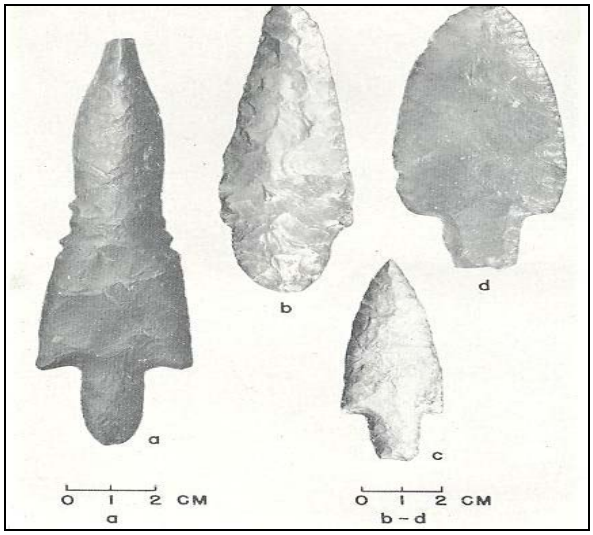
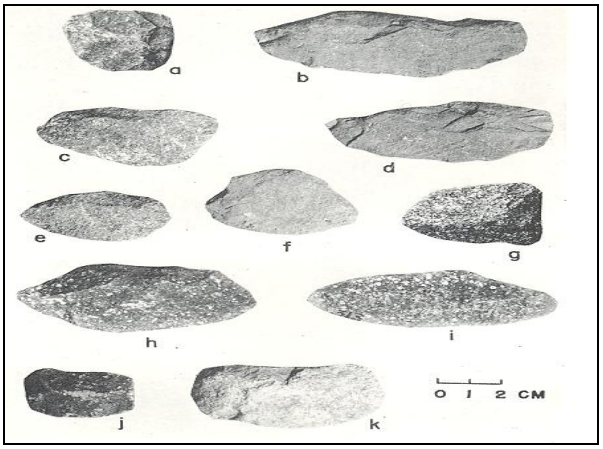


Figure 2: Examples of Potentially Significant Archaeological Artefacts [source: (Plew, 2012)]

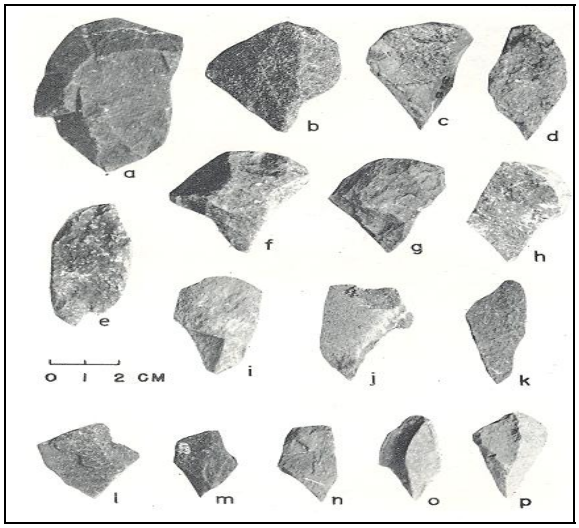
Projectile points



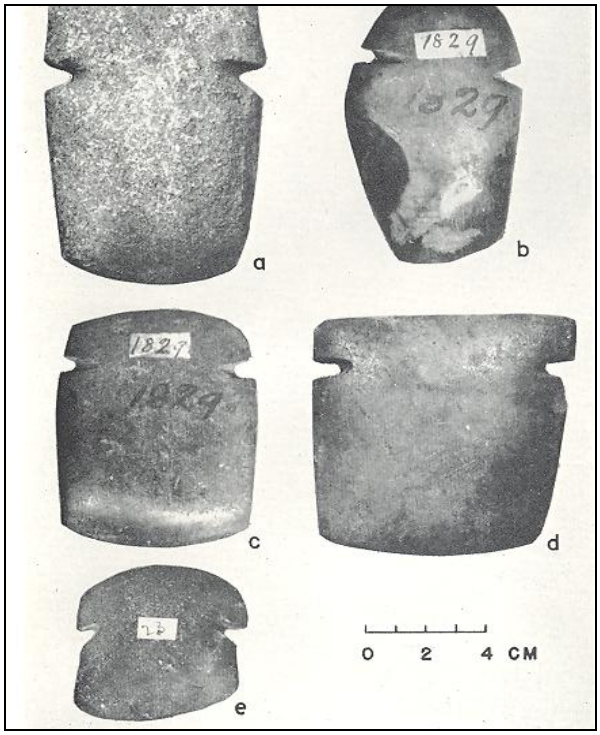
Flake tools



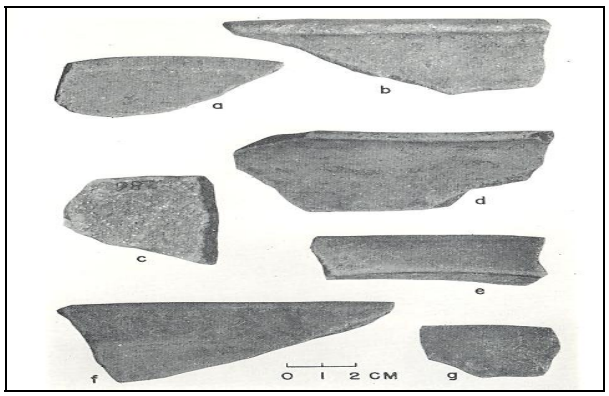
Picks



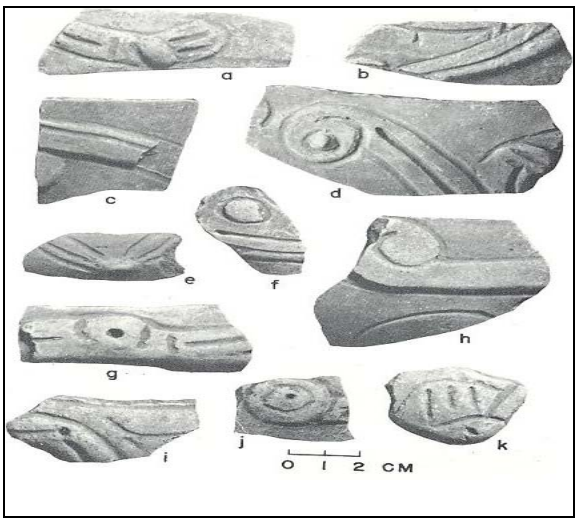
Stone axes



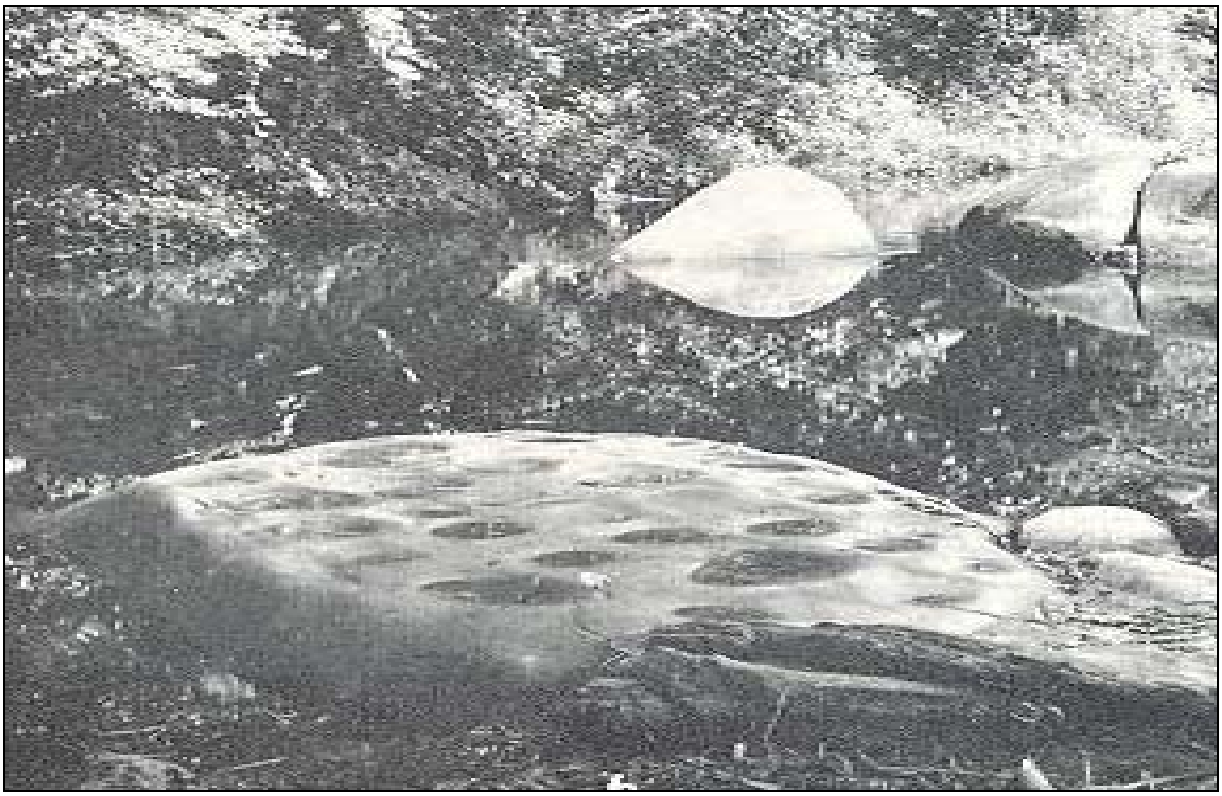
Plain pottery shards



Decorated pottery shards



Grinding surfaces



	STANDARD OPERATING PROCEDURE **GG-26: Safe Use of All-Terrain Vehicles**
Approved by: (Aurora Project Manager)	Approved by: (Environmental Manager)
Effective Date: August 30, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes minimum requirements for the safe operation of all-terrain vehicles at the Guyana Goldfields, Inc. (GGI) Aurora Project. This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 All-Terrain Vehicle

All-terrain vehicles (ATVs) are small, lightweight, motorcycle-engine powered, petrol-fueled, 4-wheel drive off-road vehicles, typically steered via handlebars and designed for use by a single individual rider.

2.2 ATV Rider

The ***ATV rider*** is defined as worker with the experience and training that permit them to be authorized to operate ATVs owned by GGI.

2.3 ATV Rider Training

ATV rider training is defined as completion of an approved ATV rider training course, written examination, and a practical hands-on skills review by a qualified supervisor or manager, as described in this SOP.

2.4 Vehicle Accident

A ***vehicle accident*** is an unplanned vehicular event that results in injury, death, vehicle or property damage, trip interruption, or other loss.

3.0 RESPONSIBILITIES

3.1 Procurement Manager

The Aurora Project Procurement Manager is responsible for purchasing ATVs that conform to international (and applicable national) automotive safety standards, with appropriate options suitable for hard use in remote mining operations.

3.2 Construction Manager

The Construction Manager is responsible for ensuring that all ATV riders are trained and qualified in accordance with this procedure.

3.3 Chief Mechanic and Mechanical Shop personnel

The Chief Mechanic and assigned mechanics are responsible for ensuring that all ATVs are maintained and serviced daily to ensure their continued safe operating condition.

3.4 ATV Rider

The ATV rider is responsible for successfully completing rider training as specified herein. Operators shall complete pre-shift safety walk-around inspections of their assigned ATVs, and report any problems to the Mechanical Shop for resolution. Riders are also responsible for safely operating ATVs in strict accordance with the guidance provided in Section 4.4.

4.0 PROCEDURES

4.1 Procurement of ATVs and Entry into Maintenance Tracking System

ATVs shall be purchased or leased that conform to international (and applicable national) automotive standards. After receipt of each new vehicle, the Procurement Manager or designee shall ensure that each ATV is provided a small first aid kit (sized to permit storage under the rider's seat) as well as an Aurora Project control number, which shall be plainly marked on the vehicle. All ATVs shall be entered into the Aurora Project's maintenance tracking system.

4.2 Selection, Training, and Qualification of Riders

Area Managers shall nominate experienced personnel to serve as ATV riders. The Construction Manager shall ensure that nominated ATV riders attend a training course and pass a written examination based on the contents of this SOP and the *ATV Rider Course: Student Handbook* (ATV Safety Institute, August 2010). The training course shall also include the minimum requirements for safe operation described in Section 4.4.

Candidates shall also demonstrate their driving skills to a qualified supervisor or manager designated by the Construction Manager. Successful rider candidates shall receive a vehicle operator's qualification card from the Construction Manager (see **Figure 2**) to be carried with their Aurora Project identification at all times. Appropriate Personal Protective Equipment (PPE; see GG-11, "Personal Protective Equipment") shall be issued to qualified riders, and will include an approved ATV helmet with face shield and goggles, and leather boots.

GGI reserves the right to rescind an ATV rider's vehicle operator's qualification card in the event of an at-fault accident or if unsafe behaviour is observed; see the GGI "Labour Grievance Policy."

4.3 Pre-Shift Maintenance and Safety Checks

The Mechanical Shop shall complete a daily safety and maintenance inspection of all ATVs returned from the field, prior to releasing for any subsequent use; at a minimum, the inspection must include the following:

- Check tires for proper inflation and cuts or gouges or excessive wear; damaged or unacceptably worn tire should be replaced;
- Check for security of cotter pins on axle and wheel nuts;
- Check for broken fenders, headlights, or loose fasteners or parts, and make repairs as necessary to ensure functionality, and ensure that brake levers and clutch mechanisms function smoothly;
- Make sure that throttle mechanism works smoothly, and snaps closed with the handlebar in any position;
- Check the functionality of the ignition and engine stop switch;
- Check that the vehicle seat is in good condition and that a first aid kit is stored under the rider's seat;
- Remove and examine air filter, and clean or replace as indicated;
- Check for fuel, transaxle, and engine oil leaks, and make repairs to seals or bearings as indicated; and
- Check fuel and fluid levels, and top off before releasing for use (see GG-17 "Vehicle Fuelling and Spill Prevention");

4.4 General Rules for Safe Operation

At a minimum, the operator must observe the following rules when operating a light vehicle. These rules must be addressed in operator training and shall be implemented in actual practice. *Failure to follow these rules may result in revocation of the operator's qualification card or other appropriate action;* see the GGI "Labour Grievance Policy."

General Rules for the Safe Operation of Light Vehicles

- ***Only qualified operators are permitted to drive vehicles – NO EXCEPTIONS!***
- ***Riders must wear their assigned PPE (***approved ATV helmet with face shield and goggles and leather boots; note that standard hard hats or unapproved lightweight helmets are forbidden while riding an ATV). Riders will be required to present their ATV helmet and qualification card in order to receive vehicle keys from the Maintenance Shop.
- At the start of each shift, riders shall ***conduct a walk-around inspection*** prior to leaving for the field, noting any leaks, loose or broken parts, or tire inflation problems; any issues shall be referred to the Mechanics Shop for resolution.
- ***ATVs are typically designed for use by a single rider only;*** a maximum of two passengers may be carried in an emergency situation, but the practice is discouraged. Do not offer rides to hitchhikers or non-employees. If passengers must be carried, the rider shall drive at a slower speed; passengers shall sit immediately behind the driver and position their hands and legs so as not to interfere with the safe operation and steering of the ATV; passenger hardhats must be fitted with a chin strap so that they stay secured while riding.
- ***Speeding, other careless or reckless driving, or driving under the influence of alcohol or drugs will not be tolerated and are grounds for immediate dismissal;*** see the GGI "Labour Grievance Policy."
- Obey all posted speed limits, and maintain a safe following distance (at least 3 vehicle lengths).
- Pedestrians and heavy equipment always have the right of way; ensure that eye-contact is made with heavy equipment operators before passing.
- Under all conditions, operate the vehicle at a speed that will allow safe stopping; reduce speed for wet and slippery road conditions; do not leave a running ATV unattended.

- Immediately report all accidents involving GGI ATVs (and other accidents that may be observed by GGI vehicle operators) to the Health and Safety Officer via radio or cellular telephone, no matter how minor. If there are any injuries, follow the procedures outlined in GG-12, “First Aid and Emergency Medical Response.

4.5 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, “Records Management” and include hard copies of all training session attendance sheets and any distributed hand-out materials (see GG-06, “ESMS Training Program”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Health and Safety/Accident Prevention Plan*
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-11, “Personal Protective Equipment”
- GG-12, “First Aid and Emergency Medical Response”
- GG-17, “Vehicle Fuelling and Spill Prevention”
- *ATV Rider Course: Student Handbook* (ATV Safety Institute, August 2010).

Figure 1: ATV Procurement, Operation, and Maintenance Process

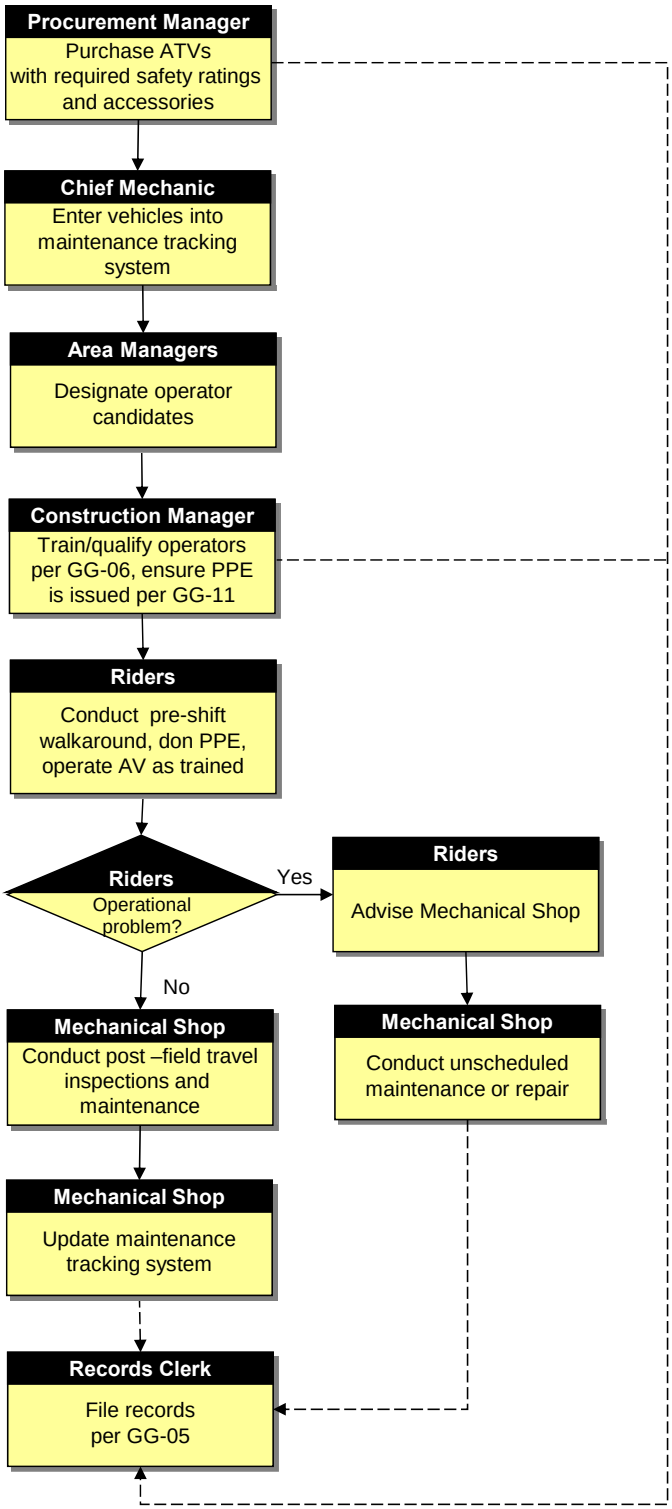


Figure 2: Vehicle Operator Qualification Card
(not to scale)

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines minimum requirements for chainsaw safety that must be complied with by all chainsaw operators working for the Guyana Goldfields, Inc. (GGI) Aurora Project. This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Occupational Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Chainsaw Kickback

Chainsaw kickback can cause severe injury or death, and occurs when a chainsaw blade suddenly jams or catches, so that the momentum of the chain causes the blade to spring back toward the operator. All chainsaws used on the Aurora Project must have a chain brake that immediately stops the chain if kickback occurs.

3.0 RESPONSIBILITIES

3.1 Qualified Chainsaw Instructor

One or more experienced logging supervisors or experienced and chainsaw operators will be selected by the Construction Manager, Environmental Manager, and Health and Safety Officer to serve as instructors for periodic classroom training and supervised on-the-job training (OJT) of all chainsaw operators.

3.2 Chainsaw Operators

Chainsaw operators are responsible for operating and maintaining chainsaws in strict conformance with this SOP and the manufacturer's recommendations for the make and model of saw assigned for their use.

3.3 Health and Safety Officer

The Health and Safety Officer shall monitor compliance with this SOP by conducting periodic inspections in accordance with SOP GG-03, “Field Inspections.”
.

4.0 PROCEDURE

4.1 Chainsaw Hazards

Chainsaws have many intrinsically dangerous characteristics and are potentially the source of very serious injuries and fatalities. Hazards include:

- Cuts, lacerations, or amputations caused by kickback or contact with a running chainsaw blade;
- Impact injuries from felling trees, or from cutting tree limbs or snags;
- Slips, trips and falls caused by poor footing on rough, slippery, steep, or uneven ground
- Burns caused by contact with hot motors,
- Forest or bush fires caused by careless fuelling of a saw with a hot motor, sparks generated while cutting, or fuel spills; and
- Fuel spills caused by improper fuelling procedures or inadequate training.

It is therefore imperative that the key considerations for chainsaw safety outlined in this SOP[1] and applicable manufacturers’ instructions be strictly complied with. ***Failure to comply with this SOP could have serious life safety consequences for individual operators or their co-workers***, and may result in disciplinary action, up to and including termination; see the GGI “Labour Grievance Procedure.”

4.2 Procurement of Approved Chainsaws

The GGI Procurement Manager will be permitted to purchase only those makes and models of chainsaws that meet widely recognized safety standards, such as CSA Standard Z62.3-96 or ANSI Standard B175.1-1991. All chainsaws must be equipped with the manufacturer’s approved user manual, and with a kickback-reducing device such as a chain brake, a low kickback chain, or a reduced kickback bar that is designed for the specific model of chainsaw.

[1] The primary reference for these requirements is the Prospectors & Developers Association of Canada (PDAC) “e3Plus: Excellence in Health and Safety e-toolkit (EHS)” Version-01, pages 98-102 (PDAC, 2009)

4.3 Operator Training Considerations

All chainsaw operators must be trained by qualified external consultants or one or more experienced senior staff members designated by the Construction Manager and Environmental Manager, in consultation with the Project Health and Safety Officer. Training programs shall be specific to the make and model of the chainsaw assigned to a prospective operator, and shall include review of the manufacturer's user manual and the specific functions of all factory-installed safety devices. Training shall include both the documented classroom and on-the-job training (OJT) options permitted by GG-06, "ESMS Training Program." All chainsaw operator training sessions shall, at a minimum, emphasize the following points:

- All chainsaws will be physically identified with a GGI tracking control number (painted or engraved); specific saws with be issued to specific operators, and the operator will be held responsible for the care and proper use of the saw while it is in their possession.

- Unauthorized removal of safety devices or modification of a chainsaw, including unauthorized cannibalization of non-functional saws for spare parts, is a highly dangerous practice and is strictly forbidden.

- Chainsaw parts (including chain bars) may NOT be interchanged between makes or models, unless such interchange is specifically allowed in the manufacturer's manual.

- Chain rakers may NOT be filed off; chain sharpening files and filing techniques may NOT deviate from the manufacturers' instructions.

- Mufflers and spark arrestors may NOT be removed.

- Use only manufacturer-approved bar oil only (used motor oil may NOT be used).

- Do not fuel a chainsaw when hot; let cool for at least 30 minutes. Use only premium grade fuel, mixed in strict accordance with the manufacturer's instructions, and stored in containers specifically designed for fuel (used plastic jugs originally intended for other purposes may NOT be used). Fuel must be stored in drip trays or other appropriate containment when in the field, in accordance with GG-14, "Handling and Storage of Hazardous Materials."

- All saws will be provided with blade covers, which must be replaced when the saw is not being used, is placed in storage, or is being transported.

- A fire extinguisher or supply of water should be kept near the field activity as well as a shovel, for extinguishing any small fires that may be started from chainsaw use in dry conditions.

- Chainsaws should be placed on the ground or a stable stump or log for starting; NEVER start a saw on a knee or while being held with one hand.

- Always carry the chainsaw with the motor shut off, the blade pointing backwards, and the chain guard in place.

- Chainsaws retained overnight in field camps shall not be stored directly on the ground.

- Chainsaws shall be returned to the Mechanical Shop for routine maintenance and verification of safety feature functionality on at least a monthly basis. No mechanical maintenance beyond cleaning or changing a spark plug or replacing a chain shall be attempted by a chainsaw operator in the field.

- When cutting, maintain full control over the saw at all times; make sure you have secure, balanced footing, and do not work in an awkward position. Clear debris away from the work area to improve footing. Never stand directly behind the chainsaw or straddle the saw while cutting, stand to one side to minimize injury from any potential kickback.

- To avoid kickback:

  - Inspect the chain to make sure it is in good working condition; check that the cutting teeth are properly sharpened. Dull chainsaws will kick back more frequently and with greater force.

  - Make sure that all parts are tight and the chain is at the proper tension.

  - Adjust the idle correctly; the blade must stop when the throttle trigger is released

  - NEVER cut with the tip of the blade.

  - Cut ONLY with the underside of the blade; never cut with the upper side of the blade unless it is absolutely necessary, such as when making an undercut on a limb to relieve tension.

  - When removing limbs, make sure the saw tip does not touch another branch. Make sure there are no hidden obstructions that the saw blade might hit and cause the tip to kickback.

  - NEVER cut with the saw held above shoulder height.

- Follow safe felling practices as follows:

- Operators shall plan the cut before starting, and seek the advice of a more experienced employee if uncertain about any aspect of the felling procedure.

- Operators must keep other workers at least two tree lengths away when felling a tree, and make sure they are aware of the operator's activity.

- Operators must assess the tree and the site for felling hazards, including the relative lean of the tree

- Operators shall examine the ground, the crown, the trunk and roots to check if the wood appears to be sound, as it is more dangerous to fell a tree with rot or potential root failure.

- Operators should determine whether or not the tree is under stress, as it may fall unpredictably when pressure is released as it is cut; special attention should be paid to branches or limbs that are bent or "pre-stressed", as they may spring back or break.

- Operators should note if the tree top is entangled in vines or with another tree; do not cut trees if the tops are obscured by fog or rain.

- Operators felling a tree must plan an escape route preferably two routes in different directions upgradient from the predicted direction of fall. Clear and walk the paths to remove tripping and slipping hazards before cutting. The escape routes should be about 135° from the planned direction of fall.

- Turn off the saw and immediately move along the exit pathway as the tree begins to fall.

4.4 Personal Protective Equipment

Always keep a first aid kit nearby; the kit should include a large pressure bandage and ties

All chainsaw operators will be issued the following personal protective equipment (PPE) in compline with GG-11, "Personal Protective Equipment":

- hard hat with ear muff-style noise protection;
- full-face safety shields;
- gauntlet-style leather gloves;
- chainsaw chaps (to be used when felling trees ONLY);
- cutter's pants (to be used when cutting alignments in the bush); and
- high leather or rubber boots with steel toes and non-skid soles.

4.5 Field Inspections

Compliance with the requirements of this SOP shall be monitored via periodic inspections conducted at the direction of Health and Safety Officer, in compliance with GG-03, “Field Inspections.” Any non-conformance noted in such inspections shall be collaboratively evaluated and resolved in accordance with GG-04, “Identification of Non-conformances and Corrective Preventive Action.”

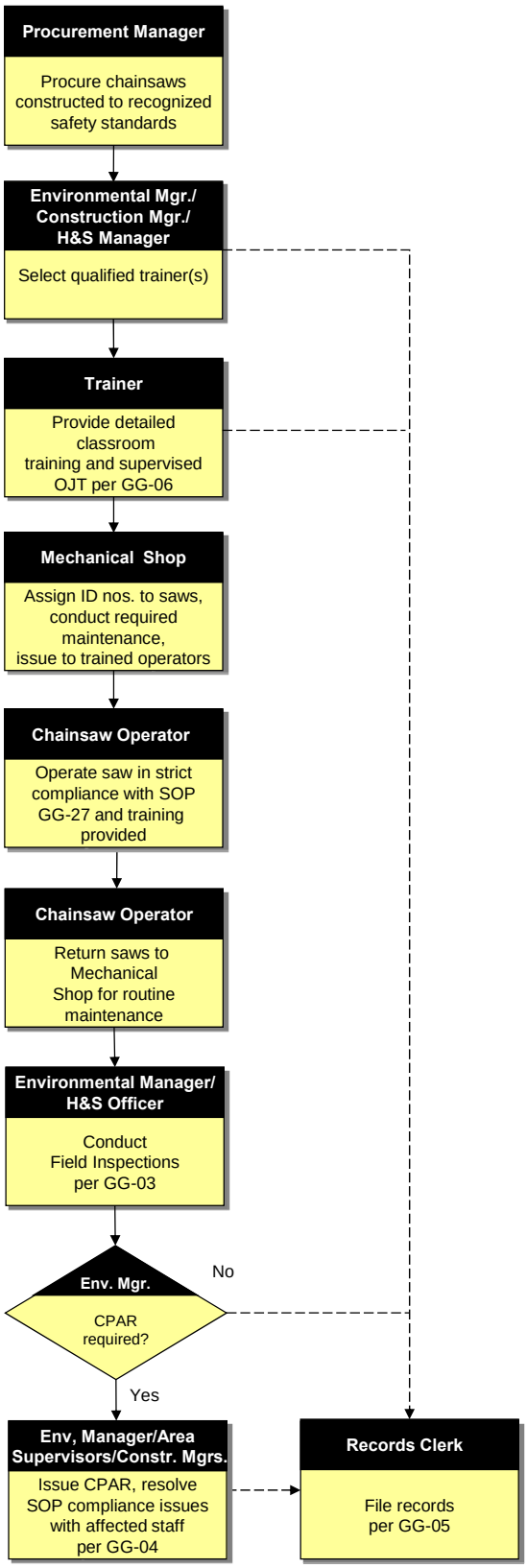
4.6 Records

Records of chainsaw assignment shall be retained by the Mechanical Shop; all training records shall be filed in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-03, “Field Inspections.” Any non-conformance noted in such inspections shall be collaboratively evaluated and resolved in accordance with
- GG-04, “Identification of Non-conformances and Corrective /Preventive Action.”
- GG-05, “Records Management”
- GG-11, “Personal Protective Equipment”
- GG-14, “Handling and Storage of Hazardous Materials”
- ANSI Standard B175.1-1991: “Safety Requirements for Gasoline Powered Chain Saws”
- CSA Standard Z62.3-96: “Chain Saw Kickback”
- “e3Plus: Excellence in Health and Safety e-toolkit (EHS)” Version-01, pages 98-102 (PDAC, 2009)

Figure 1: Management of Chainsaw Use



	STANDARD OPERATING PROCEDURE **GG-28: Heat Stress**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) defines a range of practices that Guyana Goldfields, Inc. (GGI) will use to minimize the potential for heat stress to be encountered by the Aurora Gold Project workforce, contractors, and site visitors. The Aurora Project site is located in a hot and humid tropical climate with temperatures that range from 22° C to 34 °C or higher. Although most workers are expected to be from the local area and relatively acclimatized to these conditions, there is still significant potential for heat stress to occur, especially in dry seasons. Additionally, visitors from other locales may be more prone to heat stress. Several factors contribute to heat stress in the work environment, including high temperature and humidity; direct sun or heat; limited air movement; physical exertion; poor physical condition; the effects of some medications; low individual tolerance for hot workplaces; and insufficient water intake.

This SOP will apply over the life of the Project; it supports Section 2.12 of the GGI *Occupational Health and Safety Management/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Heat Stroke

Heat stroke is a life-threatening heat related disorder that occurs when the body's temperature regulation abilities fail and body temperature rises to critical levels. The primary signs and symptoms of heat stroke are confusion, irrational behaviour, loss of consciousness, convulsions, a lack of sweating, hot dry skin, and an abnormally high body temperature.

If an individual shows signs of possible heat stroke, professional medical treatment should be obtained immediately. The worker should be placed in a shady, cooler area and their outer clothing should be removed. Douse the worker with cool water and circulate air to improve evaporative cooling. Provide the worker fluids, preferably water, but avoid caffeine.

2.2 Heat Exhaustion

A combination of excessive heat and dehydration can result in ***heat exhaustion***. Signs and symptoms include headache, nausea, dizziness, weakness, thirst, and giddiness. Fainting and collapse is often associated with heat exhaustion.

Workers suffering from heat exhaustion should be removed from the hot environment and given fluid replacement. They should be encouraged to rest and if possible, ice packs should wrapped in towels and applied to the core of the body.

2.3 Heat Cramps

Heat cramps can occur when performing hard physical labour in a hot environment. They have been attributed to an electrolyte imbalance caused by sweating and lack of water replenishment. Workers in hot environments should drink water every 15 to 20 minutes; carbohydrate-electrolyte replacement liquids (sports drinks) will also help alleviate symptoms.

2.4 Heat Rashes

The most common problem in hot work environments is a result of the skin being persistently wetted by unevaporated sweat, which can result in ***heat rashes*****.** Heat rash looks like a red cluster of pimples or small blisters and is more likely to occur on the neck, upper chest, groin, under the breasts, and in elbow creases. The best treatment for heat rash is to provide a cooler, less humid environment and keep the affected area dry.

3.0 Responsibilities

3.1 Health and Safety Officer

The Health and Safety Officer will be responsible for ensuring that supervisors and workers are trained on the prevention of heat stroke and other types of heat stress, and how to recognize early signs of heat intolerance such as weakness, unsteady gait, irritability, disorientation, changes in skin colour, or general malaise. The Health and Safety Officer shall ensure that adequate training is provided visitors to the site that may not be used to the heat.

3.2 Site Medics and First Aid Providers

Site Medics will provide medical care in the case of severe heat stress, i.e., heat stroke. First Aid Providers should be able to diagnose heat stress related conditions and provide medical care for less severe heat exhaustion, heat cramps, and heat rashes. First Aid Providers may also help diagnose heat stroke.

3.3 Supervisors

Supervisors will remain alert to the signs of heat stress and will act to remove employees or visitors from the heat if symptoms appear. Additionally, supervisors shall ensure that workers have shady places to rest and adequate supplies of cool water or other hydrating beverages available to the worksite.

3.4 All Employees

Throughout the work day, workers will make sure that they are drinking water or hydrating beverages on a regular basis. Workers will be encouraged to immediately report any heat-related problems that they experience or observe in fellow workers. Any worker exhibiting signs of heat stress and exhaustion should be made to rest in a shady location and drink plenty of water.

4 PROCEDURE

The following general practices are recommended for the prevention of heat stress.

- As part of induction training when first hired (see GG-06, “ESMS Training Program”), the Health and Safety Officer shall train all workers in the prevention and recognition of heat stress. Workers shall also be trained in the factors that may increase the risk of heat stress (e.g., physical fitness level), proper use of personal equipment, and the importance of reporting heat stress in its initial stages. Site visitors shall also be alerted to the potential for heat stress in their initial site briefings.

- Potable drinking water and other hydrating liquids (non-caffeinated) will be provided to workers; workers should be encouraged to drink 150-200 mL of water every half hour to an hour.

- Workers shall be encouraged to wear light clothing unless there are task-specific PPE requirements.

- When necessary, physical demands will be reduced by lessening requirements for extreme physical exertion, by increasing the number of workers doing a particular job, or by the assignment of relief workers.

- Recovery areas such as fan-cooled enclosures or rooms or other shaded areas will be provided where possible in order to allow intermittent rest periods.

- To the extent possible, hot jobs (e.g., welding and cutting) will be scheduled for the cooler part of the day, and major maintenance and repair work shall be scheduled for wetter seasons to the extent possible.

- PPE such as reflective clothing and wetted or water cooled garments can be effective in reducing heat stress.

5 REFERENCES

- GG-06, “ESMS Training Program”
- GGI *Occupational Health and Safety Management/Accident Prevention Plan*

	STANDARD OPERATING PROCEDURE **GG-29: Determination of Environmental and Social Aspects and Significant Impacts**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) defines the methods that Guyana Goldfields, Inc. (GGI) will use to periodically evaluate, refine, and update its understanding of the environmental and social aspects of Aurora Gold Project (Project) operations, based on the initial results of the final updated Environmental and Social Impact Assessment (ESIA) prepared for the Project.[1] This SOP guides the preparation of an annually updated register of environmental aspects and impacts, initially based on ESIA results, which will in turn be used over the life of the Project as a primary reference in determining appropriately prioritized objectives and targets for environmental and social performance improvements (see GG-30, "Environmental and Social Objectives, Targets, and Performance Improvement Program").

This SOP will apply over the entire life of the Aurora Gold Project, and directly supports the following Sections of the Project *Environmental and Social Management System Plan (ESMS Plan):*

- Section 3.2, "Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management Planning";
- Section 4.1, "Environmental, Social, and Health & Safety (ESHS) Objectives and Targets", and
- Section 4.2 , "ESHS Performance Improvement Management Program/Management Plans."

[1] See "Updated Environmental and Social Impact Assessment – Aurora Project, Guyana" (ENVIRON, 2013), Section 6.

2.0 DEFINITIONS

2.1 Environmental or Social Aspect

An ***environmental or social aspect*** is defined as any element of Aurora Gold Project operations that can interact with the environment and/or adjacent communities; social aspects are also considered to include aspects related specifically to human health and safety. Aspects may be positive or negative; ***significant aspects*** are defined as those aspects that have or can potentially have a substantial negative impact on human welfare, quality of life, or the environment. ***Regulated*** aspects are subject to external legal control through national laws and regulations.

2.2 Environment

The ***environment*** is defined as the natural and man-made physical surroundings in which GGI operates [e.g., the Aurora mine site, Tapir Crossing, the Barama (M3) road and Aurora extension, and the Buckhall logistics centre and river port], and includes air, water, land, natural resources, plants, animals, humans, and their interrelationships.

3. RESPONSIBILITIES

3.1 Area Managers

GGI Area Managers (or their designees) are responsible for assisting in the identification of environmental or social aspects specific to their assigned functional area or department, as part of the development of a Project-specific Environmental and Social Aspects Register (ESAR; see Figure 2).

3.2 Environmental Manager

The Environmental Manager or his designee will prepare the GGI ESAR and update it on at least an annual basis, with the assistance and participation of affected Area Managers, the Community Relations Manager, and other experienced staff as required. The Environmental Manager will evaluate environmental or social aspects to determine the relative significance of their impacts, and will recommend a threshold for undertaking formal improvement actions based on overall impact scores, as discussed in Section 4.

3.3 Chief Operating Officer (COO)

The GGI COO or their designee will review and approve the ESAR and the recommended numerical threshold for undertaking specific improvement actions.

4.0 PROCEDURE

The general process for periodically evaluating environmental aspects, creating or updating the GGI EAR, and setting an appropriate improvement action threshold is described in the following steps. This process is also summarized as a flowchart in Figure 1.

4.1 Environmental and Social Aspects Review

The Environmental Manager (with the assistance of other experienced environmental staff, as required) shall meet with the Area Managers on at least an annual basis to conduct a review of the environmental and social aspects associated with the operational areas for which they are responsible. Aspects will be identified and documented for activities in the following general categories:

- emissions to air;
- wastewater discharges and other releases to water;
- hazardous material management;
- solid waste;
- hazardous waste;
- transportation;
- raw materials/natural resource use (including energy use);
- impacts to plants and animals; and
- community/external stakeholder relations.

Brief descriptions shall be recorded on the ESAR (see Figure 2) for all aspects so identified, along with an indication of whether the associated environmental impacts are considered positive or negative.[2] Brief references shall be provided for any aspects known to be regulated, using the Regulatory Requirements Register (prepared in accordance with GG-31, "Development and Maintenance of Legal and Regulatory Requirements Register") as a primary reference. If any aspect is known to have an open regulatory compliance issue associated with it, the circumstances shall be noted. Any questions regarding regulatory applicability for a given aspect shall be referred to GGI's Legal Counsel for guidance.

4.2 Evaluation of Associated Impacts and Ranking of Relative Significance

In general, an aspect is likely to be considered <u>significant</u> if it is legally regulated (e.g., is related to a specific permit condition), or if one or more of the following conditions exist with regard to its associated environmental impacts:

- the scale of any associated environmental or social impacts is large;

[2] Environmental and social aspects noted in Section 6 of the Project ESIA (ENVIRON, 2013) shall be considered and entered in the first iteration of the ESAR.

- a high probability exists that such impacts will occur (i.e., they cannot be considered a rare event or transient condition);

- the impact has a long duration;

- the impact may result in regulatory or legal exposure;

- the impact is technically difficult or expensive to manage or to mitigate;

- the impact is known to be of substantial concern to local communities or external stakeholders; or

- the impact has the potential for negatively affecting the public image of GGI and/or the Aurora Gold Project.

The relative significance of the environmental impacts associated with all negative aspects shall be estimated using six basic factors, which include:

- the relative ***scale*** of the impact;

- the relative ***severity*** of the impact;

- the ***frequency*** or duration of the impact;

- the ***duration*** of the impact;

- GGI's ***ability to influence*** the scale, severity, frequency, or duration of the impact; and

- the potential for a negative ***image*** of GGI operations to be generated.

Each factor shall be ranked numerically from 1 to 5 on the basis of best professional judgement and institutional knowledge, with 5 representing the worst case scenario for all factors. For "ability to influence," a higher ranking will indicate a generally greater ability to influence, the assumption being that those issues that are clearly within GGI's ability to influence should be considered for more immediate action.

The rankings shall be added and the sum then multiplied by a probability factor of 0.1 to 1.0, 1.0 representing the most certain condition (i.e., highly likely to occur) and 0.1 being the most uncertain or least likely to occur. The resulting composite impact score shall be recorded on the ESAR.

4.3 Set Proposed Environmental Performance Improvement Threshold

The Environmental Manager shall review the draft of the ESAR compiled from input from all affected functional areas or departments. Based on the range of impact scores

presented, a proposed numerical threshold shall be recommended, above which objectives and targets for performance improvements will be established in the coming year, in accordance with GG-30, "Environmental and Social Objectives, Targets, and Performance Improvement Program." *Any aspect for which an open compliance issue is known to exist or for which a regulatory deadline is pending shall categorically be considered to be significant, regardless of impact score,* and shall be prioritized for improvement or action through the process described in GG-30.

4.4 ESAR Review and Approval

The completed ESAR and proposed threshold for undertaking improvement actions shall be submitted to the COO or their designee for review and approval. All comments shall be resolved to the reviewers' satisfaction, and the document updated accordingly prior to releasing for controlled distribution (see Section 4.6) and further use.

4.5 Review Adequacy of Current Operational Controls

All aspects determined to be *significant* (i.e., that have impact scores at or above the approved action threshold) shall specifically require the development and implementation of appropriate planning and procedural controls per Section 4.3 ("Operational Control') of the GGI *ESMS Plan*. However, the Environmental Manager shall also make a general evaluation of those aspects with scores <u>below</u> the threshold described above, in order to ensure that current procedures, plans, or instructions are adequate to at least maintain current levels of performance. If any modifications or improvements are needed, the Environmental Manager shall take the necessary steps to initiate appropriate planning or procedural changes. The results of this review shall be summarized in a brief memorandum to file and retained in records as noted in Section 4.7.

4.6 Distribution of Approved ESAR

The approved ESAR shall be distributed at the direction of the Environmental Manager for use in creating objectives and targets and performance improvement plans for the following year, per GG-30, "Environmental and Social Objectives, Targets, and Performance Improvement Program" and for consideration in establishing or upgrading operational or mitigation plans and supporting SOPs per Section 4.3 of the *ESMS Plan.*

4.7 Records

A hard copy of each updated ESAR and the review memorandum noted in Section 4.5 shall be filed and maintained in accordance with GG-05, "Records Management."

5.0 REFERENCES

- ENVIRON, 2013. “Updated Environmental and Social Impact Assessment – Aurora Project, Guyana. Environmental Internal Corp, Washington DC. June 2103.
- GGI *ESMS Plan*
- GG-05, “Records Management”
- GG-30, “Environmental and Social Objectives, Targets, and Performance Improvement Program”
- GG-31, “Development and Maintenance of Legal and Regulatory Requirements Register”

Figure 1: Environmental Aspects/Significant Impacts Determination Process

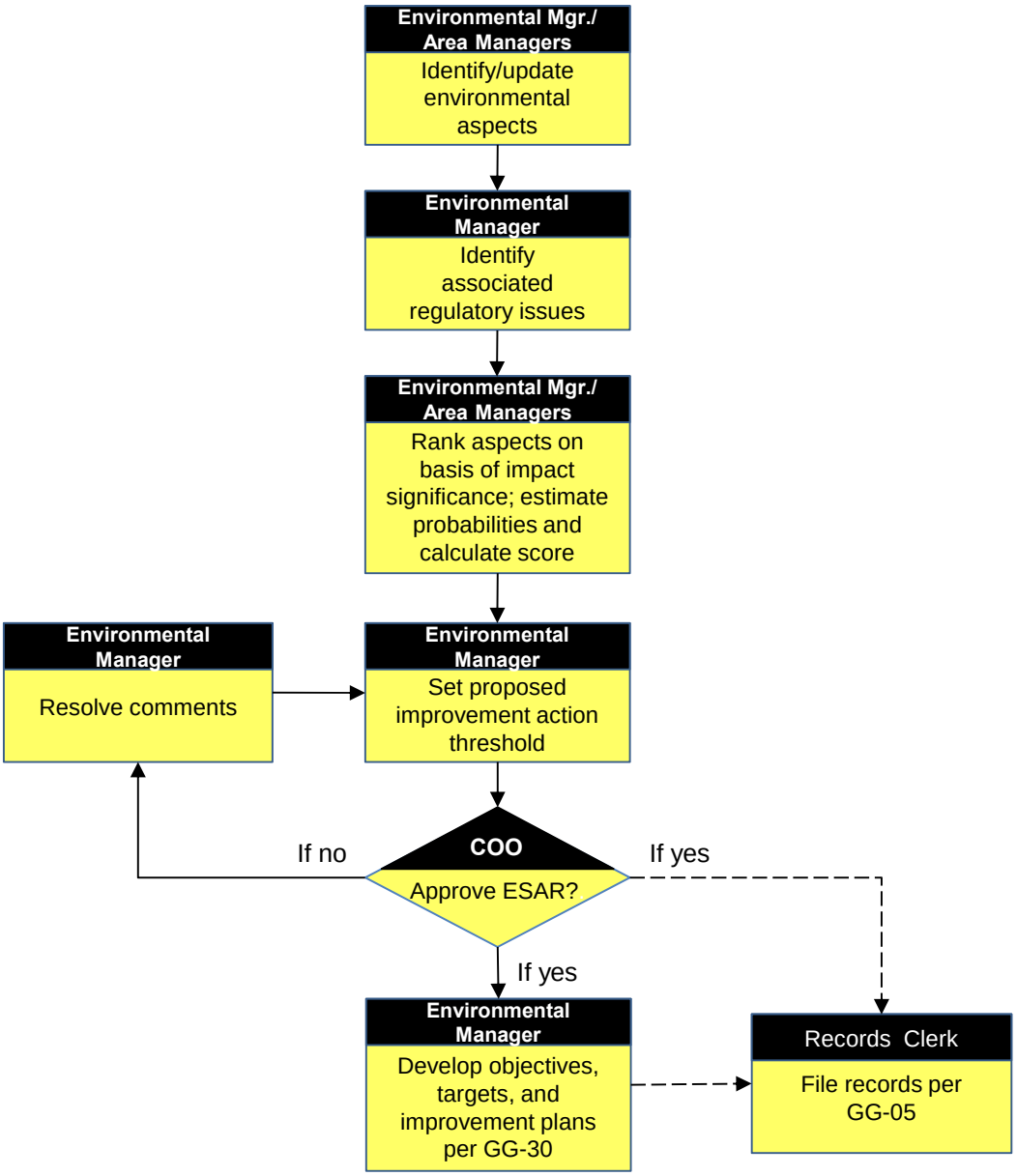


Figure 2: Environmental Aspects Register Format

Environmental and Social Aspects Register (ESAR)

Approved by: _____ Approved by: _____ Issue Date:_____ Improvement Action Threshold Number : _____

COO Environmental Manger

Aspect Category	*Aspect Description*	*+ or – impacts?*	*Regulated? If so, provide citation; flag any aspects with open regulatory issues*	*Impact significance Ranking (- aspects only)*							*Impact Score*
				Scale	*Severity*	*Frequency*	*Duration*	*Ability to influence*	*Image*	*Probability factor (X)*	
Emissions to air											
Wastewater discharges and other releases to water											
Hazardous material management											
Solid waste											
Hazardous waste											
Transportation											
Raw materials/natural resource/energy use											
Impacts to plants and animals											
Community issues/external stakeholder relations											
Occupational health and safety											

	STANDARD OPERATING PROCEDURE **GG-30: Environmental and Social Objectives, Targets, and Performance Improvement Program**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) defines the methods that Guyana Goldfields, Inc. (GGI) will use to periodically determine appropriately prioritized objectives and targets for environmental and social (including human health and safety) performance improvements at the Aurora Gold Project. At a minimum, such targets will be determined for those environmental and social aspects with impacts deemed to be "significant" by the process described in SOP GG-29, "Determination of Environmental and Social Aspects and Significant Impacts."

This SOP will apply over the entire life of the Aurora Gold Project, and directly supports the following Sections of the Project *Environmental and Social Management System Plan (ESMS Plan):*

- Section 3.2, "Social and Environmental Aspects and Impacts, Risk Assessment, and Risk Management Planning";
- Section 4.1, "Environmental, Social, and Health & Safety (ESHS) Objectives and Targets", and
- Section 4.2 , "ESHS Performance Improvement Management Program/Management Plans."

2.0 DEFINITIONS

2.1 Environmental or Social Aspect

An ***environmental or social aspect*** is defined as any element of Aurora Gold Project operations that can interact with the environment and/or adjacent communities; social aspects are also considered to include aspects related specifically to human health and safety. Aspects may be positive or negative; ***significant aspects*** are defined as those aspects that have or can potentially have a substantial negative impact on human

welfare, quality of life, or the environment. ***Regulated*** aspects are subject to external legal control through national laws and regulations.

2.2 Environment

The ***environment*** is defined as the natural and man-made physical surroundings in which GGI operates [e.g., the Aurora mine site, Tapir Crossing, the Barama (M3) road and Aurora extension, and the Buckhall logistics centre and river port], and includes air, water, land, natural resources, plants, animals, humans, and their interrelationships.

2.3 Environmental or Social Objective

An ***environmental or social objective*** is defined as an overall environmental or social goal, consistent with GGI's Human Resources, Community Relations, and Environmental, Health, and Safety Policies (see *ESMS Plan* Appendix C), which GGI intends to achieve by means of the processes described in this procedure.

2.4 Environmental or Social Target

An ***environmental or social target*** is defined as a detailed performance requirement applicable to all or part of Aurora Gold Project operations, that is based on an environmental or social objective and provides the incentive or structure by which such objectives can be achieved.

2.5 Performance Indicators

Performance indicators are quantitative, semi-quantitative, or qualitative measurement tools that many be established to support the evaluation of environmental or social performance, or the monitoring of progress with respect to the achievement of a specific target.

3. RESPONSIBILITIES

3.1 Area Managers

GGI Area Managers (or their designees) are responsible for assisting in the identification of environmental and/or social aspects specific to their assigned functional area or department, as part of the development of a Project-specific Environmental and Social Objectives and Targets Register (ESOTR; see Figure 2).

3.2 Environmental Manager

The Environmental Manager or designee will prepare the GGI EOTR and update it on at least an annual basis, with the assistance and participation of other experienced staff as required. The Environmental Manager will evaluate significant environmental aspects as

documented in the current approved Environmental Aspects Register (EAR; see SOP-01, “Determination of Environmental Aspects and Significant Impacts” and develop appropriate objectives, targets, performance indicators, as well as appropriately detailed Environmental or Social Action Plans (ESAPs; see Figure 4) for undertaking specific performance improvement actions, as discussed in Section 4.

3.3 Chief Operating Officer (COO)

The GGI COO will review and approve the ESOTR and the recommended ESAPs as part of annual management review process described in GG-34, “Management Reviews.”

4.0 PROCEDURE

The general process for periodically evaluating GGI’s significant environmental and social aspects and creating or updating the GGI ESOTR and associated ESAPs is described in the following steps. This process is also summarized as a flowchart in Figure 1.

4.1 Prioritization of Significant Aspects

The Environmental Manager shall review the current approved Environmental and Social Aspects register (ESAR) developed under GG-29, “Determination of Environmental and Social Aspects and Significant Impacts.” Ranked aspects shall be entered into the ESOTR worksheet (see Figure 2). Regulatory status shall also be described; see the Regulatory Requirements Register prepared under GG-31, “Development and Maintenance of Legal and Regulatory Requirements Register.”

The adequacy of current operational controls (e.g., current operational plans, impact mitigation plans, or SOPs) shall also be considered. If found to be missing for any noted significant aspect, the Environmental Manager shall initiate action as necessary to fill the noted planning gap, in parallel with the completion of the ESOTR. If new SOPs are required, they shall be prepared in accordance with GG-02, “Preparation, Review, Approval, and Update of Standard Operating Procedures.” Once approved, new plans or SOPs shall be distributed for use in accordance with GG-07, “Distribution and Control of ESMS Documents” and appropriate training actions initiated in compliance with GG-06, “ESMS Training Program.”

Each significant aspect will be prioritized using the logic chart included as Figure 3, which is focused on first resolving those issues for which the greatest potential financial or legal liability exists. Six potential priority designations should be considered, which are explained in the following paragraphs:

- **Priority 1** aspects are defined as those ***negative significant*** aspects for which there is a ***known lack of regulatory compliance*** and a ***pending regulatory***

deadline. Lack of compliance is a condition that may represent substantial legal and financial liabilities to GGI, and is contrary to GGI's Environmental, Health, and Safety Policy (see *ESMS Plan* Appendix C). If multiple Priority 1 aspects are noted, they will be prioritized further on the basis of their associated regulatory deadlines or due dates.

- **Priority 2** aspects are also ***negative, significant***, and have a ***known lack of regulatory compliance***, but do not have a pending regulatory deadline. If multiple Priority 2 aspects are noted, they will be prioritized further on the basis of their original ESAR impact scores.

- **Priority 3** aspects are ***negative*** and ***significant***, but are not out of compliance. If multiple Priority 3 aspects are noted, they will be prioritized further on the basis of their original ESAR impact scores.

- **Priority 4** aspects consist of all remaining ***negative*** aspects with ***impact scores above the annually established threshold*** for improvement action. Priority 4 aspects will be prioritized further on the basis of their original ESAR impact scores.

- **Priority 5** aspects consist of all remaining ***negative*** aspects with ***impact scores below the annually established threshold*** for improvement action. Priority 5 aspects will be prioritized further on the basis of their original ESAR impact scores.

- **Priority 6** aspects are categorically ***positive***, and as such will not be candidates for improvement actions until all Priority 1-5 items are resolved or effectively mitigated. If multiple Priority 6 aspects are identified, they shall be further prioritized for improvement action at management's discretion.

4.4 Objectives, Targets, and Performance Indicators

The Environmental Manager shall prepare appropriate objective and targets for each prioritized aspect, and record the information on the ESOTR. Targets may be devised that if achieved, would also fully achieve the associated objective. Targets may also be incremental; the rate of progress may vary with the nature and complexity of the objective and the availability of resources, as long as achievement of the target will also represent a credible step towards achievement of the objective. Appropriate performance indicators may be added at the Environmental Manager's discretion as an aid in monitoring progress towards the achievement of specific performance improvement targets over the next fiscal year.

An example of a potential environmental objective, target, and performance indicator sequence is provided as follows:

- **Example Significant Aspect:** Use of fresh water for process use.

- **Example Significant Impact:** Overuse or diversion of fresh water in seasonally low flow conditions may potentially impact biota and minimum biological base flows needs.

- **Example Objective:** Reduce fresh water needs in order to provide additional biological buffer in low flow (dry season) conditions.

- **Example Target:** Achieve 5% reduction in fresh water needs by end of calendar year (CY) 20XX.

- **Example Performance Indicator:** Current volume of monthly process water provided by the Fresh Water Pond, as a percentage of average monthly usage rates over previous 2 years.

An example of a potential social objective, target, and performance indicator sequence is also provided as follows:

- **Example Significant Aspect:** Traffic hazards from the transportation of materials and equipment from Buckhall to the Aurora site..

- **Example Significant Impact:** Heavy Project traffic increases the potential for accidents involving Barama employees or residents of the Buckhall community.

- **Example Objective:** Prevent traffic accidents involving Barama employees, residents of the Buckhall community

- **Example Target:** Achieve and maintain a zero traffic accident rate on the Barama (M3) road.

- **Example Performance Indicator:** Quarterly accident rate involving GGI or contractor vehicles and Barama employees or residents of the Buckhall community.

4.5 Preparation of Environmental or Social Action Plans (ESAPs) for Next Fiscal Year

The Environmental Manager will summarize specific proposed actions on the draft ESOTR for each significant aspect, which should be designed to help GGI achieve the proposed target over the next fiscal year. As previously noted, all actions necessary to achieve a specific objective do not necessarily need to be taken in a given year, but the proposed action should represent a demonstrable improvement that will ultimately help GGI meet the underlying objective. The proposed action shall form the basis of an ESAP (see Figure 4) that identifies organizational responsibilities and support needs, budget requirements, procurement or contracting needs, schedule requirements, and

other information necessary to complete the required action. Progress reporting requirements and schedules should also be defined as necessary to support any specified performance indicators.

4.6 Management Review

The completed draft EOTR and EAPs will be presented to the COO for evaluation as part of the Management Review process described in Section 7.5 of the GGI *ESMS Plan* and GG-34, "Management Reviews." All comments shall be resolved and the ESOTR and associated ESAPs updated accordingly. Once approved, the ESAPs may be issued to the department or individuals responsible for completion of the required action.

4.7 Progress Monitoring

The organization or individuals responsible for completion of approved ESAPs shall report progress to the Environmental Manager in manner specified in the ESAP, with data provided to support the required performance indicator or as otherwise specified.

4.8 Records

Hard copies of each approved ESOTR and final issued ESPs shall be filed and maintained in accordance with GG-05, "Records Management", as well as records copies of any newly prepared plans or SOPs and associated training records.

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-02, "Preparation, Review, Approval, and Update of Standard Operating Procedures"
- GG-05, "Records Management"
- GG-06, "ESMS Training Program"
- GG-07, ""Distribution and Control of ESMS Documents"
- GG-29, "Determination of Environmental and Social Aspects and Significant Impacts"
- GG-31, "Development and Maintenance of Legal and Regulatory Requirements Register"
- GG-34, "Management Reviews"

Figure 1: Objectives and Targets Development/Action Planning Process

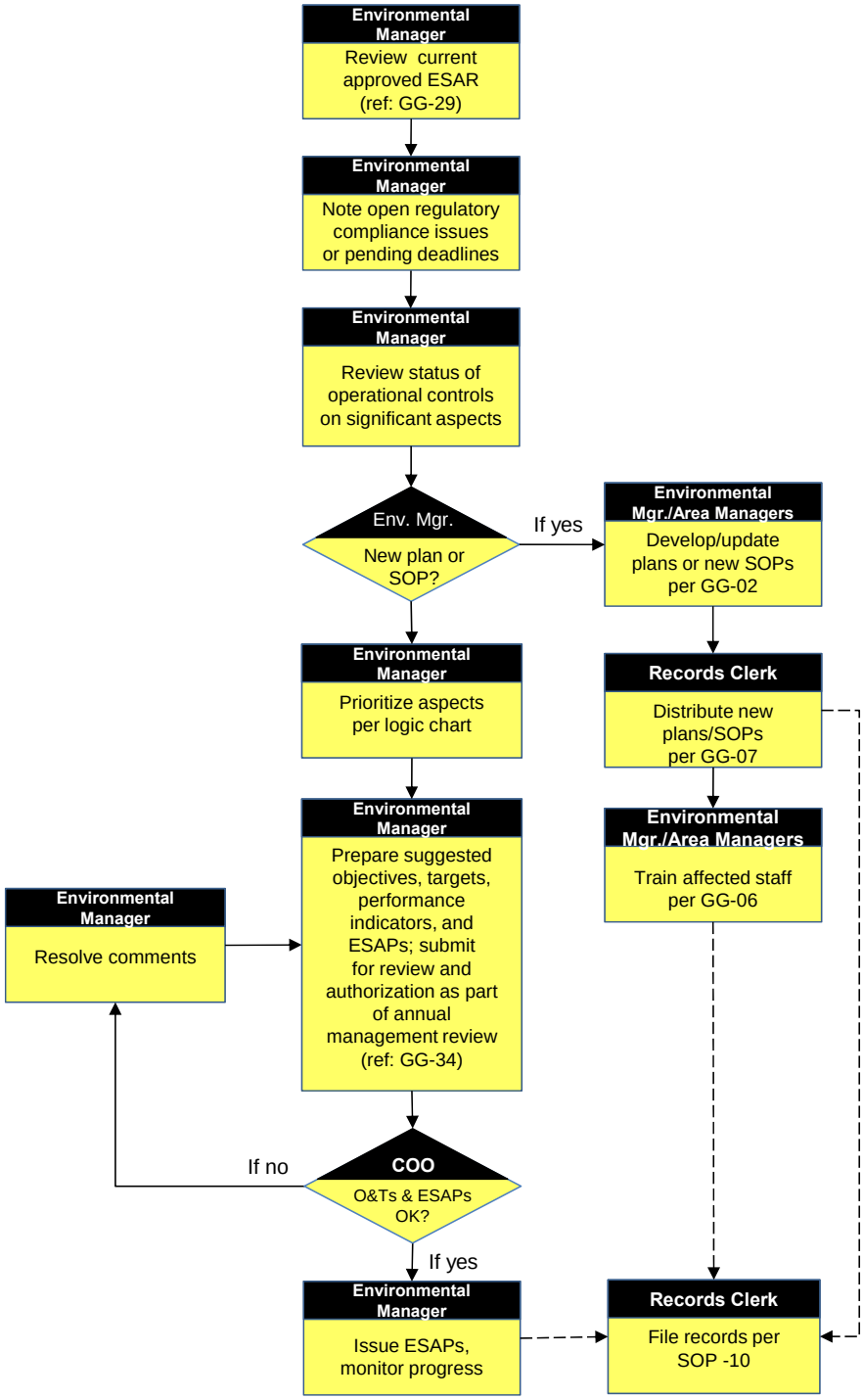


Figure 2: Environmental and Social Objectives and Targets Register Format

Environmental and Social Objectives and Targets Register (ESOTR)

Approved by: _____ Approved by: _____ Issue Date:_____

COO Environmental Manager

Aspect Category	*Significant Aspect Description*	*Regulated? If so, provide citation; flag any aspects with open regulatory issues*	*Impact Score*	*Priority Group*	*Objective*	*Target*	*Performance Indicator*
Emissions to air							
Wastewater discharges and other releases to water							
Hazardous material management							
Waste management							
Transportation							
Raw materials/natural resource/energy use							
Impacts to plants and animals							
Community issues/external stakeholder relations							
Occupational health and safety							

Figure 3: Logic Chart for Prioritizing Significant Environmental Aspects

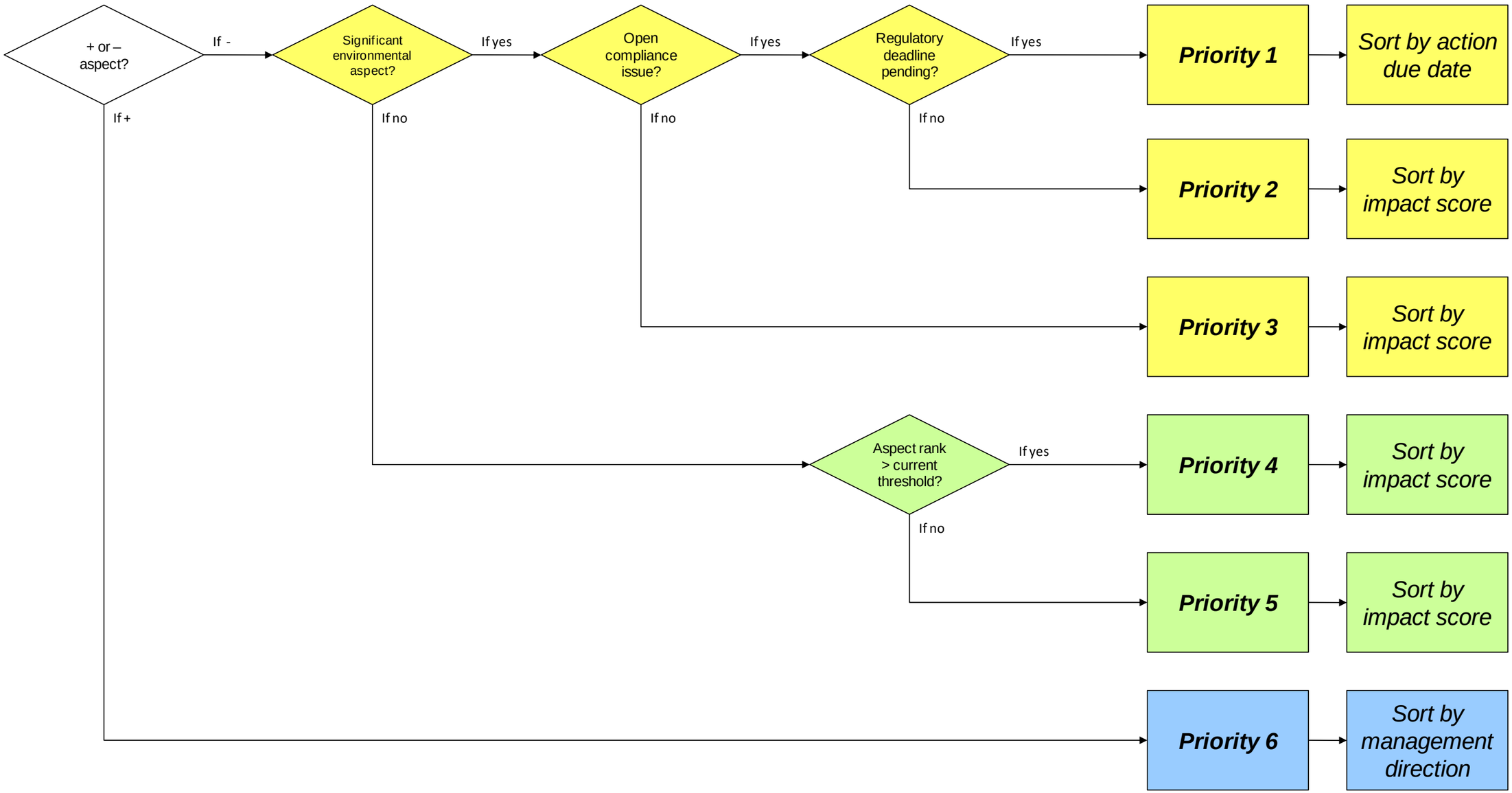


Figure 4: Environmental or Social Action Plan (ESAP) Format

ENVIRONMENTAL OR SOCIAL ACTION PLAN (ESAP)		
Prepared by: Environmental Manager	Approved by: COO	Issue date:
Description of Significant Aspect:		
Objective:	Target:	

Required Improvement Actions or Tasks	Responsible Individual or Department	Due Date

Budgetary Considerations/Requirements:
Reporting Requirements and Schedule:

	STANDARD OPERATING PROCEDURE **GG-31: Development and Maintenance of Legal and Regulatory Requirements Register**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: October 20, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the methods used by Guyana Goldfields, Inc. (GGI) to document and maintain its understanding of 1) the legal, regulatory, and other requirements that will apply to Aurora Project activities in all phases of mine life, as well as 2) any associated permitting, planning, operating, monitoring, or reporting requirements. These requirements will be documented in a master Regulatory Requirements Register that will serve to guide permit application, planning, and monitoring activities in day-to-day operations.

The Regulatory Requirements Register discussed in this procedure will be evaluated and updated, as necessary, on at least an annual basis, or when prompted by regulatory changes or significant policy, process, or facility changes that could affect the Project's permit conditions or regulatory compliance status. These documents will also be verified and used as a primary reference in periodic regulatory compliance audits (see GG-32, "Regulatory Compliance Verification Audits").

This SOP will apply over the life of the Aurora Project; it supports Section 3.1 ("Legal and Other Requirements") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Environmental or Social Aspect

An environmental or social aspect is defined as any element of Aurora Project activities or processes that can interact with the environment, the workforce, or local communities, at any phase in the Project. Aspects are considered significant if they can potentially have a substantial negative impact on the environment, or the health, safety, or well-being of the workforce, local communities, contractors, or site visitors. Regulated aspects are subject to control under the laws or regulations of the nation of Guyana.

2.2 Environment

The environment is defined as the physical surroundings in which GGI operates (e.g., mine, mill, the Aurora to Buckhall road, the Aurora man-camp and supporting infrastructure, Tapir Crossing, Buckhall), and includes air, water, land, natural resources, plants, animals, humans, and their interrelationships.

2.3 "Other" Requirements

"Other" requirements are defined as voluntary industry-specific guidelines, lending institution guidelines, or other requirements that may not be specifically required by governing permits or regulations, but that GGI management chooses to adopt as a matter of policy, using the same general level of control that would be afforded an actual regulatory requirement. Examples of "other" requirements applicable to the Aurora Project include:

- the International Cyanide Management Code [ICMC; International Cyanide Management Institute (ICMI), 2012)];
- the World Bank/International Finance Corporation (IFC) "Environmental, Health and Safety Guidelines for Mining" (IFC, 2007); and
- the IFC environmental and social Performance Standards (IFC, 2012).

3.0 RESPONSIBILITIES

3.1 Legal Counsel

Legal Counsel for the Aurora Project shall coordinate with the Environmental Manager in the identification of legal, regulatory, and other requirements that apply to all phases and aspects of Project operations. Legal Counsel is responsible for maintaining access to websites, governmental gazettes, and other sources of information defining current and pending regulations, and for periodically updating the Regulatory Requirements Register as necessary to address any new regulations, or revisions to previously identified regulations. Legal Counsel shall also engage the Operations Manager and Environmental Manager in discussion of specific permit requirements, and work with them to ensure that level of effort necessary for permit preparation, reviews, and approval is properly scheduled and budgeted.

3.2 Environmental Manager

The Environmental Manager responsible for preparing and periodically updating the Regulatory Requirements Register, with the assistance of Legal Counsel and the Operations Manager

3.3 All Personnel

GGI personnel are responsible for participating in the training programs established by GG-06, "ESMS Training Program" and thereby developing a working understanding of the regulatory compliance requirements applicable to their specific work areas. All personnel shall notify their supervisors, the Environmental Officer or Health and Safety Officer, or the Environmental Manager regarding any spills, accidents, equipment malfunctions, environmental conditions, or unsafe practices or conditions that could be a potentially significant environmental or social impact, or a violation of a permit conditions or other regulatory compliance requirement.

4.0 PROCEDURE

The process for creating and updating the Aurora Project Regulatory Requirements Register) is described in the following steps and summarized as a flowchart in **Figure 1**.

4.1 Conduct Legal and Regulatory Requirements Review

On at least an annual basis (or when prompted by significant facility changes or notifications of regulatory changes), the legal, regulatory, and "other" requirements applicable to Aurora Project activities shall be reviewed by Legal Counsel with the assistance of the Environmental Manager. Legal Counsel shall maintain access to the permit requirements, regulatory requirements databases, reference documents, government gazettes, and other information as necessary to support the completion and update of a complete and accurate listing of permits and other regulatory requirements. At a minimum, permit requirements and the applicability of any regulatory and other requirements shall be evaluated for the following issues, as applicable to the current phase of mine life:

- exploratory investigations, including acquisition of soil and water samples (surface and subsurface), management of exploration wastes, and stabilization/restoration of exploration sites,
- hazardous materials and hazardous waste management;
- transportation, storage, and use of sodium cyanide reagent;
- purchase, transportation, storage, and use of explosives;
- usage and maintenance of roadways between the Aurora and Buckhall sites;
- generation and transmission of electrical power;
- site and transportation security (including communications requirements involving police or military and regulations on small arms use);

- non-hazardous solid waste management, including construction and permitting of landfills at Aurora and Buckhall;
- extraction or abstraction of water resources;
- wastewater discharges;
- erosion control and stormwater management;
- air emissions (including greenhouse gases);
- protection of biodiversity/threatened or endangered species;
- emergency preparedness and response planning and community outreach issues;
- spill response; and
- hazardous materials/hazardous waste worker training.

It is recognized that in Guyana, regulations may not always be promulgated in the subject areas suggested by this list; however, the list should be revisited in each review in order to detect the potential introduction of regulatory changes.

4.2 Preparation and Update of Regulatory Requirements Register

Legal Counsel shall document all regulatory requirements identified in the review discussed in Section 4.1 in a Regulatory Requirements Register (see **Figure 2**). Any specific permitting, planning, monitoring, and/or reporting requirements prompted by the governing regulation shall be summarized in the last column of the register, or cross-references provided to appropriate documents. A master list of permit requirements and associated agency or directorate contacts shall also be prepared that encompasses all phases of the Project, using the Master Permits List format specified in **Figure 3**.

4.3 Review

The completed Regulatory Requirements Register and all subsequent updates shall be submitted to the VP, Aurora Project for final review and approval. All review comments shall be resolved before distribution.

4.4 Controlled Distribution

The approved Regulatory Requirements Register and Master Permits List will be distributed in accordance with GG-07, “Distribution and Control of ESMS Documents” as necessary to support 1) permit preparation and submittal actions; 2) the monitoring and reporting activities described by the Aurora Project *Environmental and Social Monitoring Plan;* and 3) the processes described in:

- GG-29, ""Determination of Environmental and Social Aspects and Significant Impacts";
- GG-30, "Environmental and Social Objectives, Targets, and Performance Improvement Program"; and
- GG-32, "Regulatory Compliance Verification Audits."

4.5 Training

Training shall be conducted for all employees whose job descriptions require an understanding of the permitting process, permit requirements, and other regulatory compliance requirements, in accordance with GG-06, "ESMS Training Program." Training shall be conducted by or at the direction of Legal Counsel or the Environmental Manager.

4.6 Compliance Audits

At least once every two years, the Environmental Manger shall schedule internal compliance audits in accordance with GG-32, "Regulatory Compliance Verification Audits." As noted in GG-32 the scope of such audit will include independent verification of the accuracy of the current version of the Regulatory Requirements Register and Master Permits List developed under this SOP. Legal Counsel shall update the list and register as necessary as part of the resolution of audit findings, as also discussed in GG-32.

4.7 Records

Record copies of all current and superseded versions of the Regulatory Requirements Register, the Master Permits List, and associated training and compliance audit records shall be retained in accordance with GG-05, "Records Management."

5.0 REFERENCES

- ICMI, 2012; *International Cyanide Management Code;* accessed at http://www.cyanidecode.org/pdf/thecode.pdf; International Cyanide Management Institute, Washington, D.C., USA, July 2012.
- IFC, 2007; "Environmental, Health and Safety Guidelines for Mining", December 10, 2007; accessed online at http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_Mining/$FILE/Final+-+Mining.pdf ; World Bank Group/International Finance Corporation, Washington, DC. 2007.
- IFC, 2012; Performance Standard 1, "Assessment and Management of Environmental and Social Risks and Impacts", Version January 1, 2012; accessed online at http://www.ifc.org/ ifcext/sustainability.nsf/AttachmentsByTitle/pol_Performance Standards2006_full/$FILE/IFC+Performance+Standards.pdf ; World Bank Group/International Finance Corporation, Washington, DC. 2011.
- GGI *ESMS Management Plan*
- GGI *Environmental and Social Monitoring Plan*

- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-07, “Distribution and Control of ESMS Documents”
- GG-29, ““Determination of Environmental and Social Aspects and Significant Impacts”
- GG-30, “Environmental and Social Objectives, Targets, and Performance Improvement Program”
- GG-32, “Regulatory Compliance Verification Audits”

Figure 1: Preparation and Maintenance of Regulatory Requirements Register and Master Permits List

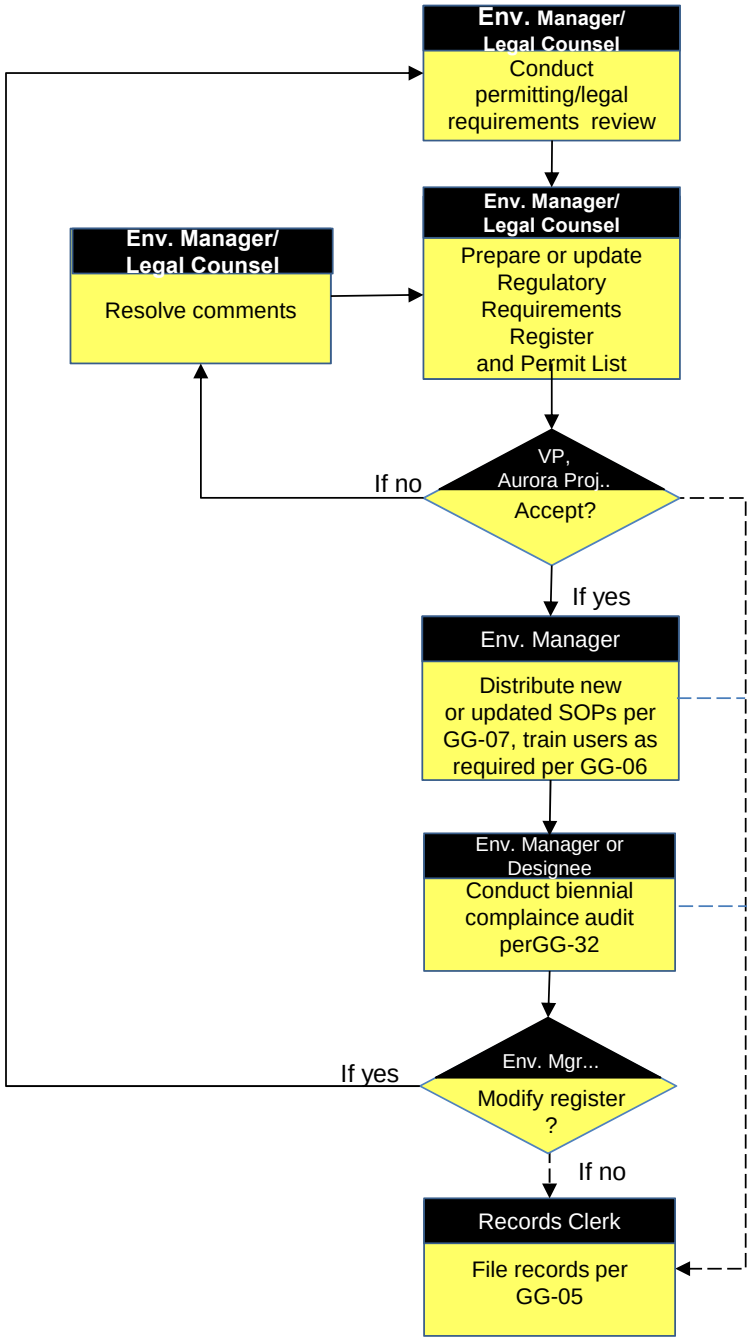


Figure 2: Regulatory Requirements Register

Aurora Project – Regulatory Requirements Register

Last updated: _____ By: _____
Legal Counsel

Regulated Area	Applicable Regulation or Standard	Associated Permit, License, or Agreement	Summary Description of Requirement	Permitting, planning, monitoring, and/or reporting requirements (summary)
Exploratory investigations				
Hazardous waste				
Hazardous materials (general)				
Hazardous materials (sodium cyanide)				
Purchase, transportation, storage, and use of explosives				
Transportation of concentrate				
Usage and maintenance of roadways				

Regulated Area	Applicable Regulation or Standard	Associated Permit, License, or Agreement	Summary Description of Requirement	Permitting, planning, monitoring, and/or reporting requirements (summary)
Transmission and usage of Electrical power				
Site and transportation security				
Non-hazardous solid waste management				
Extraction or abstraction of water resources				
Wastewater discharges				
Erosion control and stormwater management				
Air emissions (including greenhouse gases)				
Protection of biodiversity/threatened or endangered species				
Emergency preparedness and response planning and community outreach				

Regulated Area	Applicable Regulation or Standard	Associated Permit, License, or Agreement	Summary Description of Requirement	Permitting, planning, monitoring, and/or reporting requirements (summary)
Spill response				
Hazardous materials/hazardous waste worker training				
To be determined (TBD)				
TBD				

Figure 3: Master Permits List

Aurora Project – Master Permits List

Last updated: _____ By: _____
Legal Counsel

Project Phase or Activity	Applicable Regulation or Standard	Associated Permit or License	Responsible Agency/ Contact Information	Summary of Approval Conditions	Current status (In Preparation, Submitted, Approved)
Exploration					
Construction					
Operations					

Project Phase or Activity	Applicable Regulation or Standard	Associated Permit or License	Responsible Agency/ Contact Information	Summary of Approval Conditions	Current status (In Preparation, Submitted, Approved)
Decommissioning and closure					
Postclosure					

	STANDARD OPERATING PROCEDURE **GG-32: Regulatory Compliance Verification Audits**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) defines the methods that the Guyana Goldfields, Inc. (GGI) Aurora Gold Project (Project) shall use to periodically verify compliance with applicable environmental regulations and other requirements. The current version of the Regulatory Requirements Register developed in accordance with GG-31, "Development and Maintenance of Legal and Regulatory Requirements Register" shall serve as the basis of the compliance verification audit. This SOP will apply over the construction, operations, and decommissioning/closure phases of the Project, and supports Section 3.1("Legal and Other Requirements") and 7.2.2 ("Regulatory Compliance Verification Audits") of the Project *Environmental and Social Management System Plan (ESMS Plan).*

2.0 DEFINITIONS

2.1 Compliance Verification Audit

A ***compliance verification audit*** is a comprehensive annual review of the regulatory compliance status of Aurora Gold Project operations sites.

2.2 Compliance Verification Auditor or Audit Team

The ***compliance verification auditor*** for a compliance verification audit shall be a (or, if an ***audit team*** is assigned, shall include at least one) compliance specialist well-versed in applicable permit requirements and World Bank/International Finance Corporation (IFC) environmental and occupational health and safety regulations. Selection of the compliance verification auditor or audit team is at the discretion of the Environmental Manager.

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager is responsible for scheduling annual compliance verification audits, selecting the Audit Team Leader, and for appointing any other members of the audit team. The Environmental Manager shall also review all resulting compliance verification audit reports, and initiate any required corrective and preventive action requests (CPARs) per GG-04, "Identification of Nonconformances and Corrective/ Preventive Action." The Environmental Manager shall also direct any required updates to the Regulatory Requirements Register (see GG-31, "Development and Maintenance of Legal and Regulatory Requirements Register") that may be detected in the audit. All or a portion of these responsibilities may be delegated to another appropriate management representative.

4.0 PROCEDURE

The regulatory compliance audit process is described in the following steps and is summarized as a flowchart in Figure 1.

4.1 Schedule Annual Compliance Verification Audit

The Environmental Manager shall contact the Construction Manager (or, during the operational phase of the Project, the Operations Manager) and schedule the compliance verification audit, giving due consideration to the need to minimize disruption to routine operations. A memo confirming the schedule so established shall be issued, with a copy forwarded to the VP, Aurora Project and GGI's Legal Counsel. All audit reports shall be considered to be proprietary and confidential materials.

4.2 Select Audit Team Leader and Members

The Environmental Manager shall select an appropriately qualified compliance auditor or audit team. The auditor (and/or the audit team members) may be a GGI employee or an external consultant. All team members shall receive at least reading-level training in the requirements of this SOP, in accordance with GG-06, "ESMS Training Program."

4.3 Conduct Compliance Verification Audit

The auditor or audit team shall conduct the verification through a combination of physical inspections and ESMS record reviews, using an appropriate sample of the records produced since the preceding compliance verification. Special attention shall be placed

on new or substantially modified operations and nonconforming operations and conditions that may have been noted during previous verification audits. The auditor or audit team shall employ a checklist based on the individual requirements identified in the current Regulatory Requirements Registrar (see GG-31, “Development and Maintenance of Legal and Regulatory Requirements Register”) to guide the review of information.

4.4 Preparation of Compliance Verification Audit Report

The compliance verification audit report shall include a brief discussion of the objectives and scope of the audit. Any protocols followed during the audit shall be cited in the report. The report will summarize all audit findings and include the following information for each finding: the regulatory citation; a brief summary description of the specific regulatory requirement, as interpreted by the audit team; and discussions of any potential or observed nonconformances. All audit reports shall be marked “Confidential.” Suggested format for preparing a compliance verification audit report is included in Figure 2.

4.5 Review of Compliance Verification Audit Report

The draft audit report will be reviewed for accuracy and applicability of cited requirements by the Environmental Manager. The auditor or audit team shall issue a final compliance verification report after the resolution of all review comments. The Environmental Manager shall sign the approved audit report.

4.6 CPAR Initiation and Review of Regulatory Compliance Matrix

Upon receipt of notification of any potential nonconforming conditions from the compliance verification audit report, the Environmental Manager shall initiate any necessary CPARs in accordance with GG-04, “Identification of Non-conformances and Corrective/Preventive Action.” The Environmental Manager shall refer any suggestions for changes to the Regulatory Requirements Register to Legal Counsel for consideration during annual review, as required by see GG-31, “Development and Maintenance of Legal and Regulatory Requirements Register.”

4.7 Records

Record copies of audit team training, the annual compliance verification audit report, and any resulting CPARs shall be filed in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-04, “Identification of Nonconformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-31, “Development and Maintenance of Legal and Regulatory Requirements Register”

Figure 1: Planning and Conducting Regulatory Compliance Audits

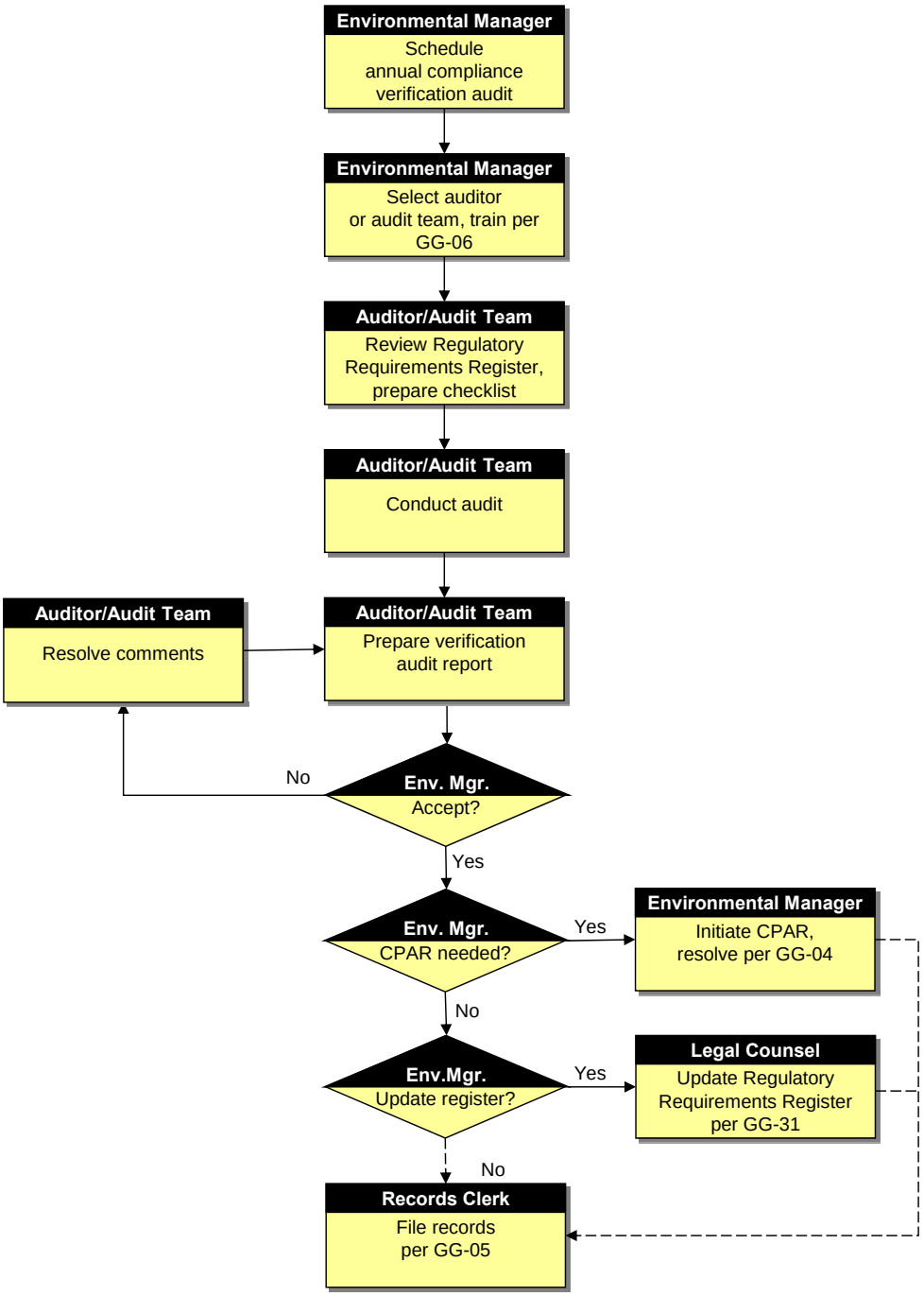


Figure 2: Compliance Verification Audit Report Format

CONFIDENTIAL

Aurora Gold Project Compliance Verification Audit Report

Approved By: _____ _____

Environmental Manager Date

Audit Objective and Scope

Identify the following:

- auditor or audit team leader
- members of audit team (if applicable)
- date audit was performed
- areas or facilities which were audited
- protocols or guidelines used (including date and revision level of Regulatory Requirements Register)

1. Audit Summary

Summarize the following information for *each* audit finding:

- regulatory citation
- description of requirement imposed by regulation
- description of finding of nonconformance (reference CPARs by number)

2. Recommendations for Revision to Regulatory Compliance Matrix

If, based on the verification audit and knowledge of environmental compliance obligations, the audit team either has discovered errors in the Regulatory Requirements Register or has suggestions on how to improve it, this section should be used to summarize suggested changes.

3. Conclusion and Recommendations

Include any positive observations on areas where the Project manages compliance obligations particularly well; and make recommendations for general corrective and preventive actions to correct the nonconformances and prevent them from recurring.

_____ _____

Compliance Verification Auditor Date

_____ _____

Team Members (as applicable) Date

	STANDARD OPERATING PROCEDURE **GG-33: Internal ESMS Audits**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1. PURPOSE

This Standard Operating Procedure (SOP) establishes minimum requirements for planning, performing, and documenting periodic internal audits of the Environmental and Social Management System (ESMS) established for the Guyana Gold Fields Inc. (GGI) Aurora Gold Project (Project).

This SOP will apply over the operational and decommissioning/closure phases of the Project, and supports Section 7.4 ("Internal ESMS Audits") of the Project *Environmental and Social Management Systems Plan (ESMS Plan).*

2. DEFINITIONS

2.1 Internal ESMS Audit

An ***internal ESMS audit*** is defined as a planned and documented investigation of objective evidence, performed in accordance with written procedures or checklists, for the purpose of verifying that applicable elements of the Project ESMS have been developed, documented, and effectively implemented. Such audits may be performed by internal and/or contractor staff, and are planned, organized, and conducted by a qualified Lead Auditor. Depending on the overall complexity or specific technical issues likely to be encountered in the audit, the Lead Auditor may be supported by an audit team consisting of one or more auditors or observers. Audit team members may be selected from GGI staff, provided that they are independent from the day-to-day management of the areas to be audited.

2.2 Lead Auditor

The ***Lead Auditor*** is a qualified and trained individual who is authorized to plan, organize, and direct internal ESMS audits; to report findings and observations; and to evaluate corrective and preventive action. The Environmental Manager will confirm the Lead Auditor's qualifications based on education, experience, or completion of appropriate training programs.

2.3 Auditor

An ***Auditor*** is defined as a qualified and trained individual who is authorized to perform specific internal ESMS audit functions under the direction of a Lead Auditor. At a minimum, each auditor must attend a documented training session (see GG-06, “ESMS Training Program”) conducted by the Lead Auditor that presents the detailed requirements of this procedure and discusses their roles in the planned audit.

2.4 Audit Observer

An ***Audit Observer*** is an audit team member permitted to observe audit activities under the direction of the Lead Auditor. At the Lead Auditor's discretion, technical observers may be requested to perform specific audit functions in relation to their area of expertise. At a minimum, each observer must attend a training session (see GG-06, “ESMS Training Program”) conducted by the Lead Auditor that presents the detailed requirements of this procedure and discusses their roles in the planned audit.

2.5 Finding

A ***finding*** is defined as a deficiency or lack of conformance with any element of the GGI ESMS. All findings must be formally resolved using the procedure defined in GG-04, “Identification of Non-conformances and Corrective/Preventive Action” to ensure effective correction of the observed condition and create system improvements or other preventive measures to reduce or preclude recurrence.

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager is responsible for scheduling an internal ESMS audit on at least a biannual basis, and for and selecting an appropriately qualified Lead Auditor who is independent of the day-to-day management of the areas to be audited. The Environmental Manager is responsible for approving the audit plan and checklists, evaluating and approving ESMS audit reports, and in coordinating any necessary corrective and preventive action that may be required.

3.2 Lead Auditor

The Lead Auditor may be a GGI or contractor employee, at the Environmental Manager’s discretion, and is responsible for the organization and direction of internal ESMS audits as well as for selecting, training, and supervising the activities of the audit team. The Lead Auditor also prepares audit plans and reports, and is responsible for

evaluating and approving any required corrective and preventive action responses resulting from audit findings.

3.3 Auditors or Observers

Auditors are responsible for assisting in audit preparation, conducting audit investigations, and reporting results in compliance with this procedure, under the direction of the Lead Auditor. When requested, audit observers may assist in audit preparation and in auditing areas in which they have specific expertise.

3.4 Area Managers

GGI Area Managers or supervisors will provide time, workspace, and personnel as necessary to support the performance of the audit. They are responsible for working with the Environmental Manager in the prompt and effective resolution of audit findings, in accordance with GG-04, “Identification of Non-conformances and Corrective/ Preventive Action.”

4.0 PROCEDURE

The internal ESMS audit process is described in the following steps, and is summarized in the flowchart shown in Figure 1.

4.1 Audit Scheduling

Internal ESMS audits will be conducted at least every two years, but frequency may be increased at the discretion of the Chief Operating Officer or Environmental Manager.

4.2 Audit Notification

The Environmental Manager will appoint the Lead Auditor, who will in turn notify the affected managers or supervisors by memo or e-mail at least three weeks prior to the projected audit date. The notification memo will set the date, time, and location of the opening meeting, and request that appropriate GGI personnel attend.

4.3 Audit Plan

The Lead Auditor will prepare an audit plan for each internal ESMS audit. At a minimum, the audit plan will include the following:

- the audit number (consecutive, by calendar year);
- a brief statement of the audit objectives;
- identification of the specific operational area or areas being audited;

- a discussion of any special emphasis or focus;
- references to appropriate plans, procedures, or requirements documents;
- the planned date(s) of the audit; and
- identification of the audit team and discussion of the team members' assigned roles.

During preparation of the audit plan, records of previous audits and any associated corrective and preventive action requests (CPARs; see GG-04, "Identification of Non-conformances and Corrective/Preventive Action") will be reviewed. Trends or recurring problems identified during the review will be reflected in the scope of the audit. Other areas of special emphasis will also be noted as appropriate.

Audit team selection will be based on consideration of the particular areas of emphasis for the audit and the experience, qualifications, and capabilities of the prospective team members. Audit team members should be sufficiently independent of the day-to-day management of the audit areas that they are responsible for, so that the potential for conflict of interest is minimized.

4.4 Audit Checklist Preparation

The Lead Auditor will prepare or direct the preparation of an audit checklist based on the overall requirements of the GGI *ESMS Plan.* Auditors or observers may be assigned the preparation of specific checklist sections, especially in areas for which they will assume auditing responsibilities. Checklist content will be consistent with the scope of the audit presented in the Audit Plan. Copies of the checklist, the audit plan, and any required reference specifications, procedures or plans will be approved by the Environmental Manager prior to the audit. The Lead Auditor will brief the audit team on the general scope of the audit and the details of the audit plan, and will discuss audit checklist assignments prior to the pre-audit opening meeting.

4.5 Opening Meeting

The pre-audit opening meeting will be conducted by the Lead Auditor, and will be attended by the audit team members and representatives of the audited operational area(s). Attendance will be documented. The scope of the audit and duties of the auditors or any technical observers will be briefly presented. Questions from the audited organization will be answered, proper lines of communication established, and a time set for the closeout meeting.

4.6 Conducting the Audit

Each auditor will proceed with the investigations required by their assigned portion of the checklist. Auditing methods will include records review; interviews with individual GGI staff members; direct observation; or an appropriate combination of these

methods. The audit team will meet periodically and report on audit progress as requested by the Lead Auditor. Any observed conditions that represent unsafe conditions or require immediate action should be promptly referred to the responsible manager or supervisor. *Demands on operational resources and time should not be increased beyond the level presented in the opening meeting without first discussing such requests with the affected managers or supervisors*. When the checklist items have been completed, the audit team will meet and present their potential findings to the Lead Auditor. The Lead Auditor will review the auditors' input, obtain additional clarifications where required, and prepare or direct the preparation of a draft list of potential findings.

4.7 Closing Meeting

A draft list of potential findings and general observations will be presented in a brief post-audit closing meeting. Attendance will be documented. Discussion will generally be limited to the presentation of findings and the clarification of any misunderstandings.

4.8 Audit Report Preparation

After the closing meeting, the auditors will prepare final copies of their completed checklist sections and submit them to the Lead Auditor. The Lead Auditor will prepare a formal audit report, which will include the following items:

- a brief description of the audit scope;
- the identification of the audit team and key personnel contacted from the audited organization;
- a general statement summarizing the effectiveness of the ESMS; and
- a brief discussion of any findings.

4.9 Review of Corrective and Preventive Action Responses and Audit Closeout

The Lead Auditor will participate in the development of corrective and preventive actions in accordance with GG-04, "Identification of Non-conformances and Corrective/ Preventive Action", as necessary, to ensure that each finding or observation has been adequately addressed. As noted in GG-04, if multiple corrective and preventive actions are required, the Lead Auditor may, at his discretion, initiate one or several CPAR documents to facilitate the efficient tracking of closure actions. For the sake of efficiency, all required actions for a specific responsible area or department should be grouped under a single CPAR.

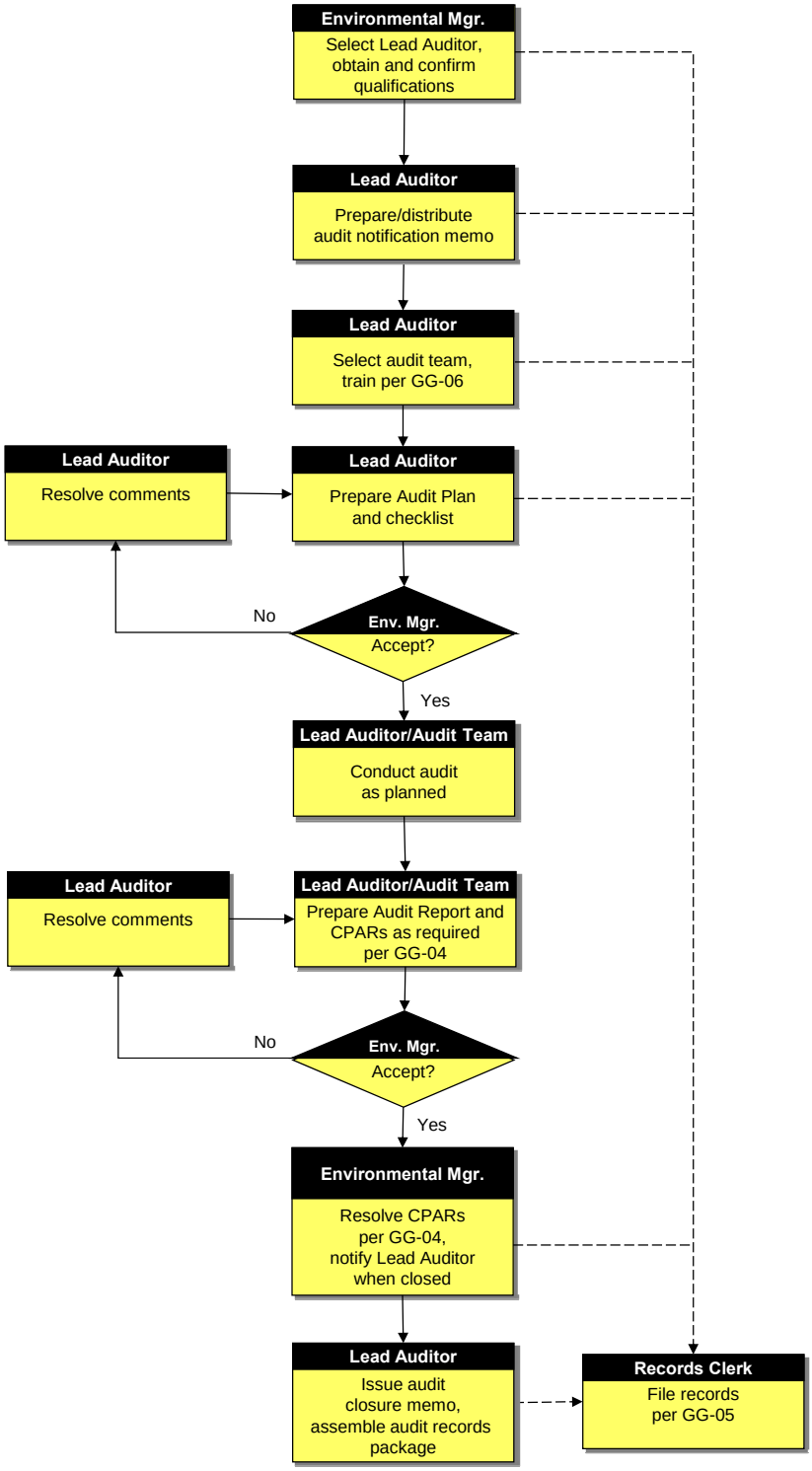
4.10 Audit Documentation

Once the audit has been closed, the Lead Auditor will forward a complete copy of the audit documentation for filing in accordance with GG-05, “Records Management.” At a minimum, audit documentation will include copies of the audit notification memo, the audit plan, audit opening and closing meeting attendance sheets, the completed audit questionnaire, the audit report, and any associated CPAR record(s).

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”

Figure 1: Planning and Conducting Internal ESMS Audits



	STANDARD OPERATING PROCEDURE **GG-34: Management Reviews**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) defines the methods that Guyana Goldfields, Inc. (GGI) will use to conduct annual management reviews to evaluate the suitability and effectiveness of the Environmental and Social Management System (ESMS) established for the Aurora Gold Project (Project).

This SOP will apply over the operational and decommissioning/closure phases of the Project, and supports Section 7.5 ("Management Review") of the Project *Environmental and Social Management System Plan (ESMS Plan).*

2.0 DEFINITIONS

2.1 Management Review

Management review is defined as a high-level evaluation of the suitability and effectiveness of the ESMS, as currently documented and implemented. Such reviews will focus on:

- the degree to which the principles and commitments contained in GGI's Human Resources, Community Relations, and Environmental, Health, and Safety Policies (see *ESMS Plan* Appendix C) are being supported;
- the level of compliance maintained with respect to applicable regulatory requirements (see GG-32, "Regulatory Compliance Verification Audits");
- GGI's responsiveness to the environmental and social issues communicated by the Project's external stakeholders;
- indications of improvement of environmental, health and safety, and social performance relative to previous reviews; and
- The level of conformance that has been maintained with the current version of the Project *ESMS Plan* and its supporting plans and procedures.

3. RESPONSIBILITIES

3.1 Chief Operating Officer (COO)

GGI's COO is responsible for performing (or delegating the performance of) a management review in compliance with this SOP on at least an annual basis. The COO is responsible for evaluating and approving the suggested agenda for the review, as well as for the review and approval of the final report, if delegated, and for authorizing any resulting action items.

3.2 Environmental Superintendent

The Environmental Manager is responsible for requesting the performance of the review, and for submitting all necessary records and system documentation to the COO or their designee in advance of the review. The Environmental Manager shall also prepare a suggested agenda for the review, to be approved by the COO.

4.0 PROCEDURE

The management review process consists of the following steps (summarized as a flowchart in **Figure 1**):

4.1 Schedule and Agenda

The Environmental Manager will advise the COO when a management review should be conducted and will submit a suggested agenda for review and approval. Management reviews may consider one, several, or all elements of the ESMS, but at a minimum should specifically consider the following:

- results of any internal or external audits which have been completed since the last management review;
- the nature of the issues addressed in all Corrective/Preventative Action Requests (CPARs; see GG-04, "Identification of Nonconformances and Corrective/ Preventive Action") generated since the previous management review, along with CPAR completion status;
- any grievances (see *ESMS Plan* Appendix A, "Labour Grievance Procedure" and Appendix B, "Community and Environmental Grievance Procedure") or other stakeholder complaints or concerns received since the previous management review;
- environmental monitoring data summaries or summary reports;

- any accident or incident reports;

- progress made against GGI's current environmental objectives and targets (see GG-30, ""Environmental and Social Objectives, Targets, and Performance Improvement Program";

- the report from the previous management review; and

- information on recent or pending organizational or facility changes, corporate policy directives, regulatory changes, or other external developments that may affect GGI's environment and social aspects and impacts (see GG-29, "Determination of Environmental and Social Aspects and Significant Impacts").

4.2 Assemble Background Information

The Environmental Manager shall assemble reference materials for the COO's use that address the information needs described in Section 4.1, as well as reference copies of the current version of the *ESMS Plan*, relevant management plans, SOPs, and other documents as requested or deemed necessary to support the proposed review agenda.

4.3 Approval of Agenda

The COO shall review the proposed review agenda and resolve any questions or concerns with the Environmental Manager before proceeding with the review.

4.4 Performance of Management Review and Preparation of Management Review Report

The COO, at their discretion, may personally prepare or delegate the conduct of the review and the preparation of a summary Management Review Report (MRR) that documents the scope of the review, its results, and any appropriate action items. MRR format is discretional. The review may be based on evaluation of documents, discussions with specific individuals, direct observation of specific aspects of mine operations, or any suitable combination of methods. Timetables for the resolution of all action items shall be defined, as well as individual responsibilities for action item completion. If the review is delegated, the MRR shall be reviewed by the COO and all comments resolved prior to further discussion with the Environmental Manager.

4.5 Resolution of Action Items

The COO shall discuss the results of the final MRR with the Environmental Manager, with an emphasis on observations, concerns, and specific action item requirements. If any action item constitutes a non-conformance, it shall be separately documented Manager and resolved in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action." If an action item does not constitute a non-

conformance, copies of the requested action shall be distributed to the assigned personnel by the Environmental Manager and completed in compliance with the schedule specified in the MRR. The Environmental Manager shall track progress on all required actions, and provide a simple closure memo to the COO when they are complete.

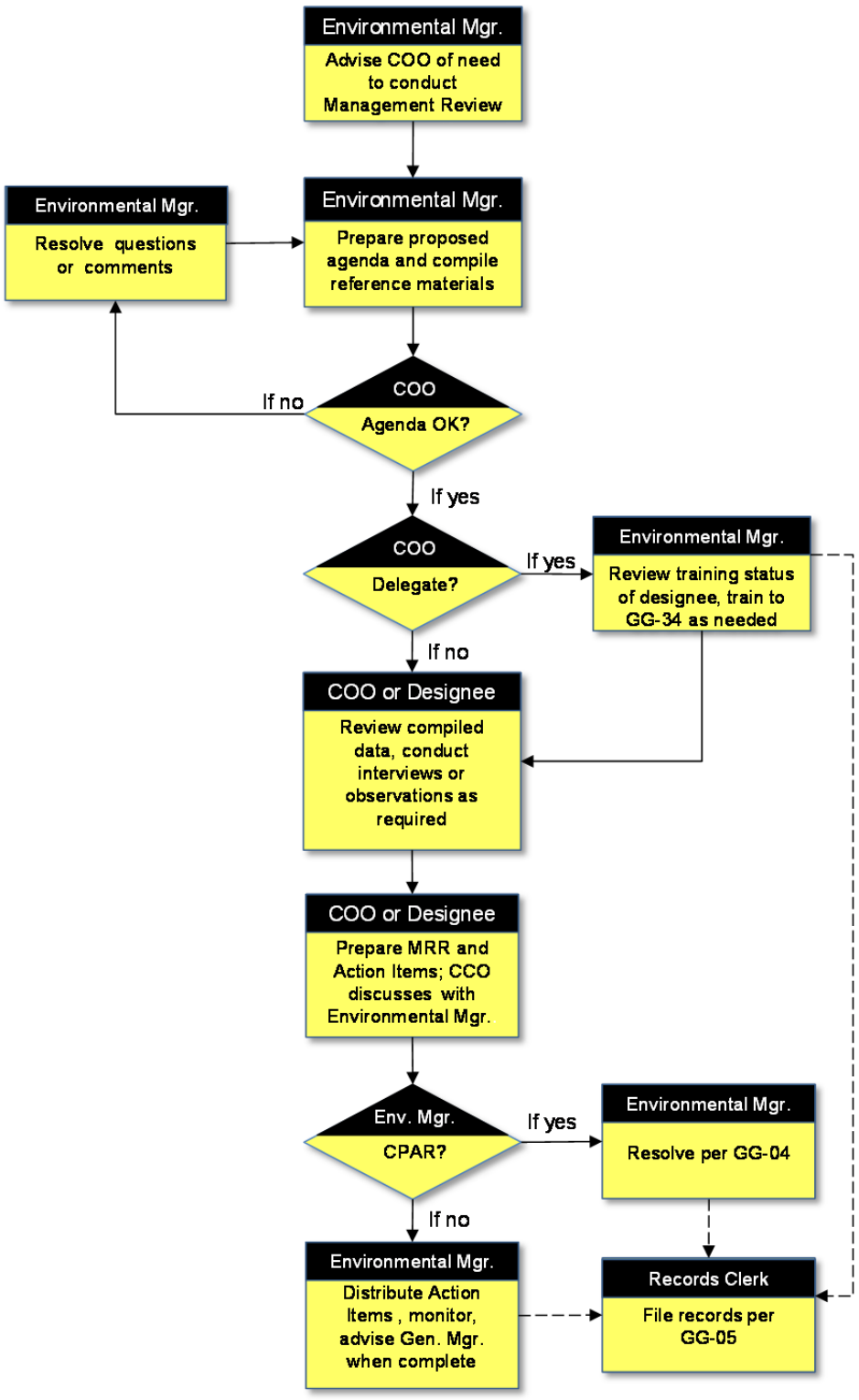
4.6 Records

The final management review agenda, final MRRs, action item closure memos, and any associated CPARs shall be filed in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*, with Appendix A ("Labour Grievance Procedure"), Appendix B ("Community and Environmental Grievance Procedure"), and Appendix C (Human Resources, Community Relations, and Environmental, Health, and Safety Policies")
- GG-04, "Identification of Non-conformance and Corrective/Preventive Action"
- GG-05, "Records Management"
- GG-29, "Determination of Environmental and Social Aspects and Significant Impacts"
- GG-30, "Environmental and Social Objectives, Targets, and Performance Improvement Program"

Figure 1: Management Review Process



	STANDARD OPERATING PROCEDURE GG-35: Community Health and Safety Awareness Meetings
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) outlines the procedures that Guyana Goldfields, Inc. (GGI) will follow in conducting periodic community health and safety awareness meetings for the Aurora Gold Project (Project). This SOP will apply during the construction and operational phases of the project. It supports the Project *Emergency Preparedness and Response Plan, Cyanide Management Plan, Community Relations Management Plan*, and Section 8 ("Stakeholder Engagement") and Section 9 ("External Communications and Grievance Mechanisms" of the *Environmental and Social Management Systems Plan (ESMS* Plan).

2.0 DEFINITIONS

- None

3.0 RESPONSIBILITIES

3.1 Community Relations Manager, Health and Safety Officer, and Environmental Manager

The Community Relations Manager, Health and Safety Officer, and Environmental Manager are collectively responsible for conducting periodic community health and safety awareness meetings in the community of Buckhall, and Aranka Mouth, and, as appropriate, at one or more Barama Company Ltd. (Barama) sites, on at least an annual basis. They will also assist in distributing agendas or written materials in advance of meetings, and will assist in the answering of questions or concerns and the resolution of any complaints.

4.0 PROCEDURE

The general process for conducting periodic community health and safety awareness meetings is outlined in the following paragraphs. The process is also summarized as a flowchart in **Figure 1**.

4.1 General

It is recognized that over the life of the Aurora Gold Project, some of the Project workforce will be composed of local residents. As a consequence, the Project and

the local communities share a common interest in mitigating the health and safety hazards experienced by the Project workforce, whether such hazards originate in the workplace or in the communities, or may be associated with the transportation of goods and materials to the Aurora site. Formal community health and safety meetings shall therefore be conducted at least annually in Aranka Mouth and Buckhall, as well as Barama camps or offices that may be near the Barama road that will experience an increase in vehicle traffic and may be called upon to participate in the investigation and cleanup of any transportation-related accidents that may occur on the Barama portion of the road. Additional meetings may be scheduled as necessary to discuss specific questions or health and safety issues, or if management or Project staff identify new issues that merit broader discussion. All meetings will include an open discussion period in which residents can openly express perceived risks or hazards and their other interests, concerns, and opinions.

4.2 Organization and Scheduling

The Community Relations Manager, Health and Safety Officer, and Environmental Manager shall collaboratively select an appropriate venue for each year's meeting, rotating locations as necessary from year to year to ensure that reasonable participation opportunities are provided to all affected communities. The primary purpose of these annual meetings will be to provide a forum for local community residents to air their mining-related health and safety concerns and questions, as well as to provide information to local communities that:

- describes the general health and safety hazards associated with mine construction, operations, and closure, including discussion of the hazards experienced by mine employees, any environmental hazards, and hazards associated with the transportation of cyanide reagent, fuel, and other supplies on the Barama (M3) Road and the extension of the M3 to Tapir Crossing and the Aurora site;

- describes the measures that have been established to mitigate such hazards and thereby protect the health and safety of the workforce and the residents of local communities;

- describes any planned or pending process or infrastructure improvements that will serve to further minimize or mitigate occupational health and safety risks;

- informs the community of standard actions and procedures to follow in the event of an emergency related to mine operations or the transportation of concentrate or supplies (as defined in the Project *Emergency Preparedness and Response Plan* and Cyanide Management Plan, or if hazards or risks to public health and safety as a result of mine operations are observed; and

- also provides a forum to discuss the monitoring and prevention of communicable diseases (see GG-10, "Prevention and Monitoring of Communicable Diseases") that could potentially affect the workforce as well as local community residents.

The content of these meetings will be dependent upon an evaluation of community health and safety risks, as well as the perception of risk that the community may have about Project operations. Meeting attendance may be open, by invitation to specific individuals, by invitation plus guest, or other appropriate format as recommended by the Community Relations Manager, bearing in mind that the intent of the meeting is to focus on communication with community residents on specific health and safety related issues. The Community Relations Manager should provide guidance in identifying who will benefit most from participation, and when and where to conduct such meetings so they are accessible to all who will benefit from attending. An attempt should be made to engage any governmental representatives, members of the clergy, or other individuals well-respected in the community.

Appropriate posters, flyers or other advance materials or agendas should be prepared in advance of the meeting.

4.3 Conducting the Health and Safety Awareness Meeting

The level of detail discussed in community meetings may be expected to vary with Project phase activities and the number and age of the attendees. Meetings shall be organized and conducted in an orderly and professional manner, using prepared materials and visual aids to present information in as straightforward and understandable form as possible. Project attendees should include, at a minimum, the Community Relations Manager, Health and Safety Officer, and Environmental Manager. An attendance sheet should be distributed. It should be clear from the outset of the meeting that a generous amount of time will be set aside for comments, questions, and discussion at the end of the information presentation.

Minutes shall be recorded, with special attention given to the discussion period and specific issues, concerns, or complaints. Attendees should be advised that the Project will provide a thoughtful response to all issues, concerns, and complaints that may have been raised in the meeting.

It is recognized that public meeting dynamics are difficult to predict and disruptions may occur; however, a concerted effort shall be made to conduct the meeting in as positive and productive manner as is possible. Aurora Gold Project employees will conduct themselves professionally and politely at all times. However, if disruptions are excessive to the point that a productive discussion cannot be held, GGI participants may politely and patiently terminate the meeting, advising the participants that a follow-on meeting will be scheduled at some point in future.

4.4 Resolution of Action Items or Complaints

Meeting minutes, attendance sheets, and copies of all distributed materials shall be reviewed by the Community Relations Manager, Health and Safety Officer, and Environmental Manager, and forwarded to the VP, Aurora Project and the GGI Chief Operations Officer (COO)for their review. The VP, Aurora Project and the GGI Chief Operations Officer (COO)shall jointly decide on an appropriate course of action to resolve any action items resulting from the meeting. Direction shall be provided to

the Community Relations Manager, Health and Safety Officer, and Environmental Manager by internal memo on other required action items, which may include holding additional information-sharing meetings, distribution of additional information, one-on-one discussions with specific individuals, or other appropriate actions. If no other actions are required, the reviewed minutes and other information shall be filed as noted in Section 4.5 and referred to in the planning of the next meeting.

4.5 Records

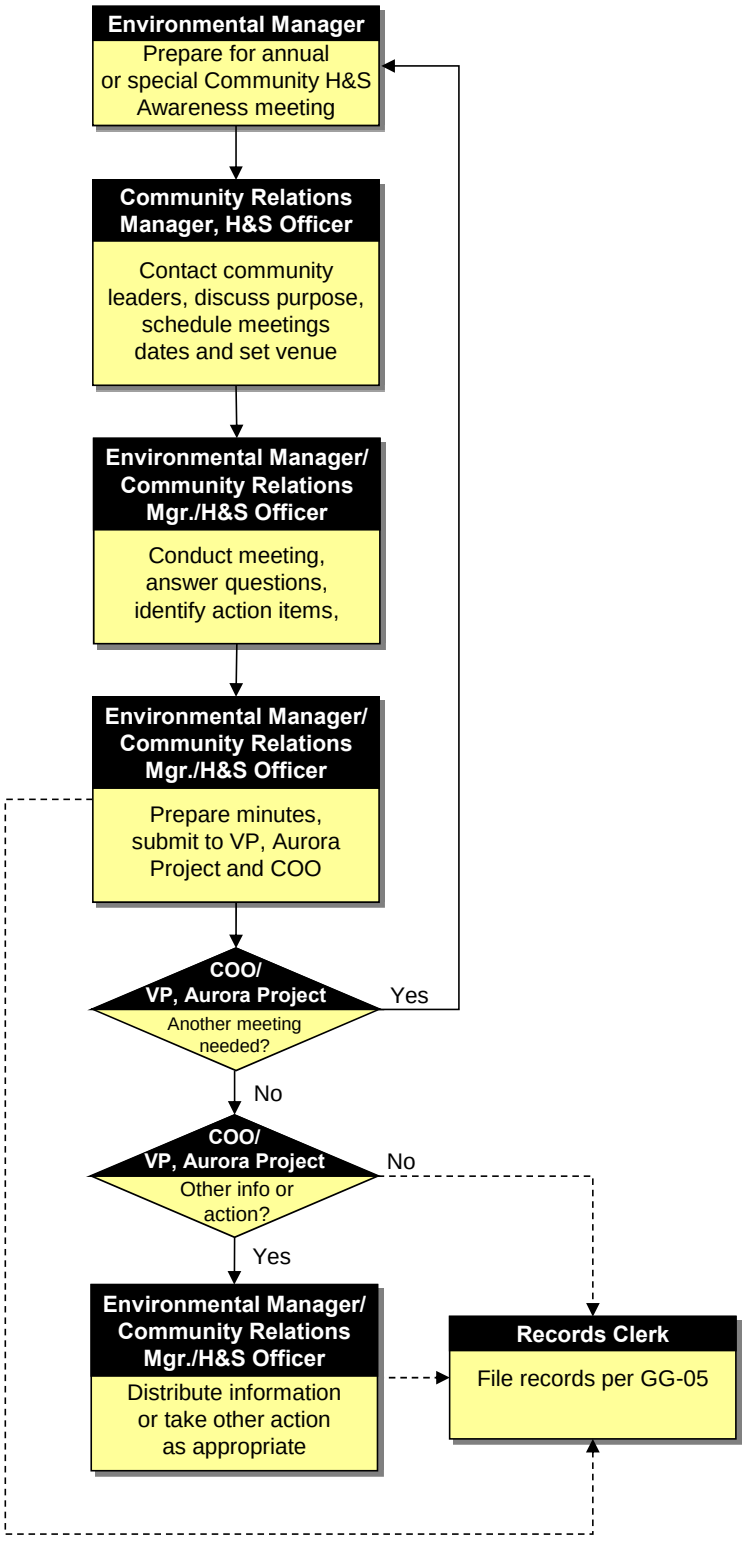
Records produced as a result of implementation of this SOP include materials distributed in the meeting, attendance sheets, minutes, and any internal memos issued to initiate other action. All records shall be forwarded to the Records Clerk, who shall file the documents in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Emergency Preparedness and Response Plan*
- GGI *Cyanide Management Plan*
- GGI *Community Relations Management Plan*
- GG-05, Records Management”
- GG-10, “Prevention and Monitoring of Communicable Diseases”

-

Figure 1: Community Health and Safety Awareness Meeting Process



	STANDARD OPERATING PROCEDURE **GG-36: Lockout/Tag-out Requirements**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) establishes a "lockout/tag-out" process for the operational phase of the Guyana Goldfields, Inc. (GGI) Aurora Gold Project (Project). This procedure will be invoked after commissioning and acceptance of the mill, process plant, power generation plant, and other facilities from the Engineer/Procure Construct (EPC) contractor. It is intended for use by the GGI and contractor workforce and is designed to prevent serious injuries or potential fatalities due to the unexpected start-up, energizing, activation, or release of electrical or mechanical energy or compressed air or gases during the construction, servicing, cleaning, inspection, and/or maintenance of machinery, conveyor systems, and other stationary equipment.

This procedure does not apply to the maintenance or repair of vehicles or mobile equipment, or to the use of cord-connected electrical equipment that can be easily unplugged or deactivated by the personnel using the equipment.

This procedure will apply during the operational and decommissioning/closure phases of the Project, and supports Section 3.3 ("Occupational Health and Safety Hazard Identification, Risk Assessment, and Risk Management Planning") and Section 4.3 ("Operational Control") of the Project *Environmental and Social Management System Plan (ESMS Plan).*

2.0 DEFINITIONS

2.1 Affected Employee

For the purpose of this procedure, ***affected employee*** refers to any Project employee or contractor, whose assigned duties require the operation or use of machinery or equipment on which construction, servicing, maintenance, modification, or other tasks are being performed under lockout/tag-out conditions, or whose job requires working in an area in which such servicing or maintenance is being performed.

2.2 Authorized Employee

Authorized employee refers to a competent and experienced individual assigned to perform construction, service, maintenance, or other job assignments under lockout/tag-out conditions, and who therefore is responsible for personally locking out or tagging out

the affected machinery or equipment. The authorized employee is also *the only person* authorized to remove such locks or tags.

2.3 Energy-Isolating Device

An ***energy-isolating device*** is a type of mechanical device that physically prevents transmittal or release of energy. Such devices may include:

- manually operated electrical circuit breakers;
- disconnect switches;
- manually operated switches that disconnect the conductors of a circuit from all ungrounded supply conductors;
- line valves in piping systems for fluids or compressed gases; and
- similar devices used to block or isolate energy.

2.4 Hazardous Energy System

Hazardous energy system refers to any machinery or equipment item or other device that could cause personal injury or other loss in the event of unexpected activation, start-up, or release. A hazardous energy system may be directly connected to an energy source, may contain residual or stored energy (e.g., mechanical, electrical, thermal, chemical), or may enable a release of materials or flow of liquids or gases, including water and steam.

2.5 Lockout

Lockout refers to the placement of a locking device on energy-isolating equipment to ensure that the machinery or equipment items being controlled cannot be physically operated until the device is removed.

2.6 Lockout Device

A ***lockout (or locking) device*** uses a keyed (or combination) lock or other positive method (e.g., installation of blind flanges to isolate a section of piping system) to secure energy-isolating equipment in a safe position and prevent the energizing of associated machinery or equipment. Where technically and economically feasible, lockout devices are preferred over “tag-out” methods in the design of new installations or modifications.

2.7 Servicing and/or Maintenance

Servicing and/or maintenance means workplace activities such as constructing, installing, setting up, adjusting, inspecting, modifying, and maintaining and/or servicing machines or equipment. These activities include lubrication, cleaning, or “un-jamming” of blocked or broken machines or equipment and making adjustments or repairs, where the employee may be exposed to the unexpected energizing or start-up of the equipment or a hazardous release of energy. For the purposes of this SOP, “servicing

and/or maintenance" should not be interpreted to include frequent, routine maintenance or service activities that are normally performed while the system is in operation in accordance with manufacturer's recommendations.

2.8 Tag-out

Tag-out refers to the placement of a tag device on an energy-isolating equipment item in order to visually warn operators or technicians that the energy-isolating equipment and/or machinery being controlled may not be operated until the device is removed.

2.9 Tag-out Device

Tag-out device refers to a prominently marked visual warning device, such as a tag or warning sign, and a positive means of attachment (e.g., nylon cable ties, wires, or chains), which can be securely fastened to an energy-isolating equipment item. The purpose of such devices is to warn operators or technicians that the machinery or equipment being controlled may not be operated until the tag-out device is removed. Tag-out devices should be used in new installations or modifications of existing machinery or equipment only when the installation of lockout devices (see Section 2.6) is not technically or economically feasible.

3.0 RESPONSIBILITIES

3.1 Operations Manager/Health and Safety Officer

The Operations Manager and Health and Safety Officer are jointly responsible for ensuring that the provisions of this SOP are observed. They are also responsible for:

- ensuring that new or significantly modified machinery or equipment is designed to employ lockout devices in lieu of tag-out devices, wherever technically and economically feasible; and

- ensuring that appropriate lockout/tag-out devices are provided for hazardous energy systems, and for reviewing and authorizing other appropriate corrective and preventive actions that may result from the periodic inspections and evaluations described in this SOP.

3.2 Are Mangers or Supervisors

GGI Area Managers or Supervisors are responsible for performing or supervising risk assessments in their assigned work areas to identify any specific machinery, equipment, or other systems or devices that could cause injury due to unexpected energizing or start-up during servicing, cleaning, inspection, and/or maintenance. All such machinery

and equipment shall be documented on a periodically updated Hazardous Energy System Equipment List.

Supervisors have overall responsibility for safety within their work groups and/or work areas and are responsible for controlling and directing the entire lockout/tag-out process, either personally or by an authorised designee. Supervisors are also responsible for designating a primary authorized employee in the event that one or more authorized employees are engaged in the same operation under lockout/tag-out procedures.

3.3 Health and Safety Officer

The Health and Safety Officer or his designee is responsible for preparing equipment-specific Lockout/Tag-out Instructions as described in Section 4.3, and shall coordinate all necessary staff training in accordance with GG-05, “ESMS Training Program” in order to ensure that all employees receive training in energy control principles and the requirements of this procedure at a level commensurate with their work assignments.

The Health and Safety Officer or his designee will also perform periodic inspections of lockout/tag-out procedures in accordance with GG-03, “Field Inspection, “Surveillance Inspection.” The Health and Safety Officer shall also review and approve the periodically updated list of Hazardous Energy System Equipment List, and associated equipment-specific Lockout/Tag-out Instructions and their updates.

3.4 Affected and Authorized Employees

All affected or authorized employees are responsible for compliance with the requirements of this SOP as applicable to their individual work assignments. It is the responsibility of the authorized employee to implement the specific lockout/tag-out process established for a particular hazardous energy system in conformance with this SOP before beginning work on any such system.

3.5 Primary Authorized Employee

The ***primary authorized employee*** has overall responsibility for implementation of lockout/tag-out procedures, in the event that the anticipated repair or maintenance action involves a group of workers or extends over multiple shifts.

3.6 All GGI Employees

All GGI employees are expected to have a general understanding of basic energy control principles and the overall purpose of the lockout/tag-out process described by this procedure. ***Unauthorized employees shall in no case attempt to remove, alter, or interfere with the function of lockout/tag-out devices;*** unauthorized removal of such devices may constitute grounds for dismissal. Any employees who are aware of machinery or equipment that may meet the definition of a “Hazardous Energy System” but that has not been identified and/or listed as such should bring that equipment to the

immediate attention of their supervisors or the Health and Safety Officer (see GG-24, “Recognition and Reporting of Safety Hazards”).

4.0 PROCEDURE

4.1 Identification and Documentation of Hazardous Energy System Equipment

The Health and Safety Officer shall either perform or direct a risk assessment per GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks.” The risk assessment process shall include a comprehensive, facility-wide survey of hazardous energy systems (as defined in Section 2.4 above). The purpose of the survey is to identify and evaluate the condition of machinery, equipment, or other devices, which are connected to an energy source or contain residual or stored energy that could cause injury or loss from unexpected activation or start-up.

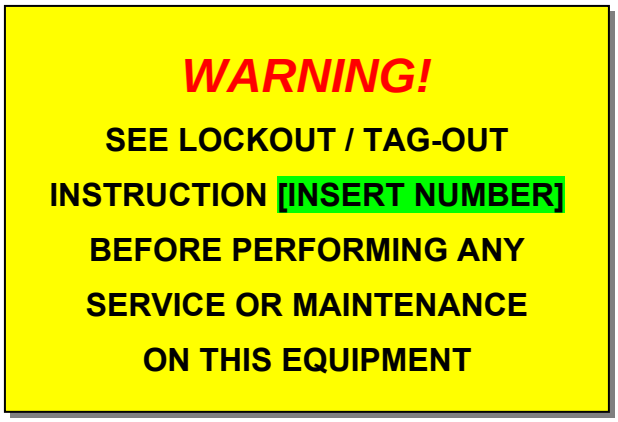
Electricity is likely to be the most common source of energy encountered in the Project and may be directly connected to motors, energized circuits, or heaters, or stored in batteries. Mechanical hazards such as moving gears, blades, shafts, conveyor belts, rotary mills, or rotary or gyratory crushers are typically dependent upon electricity but may also include stored energy in springs or pressure vessels, or potential energy due to gravity. Other sources of energy that must be considered in identifying hazardous energy systems include: ***thermal energy*** such as heat from combustion sources or steam; chemical energy which may result in heat, pressure, or explosion; ***pneumatic energy*** from pressurized systems; and ***hydraulic energy*** in pressurized actuators, reservoirs, or supply lines.

Hazardous energy systems that require special lockout/tag-out procedures prior to servicing or maintenance shall be clearly identified as such by means of a conspicuous sign. Any equipment items that in the Health and Safety Officer’s judgment require immediate modification or replacement to allow adequate lockout/tag-out protection shall be documented on a corrective/preventive action request (CPAR) and forwarded to the responsible Area Manager for action, in accordance with GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

The Hazardous Energy Systems Survey shall be repeated on at least an annual basis, or when prompted by major facility changes, equipment replacements, or management request. If the annual survey does not prompt a revision to the Hazardous Energy System Equipment List (see Section 4.2), a brief memo to file shall be prepared to document review results.

4.2 Preparation or Update of Hazardous Energy System Equipment List

All hazardous energy system equipment items or machinery identified in the survey described in Section 4.1 shall be identified by name, numerical designator, and location in an up-to-date, facility-specific Hazardous Energy System Equipment List (see Figure 2). Facility maps shall be attached to the list with detail sufficient to locate each identified equipment item. Each listed system shall be clearly identified by means of a conspicuously posted metal, plastic, or plastic-laminated paper sign bearing the numerical designation and the following warning:



4.3 Preparation of Lockout/Tag-out Instructions

Simple, step-by-step instructions shall be prepared for each identified equipment item using the form depicted in Figure 3. The written instruction for any given hazardous energy system shall be based on the generic lockout/tag-out process described below and as depicted in Figure 1. In all cases, the instruction shall include: the name, numerical designator, and location of the equipment item; a list of the employees authorized to perform lockout/tag-out functions for the specific equipment item; and the specific steps to be followed to properly secure the hazardous energy system. At a minimum, these steps shall include:

- **Identify Energy Source(s):** Identify the type and magnitude of the energy source(s), the hazards of the energy to be controlled, and the methods to control them.

- **Notify Affected Personnel:** Notify the affected supervisor and Area Manager and all affected employees that the equipment or system will be shut down for the required servicing and/or maintenance activities.

- **De-energize System:** Turn off or shut down the machinery, equipment, or system involved following standard operational procedures.

- **Isolate System:** Completely isolate the equipment from the energy source(s) using appropriate isolating devices (e.g., turn off the disconnect switch or circuit breaker, install blind flanges, or install or insert locks, keys, chains, self-locking fasteners, or other devices).

- **Install Lockout Device:** *Lockout devices shall be preferentially specified over tag-out devices wherever technically and economically feasible.* If the equipment will accept a lockout device, the instruction should require the installation of a specific type of device. If padlocks or combination locks are used, they shall be specifically assigned to the authorized employee. If the energy-isolating device will not accept a lockout device, note on the instruction and require that a suitable tag (see Section 4.4) be installed in a visible blocking position with a durable nylon cable tie, wire, or chain.

- **Release or Neutralize Stored or Residual Energy:** As appropriate, release or neutralize any stored or residual energy (e.g., by grounding, draining, blocking, repositioning, or bleeding the system).

- **Conduct "Try" Test:** Verify that the system is in a zero-energy state and that no employees are exposed, and perform a "try" test (i.e., deliberately attempt to activate the system). The try test is considered successful if the system cannot be activated.

- **Conduct Service or Repair:** At the completion of this initial sequence of activities, the system may be considered locked or tagged out, and the intended servicing and/or maintenance activities may be performed.

- The instruction shall also include the following sequence of activities to remove the system from lockout/tag-out status.

- **Verify operational condition:** Upon completion of the servicing or maintenance activities, check the machinery or equipment and the immediate area. Make sure that the system is in operating condition and ready to be activated.

- **Verify affected employee location:** Verify that all affected employees are clear of the system, in a safe location, and aware that the system is about to be activated.

- **Verify that controls are in neutral** (as applicable).

- **Remove lockout device or tag:** The authorized employee shall remove the lockout device and any energy-isolating devices, or tag as appropriate.

- **Re-energize system:** Re-energize the system, and notify all affected employees that the service/repair activities have been completed and the system is back in service.

The Hazardous Energy System Equipment List and Lockout/Tag-out Instructions (or updates; see Section 4.9) shall be presented to the Health and Safety Officer for review and approval. Comments shall be resolved to the reviewer's satisfaction; approval shall be indicated by the reviewer's signature in the blocks provided on page 1 of each form.

The Health and Safety Officer shall distribute copies of the current approved Hazardous Energy System Equipment List and a compiled and indexed manual of current Lockout/Tag-out Instructions to upper management and affected supervisors, in accordance with GG-07, "Distribution and Control of ESMS Documents." Copies distributed to affected supervisors shall be kept in a location readily accessible by affected and authorized employees. Individual copies of current Lockout/Tag-out Instructions shall be placed in appropriate protective covers and securely fastened or posted in a protected location near each affected equipment item. Superseded versions of the Hazardous Energy System Equipment List and of Lockout/Tag-out Instructions shall be physically retrieved and destroyed.

4.4 Tag-out Procedures

If the energy-isolating device will not accept a lockout device, the Health and Safety Officer or his designee shall tag out the energy-isolating device using one of the following tags, as appropriate to the situation:

Tags shall be made of metal, plastic, or strong, plastic-laminated paper that will not fade or deteriorate if exposed to weather or damp or wet conditions, and must be affixed via nylon cable ties, wire, chain, or other secure method that is not easily removed without the use of tools. Where appropriate, additional safety measures may be used with the tag-out system to provide additional protection, and could include:

- removing part of the isolating circuit;
- blocking a controlling switch;
- opening an extra disconnecting device; or
- removing a valve handle.

When a tag-out device is used in place of a lockout device, it must be affixed to the energy-isolating device so that it clearly indicates that moving the device from the "safe" or "off" position is prohibited. If it is not possible to attach a tag-out device directly, it must be located as close as safely possible to the energy-isolating device, plainly visible to anyone attempting to operate it.

Affected employees' training must emphasize that such tags must be recognized and treated in the same manner as a lockout device, and shall not be removed, bypassed, or ignored.

4.5 Distribution of Lockout and Tag-out Devices

Area EHS Coordinators and Area Supervisors shall arrange for the distribution of appropriate lockout/tag-out materials and hardware (e.g., locks, keys, chains, key blocks, wedges, adapter pins, and self-locking fasteners) to authorized employees.

4.6 Lockout/Tag-out Process

Prior to performing any servicing and/or maintenance on any machinery, equipment, or mechanical, electrical system or other process, the affected employee shall identify the numerical designation on the machinery or equipment and obtain the appropriate Lockout/Tag-out Instructions for that specific hazardous energy system.

- The actual lockout/tag-out process must be performed by an authorized employee, and may not be delegated to other personnel. The authorized employee shall follow the appropriate Lockout/Tag-out Instructions and complete the servicing and/or maintenance task as planned.

If there is no "Hazardous Energy System" designation and the work to be performed clearly poses an energy control safety issue, the affected supervisor shall bring the situation to the attention of the Health and Safety Officer, who shall immediately initiate a CPAR in accordance with GG-04, "Identification of Non-conformances and Corrective/Preventive Action." Servicing and/or maintenance tasks shall not proceed until the CPAR has been resolved.

4.7 Lockout/Tag-out Protection for Groups of Employees

When a servicing or maintenance operation involves more than one authorized employee, lockout/tag-out procedures must provide each member of the work group with the same level of protection. The Area Manager or responsible supervisor will assign a primary authorized employee, who will have overall responsibility for the service or

maintenance operation and is the first authorized employee to attach his or her lockout/tag-out device to the energy-isolating device which then serves as the “group” device.

Each authorized employee must attach a personal lockout or tag-out device to the group lockout device before beginning work and must not remove it until they have finished work on the machine or equipment. The primary authorized employee will be the last person to remove his or her lockout/tag-out device, and only after all others have been removed.

If the servicing or maintenance operation involves more than one shift or more than one group of employees, in addition to the primary authorized employee within each group or on each shift, the EHS Coordinator or Area Supervisor shall assign a primary authorized employee as the group coordinator with overall responsibility to coordinate the different work groups and maintain continuous lockout or tag-out protection.

4.8 Contractors

Contractors working on hazardous energy systems shall be required to work under the provisions of this procedure as a condition of their contract or procurement document, in accordance with Section 4.3.3 of the Project ESMS Plan. The Health and safety Officer or his designee shall plan and either conduct or arrange all necessary training for all authorized contractor employees. Such training shall provide these employees with an understanding of the purpose and function of the lockout/tag-out program and shall impart the knowledge necessary to carry out their contractual responsibilities.

4.9 Periodic Lockout/Tag-out Program Inspections

The Health and Safety Officer or his designee shall inspect lockout/tag-out activities on a discretionary basis, but at least one lockout/tag-out action by each authorized employee should be observed and evaluated each year. Such inspections shall be planned and documented as specified in GG-03, “Field Inspections.” At a minimum, the review shall verify that employees know and can apply the energy control procedures required by the current version of applicable Lockout/Tag-out Instructions, and that employees respond properly to any deviations or inadequacies that may be identified.
Unacceptable employee practices or equipment issues that require immediate attention to ensure adequate lockout/tag-out protection shall be documented on a CPAR and resolved in accordance with GG-04, “Identification of Non-conformances and Corrective/ Preventive Action.”

4.10 Maintenance of Lockout/Tag-out Records

Copies of current and superseded versions of the Hazardous Energy System Equipment List, individual equipment-specific Lockout/Tag-out Instructions, training records, facility evaluation or inspection memos, and associated corrective/ preventive action records shall be retained in compliance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GG-03, “Field Inspection”
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, Records Management”
- GG-06, “ESMS Training Program”
- GG-07, “Distribution and Control of ESMS Documents”
- GG-09, “Identification of Project-related Safety Hazards, and Assessment of Risks”
- GG-24, “Recognition and Reporting of Safety Hazards”

Figure 1A: Lockout/Tag-out Process

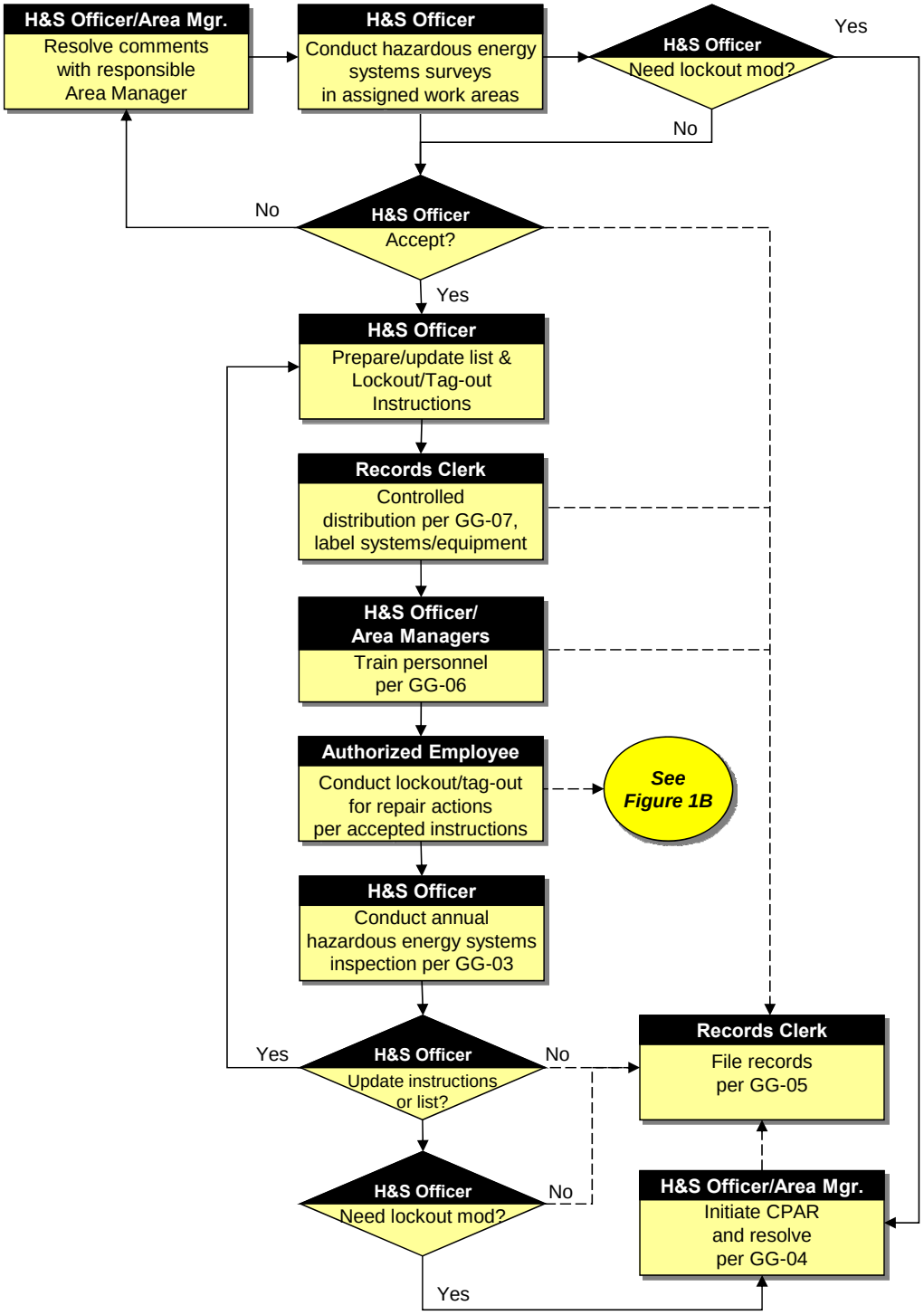


Figure 1B: Lockout/Tag-out Process

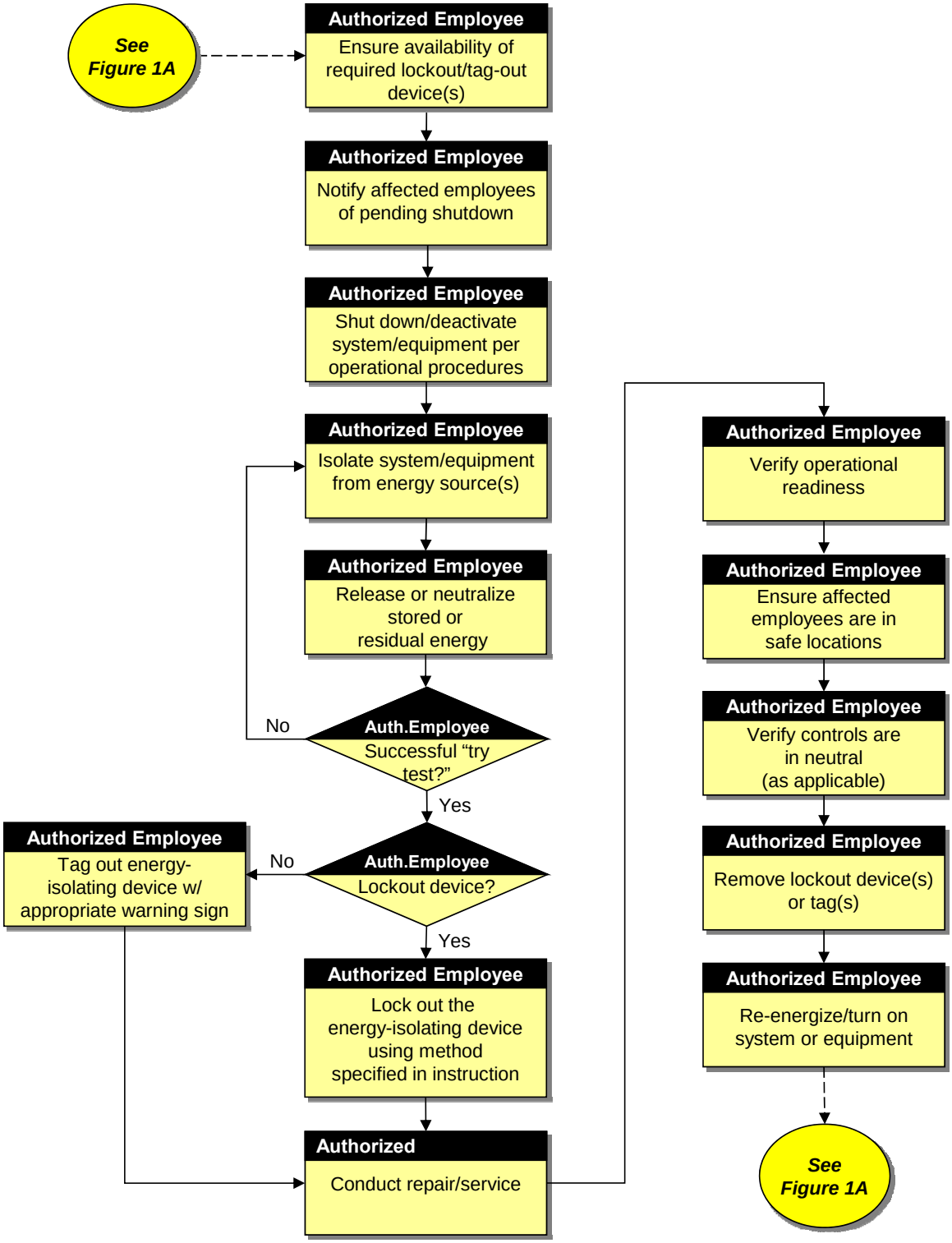


Figure 2: Hazardous Energy System Equipment List

HAZARDOUS ENERGY SYSTEM EQUIPMENT LIST		
Approved by:		Last Update:
Number	***Equipment/Machinery Description***	***Location (attach maps or sketches as appropriate)***

Figure 3: Hazardous Energy System Equipment
Lockout/Tag-out Instruction Form

<table>
<tr><th colspan="3">LOCKOUT/TAG-OUT INSTRUCTION</th></tr>
<tr><td colspan="2">Approved by:</td><td>Last Update:</td></tr>
<tr><td>Number:</td><td>Equipment/Machinery Description:</td><td>Location:</td></tr>
<tr><td colspan="3">Employee(s) Authorized to Perform Lockout/Tag-out Tasks:</td></tr>
<tr><td colspan="3">Lockout Device or Tag Description:</td></tr>
<tr><td colspan="3">Lockout/Tag-out Steps:

• Identify Energy Source(s)

• Notify Affected Personnel: Notify the affected supervisor and Area Manager and all affected employees that the equipment or system will be shut down for the required servicing and/or maintenance activities.

• De-energize System: Turn off or shut down the machinery, equipment, or system involved in accordance with (described)

• Isolate System: Completely isolate the equipment from the energy source(s) by using appropriate isolating devices (describe):

• Install Lockout Device

• Release or Neutralize Stored or Residual Energy (Describe action):

• Conduct “Try” Test: Verify that the system is in a zero-energy state and that no employees are exposed; deliberately attempt to activate the system. The try test is considered successful if the system cannot be activated.

• Conduct Required Service or Repair</td></tr>
</table>

LOCKOUT/TAG-OUT INSTRUCTION

- **Verify operational condition:** Upon completion of the servicing or maintenance activities, check the machinery or equipment and the immediate area. Make sure that the system is in operating condition and ready to be activated.

- **Verify affected employee location:** Verify that all affected employees are clear of the system, in a safe location, and aware that the system is about to be activated.

- **Verify that controls are in neutral** (as applicable).

- **Remove lockout device or tag:** The authorized employee shall remove the lockout device and any energy-isolating devices, or tag as appropriate.

- **Re-energize system**: Re-energize the system, and notify all affected employees that the service/repair activities have been completed and the system is back in service.

	STANDARD OPERATING PROCEDURE **GG-37: Control of Erosion and Sedimentation**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 31, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the measures that Guyana Goldfields, Inc. (GGI) will implement to address specific erosion control needs at the Aurora Project. Action under this SOP may be taken in response to the direct observation of an erosion issue, a specific management request, or when prompted by the routine monitoring of project roadways, earthworks, and infrastructure as described in the GGI *Erosion Prevention and Control Plan.*

This SOP will apply over the life of the Aurora Project. It is designed to support the implementation of the *Erosion Prevention and Control Plan*; Section 4.3.2 ("Management of Social and Environmental Impacts" of the GGI *Environmental and Social Management System Plan (ESMS Plan)*; and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Gabions

Gabions are rectangular steel mesh cages or boxes filled with coarse boulders or riprap that can be wired or interlocked to create a stable erosional barrier that can withstand substantial waterflow. Example installations are shown in the GGI *Erosion Prevention and Control Plan,* Appendix C, Figures C-3 and C-4.

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager or his designee will evaluate Aurora Project erosion control needs, whether reported or observed directly or identified as part of the monitoring conducted under *Erosion Prevention and Control Plan* requirements, and work with the Construction Manager or his designee to develop an appropriate technical approach to

correcting the observed condition, as well as to lay out an appropriate scope for the safe and timely completion of field work.

3.2 Environmental Officer

The Environmental Officer will assist the Environmental Manager in evaluating specific erosion control needs, and is responsible for managing stores of basic erosion control supplies at the Aurora site, as well as stocks of appropriate native plants at the site restoration nursery. The Environmental Officer will also monitor and direct the activities of the GGI Erosion Control Team, and will conduct post-work inspections of erosion control actions to ensure that the desired outcome has been achieved.

3.3 Construction Manager

The Construction Manager will assign or request the hiring of the workers that will comprise the Erosion Control Team, and will work with the Environmental Manager to develop an appropriate scope for the required field work.

3.5 Erosion Control Team

The Erosion Control Team is responsible, under the direction of the Environmental Officer, for completion of the specific erosion control tasks requested by the Environmental Manager and Construction Manager.

3.6 All GGI Staff

All GGI staff are responsible for reporting unusual or significant erosion conditions that may be observed on Project roadways, trails, dikes or embankments, mining areas, stockpiles, or other earthworks to their supervisors, the Construction Manager, the Environmental Officer, or the Environmental Manager, for evaluation and potential correction in compliance with the GGI *Erosion Prevention and Control Plan* and this SOP.

4.0 PROCEDURE

The general process for taking action in response to identified erosion control needs is described in the following steps, and summarized as a flowchart in **Figure 1**.

4.1 Regulatory Considerations

The World Bank Group/International Finance Corporation (IFC) *Environmental, Health, and Safety Guidelines for Mining* (IFC, 2007) specify a Total Suspended Solids (TSS) standard (50 mg/L) for site runoff and treated effluents. The Guyana *Mining Act* (No 20 of 1989) does not specify standards for site runoff, although a 100 mg/L TSS and 50 Nephelometric Turbidity Units (NTU) standard for effluents from settling ponds may be inferred.

As GGI is committed to meeting the more stringent of all applicable regulations and guidelines, the ultimate goal of the *Erosion Prevention and Control Plan* and this SOP is therefore to ensure that no site runoff or treated effluents with TSS $\geq$ 50 mg/L and turbidity $\geq$ 50 NTU are released to local waterways.

4.2 Site Restoration Nursery

A site restoration nursery will be established and maintained within the boundaries of the Aurora concession under the direction of the Environmental Officer. The nursery will contain seeds or seedlings of two easily propagated native plants, Common baromalli or (*Catostemma commune*) and Conga palm (*Cecropia* Loeflling); see **Figure 2**. Initial stocks of plant material will be selectively harvested from both the Aurora project site and the access road right of way (ROW). Both plants are known to have high survival rates. Conga palm is one of the first species to naturally colonize cleared areas in this part of Guyana, and Common baromalli is a common understory tree species that will ultimately grow to canopy height.

The initial harvesting of nursery stock from natural sources will be limited to the minimum necessary to establish the nursery. No individual collection site will be denuded or over-harvested. Once the initial nursery stock is collected, it is intended that additional stock be developed through cuttings to the extent possible, to reduce the need for additional harvesting from natural sources.

4.3 Maintenance of General Erosion Control Supplies

The Environmental Officer shall also establish and maintain appropriate stocks of basic erosion prevention materials for use by the Erosion Control Team, in sufficient quantities to permit a rapid and complete response to basic erosion control needs (e.g., reclamation of roadway ROWs or boundaries of building sites; maintenance of culverts, catch drains, or diversion structures). Such materials may include:

- wood-and-geotextile silt fencing material (see *Erosion Prevention and Control Plan,* Appendix C, Section 2);
- rice sacks, for transportation of nursery seedlings;
- non-phosphate fertilizers;
- sandbags, for temporary control of water features;
- plastic culvert and side-drain pipe sections;
- coarse rock and gravel (when made available as part of mining operations) for use in armouring water control features;

- geotextile material in lengths and widths appropriate for potential erosion control needs;

- steel mesh for construction of gabions, with small stockpiles of ripap rock appropriately sized for typical intended applications;

- supplies of reserved topsoil;

- jute or coconut fibre matting; and

- plastic totes or containers, with distribution hoses, for transporting water to planting sites and watering new plantings.

4.4 Identification and Evaluation of Erosion Control Needs/Preparation of Erosion Control Instructions

As discussed in Section 5 of the GGI *Erosion Prevention and Control Plan,* erosion control needs may be identified as a result of the monitoring of:

- new construction;

- the ongoing use of the Buckhall to Aurora access road; and

- constructed roadways, wharf areas, and other earthworks at the Aurora, Tapir Crossing, and Buckhall sites.

Erosion control needs may also be directly observed by any member of the GGI workforce. Regardless of the source, erosion control issues should be referred to the Environmental Manager and Construction Manager for evaluation using the decision tree flowcharts contained in Appendix D of the GGI *Erosion Prevention and Control Plan* as general guidance. The Appendix D flowcharts will note a number of situations in which geotechnical or civil engineering input or specialty contractor services (i.e., hydroseeding) may be required. If the Environmental Manager and Construction Manager concur with the guidance provided, engineering and/or contractor support should be arranged.

After completion of the evaluation and the development of an appropriate control strategy, the Environmental Manager and Construction Manager meet with the Erosion Control Team to discuss the work to be done. The location of the observed erosion problem and the specific issues that must be rectified will be noted, along with an explanation of the Global Positioning System (GPS) coordinates or other locational information as appropriate. Any required engineering input or required interactions with external contractors (including any requirements for offsite analysis of grab samples for TSS and turbidity) should be discussed, along with specific instruction for the inspection of the site after works have been completed.

4.5 Field Work/ECI Implementation

All field work shall be conducted in accordance with the GGI *Occupational Health and Safety/Accident Prevention Plan* and the applicable SOPs cited therein.

The Erosion Control Team will conduct the work as planned, under the supervision of the Environmental Officer. If the condition at the work site is observed to be substantially worse than anticipated, the Environmental Manager and Construction Manager will be immediately notified and modifications made as appropriate for the changed conditions.

Special precautions should be taken with all revegetation tasks; seedlings should be wrapped in rice sacks during transport to prevent drying and planting should occur the same day as harvesting to prevent the roots from drying out. Plants shall be transported form the nursery to the work site in rice sacks, with a small quantity of topsoil so that the root systems do not dry out. After a transplant holes are dug, topsoil should be placed in the hole to provide better nutrients and to prevent the roots of the transplant from drying out. Generally speaking, harvesting of plants and preparation of the planting site should be scheduled for the morning and early afternoon, with actual planting to follow in the late afternoon, so that dew and potential nighttime rainfall provides the plants sufficient moisture to survive. In very dry conditions, transplanted seedlings will require at least an initial watering.

After completion of any revegetation actions, the Environmental Officer should evaluate the plant stocks remaining in the nursery, and take steps as necessary to propagate new cuttings or seedlings, or to collect additional specimens as necessary to provide an adequate nursery reserve.

Erosion prevention work on or near roadways (e.g., cleaning of culverts or side drains, re-armouring of slopes, placement of fiber mats) may require appropriate warning signs, and as necessary, use of flagmen to control traffic, as noted in the *Occupational Health and Safety/Accident Prevention Plan.* All excavations or works in progress will be appropriately flagged and marked until complete. Completed sites shall be examined carefully for trash, equipment, or unused materials; all wastes shall be removed from the site and disposal of properly in accordance with the GGI *Waste Management Plan.*

4.6 Follow-on Inspection

Completed erosion control works shall be inspected by the Environmental Officer. If the work is unacceptable or additional plantings or rework is required, the Environmental Manager and Construction Manager shall be notified and the Erosion Control Team mobilised to conduct the required actions or repairs. When the Environmental Officer is satisfied that all works have been satisfactorily completed, photographs shall be taken and forwarded to the Environmental Manager electronically with the location and date noted.

4.7 Project Records

Records produced as a result of the implementation of the SOP will consist of annotated photographs of accepted restoration areas, which shall be retained as described by GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Erosion Prevention and Control Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GGI *Waste Management Plan*
- GG-05, "Records Management"
- Guyana *Mining Act* (No 20 of 1989)
- IFC, 2007; "Environmental, Health and Safety Guidelines for Mining", December 10, 2007; accessed online at http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_Mining/$FILE/Final+-+Mining.pdf ; World Bank Group/International Finance Corporation, Washington, DC. 2007.

Figure 1: Implementation of Erosion Control Actions

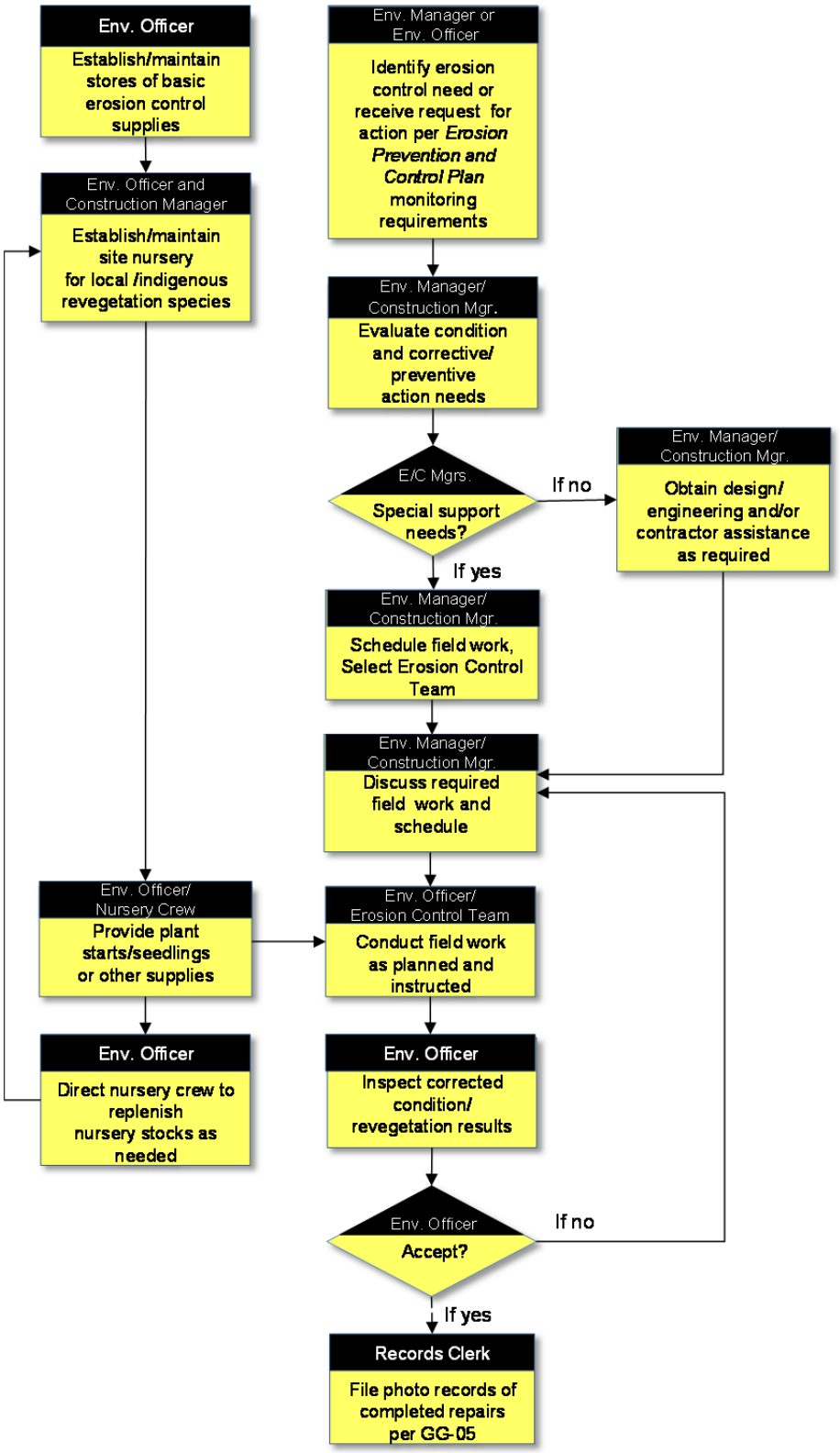


Figure 2: Native Plants in Restoration Nursery

Conga palm (*Cecropia* Loefling)

Common baromalli (*Catostemma commune*)

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) establishes minimum safety requirements for Guyana Goldfields, Inc. (GGI) employees performing construction or maintenance work at heights for the Aurora Project. Work areas affected by this SOP may include the roof areas of Project buildings, rainwater collection cistern support structures, masts of drill rigs, and other structures typically 1 - 2 stories in height; see Appendix 1 for examples of affected structures and potential work areas.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Fall Arrestors

Fall Arrestors are items of special personal protective equipment (PPE) used to prevent the serious injuries or fatalities that could result from an accidental fall from height. They typically include a body harness and a short retractable lanyard that clips to an item of infrastructure, or to a fixed safety rope, cleat, or cable. See Figure 1 for an example of a safety harness and retractable lanyard.

3.0 RESPONSIBILITIES

3.1 Health and Safety Officer

Prior to the start of work, the Health and Safety Officer or his designee shall review all ladders, safety gear, and tools assembled for a given high work project, for consistency with this SOP and general safe work practices,

3.2 Supervisor or Lead Worker

The supervisor or lead member of a work team assigned to work at height is responsible for selecting the appropriate ladder, PPE, and tools for the job, and for reviewing safety procedures with the Health and Safety Officer prior to the initiation of work.

4.0 PROCEDURE

The overall process to be followed when working at heights is described in the following steps, and is summarized in the flowchart shown in Figure 2.

4.1 Preparation for Climbing

The supervisor or lead member of any GGI work team assigned responsibilities for working at heights shall assemble the work team and all required equipment for review by the Health and Safety Officer prior to starting work. At a minimum, items to consider in preparation for working at heights include the following:

- Inspect all ladders before every use. If there are defects, the ladder should be taken out of service and repaired or replaced. Defects may include loose or missing rungs, cracks or splits (if made of wood), or a bent frame.

- Fall arrest devices are required for all personnel working at heights; inspect all fall arrest equipment before every use. If there are any defects, the equipment should be taken out of service and replaced. Defects may include mold, mildew, fraying, or tears in the harness, or cracks in metal fittings.

- All workers should wear proper footwear with non-skid soles. Leather boots with a heel are preferred; muddy boots must be cleaned before climbing ladders.

- Wear a hard hat, preferably with a chin strap; wear leather gloves if needed for the task and for protection against hot reflective surfaces.

- Use a belt for tools and/or plan to raise and lower tools to and from the work area with a rope; heavy tools (power tools, saws, and hammers in particular) should be secured with lanyards.

- Always work in a group of two or more, with one individual assigned to the ground surface to assist in raising and lowering of tools, and for steadying portable ladders.

- Only use electrical tools and extension cords with proper ground fault interrupters (GFIs); avoid using electrical tools in rainy conditions.

- Prepare for the weather. Whenever possible, avoid conducting work at heights when it is raining. If work during rain is required, wear appropriate rain gear and ensure that footwear retains traction when wet.

- Take frequent breaks and drink water to stay hydrated, especially during sunny weather conditions.

- With respect to portable ladders, choose the proper ladder for the task;
    - Ladders should be tall enough to permit work to be accomplished without dangerous reaching;
    - Straight ladders should be placed against a building at a 4:1 slope (height to base); this means that ladders should be 0.3 m from the wall for every 1.2 m in height;
    - Ladders should extend at least 3 rungs (or about 0.9 m) above the roofline;
    - Never use a metal ladder if using electrical equipment; select a wooden or fiberglass ladder instead;
    - Place ladder on a firm, stable, flat surface, using large flat boards to level uneven surfaces if necessary; and
    - Assign a worker to hold the bottom of the ladder to ensure stability when it is being used.
- For stationary ladders, ensure that a stationary safety line or other fall protection arrangement is in place and in good working order; an example of a stationary line is provided in the Figure 3.

The Health and Safety Officer shall review the condition and adequacy of the assembled equipment and PPE for the job, and ensure that all staff are aware of the requirements of this SOP prior to starting work. Attendance may be documented in the Health and Safety Officer's personal log or by a standard GGI training attendance sheet as provided in GG-06, "ESMS Training Program."

4.2 Climbing a Ladder

Before climbing any ladder, all workers must obtain approval from the Health and Safety Officer that the ladder is in good condition and that all personal safety equipment has been donned appropriately. Items to remember in climbing a ladder include:

- When climbing up, face forward towards the ladder.
- Maintain three points of contact with hands and feet at all times (see Figure 4).
- Do not climb above the second highest step on a step ladder or the third from the top on a straight ladder. If you have to climb above these steps, then the ladder is too short to do the job and a taller ladder should be obtained.

- Make sure that only one worker uses a ladder at a time.

- Ensure that any electrical extension cords are properly secured to prevent cuts, scrapes or other damage.

- Do not carry tools in your hands. Place them in a tool belt and/or pull up to the work area with a rope.

- If working above 2 m without a guard rail, use a fall arrest system with a full body harness (See Figures 1 and 5). This includes stationary ladders and drill rigs that extend above 2 m. Ensure that the harness and lanyard will support the weight of the worker and his tool belt.

- The body harness should have a drop-forged “dee” ring in the back to attach the lifeline.

- The lifeline may be retractable or fixed-length, and must be of sufficient strength to stop free fall.

- The attachment point should be strong enough to support at least 2,300 kg, and should be located to prevent entanglement and to safely limit the distance of a potential free fall.

- When working on a roof without fall protection, workers should stay at least 2 m from the edge of the roof. This distance can be maintained using a fall restraint system anchored to the roof, or by roping off an area 2 m from the edge of the roof. See Figure 6 for an illustration.

- If the weather is sunny and the work area is reflective, wear UV eye protection.

4.3 Descending from Heights

When descending from a high work area, observe the following:

- When climbing down, face forward towards the ladder.

- Disengage fall arrestors.

- Maintain three points of contact (with hands and feet) at all times.

- Do not carry any tools in your hands. If tools were brought up by a rope, lower the tools down to a worker on the ground before descending.

- Make sure that only one person uses a ladder at a time.

- Remove fall arrestor PPE and properly stow in its designated storage area. Return portable ladders to storage

4.4 Records

The Health and Safety Officer of his designee shall record the names of the participants in the pre-work review described in Section 4.1, in a personal logbook or on the standard GGI training record form as described in GG-06, “ESMS Training Program.”

5.0 REFERENCES

- GGI *ESMS Management Plan*
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”

Figure 1: Examples of Fall Arrestor Harness and Retractable Lanyard[1]

[1] Source: http://www.rigidlifelines.com/products.html

Figure 2: Working at Heights – Typical Work Process

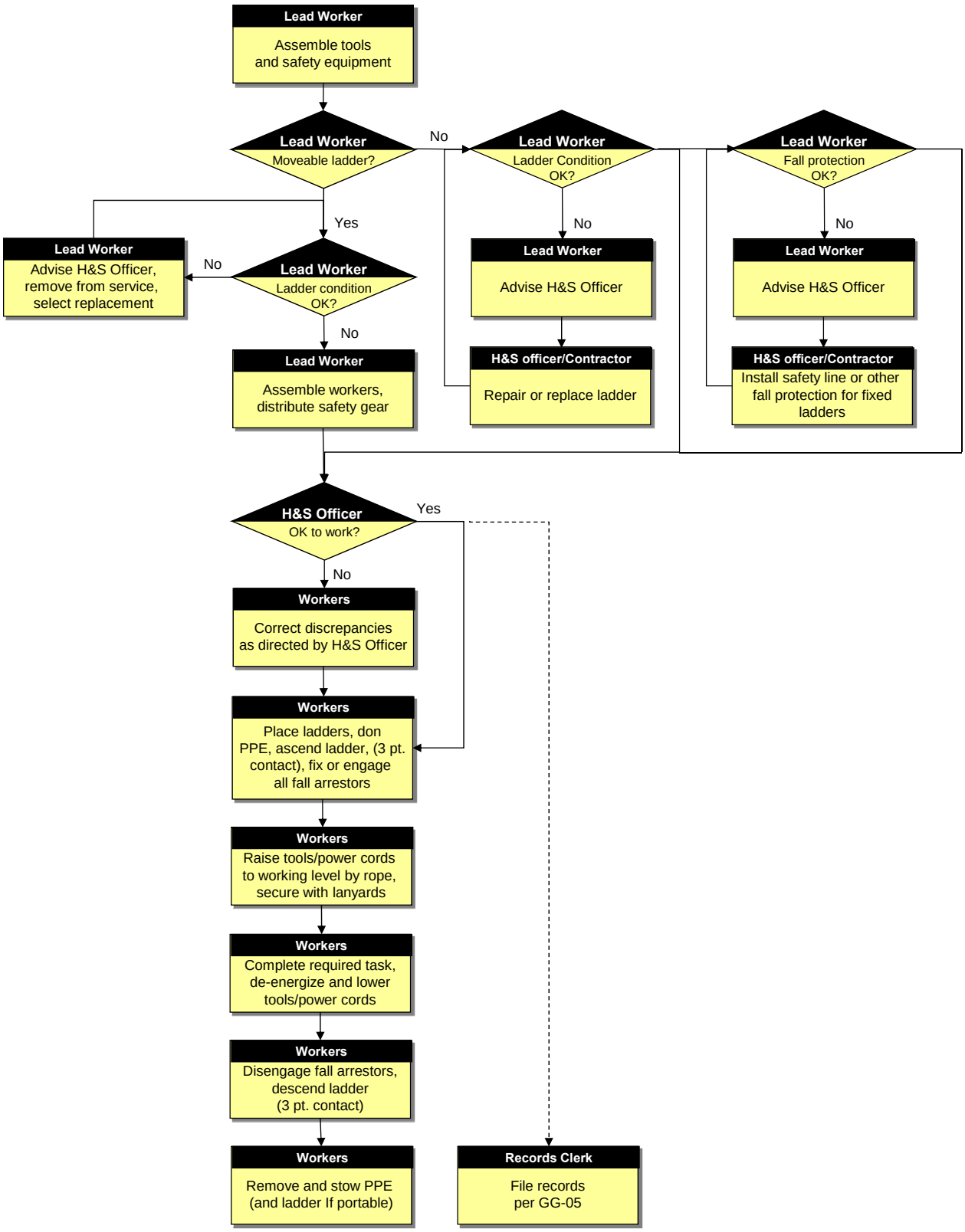


Figure 3: Example of a Safety Line for a Stationary Ladder[2]

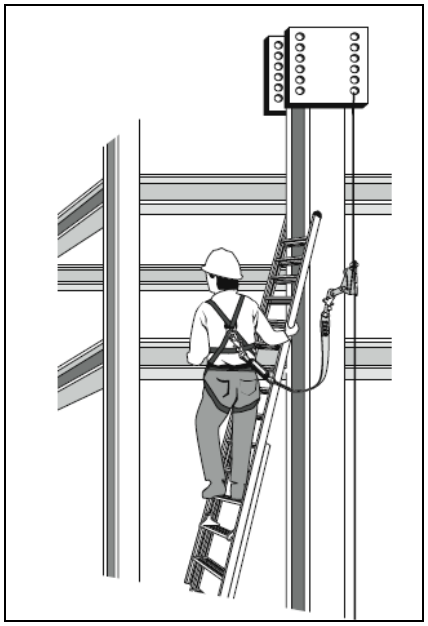
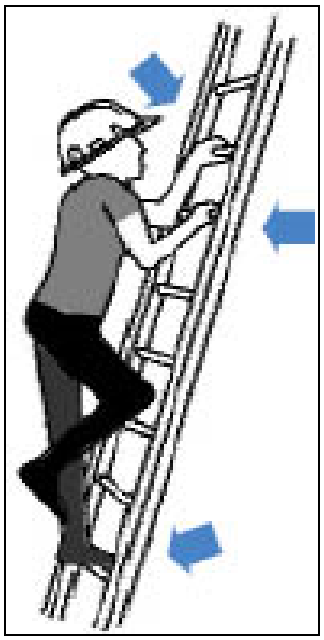


Figure 4: Illustration of Using
Three Points of Contact for Climbing a Ladder [3]



[2] (Source: Oregon OSHA's Oregon OSHA standards and Technical Resources publication: Fall Protection for the Construction Industry. Oregon Occupational Health and Safety Administration. http://www.orosha.org/pdf/pubs/2824.pdf)

[3] (Source: OSHA. Portable Ladder Safety. Occupational Health and Safety Administration. http://www.osha.gov/Publications/portable_ladder_qc.html)

Figure 5. Illustration of a Full Body Harness and Lanyard[4]

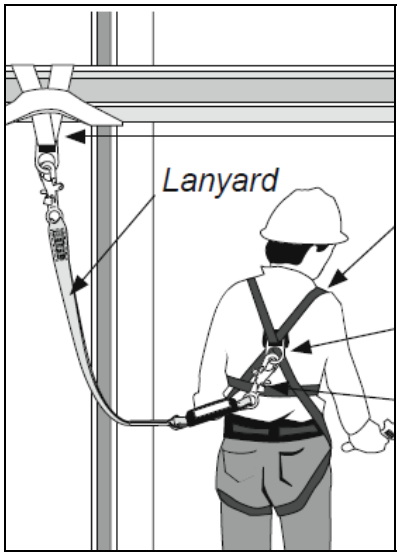
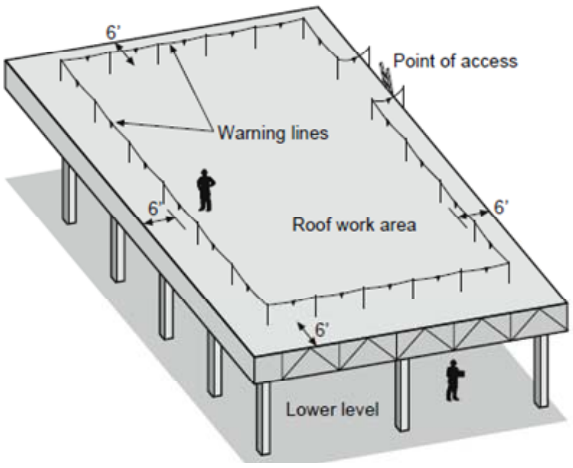


Figure 6: Illustration of a Fall Restraint System and Fall Prevention Warning lines on Roofs[5]

A fall-restraint system



[4] (Source: Oregon OSHA's Oregon OSHA standards and Technical Resources publication: Fall Protection for the Construction Industry. Oregon Occupational Health and Safety Administration. http://www.orosha.org/pdf/pubs/2824.pdf)

[5] (Source: Oregon OSHA's Oregon OSHA standards and Technical Resources publication: Fall Protection for the Construction Industry. Oregon Occupational Health and Safety Administration. http://www.orosha.org/pdf/pubs/2824.pdf)

Attachment 1: Typical Project Locations Involving Work at Heights

	STANDARD OPERATING PROCEDURE **GG-39: Monitoring and Maintenance of Potable Water Quality**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) defines the methods that Guyana Goldfields, Inc. (GGI) will use to monitor and maintain potable water quality for the Aurora Gold Project. Water for the Aurora Project will be collected in cisterns fed by rooftop collection systems and wells. All water used as potable water will require treatment and testing. This SOP will apply during the construction phase of the Project pending the anticipated installation of self-contained, modular water treatment plants at Buckhall and the Aurora man-camp; these units are expected to be commissioned prior to the operational phase of the Project. At that time, this SOP will be modified to incorporate the manufacturer's operations and maintenance (O&M) instructions and specific requirements for treatment plant water quality testing instructions. This SOP supports Section 4.3.2 of the GGI *Environmental and Social Management Plan* (*ESMS Plan*) Section 2.7 of the GGI *Occupational Health and Safety Management/Accident Prevention Plan* and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Potable Water

Potable water is defined as the water used for drinking, bathing, cooking, washing of foods, washing of cooking and eating utensils, and the washing of food preparation and processing areas.

2.2 Filtration

Filtration is a primary treatment method for drinking water where suspended particles and associated microorganisms are removed by a physical sieve or filter.

2.3 Chlorination

Chlorination is the use of chlorine in water to inactivate bacteria and other microorganisms through chemical reactions.

2.4 Ultraviolet light (UV)

Ultraviolet light (UV) is a drinking water treatment system, typically used at the point of use and know to be effective at removing microorganisms from water.

3.0 RESPONSIBILITIES

3.1 Environmental Manager

The Environmental Manager or his designee will conduct annual site surveys at the Aurora and Buckhall project locations that examine water treatment equipment, practices, and general sanitation. The Environmental Manager will oversee the treatment and testing of the potable water at all three project locations, and will adjust the testing schedule as needed, based on the results observed. When the modular water treatment plants are installed at Buckhall and the Aurora man-camp, the Environmental Manager will also direct an appropriate update of this SOP to incorporate the plant manufacturer's O&M instructions and testing requirements.

3.2 Health and Safety Officer

In the event that there is a positive biological test in the potable water supply, the Health and Safety Officer will work with the Environmental Manager to determine the cause of the contamination and coordinate decontamination efforts. The Health and Safety Officer will also be responsible for working with the Site Medics to determine any likelihood of workers developing disease as the result of any potential biological contamination.

3.3 Camp Managers

Camp Managers will ensure that potable water is provided and maintained at all worksites. Camp Managers will also oversee and assist with the treatment and testing of water.

4.0 PROCEDURE

The general processes for the treatment and testing of potable water are described in the following sections and summarized in **Figure 1**.

4.1 Provision of Potable Water

Potable water shall be provided in all places of employment for drinking; cooking; washing of the person; washing of foods; cooking or eating utensils; food preparation and processing premises; bathrooms; and eyewash and safety shower stations. Water treatment and testing requirements associated with this program are designed to provide

assurance of acceptable water quality pending installation of modular water treatment plants at Buckhall and the Aurora man-camp.

Potable drinking water dispensers shall be designed, constructed, and serviced so that sanitary conditions are maintained, capable of being closed, and equipped with a tap. Portable drinking water containers should be cleaned using a dilute bleach solution daily prior to filling with drinking water. Commonly shared drinking cups or sports water bottles are not allowed. Additionally, care should be taken to ensure that hands, glasses, cups, sports bottles, and other containers should not contact the bottled water coolers' spigots. Potable water storage tanks and containers, especially those potable water storage tanks supplying water for drinking purposes, should be handled with extra care to avoid potential contamination. All collection or storage cisterns fed by rooftop collection systems, streams, or wells should be periodically cleaned and inspected using appropriate cleaning and disinfection methods.

4.2 Potable Water Treatment

Potable water used at Buckhall and the Aurora man-camp will be treated with a combination of filtration, chlorination, and UV. Filtration adds protection against protozoa (e.g., *Giardia lamblia*) and reduces turbidity. Chlorine added to the water is effective at killing most disease-causing organisms in the water, and UV provides disinfection at the point of use. Please note that the water treatment methods noted in this SOP will be superseded when self-contained modular water treatment plants are installed at Buckhall and the Aurora man-camp prior to the operational phase of the Project.

4.2.1 Filtration

The first step in the disinfection process is filtration. Not only does filtration remove a number of microbial contaminants from the water, it also increases the efficiency of other treatment methods by removing particles and organic matter. Disinfection with chlorine or UV can be inhibited by turbidity because viruses and other microorganisms are often associated with particles (HC 2011). All water used for potable water on the Aurora Gold Project should be filtered using a 0.1 µm filter.

4.2.2 Chlorine Treatment

As long as chlorine levels are maintained, chlorine treatment of water is effective at removing most microorganisms of concern from drinking water. Maintenance of chlorine treatment shall be coordinated to maintain residual chlorine between 0.2 to 3.5 ppm. Should sample results fall below this applicable range, the maximum residual disinfectant level for chlorine is 4 ppm. When the chlorine concentration is above 3.5 ppm, process treatment techniques to reduce the chlorine levels may be necessary. Water characteristics (e.g., solids, pH, alkalinity, hardness) will influence the amount of chlorine required to be added to alter concentration.

To raise the chlorine level by 0.5 ppm, follow the steps below.

1. For each 1,000 litres of water, premix 1 gram (1/4 teaspoon) of 65% granular calcium hypochlorite with 1 litre of water. Household bleach may also be used provided the manufacture date is within three months and it is stored away from heat and light. The percentage of chlorine in household bleach is variable, so the Environmental Manager should determine how much bleach is necessary for treatment. Check Material Safety Data Sheets to ensure that proper personal protective equipment (PPE) is worn.

2. Add mixture to tank. Mix thoroughly by recirculation or other means.

3. Recheck residual chlorine, and repeat steps 1 and 2 if necessary.

4.2.3 UV Treatment

UV treatment should be done as the last step in the disinfection process just prior to distribution. UV treatment should always be proceeded by filtration because suspended particles can shield microorganisms from the light (HC 2011). UV treatment should be used at all project locations at the point of use of the water distribution. The proper UV dosage should be determined by the Environmental Manager with assistance from a licensed water quality engineer. In Canada, a UV dose of 40 milliJoule/cm^2 is commonly applied to water systems, frequently along with chlorine and filtration (HC 2011).

4.2.4 Disinfection Treatment

Prior to beginning disinfection, verify all facility personnel are aware that water should not be used until treatment is complete. To disinfect water systems and tanks, raise residual chlorine to approximately 50 ppm. Follow the steps below.

1. Flush and refill tank only if inspection warrants.

2. For each 1,000 litres of water, dissolve 75 grams (0.4 cups) of 65% granular calcium hypochlorite in one litre of water. This should yield the desired 50 ppm residual chlorine. Other chemicals such as liquid household bleach can also be used. The percentage of chlorine in household bleach is variable, so the Environmental Manager should determine how much bleach is necessary for treatment. Check Material Safety Data Sheets to ensure that proper personal protective equipment (PPE) is worn.

3. Add the one-litre mixture to each 1,000 litres of water. Mix thoroughly by recirculation or other means.

4. Run all taps until lines are filled with treated water.

5. Allow disinfectant treatment to remain in the system at least twelve hours.

6. Empty the system and tank and refill using the maintenance chlorine treatment.

7. Test the chlorine concentration to verify that it is within acceptable limits and total coliform levels are equal to zero (Section 4.3.2 and 4.3.3).

4.3 Potable Water Testing

All potable water should be tested with the following schedule, with modifications to be made at the Environmental Manager's discretion based on the results received:

- **Baseline:** mercury and pesticides (malathion)
- **Weekly:** free chlorine and UV unit functionality
- **Quarterly:** total and fecal coliforms and other essential characteristics classified in the "Guyana Specification for Drinking Water" (GNBS 2004)
- **Periodic** (as needed): *Legionella*

A summary of these testing recommendations and procedures for positive results is provided in Table 1.

Table 1. Summary of Drinking Water Tests

Testing Frequency	Test	Procedure for Positive Test*
Baseline	Mercury, pesticides (malathion)	Evaluate treatment methods and alternative sources
Weekly	Residual chlorine	Follow treatment procedure outlined in Section 4.2.2
Weekly	Functional check of UV unit	Check for UV source functionality, replace if burned out
Quarterly	Total and fecal coliforms	Follow methods outlined in Section 4.3.3, test for *Legionella*
Quarterly	Drinking Water Specifications	Evaluate treatment methods and alternative sources
As Needed	Legionella	Institute more frequent cleaning, testing, and disinfection

*In the case of residual chlorine, a "positive test" would be one with residual chlorine levels less than 0.2 ppm

4.3.1 Baseline Mercury and Pesticide Testing

Since Project sites may be in areas potentially associated with legacy artisanal or small-scale mining (ASM) and periodic malaria fogging operations using malathion, unless reliable baseline data exist for the specific sources in question, samples should also be taken from all sources to confirm the acceptability of mercury and pesticide concentrations (although mercury analysis for rooftop collection samples would likely not

be required). Current treatment methods must be reviewed for adequacy after review of baseline data, and alternate sources located if mercury and/or pesticide contamination is detected at unacceptable concentrations.

4.3.2 Chlorine Testing

Chlorine is added to react with all of the chemicals in the water; any remaining chlorine is residual chlorine, which does the disinfecting. Testing for residual chlorine ensures that there is enough chlorine remaining in the water to continue contaminant disinfection. Potable water shall be tested for residual chlorine on a weekly basis; the applicable range is between 0.2 and 3.5 ppm. Per the scheduled testing frequency, collect a sample (or multiple samples) and test according to the manufacturer's test kit procedure. It is recommended that portable chlorine testing equipment such as the Hach Pocket Colorimeter II (http://www.hach.com/pocket-colorimeter-ii-chlorine-free-and-total-/product?id=7640442953) be used.

Prior to collecting the sample, flush and clear the line at the sample point for one minute. It is recommended the sample(s) be collected at the farthest point or extent of the distribution system.

If residual chlorine is less than 0.2 ppm, maintenance chlorine treatment is necessary until the chlorine level is within the acceptable range, as specified in Section 4.2.2 Maintenance Chlorine Treatment.

Testing more frequently than scheduled may be required depending on water usage and other conditions. Each location should establish a schedule that enables it to maintain chlorine at the proper level. Maintain testing records per Section 4.4.

4.3.3 Total and Fecal Coliform Testing

Bacteriological testing of potable water for total coliform bacteria provides information on bodily waste (i.e., fecal) contamination of the water supply by indicating whether coliform organisms are present or absent.

As the UV unit provides a significant level of protection against bacteriological contamination, functionality should be checked on at least a weekly basis.

At least quarterly, collect a water sample (or multiple samples) using a container provided by a qualified water quality laboratory. Prior to collecting the sample, flush and clear the line at the sample point for one minute. It is recommended to collect the sample(s) at the farthest point or extent of the distribution system. Label the sample container with the project site, date, time, and location of collection.

Send the sample to a qualified water quality lab for total coliform bacteria analysis. Maintain testing records per Section 4.4.

To ensure accurate analytical results:

- Keep the sample out of direct sunlight.
- Chill and fill the sample cooler for transporting or shipping with ice as soon as possible.
- Arrange for sample shipment and the start of testing for total coliform bacteria within 24 hours of sample collection.
- Follow sample collection and chain of custody documentation procedures.

If the quarterly sample for total coliform bacteria is positive (i.e., above zero), follow these steps.

1. Do not touch, handle, or use the water.

2. Find an alternative source of water (i.e., bottled) or boil the water. If boiling the water, bring the water to a boil and let it boil for two minutes before using.

3. Coordinate disinfection treatment as described in Section 4.2.4.

4. Collect at least four same day repeat total coliform bacteria samples within 24 hours of receiving the initial positive total coliform bacteria results. If the system has five or fewer service connections or the positive sample was obtained at the distribution system end point, the number of repeat samples or the collection period can be adjusted.

5. Collect a sample for residual chlorine analysis to determine if it is within an acceptable range. If residual chlorine is less than 0.2 ppm, maintenance chlorine treatments will be necessary until the chlorine level is within the acceptable range, as specified in Section 4.2.2.

6. Repeat the disinfection process or maintenance chlorine treatment until an entire set of repeat samples are equal to zero for total coliform bacteria, prior to reinstating water usage.

4.3.4 *Legionella* Testing

Potable water is also a common source of *Legionella* bacteria. Specifically, water distribution systems, cooling towers, hot water tanks (i.e., boilers and hot water heaters), air conditioning systems, and large plumbing systems are areas where the bacteria can be found. Heat, stagnation, scale, and sediment can promote bacterial growth. Exposure to the bacteria can cause Legionnaires' disease (a serious lung infection or pneumonia). Exposure occurs when water is aerosolized into a mist and/or droplets contaminated with the *Legionella* bacteria. Since *Legionella* bacteria are reasonably resistant to standard water disinfection, control methods may require multiple treatment techniques.

Periodic sampling and testing for the presence of legionella bacteria is recommended to show that adequate microbiological control is being achieved. *If residual chlorine is less than 0.2 ppm or total coliform bacteria is above zero, this indicates that microbiological control may not have been achieved, and Legionella testing is recommended.*

Legionella testing should be done by collection of a water sample or swabbing the interior of an area (i.e., faucet or pipe) where there is scale build-up. The sample should be sent to a qualified water quality laboratory. In the event of positive *Legionella* sample, more frequent testing, cleaning, and disinfection will be required.

4.3.5 Guyana Drinking Water Specification Testing

All potable water shall be tested quarterly for the essential characteristics classified in the "Guyana Specification for Drinking Water" (GNBS 2004), i.e., colour, odour, taste, turbidity, pH, total hardness, iron, chlorides, and residual free chlorine. Water samples should be collected in containers provided by a qualified water quality laboratory.

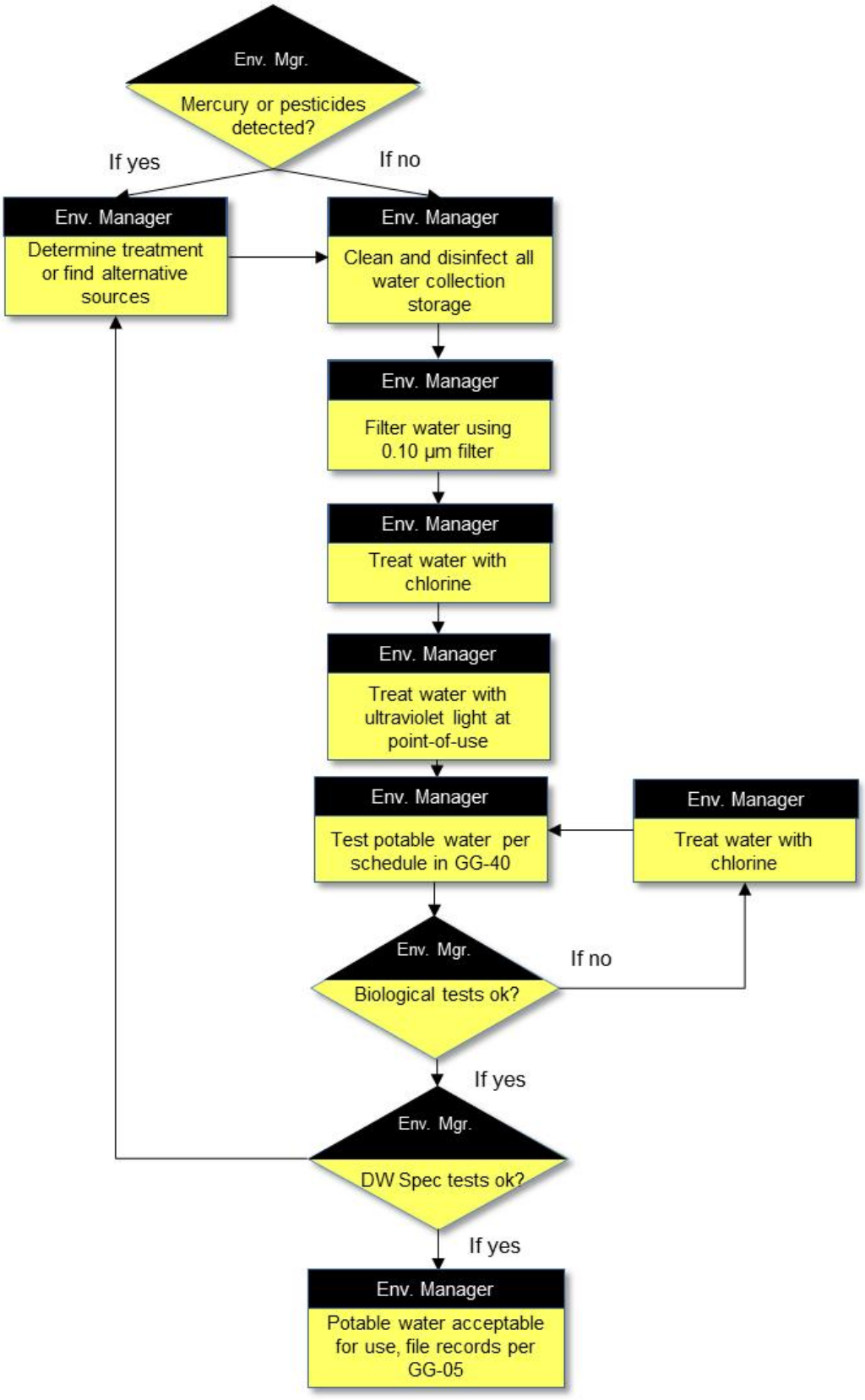
4.4 Records

The Environmental Manager or his designee shall ensure that copies of completed testing and treatment records are retained in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *Occupational Health and Safety/Accident Management Plan*
- GG-05, "Records Management"
- GNBS 2004, "Guyana Specification for Drinking Water"
- Health Canada (HC) 2011. Guidelines for Canadian Drinking Water Quality. Guideline Technical Document: Enteric Viruses. Health Canada, March 2011.

Figure 1: Potable Water Treatment and Testing Process



	STANDARD OPERATING PROCEDURE **GG-40: Site Security**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: June 1, 2013	Revision Level: -0-

1.0 PURPOSE

This Standard Operating Procedure (SOP) describes minimum general requirements for management of site security at key Guyana Goldfields, Inc. (GGI) Aurora Gold Project (Project) facilities (e.g., the Aurora mine site, mill, process plant, and supporting infrastructure and man camp; the Tapir Crossing barge ferry on the Cuyuni River; and the Buckhall logistics support centre and river port).

This SOP will apply over the life of the Project; it supports Sections 4.3 ("Operational Control") and 6 ("Emergency Preparedness and Response") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*.

2.0 DEFINITIONS

2.1 Site Security

Site security is defined as controlling and monitoring physical access to Aurora Gold Project facilities and operations in order to minimize the potential for vandalism, theft, or loss, and to minimize the potential physical endangerment of local residents, transient individuals or groups, or the GGI workforce, contractors, or site visitors.

3.0 RESPONSIBILITIES

3.1 GGI and Contractor Workforce

GGI employees and Aurora Gold Project contractors are responsible for complying with the security measures and processes described in this SOP. Any employee or contractor who becomes aware of a situation that places the security of any aspect of the Aurora Gold Project or the workforce in jeopardy shall immediately report the situation to their supervisors or to any member of the security force. All employees, contractors, and visitors will be issued temporary or permanent Aurora Gold Project

security identification badges, which shall be worn at all times while on Aurora Gold Project property.

3.2 Chief of Security

The security force shall be led by an experienced Chief of Security, who will report to the Construction Manager(or, during the operational phase of the Project, the Operations Manager) and the Vice President, Aurora Project. The Chief of Security will be responsible for staffing the site security force with appropriately trained and experienced personnel, for maintaining security force discipline, and for serving as a key liaison contact with the Guyana Police Force (GPF) with respect to significant security issues. The Chief of Secuirty or his designee shall also ensure that security force members are properly trained in the safe, non-excessive use of non-lethal security equipment and other security resources. The Chief of Security or designated security staff will also be responsible for providing security badges to all newly hired GGI personnel, contractors, and site visitors, as well as for the issue of permanent or temporary security identification badges.

4.0 PROCEDURES

The general process to be followed for managing site security is presented in the following paragraphs and summarized as a flowchart in Figure 1.

4.1 Security Systems Acceptance Inspection

The Chief of Security or a knowledgeable designee shall participate in the review of the design of the Aurora Gold Project mill, mine, access road, Tapir Crossing, and Buckhall logistics facility in order to verify the adequacy of physical security provisions. At a minimum, site designs shall provide for:

- barrier gates and guardhouse(s) at the main entrance to the Aurora site;
- a guardhouse on the north bank of the Cuyuni River at Tapir Crossing
- perimeter security fencing, barrier gate, and guardhouse at the main entrance to the Buckhall logistics facility;
- a guardhouse and passenger processing/luggage weighing and inspection facility adjacent to the Aurora site airstrip;
- secondary high-security fencing, locking gates, and where appropriate, video monitors for the gold room, chemical reagent storage tank areas, individual explosives magazines and blasting agent silos, and power substations.

Security review comments shall be addressed by the Engineer/Procure/Construct (EPC) contractor and properly reflected in final designs and specifications.

4.2 Inspection of Constructed Security Systems

The Chief of Security or his designee shall participate in the acceptance inspection of constructed facilities to verify the adequacy of physical barriers, signage, and other security systems. Comments or inpsectoin pickups shall be forwarded to the Construction Manager and EPC contractor for evaluation and resolution.

4.3 General Site Security Rule and Requirements

All project workforce members, contractors, and visitors shall observe the following security rules at all Aurora Gold Project facilities (e.g., the Aurora mine site, mill, process plant, and supporting infrastructure and man camp; the Tapir Crossing barge ferry; and the Buckhall logistics support centre and river port):

- No authorized visitors are permitted within the security perimeters of the Aurora and Buckhall sites; encounters with unauthorized individuals will be immediately referred to uniformed security personnel and/or the Chief of Security for investigation and appropriate action. Requests for emergency medical or humanitarian assistance will be coordinated with GGI medics and responded to appropriately in accordance with the Project *Community Relations Management Plan* and *Influx Management Plan.*

- Unauthorised use of the GGI airstrip, the Tapir Crossing barge ferry, or GGI vehicles is considered to be a serious breach of security; any such breach shall be immediately reported to the Chief of Security and appropriately responded to and investigated as noted in Section 4.4.

- All employees, visitors, and contractors must present personal identification and be logged in and out of the mine/mill and port sites. All personal luggage is subject to search for prohibited items as per the GGI Labour Grievance Procedure. No entry shall be permitted without proper documentation. All employees, contractors, and visitors must be issued a security identification badge, to be worn on the visible exterior of their clothing.

- At a minimum, all employees, visitors, and contractors shall be required to wear hard hats, safety glasses, and safety shoes or boots within any Aurora Gold Project security perimeter, except within the man-camp and administrative areas.

- All visitors to Buckhall and/or the Aurora site will require prearranged company escorts. Use of cameras by visitors will be evaluated and authorized by Aurora Gold Project management on a case-by-case basis. Overnight visits will require prearranged company housing and canteen access.

- Possession, consumption, or being under the influence of alcoholic beverages or illegal drugs is specifically prohibited for all employees, contractors, or visitors, as noted in the GGI Labour Grievance Procedure (*ESMS Plan*, Appendix A).

- Possession of firearms, explosives, or other potentially lethal weapons is specifically prohibited; as a general rule, security personnel are permitted to use non-lethal security equipment or guard dogs only to the extent permitted by the Government of Guyana, in full accordance with arrangements made with the GPF, and only if security force members are properly trained in the safe, non-excessive use of such resources. The Chief of Security or his designee is responsible for providing such training for all security staff as previously noted.

- Collecting, purchasing, or possessing wild animals, wild animal products, or archaeological artifacts is specifically prohibited; with respect to the latter, if any such artifacts are encountered in the normal course of work, they shall not be further disturbed and shall be immediately reported to a supervisor or the Environmental Officer, in accordance with the requirements of GG-25, “Chance Archaeological Finds.”

- All staff, contractors, or visitors shall immediately report any incident, conflict, unlawful activity, theft, or accident to their immediate supervisor, company escort, or any uniformed security guard.

- All traffic to the site shall be managed in accordance with the Project *Transportation Management Plan*; security will be advised when all convoys or authorized GGI vehicles leave Buckhall or cross the Cuynui River at Tapir Crossing. Delivery drivers must show proper documents or bills of lading upon arrival at the Aurora site. Security guards will maintain logs of all arrivals and departures; they will advise the purchasing department or delivery point manager when goods or equipment arrive and ensure that drivers are escorted to the final offloading area or delivery location.

- Non-company vehicles arriving at the Buckhall river port site or the Aurora mine site shall be inspected for contraband (e.g., alcohol, weapons) as well as fuel leaks or other potential hazards. Drivers and passengers in any vehicle in which contraband is discovered shall be detained and the matter referred to the GPF for their appropriate action.

- All vehicles traveling to the Aurora site must check in at Buckhall in accordance with the *Transportation Management Plan.* Arrival of a non-company vehicle at Tapir Crossing or the Aurora site that has not first checked in a Buckhall will be considered a potential security breach, to be investigated as noted in Section 4.4.

- Any Aurora Gold Project employee, contractor, or visitor involved in malicious vandalism, theft of company materials, or any other criminal activity will be disciplined and potentially referred to the GPF for prosecution in accordance with

the GGI Labour Grievance Procedure (*ESMS Plan*, Appendix A). Employees involved in such activities may be terminated; contractors may have their contracts cancelled. Observations of illegal activity must be immediately reported to a uniformed security guard.

- Upon leaving the Aurora site for Buckhall, or from Buckhall to other destinations, all vendor/delivery and non-company vehicles will be inspected to ensure that all materials leaving the facility are properly accounted for and that proper documentation is available.

- Security staff will restrict access to specific areas of the Project and provide all necessary support in the event of a fire, flood, explosion, major fuel or reagent spill, medical emergency, or other emergency conditions, as defined by the Project's *Emergency Preparedness and Response* Plan and (during the operational phase of the Project) *Cyanide Management Plan*.

4.4 Security Inspections and Patrols

The GGI security force shall conduct routine daily or weekly inspections or patrols of the security perimeters of the Buckhall and Aurora sites, checking facility security including any holes in security fencing or other adjacent or unfenced areas in which unauthorized persons or domestic animals may gain entry to the site. Any observed issues shall be reported to the Chief of Security. Any security breaches detected by roving patrols that result in the detaining of unauthorized individuals or encounters with armed intruders shall require immediate notification of the Chief of Security and liaison with the GPF in accordance with the requirements of the Project *Influx Management Plan* and *Community Relations Management Plan*.

4.5 Records

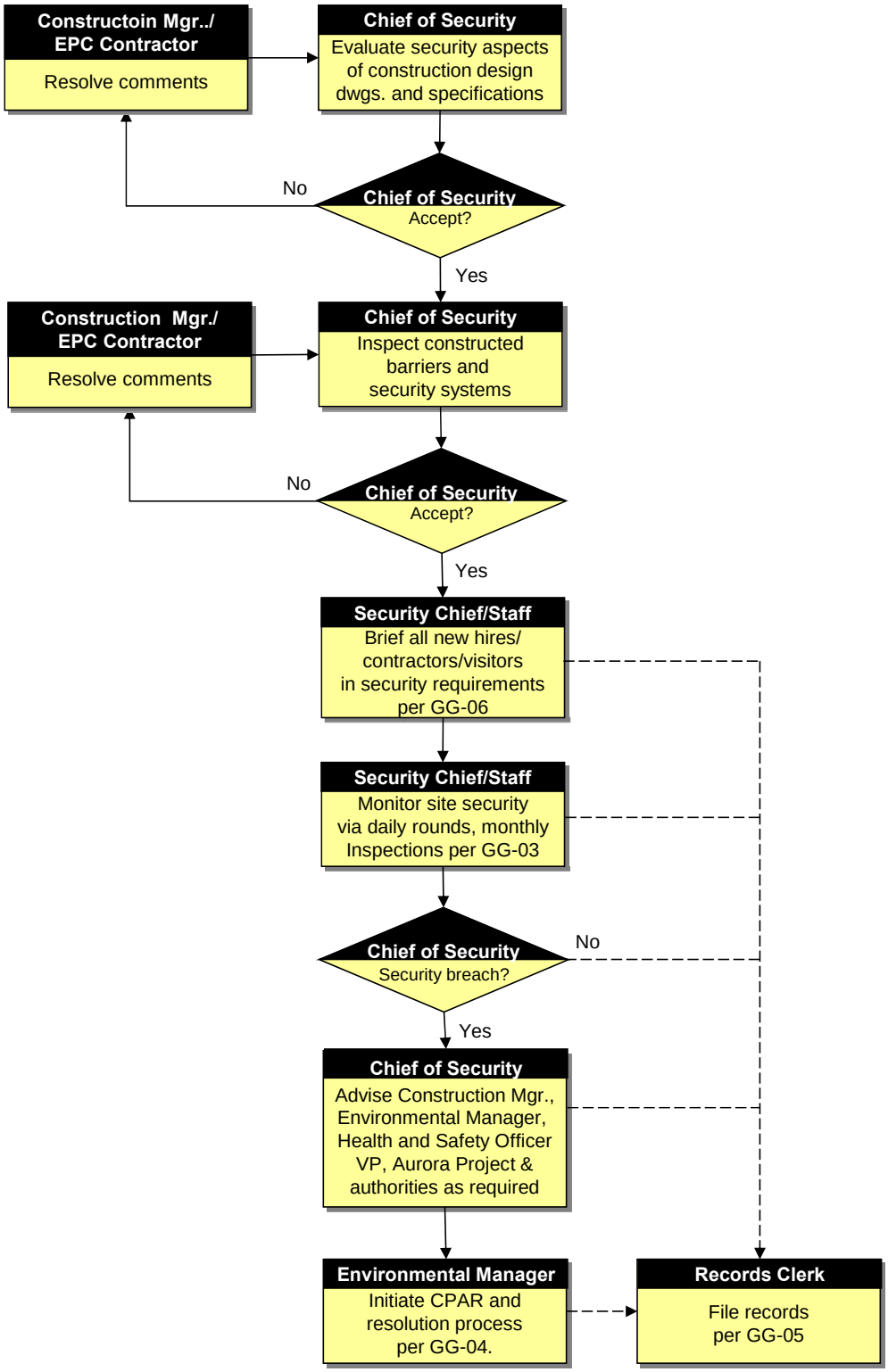
Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, "Records Management" and include hard copies of all training session attendance sheets and any distributed handout materials. Other records to be retained include: design security review/facility acceptance records, security badge assignment records, daily entry/exit log forms, patrol/inspection reports, and any completed CPAR forms.

5.0 REFERENCES

- GGI *ESMS Plan* (including, Appendix A, "Labour Grievance Procedure"
- GGI *Transportation Management Plan*
- GGI *Influx Management Plan*
- GGI *Community Relations Management Plan*
- GGI *Emergency Preparedness and Response* Plan
- GGI *Cyanide Management Plan*.

- GG-03, “Field Inspections”
- GG-04, “Identification of Nonconformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-25, “Chance Archaeological Finds”

Figure 1: Security Management Process



	STANDARD OPERATING PROCEDURE GG-41: Management of Aviation Fuel and Fuelling Operations
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: October 6, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the methods that Guyana Goldfields, Inc. (Guyana Goldfields) will use to manage aviation fuel and fuelling operations for helicopter services for the Aurora Project or other exploration activities. This SOP will apply over the life of the Project; it supports Sections 4.3.2 (“”Management of Environmental and Social Impacts”) and 6 (“Emergency Preparedness and Response”) of the GIG *Environmental and Social Management System Plan (ESMS Plan)*, the GGI *Occupational Health and Safety Management/Accident Prevention Plan (OHSM/AP Plan)*, the *Exploration Management Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

None

3.0 RESPONSIBILITIES

3.1 Exploration/Operations Managers

The Exploration or Operations Managers shall be responsible for communication with the helicopter service contractor, determining the fuel grade and volumes needed to support anticipated helicopter services, and requesting fuel purchases for delivery to the Tapir Crossing helipad or other designated locations.

3.2 Purchasing Manager

The responsible Exploration or Operations Manager will select an aviation fuel vendor currently licensed by the Guyana Energy Agency, and ensure that procurement documents specify provision of fuel of the requested grade in clean containers in good condition, and that all containers are numbered and marked with the delivery date prior to transportation to the site.

3.3 Designated Stores Coordinator

The Designated Stores Coordinator will ensure that the fuel storage shed is secure and neatly organized. The Designated Stores Coordinator will issue fuel to helicopter pilots and keep track of all fuel received or issued on a log sheet kept in the fuel storage shed. Other duties include retrieval and storage of empty containers and response to any fuelling spills.

3.4 Environmental Manager / Health and Safety Officer

The Environmental Manager or Health and Safety Officer will perform monthly inspections of the storage facility for general housekeeping, documentation of fuel receipt and issue, fire extinguisher condition, and the adequacy of the spill kit supplies kept at the fuel storage shed.

4.0 PROCEDURE

The general process for managing aviation fuel is described in the following steps, and is summarized as a flowchart in **Figure 1**.

4.1 Procurement and Transportation of Aviation Fuel

The Exploration Manager or Operations manager requiring helicopter services will communicate with the helicopter provide required fuel grades and volumes to the Purchasing Manager, who will purchase fuel from an aviation fuel vender licensed by the Guyana Energy Agency. Procurement documents must specify that fuel will be provided in clean 20 litre clear plastic jerrycans in good condition. Prior to transport to the Aurora Project site, all fuel containers will be labelled and numbered with a unique identifier and dated with the receipt date. Labels will be sturdy wire tags written in indelible ink.

Transportation of aviation fuel to Tapir Crossing or other designated storage locations will normally be made by GGI personnel at the direction of the **responsible** Exploration **or Operations** Manage**r**

4.2 Storage of Aviation Fuel

Aviation fuel will be stored on a shelf in the fuel storage shed near the helipad prepared at Tapir Crossing (see **Figures 2a and 2b**). The fuel storage shed will be locked; access will be limited to the Designated Stores Coordinator and the Environmental or Health and Safety Officers. All fuel stored in the shed will be logged in by the Designated Stores Coordinator upon receipt; the log sheet will be stored in the fuel storage shed. An example of the log sheet is provided as **Figure 3**. The oldest stock of fuel will be stored closest to the door. Empty fuel containers will be stored on a separate shelf on the opposite wall until they are returned to the vendor.

4.3 Issuing of Aviation Fuel

The Designated Stores Coordinator will issue fuel to pilots as directed by the responsible Exploration Manager or Operations Manager. All fuel shall be issued by receipt date; *oldest fuel must be issued first*. Fuel with any obvious sludge or debris, or from containers whose integrity is in any way compromised shall not be issued, and will be set aside for vendor return and replacement. Only pilots may receive fuel, and only pilots will conduct the actual fuelling, as noted in GG-42, "Helicopter Safety." Along with the fuel, the Designated Stores Coordinator will issue a spill tray to the pilots for use during fuelling and will retrieve the spill tray and empty fuel containers. The Designated Stores Coordinator will also be responsible for the clean-up of any fuel spills and disposal of any clean-up waste in accordance with the GGI *Waste Management Plan* and *Spill Prevention, Control, and Contingency Plans (Aurora Project Areas).*

4.4 Fuel Storage Shed Housekeeping

The fuel storage shed shall be kept clean and organized at all times. Only the following items may be stored in the fuel storage shed: aviation fuel in appropriate containers, empty fuel containers, a spill kit, a spill tray, fire extinguishers, and the fuel receipt/issue and inspection log sheets. Smoking is not allowed within 30 m of the fuel storage shed. The Environmental Manager or Health and Safety Officer will inspect the fuel storage shed monthly. Inspections will include checks for the following: general housekeeping, the fuel receipt and issue logging process, and the adequacy of the spill kit. Results will be documented on the inspection log sheet (see **Figure 4**), and any deficiencies immediately attended to by the Designated Stores Coordinator. Current inspection log sheet will be stored in the fuel storage shed.

5.0 Records

Completed fuel receipt/issue and inspection log sheets shall be routed to the Records Clerk for retention in accordance with GG- 05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Exploration Management Plan*
- GGI *OHSM/AP Plan*
- *GGI Waste Management Plan*
- GGI *Spill Prevention, Control, and Contingency Plans (Aurora Project Areas)*
- GG 05, "Records Management"
- GG-42, "Helicopter Safety"

Figure 1: Aviation Fuel Management Process

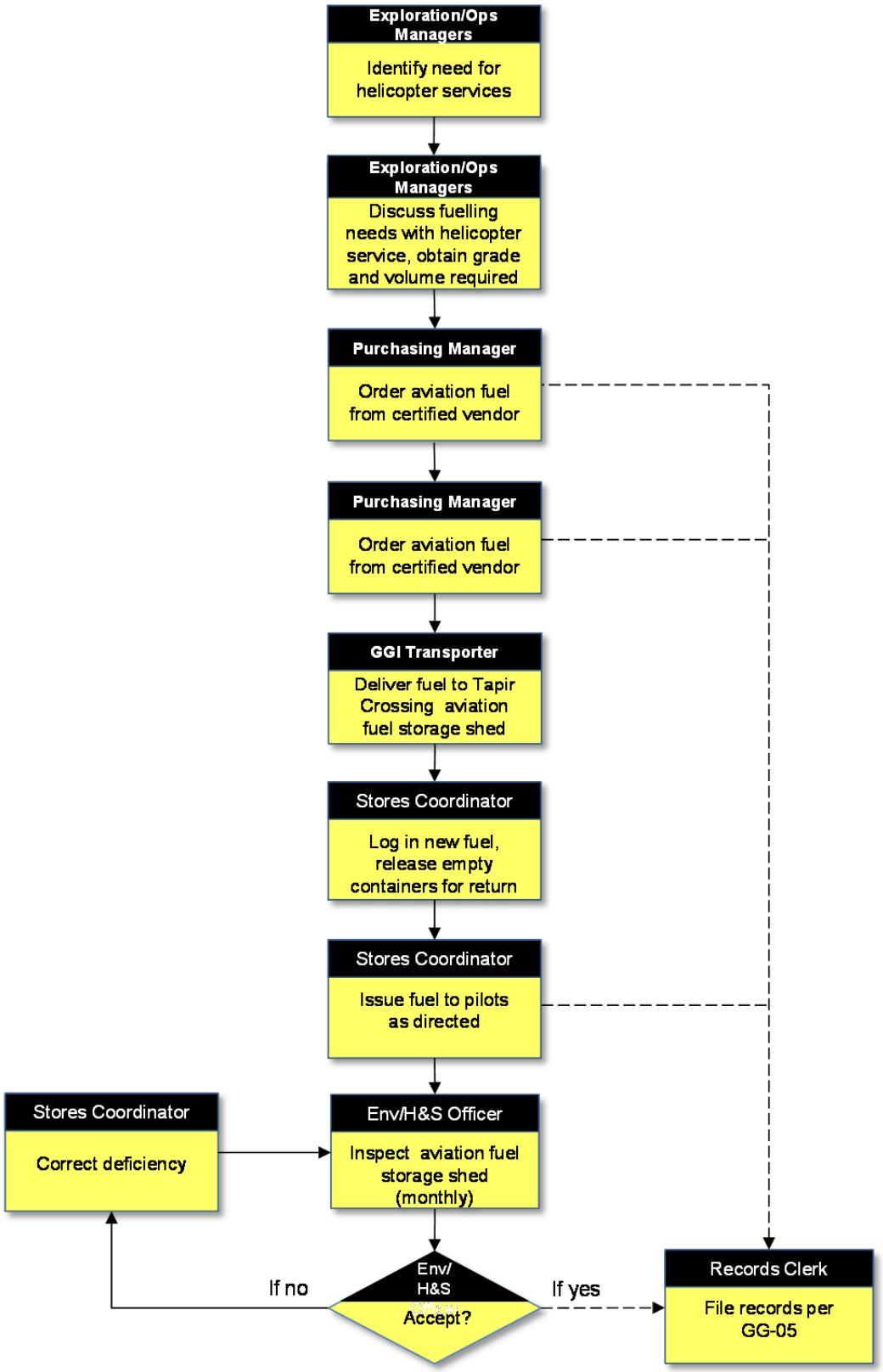


Figure 2a: Fuel Storage Shed at Tapir Crossing

Figure 2b. Inside of Fuel Storage Shed

Figure 2: Example of Aviation Fuel Log Sheet

Container Number	Date of Receipt	Container Size (litres)	Date of Issue	Recipient	Comments

Figure 4. Example of Fuel Storage Shed Inspection Sheet

Aviation Fuel Storage Shed Inspection Sheet	
Inspector:	Date:
1. Is housekeeping acceptable? Comments:	□Yes □No
2. Is the spill kit present and in good condition? Comments:	□Yes □No
3. Are the oldest fuel containers located at the front of the shed? Comments:	□Yes □No
4. Are filled and empty fuel containers on separate shelves? Comments:	□Yes □No
5. Is the log sheet filled out? Comments:	□Yes □No
6. Are all fuel containers in the shed documented on the log sheet? Comments:	□Yes □No
7. Is there a fire extinguisher in working condition? Comments:	□Yes □No
8. Was the fuel storage shed locked when you arrived? Comments:	□Yes □No
9. Did you confirm acceptable completion of any required corrective action?	□Yes □No

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines minimum safety requirements for Guyana Goldfields, Inc. (GGI) employees, contractors, and visitors who may be required to travel to Aurora Project (Project) or other GGI concession locations via contracted helicopter services. This SOP incorporates best management practices selected from Section 7.5 of the Prospectors & Developers Association of Canada (PDAC) *Field Safety Pocket Guide* (PDAC, 2012), and will apply over the life of the Project. It supports Section 6 ("Emergency Preparedness and Response") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, as well as the Project *Occupational Health and Safety/Accident Prevention Plan*, the *Exploration Management Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

None

3.0 RESPONSIBILITIES

3.1 Purchasing Manager

The Purchasing Manager is responsible for establishing a service contract with a qualified helicopter flight service; the contract shall require:

- submittal of current flight operations certifications as issued by the Guyana Civil Aviation Authority (GCAA);
- submittal of annual GCAA annual aviation safety audit report for GGI review, along with copies of the current airworthiness certificate(s) for the aircraft assigned to the Project; and
- compliance with selected elements of this SOP on the part of the contractor's pilot (e.g., provision of pre-flight briefings for GGI staff and other routine safety practices as described herein).

3.2 Environmental Manager

The Environmental Manager is responsible for the review and approval of the helicopter service contractor's current certifications and annual aviation safety audit report, prior to authorization of any helicopter transport services at the Aurora Project.

3.3 Exploration/Operations Manager

The Exploration Manager or Operations Manager is responsible for identifying and scheduling helicopter support needs sufficiently in advance of the need date to permit a review of the contractor's current aviation safety audit report, verification of their current certification status, development of any temporary helipads that may be required to support the proposed work, and the purchasing and staging of appropriate stores of aviation fuel at the Tapir Crossing heliport or other locations per SOP GG-41, "Management of Aviation Fuel and Fuelling Operations."

3.4 Contractor Pilots

The helicopter service's pilot is in charge of, and responsible for, the safe operation of the aircraft; they are also specifically responsible for:

- providing pre-flight briefings to all passengers, prior to all flights;
- filing written flight plans with GCAA, as appropriate;
- fuelling operations;
- supervising cargo loading and passenger boarding and disembarkation;
- planning all flights to ensure they can be completed in daylight hours;
- maintaining radio contact with GGI security services; and
- ensuring that the aircraft is equipped with an emergency transponder, fire extinguisher, emergency first aid kit, and appropriate emergency communications and survival equipment.

3.5 GGI Personnel, Contractors, and Site Visitors

GGI personnel, contractors, and site visitors who are required to travel by helicopter are individually and collectively responsible for obeying the instructions of the pilot, and for observing the safe practices described in this SOP.

4.0 PROCEDURE

The safe management of helicopter operations is discussed in the following sections and depicted as a flowchart in **Figure 1**.

4.1 General Considerations

Helicopters are a highly versatile, flexible, and low (environmental) impact means of transporting personnel and equipment to remote locations. However, helicopter-related incidents and accidents are recognized internationally as the leading cause of fatalities

in mineral exploration operations. Significant risks associated with helicopter use include:

- impact by rotors, flying objects from rotor downwash, and damage caused by improperly carried equipment;
- crashes caused by pilot error, bad weather, overloading, or inadequate maintenance;
- pilot fatigue, brought on by difficult working conditions or excessive client pressures or work requests;
- crashes in water resulting in drowning due to inability to escape from a submerged or overturned aircraft;
- serious injury or death from accidental contact with rotor blades; and
- stranding in remote locations due to crashes or mechanical breakdown.

All GGI staff, contractors, or site visitors who must travel to remote areas of GGI's concession via helicopter, as well as the helicopter service contractor's pilot, are therefore required to strictly comply with the minimum safety practices discussed in this SOP. ***Any willful violation of these requirements may serve as grounds for immediate dismissal or termination of contract.***

4.2 Contracting Helicopter Services

The Purchasing Manager is responsible for establishing a service contract with a qualified helicopter service. As noted in Section 3.1, the contract shall require:

- submittal of current GCAA flight operations certifications;
- submittal of the annual GCAA annual aviation safety audit report and airworthiness certificates for GGI review; and
- compliance with selected elements of this SOP on the part of the contractor's pilot (e.g., pre-flight briefings for GGI staff and other routine safety practices as described herein).

The helicopter service's credentials and certifications shall be reviewed for completeness and currency by the Environmental Manager, prior to authorization of flight operations. Any observed issues with the required certifications shall be resolved to GGI's satisfaction, or alternate sources will be required.

4.3 Pre-flight Operations

All necessary reserves of aviation fuel shall be delivered to the Tapir Crossing aviation fuel storage shed (see SOP GG-41, "Management of Aviation Fuel and Fuelling

Operations") at least one day prior to the start of project flight operations. All GGI staff, contractors, or site visitors who may be required to travel by helicopter will be trained in the requirements of this SOP in accordance with GG-06, "ESMS Training Program" prior to the arrival of the helicopter on site; training records shall be retained on file as noted in Section 4.5.

If temporary helipads are required in remote locations, efforts shall be made to locate the pad on flat ground that has already been cleared for other purposes, or does not have significant vegetation. If there are no viable alternatives and forest clearance is a requirement, the area shall first be screened in accordance with GG-08, "Environmental and Social Footprint Surveys."

Landing zone dimensions shall be defined by the helicopter service contractor's pilot, but are typically the diameter of the main rotor plus 20 metres. All temporary or permanent landing zones centres shall be marked by a large "H" made of fluorescent paint or cloth; the permanent helipad at Tapir Crossing shall also have a fluorescent windsock.

4.4 Safe Practices for Helicopter Passengers

The pilot will provide a safety briefing before each flight that addresses safe helicopter approach and departure routes, danger zones, mandatory use of seat belts and hearing protection (see GG-11, "Personal Protective Equipment), operation of doors, stowing cargo/cabin baggage, safety equipment location, communications with the pilot, and emergency procedures. In addition, all helicopter passengers shall observe the following safe practices (adapted from Section 7.5 of the PDAC *Field Safety Pocket Guide* (PDAC, 2012):

- Maintain vigilant and safe behavior at all times, and refrain from any horseplay in and around the helicopter.
- The responsible Exploration or Operations Manager shall keep track of flight plans and schedules; ground-to-air radio communication between and among the nearest GGI Security Office, the Exploration or Operations Manager, the pilot, and passengers/field crews will be required at all times.
- ***Never*** accept unsafe practices by pilots, or pressure pilots to use unsafe practices or to work to the point of fatigue.
- All operations must commence and complete in ***full daylight***; night operations are not permitted.
- Remember that the pilot is in command – regardless of your position, do ***exactly*** what the pilot says to do at all times.
- No operations requiring the use of external slings will be permitted under this SOP.

- Provide the pilot the weight of all cargo, samples, packs, equipment, and personnel (plus hand-carried items); a scale will be made available at the Tapir Crossing helipad for this purpose.

- Inform the pilot about any potentially dangerous goods cargo (e.g., compressed gas cylinders, fuel) and accept his direction on safe stowage.

- Never approach or exit without the pilot's direct permission; wait until visibility is clear and/or until the helicopter has shut down before approaching

- Do not approach or exit the helicopter when the rotors are moving slowly; the main rotor will droop as the engine slows or idles, especially when it is windy.

- Rotor clearance is greatly reduced when the ground is uneven or hummocky; if the helicopter is on a slope, crouch very low and use the downhill side to approach or exit

- To the extent possible, always attempt to approach the helicopter by moving toward the front and in full view of the pilot; ***make sure you have eye contact with the pilot*** before approaching and approach or exit in a crouching position.

- Passengers must wear hearing protection and seatbelts; wear headsets as necessary for communication with the pilot, otherwise wear muffs or disposable earplugs.

- Load and unload with the engine shut down; stow field gear, samples, and packs carefully in the cargo compartment, making sure the cargo door is firmly latched.

- Tie down or restrain all cabin baggage; ensure that no loose items can interfere with the helicopter's flight controls.

- Notify the pilot of any unusual hazard observed during the flight – do not assume the pilot has seen it.

- Do not distract the pilot or upset the helicopter balance with sudden or unpredictable movements during takeoff, landing, or flight.

- Never throw anything out of the helicopter.

- Never ride on the skids of a helicopter.

- Never exit towards the helicopter tail rotor.

- In the event of a crash or stranding from mechanical failure, stay in the vicinity of the helicopter and follow the pilot's instructions.

- When leaving a helicopter, refasten the seat belt behind you, step down smoothly and close the door carefully. Don't slam the doors - close them gently and don't let them swing in the wind. Move at least 10 metres away with your gear to a place where the pilot can see you. Crouch down and remain crouched until the helicopter has taken off. Signal the pilot to indicate that everyone is clear during unloading and prior to takeoff.

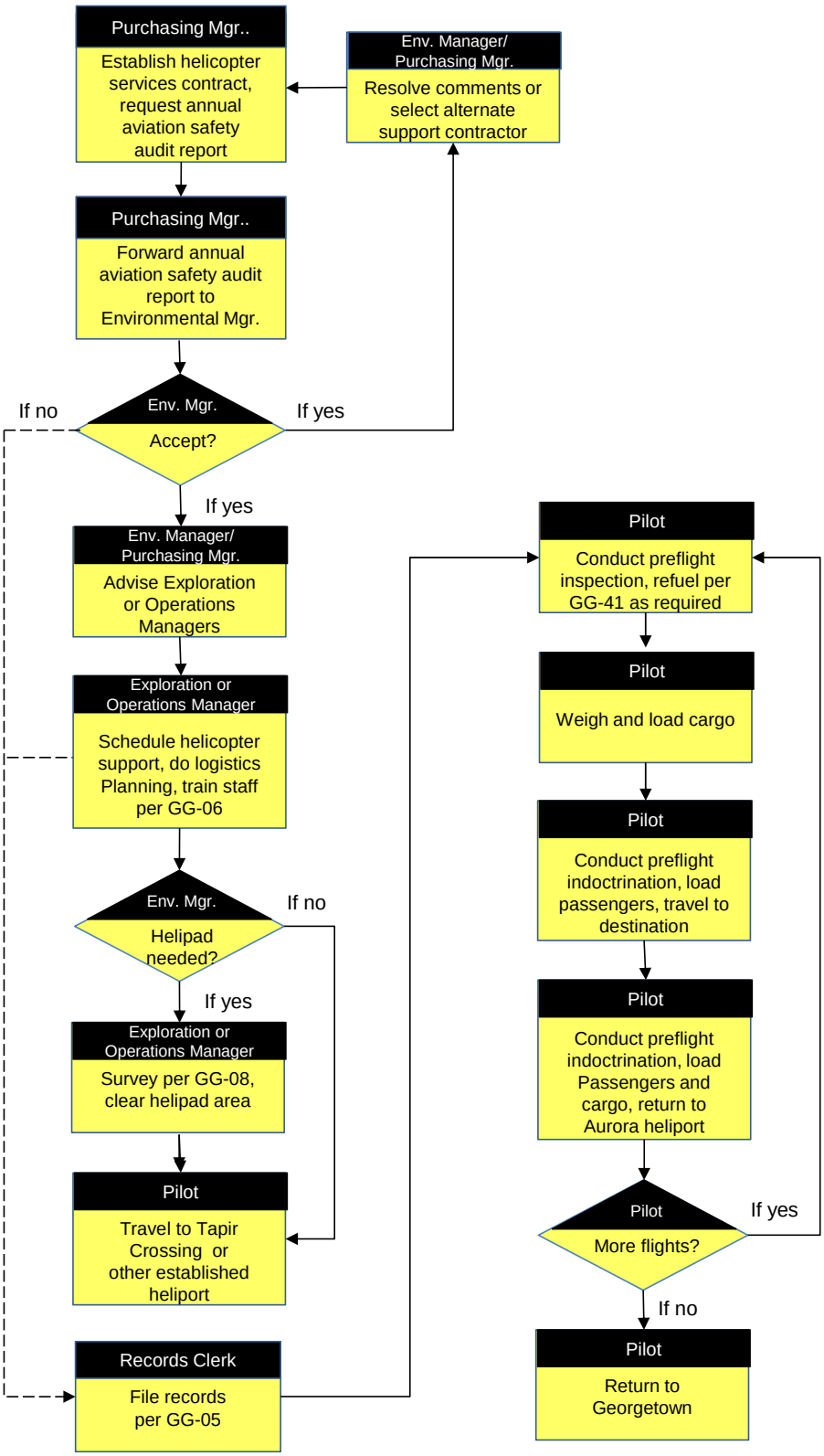
4.5 Records

All training records and helicopter service procurement records shall be routed to the Records Clerk and retained on file in accordance with GG-05, "Records Management."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-05, "Records Management"
- GG-08, "Environmental and Social Footprint Surveys"
- GG-11, "Personal Protective Equipment"
- PDAC, 20112; *Field Safety Pocket Guide,* Section 7.5, "Aircraft"; accessed at http://www.pdac.ca/pdac/misc/pdf/2012-pocket-manual.pdf ; Prospectors & Developers Association of Canada, Toronto, ON, Canada, 2012.

Figure 1: Operational Safety Process for Contracted Helicopter Services



	STANDARD OPERATING PROCEDURE **GG-43: Safe Operation of** **Grove Model 530 Hydraulic Cranes**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: November 5, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) describes minimum requirements for the safe operation of Grove Model 530 hydraulic cranes on the Guyana Goldfields, Inc. (GGI) Aurora Project.

This SOP will apply over the life of the Project; it supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, the Project *Health and Safety/Accident Prevention Plan*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Crane Operator

The ***crane operator*** is defined as a GGI worker who has the specific skills and training that permit them to be authorized to operate Grove Model 530 hydraulic crane.

2.2 Operator Training

Operator training is defined as completion of an approved training course or practical hands-on training in the use of Grove Model 530 hydraulic cranes under the supervision of qualified operators or manufacturers' representatives.

3.0 RESPONSIBILITIES

3.1 Mechanical Shop Manager

The Mechanical Shop Manager is responsible for monitoring manufacturers' onsite maintenance contracts to ensure that the Grove Model 530 cranes owned or leased by GGI are maintained in a safe operating condition.

3.2 Construction Manager

The Construction Manager is responsible for ensuring that crane operators receive appropriate classroom and hands-on training from authorized equipment manufacturer representatives and/or experienced operators as described by this SOP. The Construction Manager is also responsible for issuing vehicle operator qualification cards (see **Figure 2**) to operators who successfully complete training, and for routing training records to file as noted in Section 4.6.

3.3 Crane Operator

The GGI crane operator is responsible for successfully completing all required operator training sessions and examinations as specified herein. GGI crane operators shall complete pre-shift safety inspections as described herein, and shall report any problems to the Mechanical Shop for resolution. They are also responsible for safely operating their assigned cranes in accordance with manufacturers' instructions and the general guidance provided in Section 4.4.

3.4 Riggers

Supervisors or other experienced staff shall serve as riggers in all load lifting operations using mobile hydraulic cranes. Riggers shall be trained in the general requirements of this SOP, and shall be adept in use of appropriate hand signals to raise, lower, and position the load in the manner indicated in **Figure 3.**

4.0 PROCEDURE

4.1 Procurement or Leasing of Hydraulic Cranes and Entry into Maintenance Tracking System

Purchase or lease contracts for Grove Model 530 hydraulic cranes shall include appropriate provisions for long-term onsite maintenance and onsite operator training support. Safety equipment included with or installed on each crane shall include:

- full vehicle operating/running lights;
- redundant braking capabilities;
- wide-angle rear view and hoist mirrors;
- duty meters, pressure/temperature sensors, and alarms for hydraulics and other major systems and subsystems;
- wheel position and outrigger position indicators;
- warning horns;
- backup alarms;
- tire chocks and tire pressure indicators;
- portable fire extinguisher and spill kit;

- separation of steering hydraulics from main hydraulic systems;
- engine kill switch that permits immediate shutdown;
- electrical system lockout switches accessible from outside the battery compartment;
- low-noise and well-ventilated or air-conditioned cab interior designs, with sun screen;
- load charts prepared specifically for each as-delivered unit; and
- manufacturer's operating instructions, for each as-delivered unit.

After receipt and acceptance of each crane, the Chief Mechanic or his designee shall ensure that each unit is assigned an Aurora Project control number, which shall be prominently marked on the side of the vehicle. Once identified, each crane shall be entered into the Project maintenance tracking system.

4.2 Selection, Training, and Qualification of Crane Operators

The Construction Manager shall nominate personnel to serve as crane operators who have appropriate experience and training, as well as exemplary safety records.

The Construction Manager shall ensure that all crane operator candidates attend a training presented by the Construction Manager, assisted by the manufacturer's representative and/or an experienced operator, selected by the Construction Manager. The training session shall emphasize the minimum requirements for safe equipment operation as described in applicable operator's manuals (to be provided by the manufacturer as noted in Section 4.1), as well as the general requirements presented in Section 4.4. Crane operator candidates shall also complete on-the-job training (OJT) under the direction of the manufacturer's representative or an experienced operator. OJT sessions shall be conducted until the operator satisfactorily demonstrates the adequacy of their crane operating skills to the trainer. Successful candidates shall receive a qualification card from the Construction Manager (see **Figure 2**) marked with the specific equipment items that they are authorized to operate, to be carried with their Aurora Project identification badge at all times.

GGI reserves the right to rescind an employee's qualification card at any time in the event of an at-fault accident or if unsafe behaviour is observed; see the GGI "Labour Grievance Procedure."

4.3 Training of Riggers

Supervisors or other experienced staff shall be selected for duty as riggers in lifting operations using mobile hydraulic cranes. Riggers shall be trained in the general requirements of this SOP, with specific emphasis on the use of hand signals to raise, lower, and position the load in the manner indicated in **Figure 3.**

4.4 Pre-Shift Safety Checks

Each GGI operator shall complete a documented inspection of their assigned equipment before starting work, using the Operator's Daily Inspection Report (**Figure 4**). Any noted discrepancies shall be referred to mechanical shop personnel for correction prior to use. Copies of the daily inspection report shall be forwarded to Mechanical Shop Manager and to the Project files as noted in Section 4.6.

4.5 General Rules for Safe Operation

At a minimum, GGI crane operators and riggers must wear appropriate personal protective equipment (see GG-11, "Personal Protective Equipment"). The crane shall be operated in accordance with the manufacturer's operating manual and the minimum safety rules described in this SOP. These rules must be specifically addressed in the training of GGI operators and shall be implemented in actual practice. *Failure to follow these rules may result in revocation of the operator's qualification card or other appropriate disciplinary action;* see the GGI "Labour Grievance Procedure."

General Rules for the Safe Operation of Grove Model 530 Hydraulic Cranes

- ***Only qualified operators (or trainees and qualified trainers) are permitted to operate the crane – NO EXCEPTIONS!*** GGI operators will be required to present their driver's license and qualification card in order to receive crane operation keys from the operations office.
- The crane must be operated in strict accordance with the manufacturer's operating manual and the guidelines provided by this SOP. In the event of any conflict or interpretation questions, the requirements of the manufacturer's operating manual will always take precedence.
- Riding the hook of a mobile crane is extremely dangerous and is specifically prohibited, as is any reckless operation of the crane, or operating the crane under the influence of alcohol or drugs. Violations of these prohibitions will not be tolerated and are grounds for immediate dismissal per the GGI "Labour Grievance Procedure."
- The crane shall always be put in gear (and chocked, if the outriggers are not deployed) when powered down and parked.
- The primary hoisting hook arrangement must be inspected for cracks using magnetic particle testing methods on at least an annual basis.
- Operators must know the approximate weight of loads prior to lifting, and must consult the load charts provided by the manufacturer for recommended operating

parameters; the weight of all chains, straps or other rigging equipment must also be known and added to the estimated load weight.

- Chains or nylon straps used for lifting must be rated substantially in excess of the anticipated load, and must be inspected carefully for damage by the crane operator prior to each use. Frayed or cut nylon straps must be removed from service and discarded; all chain hooks shall be fitted with safety clasps in good condition.

- The recommended working range of the boom is noted in **Figure 5**; please note that **Figure 5** is provided for information only, and the working range defined in the operating instructions provided with the as-delivered equipment by the manufacturer must take precedence in all cases.

- Please note that lifting without having the outriggers deployed substantially restricts the safe working area (i.e., 12 degree vs. 90 degree maximum angle of rotation) of the crane; please see **Figure 6** for a comparison of safe working zones.

- The crane is designed for rough terrain, but steep roads shall nevertheless be ascended and descended slowly and carefully, and the crane positioned on firm ground in as flat an area as possible for safe operation.

- When moving the crane on roadways, operate the vehicle with the boom stowed, and travel at a speed that will allow for safe stopping; reduce speed even further for wet and slippery road conditions.

- Be aware of operating near overhead hazards, especially power lines that could be struck by an extended mast or boom.

- Use riggers for all lifting operations; maintain eye contact and follow the rigger's hand signals (see **Figure 3**) in lifiting and positioning the load.

- Be extremely cautious in backing operations, when positioning the crane for a lift or moving on roadways; ensure backup alarms are operational and use riggers (with 2-way radios, if hand signals cannot be seen clearly) in areas of poor visibility.

- Maintain awareness of other major equipment operations and general vehicle traffic.

- Never leave the crane running while unattended. The operator shall take the keys and chock the tires whenever leaving the crane.

- Immediately report all accidents involving crane operations to the Health and Safety Officer via radio or cellular telephone, no matter how minor. If there are any injuries, follow the procedures outlined in GG-12, "First Aid and Emergency Medical Response."

4.6 Maintenance Monitoring Considerations

Maintenance for GGI cranes and other heavy equipment is typically provided as a contracted service by the equipment provider or an authorized licensee. The Aurora Project Mechanical Shop Manager or designee shall ensure that each heavy equipment item is assigned an Aurora Project control number and entered into the Aurora Project's maintenance tracking system. The Mechanical Shop Manager or designee shall monitor the status of subcontracted maintenance items and may request the Health and Safety Officer to periodically evaluate the adequacy of subcontracted maintenance functions via the processes described in GG-03, "Field Inspection."

4.7 Records

Records generated from the routine implementation of this procedure shall be retained in accordance with GG-05, "Records Management" and include hard copies of all crane operator training session attendance sheets and any distributed handout materials (see GG-06, "ESMS Training Program"). Copies of pre-shift safety inspection reports and repair records shall also be retained, along with surveillance inspection reports and associated Corrective/ Preventive Action Requests (CPARs); see GG-03, "Field Inspection" and GG-04, "Identification of Non-conformances and Corrective/Preventive Action."

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GGI "Labour Grievance Procedure"
- GG-03, "Field Inspection"
- GG-04, "Identification of Non-conformances and Corrective/Preventive Action"
- GG-05, "Records Management"
- GG-06, "ESMS Training Program"
- GG-11, "Personal Protective Equipment"
- GG-12, "First Aid and Emergency Medical Response"

Figure 1: Hydraulic Crane Operation, and Maintenance Process

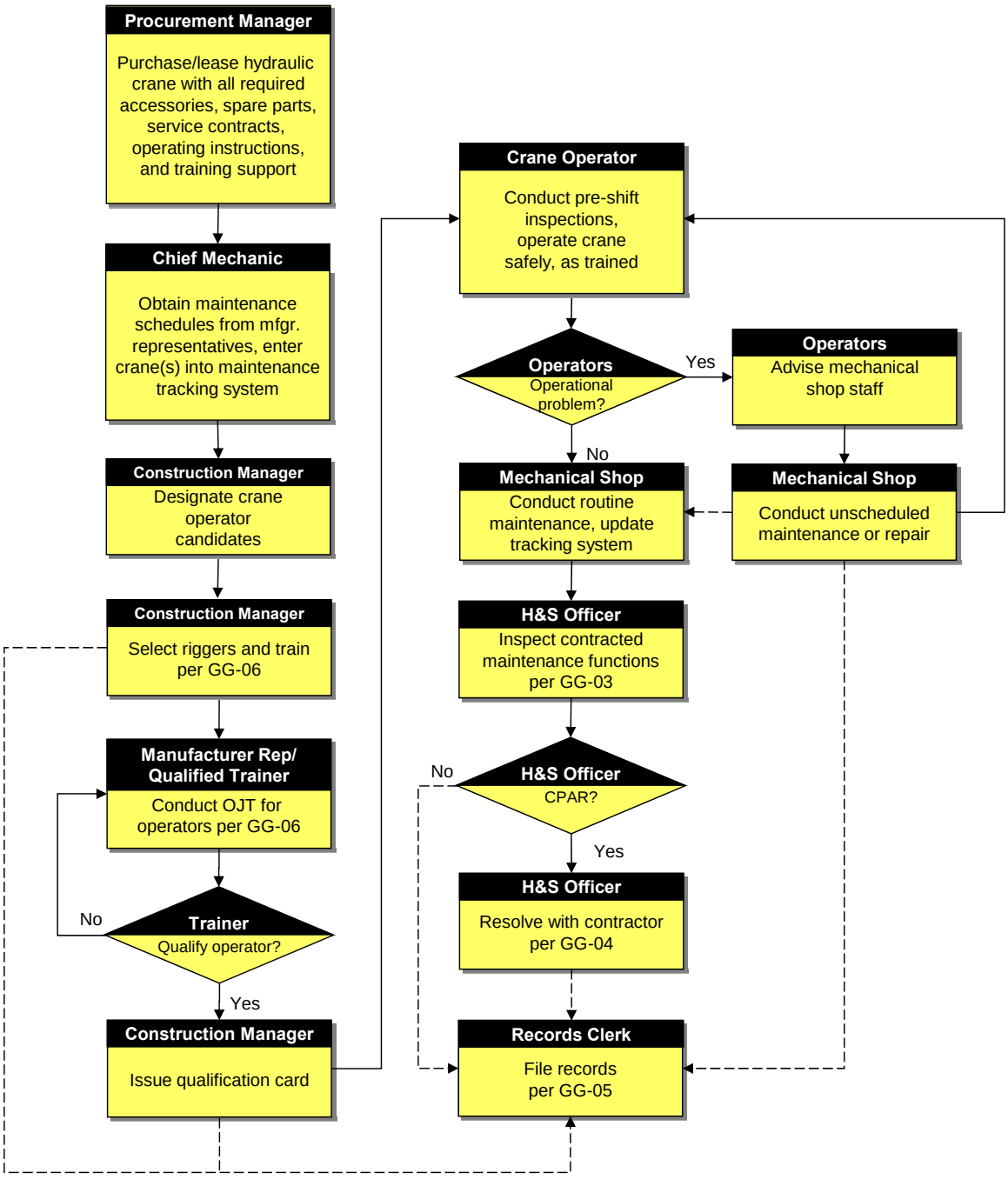
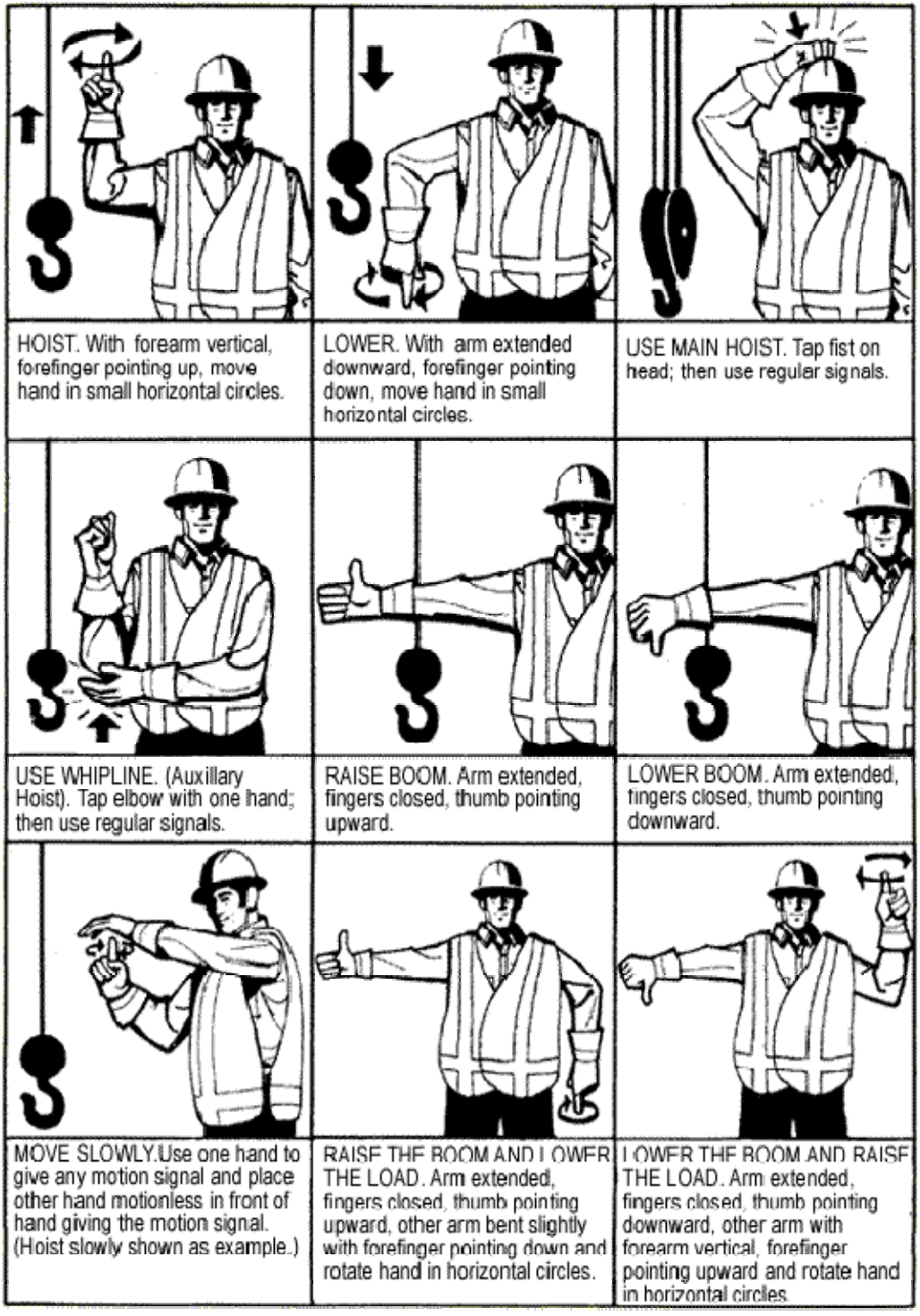


Figure 2: Crane Operator Qualification Card
(not to scale)

Figure 3: Hand Signals for Raising, Lowering, and Positioning Loads[1]



[1] Source: http://www.construction-machine.org/wp-content/uploads/2009/08/Learn-how-to-communicate-using-hand-signals-with-a-crane-operator..gif

Figure 4: Crane Operator's Daily Inspection Report

CRANE OPERATOR'S DAILY INSPECTION REPORT

Equipment Make/Model/Identification Number: Grove Model 530, ID No: _____

Note: Any deficiencies noted must be repaired before the equipment can be used.

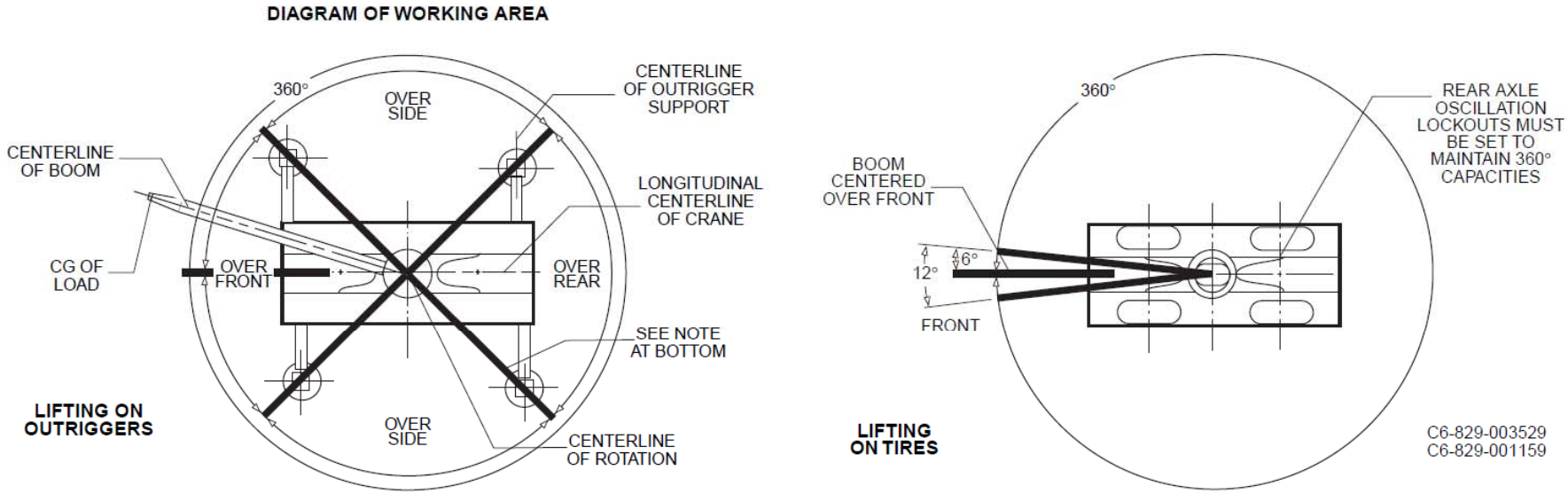
Inspection items	Comments
1. Headlights/running lights/rear lights – operability	
2. Brakes – operability	
3. Tires – hub cracks, missing lug nuts	
4. Tires – inflation pressure	
5. Hydraulic hoses – obvious cracks or leaks	
6. Impaired visibility/cracks in cab windows	
7. Wiper systems – reservoir full and functional	
8. Hydraulic hoses/actuators – obvious cracks or leaks	
9. Hydraulic oil reservoir – cracks/leaks	
10. Fuel tank – cracks, leaks, adequate fuel level	
11. Horn/backup alarms - functional	
12. Rigging/hoist chains rated for anticipated load and in good condition	
13. No visible damage to outriggers or boom assembly	
14. Manufacturer's load charts for as-delivered equipment available	
15. Fire extinguisher charged/current inspection	
16. Spill kit available and complete	

Other Comments:

Operator	Date	Time

cc: Mechanical Shop Records

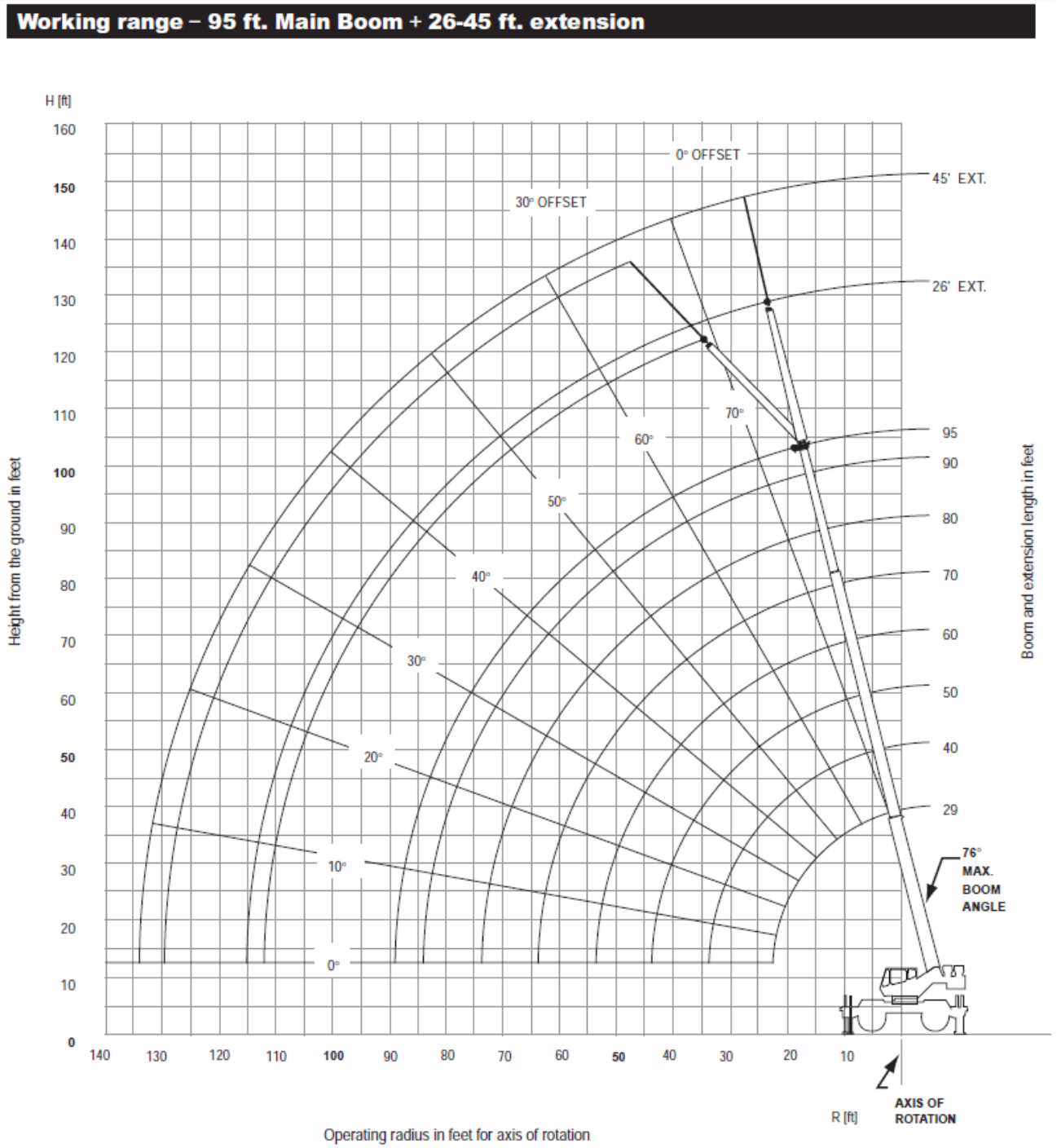
Figure 4: Safe Working Area Diagram[2]



Bold lines determine the limiting position of any load for operation within working areas indicated.

[2] Source: *Grove RT 530E Product Guide*; see http://www.bigge.com/crane-charts/rough-terrain-crane-charts/RT530E.pdf ; this figure is provided for reference only and will be superseded by the direction provided in the operating instructions provided with the as-delivered equipment.

Figure 5: Nominal Working Range of Hydraulic Boom[3]



[3] Source: *Grove RT 530E Product Guide*; see http://www.bigge.com/crane-charts/rough-terrain-crane-charts/RT530E.pdf ; this figure is provided for reference only and will be superseded by the direction provided in the operating instructions provided with the as-delivered equipment

	STANDARD OPERATING PROCEDURE **GG-44: Management of Land Clearances**
Approved by: (VP, Aurora Project)	Approved by: (Environmental Manager)
Effective Date: August 18, 2012	Revision Level: -1-

1.0 PURPOSE AND SCOPE

This Standard Operating Procedure (SOP) defines the minimum requirements for managing the clearance of land areas within the boundaries of GGI's Aurora Project concession, when required to support specific exploration, mining, or mining-related construction operations. Areas to be cleared may include prospecting areas or exploration trail alignments; surface trenches or other surface sampling locations; drill pads; roadway alignments; and/or other undeveloped areas that must be cleared for exploration purposes, or for construction of mine facilities or supporting infrastructure.

This SOP will apply through the end of the operational phase of the Project (assuming no new clearance activities will take place during decommissioning and closure). It supports Section 4.3.2 ("Management of Social and Environmental Impacts") of the GGI *Environmental and Social Management System Plan (ESMS Plan)*, and other GGI Management Plans and SOPs when specified therein.

2.0 DEFINITIONS

2.1 Archaeological Find

An ***archaeological find*** is defined as the chance discovery, during an environmental and social footprint survey (defined in Section 2.3), of relics or human artefacts with potential archaeological or historical significance. Archaeological finds will be documented and evaluated in accordance with SOP GG-25, "Chance Archaeological Finds." Such finds could include human remains; pottery or pottery shards; stone tools or implements; or metal, glass, or ceramic objects that could date to the colonial or pre-colonial era. Refuse from artisanal and small-scale mining (ASM) or other intrusive human activities that are clearly dated later than 1900 will generally not be considered to be of archaeological or historical significance.

2.2 Cut Block

A ***cut block*** is defined as a unit or subdivision of an approved clearance area that is assigned to a specific cutting crew. Dividing a clearance area into cut blocks allows

clearances to proceed in organized sequences or phases that minimize the total amount of land exposed to erosion or overclearance in a given time period. Limiting access within the clearance area to small, properly trained cutting and bulldozer crews also reduces the risk of accidents and unsafe practices.

2.3 Environmental and Social Footprint Survey

An ***environmental and social footprint survey*** (see GG-08, "Environmental and Social Footprint Surveys") is defined as a field examination of a proposed trail, roadway alignment, sampling area, or other clearance area for purposes of identifying and protecting surface water features and other potentially sensitive environmental areas or habitats, as well as noting any evidence of current or historical human use. Such surveys must be completed before clearance actions may commence as described herein.

3.0 RESPONSIBILITIES

3.1 Environmental Manager and Construction or Exploration Managers

The Environmental Manager and the Constructions or Exploration Managers shall collaboratively review and approve of all Clearance Plans, including options for further minimization of the clearance footprint as described herein. The Environmental Manager is also responsible for initiating documented environmental and social footprint surveys to support each required clearance action, in accordance with GG-08, "Environmental and Social Footprint Surveys."

3.2 Environmental Officer

The Environmental Officer is responsible for monitoring the implementation of approved Clearance Plans, and for conducting periodic water quality sampling activities and other documented field inspections in accordance with this SOP and GG-03, "Field Inspections."

3.3 Construction or Exploration Supervisors

At their Managers' direction, Construction or Exploration Supervisors will prepare Clearance Plans for assigned exploration areas or Project construction activities (e.g., clearance of footprint areas for open pit operations, waste rock stockpiles, or processing plant areas) in compliance with the guidelines of this SOP.

3.4 Site Security Personnel

By definition, all footprint surveys will be conducted within the boundaries of the Aurora Project concession, and any unauthorized ASM, logging, hunting, settlement, or other intrusive human activities encountered in preparation for site clearance represents a

breach of security. Site security personnel are responsible for assessing the nature and significance of the intrusive activities that may be reported as part of footprint surveys or authorized land clearance actions, and for resolving the incursion within the guidelines provided in GG-40, “Site Security” and the Project *Influx Management Plan.*

3.5 All GGI or Contractor Personnel

All GGI or contractor personnel involved in land clearance activities are responsible for following the requirements of approved Clearance Plans, and shall immediately advise their supervisors if unsafe conditions or erosional issues are noted, or if ASMs, other unauthorized persons, or evidence of recent incursions by such individuals are observed in the clearance area.

4.0 PROCEDURE

The process to be used for planning, evaluating, approving, and implementing land clearance actions for the Aurora Project is summarized in the following sections, and is depicted as a flowchart in **Figure 1**.

4.1 Preparation of Draft Clearance Plans

Exploratron or Construction Supervisors are responsible to their respective Managers for preparing Clearance Plans for all proposed clearance areas. Such plans may be prepared in standard GGI memo format, and a minimum must include or properly consider the following:

- **Definition of Clearance Boundaries:** The boundaries of the proposed clearance area must be plainly identified using current general arrangement maps, drawings, photographs, and/or survey coordinates.

- **Identification of Cut Blocks with Proposed Clearance:** Following the identification of overall clearance boundaries, the clearance area will be divided into cut blocks. Cut block layout will be determined in part by terrain, as unstable slopes, grades above 30 percent, waterways, or swampy areas will all serve as potential natural boundaries. To the extent possible, the cut block layout must minimize the area required to be disturbed.

- **Layout of Skid Trails and Access Trails or Roads:** Access throughout the clearing area will be determined during the layout of cut blocks. All access roads and skid trails will be situated within the clearing boundaries. Skidding distances must be kept to less than 500m wherever possible, to prevent excessive rutting and other potential erosional issues. Layout of roads and trails will consider the suitability of terrain, and shall minimize steep approaches, water crossings, and avoid entering floodplains to prevent excessive rutting, silt generation, and other

erosion. Because of potential erosional issues, clearing and skidding in saprolite areas is not permitted in rainy seasons.

- **Felling Standards:** All trees with ≥ 0.1m diameter at breast height (DBH) will be felled using chainsaws and directional felling techniques. All logs, limbs and branches with a diameter ≥ 0.1m diameter and length ≥ 2m, will be skidded to a designated landing area and stored in securely placed stacks. Landing areas will be located within the clearing boundaries on level ground, well away from water sources to avoid potential silt generation. Tree stumps, roots, and saplings with DBH <0.1m and other other ground vegetation will remain untouched within the cut block/clearing areas, in order to assist in the stabilisation of topsoil.

  Hardwood and softwood logs ≥ 0.1m diameter may be sawn or milled to produce dimensional lumber for camp and mine construction or repair. Lower-grade softwood logs, hardwood and softwood limbs/branches, residues from milling/sawing (e.g., slabs, trimmings, bark, chips, sawdust) will processed as mulch and reserved in designated stockpiles, as organic mulch will be required in the routine management of erosional issues over the life of the mine, as well as in site reclamation and closure.

- **Reservation of Topsoil and Other Organic Material**: If clearance needs require the removal of topsoil (e.g., pre-stripping of open pit mining areas; preparations for concrete building, tanks, or machinery foundations; preparation of foundation areas for waste rock stockpiles; or preparation of tailings or water management pond basins), topsoil and associated organic matter shall be reserved in a designated stockpile, as the latter material will serve as a valuable resource in the eventual reclamation of the mine site.

- **Erosion Prevention/Sediment Control Measures**: Steep slopes are to be avoided to the extent possible. Where steep slopes do exist, runoff from above the clearance site must be diverted away from exposed slopes to minimize erosion. Where steep slopes are cleared, appropriate stabilization structures must be designed to prevent potential erosion and sedimentation. Erosion prevention/control methods may be designed based on the options presented in the Project *Erosion Prevention and Control Plan*, or may be designed specifically for the proposed clearance, and fully documented in the affected Clearance Plan. All water bodies, diversion channels or other preventive measures, and proposed drainage patterns must be mapped, along with proposed downgradient sampling points for periodic water quality monitoring.

- **Health and Safety Considerations**: Clearance Plans shall require daily tailgate safety meetings for all GGI and contractor personnel involved in clearance actions, as well as compliance with the Project *Occupational Health and Safety/Accident Prevention Plan* and several key GGI SOPs; at a minimum, the latter must include:

- GG-11, “Personal Protective Equipment”;
- GG-12, “First Aid and Medical Response”;
- GG-13. “Transportation Safety” ;
- GG-16, “Safe Operation of Heavy Equipment”;
- GG-17, “Vehicle Fuelling and Spill Prevention”;
- GG-27, “Chainsaw Safety”; and
- GG-40, “Site Security.”

The draft Clearance Plan will then be submitted to the Environmental Manager and responsible Exploration or Construction Managers for review and approval.

4.2 Evaluation of Clearance Footprint Minimization/Additional Erosion Prevention Options

The Environmental Manager and responsible Exploration or Construction Managers shall review the draft Clearance Plan for compliance with the minimum requirements of Section 4.1, relative to the purposes of the clearance, and for the specific evaluation of additional options for further limiting or minimizing the proposed footprint and associated environmental risks. If footprint reduction options are determined to exist that do not create additional safety hazards, environmental impacts, and/or operational issues, the Clearance Plan shall be returned to the responsible Exploration or Construction Supervisors for revision and update.

4.3 Environmental and Social Footprint Surveys/Approval of Clearance Plan

After completion of the footprint minimization review, the Environmental Manager shall request the performance of one or more environmental and social footprint surveys that encompass initial cut blocks as well as the remainder of the entire proposed clearance area. Such surveys shall be conducted in compliance with GG-08, “Environmental and Social Footprint Survey.” As noted in GG-08, if any chance archaeological finds are encountered, they shall be documented and referred to the GGI Environmental Manager for further evaluation. As also noted in GG-08, if ASMs, other unauthorized persons, or evidence of recent incursions by such individuals are observed in the clearance area, GGI personnel will immediately leave the area and report the situation to their supervisors and GGI security for their appropriate action. Clearance actions may not be resumed until cleared by Security and re-scheduled by the Environmental Manager and the responsible Exploration or Construction Manager.

The Environmental and Social Footprint Survey report will be reviewed by the Environmental Manager. If survey results indicate sensitive habitats, other environmental issues, or the presence of chance archaeological finds, the proposed Clearance Plan will be returned to the affected construction or exploration supervisors with recommendations for appropriate setbacks or other revisions. The Clearance Plan will be updated and resubmitted for another footprint minimization options review as noted in Section 4.2. However, if no environmental or cultural issues are noted, the Clearance Plan will be considered approved and will be forwarded to the responsible

Construction or Exploration Supervisors for training of all affected GGI and contractor staff (per GG- GG-06, “ESMS Training Program”) prior to Plan implementation.

4.4 Implementation of Erosion Prevention Measures/Background Water Sampling

All required diversion channels and structures for the prevention of person shall be prioritized for completion in accordance with Clearance Plan requirements, prior to the initiation of major clearance actions. As soon as preventive measures are in effect, baseline water quality samples will be collected by the Environmental Officer and sent to an offsite analytical laboratory for evaluation against the mine site discharge limits defined by Table 1 of “Environmental, Health and Safety Guidelines for Mining” (IFC, 2007). These baseline results shall be used for comparison with of routine water quality monitoring samples collected throughout the clearance and erosional stabilisation process.

4.5 Completion and Routine Inspections of Clearance Actions

The responsible Construction or Exploration Supervisors shall implement the approved Clearance Plan as stated; any requested modifications are subject to the same review and approval requirements as the original as elaborated in Sections 4.1 through 4.3 above. At the Environmental Manager’s direction, the Environmental Officer shall periodically inspect clearance activities for conformance with the approved Clearance Plan; inspections shall be planned and documented in accordance with GG-03, “Field Inspections”, and shall include periodic water quality monitoring samples from the sampling points defined in the approved Clearance Plan. Samples shall be analyzed for at least oil and grease and total suspended solids (TSS) per (IFC, 2007) Table 1 requirements. At the end of the clearance activity, at least one final round of samples shall be analysed for the full list of constituents in (IFC, 2007), Table 1. If any nonconformances are noted, they will be documented on a Corrective and Preventive Action Request (CPAR) form and resolved as required by GG-04, “Identification of Non-conformances and Corrective/Preventive Action.”

4.6 Records

Training records, copies of approved Clearance Plans, final footprint survey reports, water quality monitoring data, field inspection reports, and copies of any required CPARs will be retained in accordance with GG-05, “Records Management.”

5.0 REFERENCES

- GGI *ESMS Plan*
- GGI *Influx Management Plan.*
- GGI *Erosion Prevention and Control Plan*
- GGI *Occupational Health and Safety/Accident Prevention Plan*
- GG-03, “Field Inspections”
- GG-04, “Identification of Non-conformances and Corrective/Preventive Action”
- GG-05, “Records Management”
- GG-06, “ESMS Training Program”
- GG-08, “Environmental and Social Footprint Surveys”
- GG-11, “Personal Protective Equipment”
- GG-12, “First Aid and Medical Response;
- GG-13, “Transportation Safety”
- GG-16, “Safe Operation of Heavy Equipment”
- GG-17, “Vehicle Fuelling and Spill Prevention”
- GG-25, “Chance Archaeological Finds”
- GG-27, “Chainsaw Safety”
- GG-40, “Site Security”
- IFC, 2007; “Environmental, Health and Safety Guidelines for Mining”, December 10, 2007; accessed online at http://www.ifc.org/ifcext/enviro.nsf /AttachmentsByTitle/gui_EHSGuidelines2007_Mining/$FILE/Final+-+Mining.pdf ; World Bank Group/International Finance Corporation, Washington, DC. 2007.

Figure 1: Land Clearance Process