nordgold
more than gold

NORDGOLD GUIDANCE ON HANDLING THE HAZARDOUS MATERIALS

1/ Handling hazardous substances and materials a key issues for safe and lean production. Industrial and environmental safety is monitored by Nordgold's Integrated Health, Safety and Environment Management System (HSEMS).

2/ The safe handling of hazardous substances is based on their identification, labelling and risk management related to operations with such substances.

3/ The guiding documents for handling hazardous substances and materials are:

- Globally Harmonized System of Classification and Labelling of Chemicals (GHS)
- Eurasian Economic Union Technical Regulation on Safety of Chemical Products " (ТР ЕАЭС 041/2017)
- Nordgold internal procedures

4/ There are nine classes of hazardous chemical materials:

Class	Material
1	explosives
2	compressed, liquefied, pressurised or deep chilled gases
3	flammable liquids
4	flammable solids
5	oxidizing substances, organic peroxides
6	poisonous (toxic) and infectious substances
7	radioactive substances
8	corrosive agents
9	other hazardous substances

Nordgold's business units, as consumers (purchasers) of chemical products: develop preventive measures when handling chemical products; strive to replace hazardous chemicals with less hazardous ones; and train employees in the safe handling of chemical products.

Nordgold's business units ensure that the necessary preventive consumer and transport labelling is in place.

5/ Production and consumer labelling of chemical products includes the following information:

- Title;
- Danger signs;
- Brief description of the hazard.

6/ Preventive measures:

- Measures for safe handling;
- Response measures to eliminate including first aid measures;
- Safe storage measures.

Chemical products are accompanied by a "(Material) Safety Data Sheet" ((M)SDS) or, in the countries of the Customs Union, a "Chemical Products Safety Data Sheet". Requirements for the Safety Data Sheet are harmonized with the requirements of the International Labour Organization (ILO), United Nations Organisations (UN), International Standardisation Organisation (ISO), the European Union (EU), which regulate information support for the safe handling of chemicals and materials.

NORDGOLD GUIDANCE ON CYANIDE USAGE

# ACTIVITY | Standard	Nordgold's procedures
1 PRODUCTION **Encourage responsible cyanide manufacturing by purchasing from manufacturers who operate in a safe and environmentally protective manner**	
1.1 Purchase cyanide from manufacturers employing appropriate practices and procedures to limit exposure of their workforce to cyanide and to prevent releases of cyanide to the environment.	The main cyanide supplier is certified for cyanide supply chains in the regions where this requirement is established in accordance with International Cyanide Management Code: http://www.cyanidecode.org/signatory-company/samsung-c-t-corporation
2 TRANSPORTATION **Protect communities and the environment during cyanide transport**	
2.1 Establish clear lines of responsibility for safety, security, release prevention, training and emergency response in written agreements with producers, distributors and transporters.	The areas of responsibility of manufacturers, distributors and transportes are determined by the terms of supply agreements.
2.2 Require that cyanide transporters implement appropriate emergency response plans and capabilities, and employ adequate measures for cyanide management.	Transporters are responsible for compliance with standards safety. Drivers are supplied with emergency vehicle cards that define the procedure for dealing with incidents. Norms and generally accepted standards for international transport of dangerous goods by road are combined in the ADR (European Agreement of 30 September 1957 concerning the International Carriage of Dangerous Goods by Road). Russia is part of the ADR.

# ACTIVITY | Standard	Nordgold's procedures
3 HANDLING AND STORAGE **Protect workers and the environment during cyanide handling and storage**	
3.1 Design and construct unloading, storage and mixing facilities consistent with sound, accepted engineering practices and quality control and quality assurance procedures, spill prevention and spill containment measures.	Cyanide is stored and loaded into the manufacturer's container. Storage takes place in specially equipped warehouses. The ADHD warehouse is a hazardous production facility. Its security and insurance are provided. Cyanide is transported and stored in solid tablet form, which ensures the efficiency of safety measures in case of incidents.
3.2 Operate unloading, storage and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.	Specialised equipment is used to blend cyanides. Grinding and preparation of solutions takes place with mechanisation. Light and sound alarms and cyanide sensors are used in the work area. Employees are obliged to to use PPE. The instructions for decontamination and disposal of containers have been approved. Hypochlorite solution is used for decontamination.
4 OPERATIONS **Manage cyanide process solutions and waste streams to protect human health and the environment**	
4.1 Implement management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.	The use of cyanides occurs with mechanisation. Automatic cyanide sensors are used in the air of the work area with light and sound alarms.
4.2 Introduce management and operating systems to minimize cyanide use, thereby limiting concentrations of cyanide in mill tailings.	Minimising the use of cyanides is achieved by applying other gold recovery methods including gravity and flotation. Cyanidation is applied to a small volume of gold concentrate after flotation rather than to the entire volume of ore. Alkalis are used to stabilise cyanide which prevent cyanide decomposition due to environmental factors. Recycling of cyanide solutions allows to significantly reduce cyanide and alkali consumption, as decontaminated solutions containing residual amounts of reagents, are back in the process.

# ACTIVITY | Standard		Nordgold's procedures
4.3	Implement a comprehensive water management program to protect against unintentional releases.	Cyanide solutions are used in the recirculation system. As a result, no cyanide effluents are generated from the plants during normal operation. Such effluents may or may not be the result of incidents, or appear during a mine closure. Decommissioning and remediation projects, as well as standards for pollutant discharges, are agreed upon by state authorities. In the event of incidents, a procedure has been developed for the neutralisation of cyanides. As a rule, hypochlorite oxidation of cyanides is used for this purpose. For hazardous production facilities, Emergency Response Plans procedures have been developed.
4.4	Implement measures to protect birds, other wildlife and livestock from adverse effects of cyanide process solutions.	Animals are protected from the effects of cyanide by a specific infrastructure. The cyanide-containing tailings storage facilities (TSF) are regularly monitored.
4.5	Implement measures to protect fish and wildlife from direct and indirect discharges of cyanide process solutions to surface water.	Cyanide-containing solutions circulate in a closed system between the processing plant, storage ponds and tailings dams (where applicable).
4.6	Implement measures designed to manage seepage from cyanide facilities to protect the beneficial uses of ground water.	The durability of the TSF is a key priority for Nordgold. We are fully committed to maintaining the dams in a safe and stable technical condition. Surveillance wells are arranged around the tailings dams.
4.7	Provide spill prevention or containment measures for process tanks and pipelines.	The Company works to contain and prevent spills. Spills can have a harmful impact on the environment, as well as causing losses in the form useful components (e.g. dissolved gold) being wasted, with residual reagents and water itself also representing a valuable resource.
4.8	Implement quality control/quality assurance procedures to confirm that cyanide facilities are constructed according to accepted engineering standards and specifications.	All designs of hazardous production facilities undergo industrial safety reviews, and authorial supervision is implemented during construction.
4.9	Implement monitoring programs to evaluate the effects of cyanide use on wildlife, surface and ground water quality.	Industrial environmental monitoring is conducted.

# ACTIVITY | Standard	Nordgold's procedures
5 DECOMMISSIONING **Protect communities and the environment from cyanide through development and implementation of decommissioning plans for cyanide facilities**	
5.1 Plan and implement procedures for effective decommissioning of cyanide facilities to protect human health, wildlife and livestock.	Decommissioning and reclamation projects for waste disposal facilities in the Russian Federation, including cyanide-containing waste, are subject to a state environmental impact assessment at the federal level. This ensures external control of this type of work.
5.2 Establish an assurance mechanism capable of fully funding cyanide-related decommissioning activities.	The financial statements include obligations to dismantle and remove items of property, plant and equipment and restore natural resources at the site it occupies (ARO - Asset Retirement Obligation).

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6	**WORKER SAFETY** **Protect workers' health and safety from exposure to cyanide**	
6.1	Identify potential cyanide exposure scenarios and take measures as necessary to eliminate, reduce and control them.	Cyanide oppresses cellular respiration and poisoning is also possible, both when inhaled and when it comes into contact with the skin. This explains the high demands placed on the individual's PPE. However, even the most adequately equipped worker can be at risk from high concentrations of cyanide. In the first instance, a person feels burnt mucous membranes from the alkaline environment of the solution. Falls into cyanide tanks pose a separate hazard. There is a separate set of rules for working in enclosed spaces as these works are considered dangerous and not just due to cyanides. The most likely incidents are those associated with falling into the cyanide tanks or accidents in the event of pipeline damage in which a jet of pressure in the pipeline is created. An employee caught in such a situation washes the affected body part with water and is monitored by physicians. In addition, to preventing poisoning from developing, amyl nitrites are used as first aid, with pentil nitrite or an equivalent as a subsequent medical treatment. Sodium nitrite, sodium thiosulphate and other specifics are introduced. Antidotes and support therapy is provided to the victim who is observed in hospital conditions for 1-3 days. When cyanides enter the environment or work areas, cyanide-containing material is collected and disposed of. Site decontamination is performed if necessary along with monitoring of cyanide content in the air and/or in the solution.
6.2	Operate and monitor cyanide facilities to protect worker health and safety and periodically evaluate the effectiveness of health and safety measures.	Employees for operations with cyanides use a specific set of PPE: overalls, a full mask, special shoes and gloves. In addition, the cyanide content in the air of the work area is monitored by automatic sensors connected to a light and sound alarm system.
6.3	Develop and implement emergency response plans and procedures to respond to worker exposure to cyanide.	When the alarm is triggered, employees leave the hazard area and implement a system for notifying those responsible for locating and eliminating the consequences of incidents, following their instructions.

# ACTIVITY | Standard		Nordgold's procedures
7	**EMERGENCY RESPONSE** **Protect communities and the environment through the development of emergency response strategies and capabilities**	
7.1	Prepare detailed emergency response plans for potential cyanide releases.	ERP for the most probable scenarios is prepared and approved by regulatory authorities and technical managers.
7.2	Involve site personnel and stakeholders in the planning process.	The Company's employees, management and shareholders are concerned with the stable and safe operation of the business units. This is ensured at the highest level by the approval of policies, action plans and investments in improving safety. Management and employees are involved in the system of material and non-material incentives for safe behaviour.
7.3	Designate appropriate personnel and commit necessary equipment and resources for emergency response.	The enterprises have a health, safety and environmental protection service that ensures production control. There are also professional (underground mines) and voluntary (surface mines) rescue units and medical personnel.
7.4	Develop procedures for internal and external emergency notification and reporting.	Procedures for recording incidents, notification of incidents and reporting have been developed and implemented at the BUs.
7.5	Incorporate into response plans monitoring elements and remediation measures that account for the additional hazards of using cyanide treatment chemicals.	For cyanide deactivation by chemical methods, oxidisers are used as a rule. Historically, the most frequently used oxidisers in Russia are hypochlorite. Global best practice demonstrates the effectiveness of chemical methods for small volumes of cyanide-containing material at high concentration of cyanides. Therefore, the current focus in decontamination of large volumes with low content shifts to using cyanide decontamination under exposure to sunlight, air oxygen and microorganisms. However, the use of hypochlorite is not uncommon in accidents, while ensuring compliance with dosage and residual control. Chlorine, as a hypochlorite itself is also unsafe a substance.
7.6	Periodically evaluate response procedures and capabilities and revise them as needed.	ERP are reviewed according to the approved schedule, as well in case of the pertinent legislative changes.

# ACTIVITY | Standard		Nordgold's procedures
8 TRAINING **Train workers and emergency response personnel to manage cyanide in a safe and environmentally protective manner**		
8.1	Train workers to understand the hazards associated with cyanide use.	All employees and regular visitors undergo suitable training, including primary and first aid training. In the course of the year, all individuals will receive training on each of the plan's items so so they can work independently and, if necessary, receive repeated, unscheduled and targeted briefings and training on accident management plans.
8.2	Train appropriate personnel to operate the facility according to systems and procedures that protect human health, the community and the environment.	Employees who have been authorised to work with cyanides are also trained to work with hazardous substances and materials.
8.3	Train appropriate workers and personnel to respond to worker exposures and environmental releases of cyanide.	Information on the circumstances of incidents and remediation of consequences is promptly distributed to all Nordgold business units and communicated to employees.
9 DIALOGUE **Engage in public consultation and disclosure**		
9.1	Provide stakeholders the opportunity to communicate issues of concern.	Nordgold's shareholders are interested in safe operations. This is implemented through an approved information mechanism, the first step of which is to send prompt reports for any incidents. A safety report is provided to the Company's senior management on a regular basis, including investigation materials on the causes. Unscheduled information is also provided to top management in the event of incidents or accidents. In a similar manner, shareholders are also informed. Information on safety and incidents is also made available to the public in an annual integrated report.
9.2	Initiate dialogue describing cyanide management procedures and responsively address identified concerns.	
9.3	Make appropriate operational and environmental information regarding cyanide available to stakeholders.	