The CODE

The Newsletter of
the International Cyanide
Management Institute
www.cyanidecode.org

2nd Quarter 2023 Edition

What's Inside

Welcome to the 2nd Quarter 2023 edition of *The Code*.

Annual Report Emphases Accountability and Transparency

ICMI has published its 2022 Annual Report with the theme "Accountability and the Cyanide Code."

The report highlights the growing trend towards greater accountability and transparency to stakeholders, investors, government regulators, industry employees and the general public from gold mining operations. The report notes that this movement to increasing stewardship of the environment and resources is not the sole purview of gold mining operations but is being felt throughout all industries. "Investors, regulators, employees, and stakeholders across society are increasingly raising the bar on company ESG and sustainability performance, and calling for increased transparency to help assess risks and long-term value. The gold industry is not immune to these increased expectations," the report stated.

However, because gold mining uses cyanide in its operations, the bar must be especially high in how it handles this chemical. The report added: "… there is growing pressure on companies to commit to credibly demonstrating that they are consistently operating at their highest levels when managing cyanide, a chemical that is critically important to the vitality of the gold industry."

The 41-page report placed a special country focus on gold-mining operations in Turkey, a country with thousands of years of mining history and which produced 30.9 metric tonnes of gold in 2022. Six mining companies with operations in Turkey have already become signatories. Additional signatories are expected in the near future.

A free copy of the Annual Report is available here.

Three Mining Companies and Four Transport Companies Join Cyanide Code

ICMI welcomes the following signatories:

Mines

Gübretaş Maden Yatirimlari A.Ş., which is developing the Söğüt Gold Mine in Turkey, is a subsidiary of Gübre Fabrikaları Türk A.Ş., a fertilizer manufacturer in Turkey.

Prodigy Gold, Inc., is a wholly-owned subsidiary of Argonaut Gold, and is developing the Magino Gold Mine in Ontario, Canada. The mine is expected to start commercial operations this year.

Sierra Antapite, is part of the Sierra Sun Group, and operates a gold mine in Peru.

Transporters

Greenline Logistics is in Ghana.

Group EGF Sarl is in Burkina Faso.

Taifa Transport & Logistics is headquartered in Dar es Salaam, Tanzania.

Linfox Transport Quang Binh Co., Ltd. in Vietnam was a previous signatory and was readmitted to the program.

As of June 30, the Cyanide Code has 219 signatories, comprised of 57 mining companies, 31 cyanide producers, and 131 transporters.

Cyanide Code Program Documents Now Available in Turkish and Russian

The International Cyanide Management Institute has published on its website Cyanide Code program documents in Turkish and Russian. The Cyanide Code is supported by a suite of documents that provides guidance and instructions to participating operations in preparing for certification and to auditors in assessing compliance. These documents also provide information, instruction, and details on administrative requirements for participating companies and auditors. Although the official language of the program is English, and all documents submitted to ICMI must be written in English, ICMI also offers Spanish, French, Chinese, Portuguese and now Turkish and Russian translations of the Cyanide Code program documents.

Translated versions of the updated Cyanide Code program documents are accessible on the Languages page of the Cyanide Code website. It should be noted that ICMI provides these documents as a resource but assumes no responsibility for any errors arising from their translation. In all instances, the English language version of the Cyanide Code program documents prevails.

Global Testing of Glycine Leaching Technology Announced

Draslovka a.s., a specialty chemicals company, has agreed with Barrick Gold Corporation to roll out a global testing and implementation program for Draslovka's proprietary glycine gold leaching product, GlyCat™, across several mines. The patent-protected technology for the recovery of gold uses a dual-lixiviant system of glycine and sodium cyanide.

Glycine is a non-toxic, biodegradable, and recyclable amino acid commonly used as a food additive. A common manufacturing process to obtain glycine is to combine formaldehyde and ammonia with hydrogen cyanide; another manufacturing method is to combine chloroacetic acid and ammonia.

According to Draslovka, tests have demonstrated that GlyCat™ enables significant operating cost savings from the reduction of cyanide, detoxification and other leaching reagents, potential improvements in gold recovery as well as reduction of waste and waste water treatment costs. It also can enable the treatment of previously uneconomical ores.

Barrick is the first major mining company to systematically roll out this new technology on a global scale, starting at the Bulyanhulu Gold Mine in Tanzania and several other Barrick operations. Large-scale test programs will be undertaken at each site to quantify the operating cost savings from the reduction of cyanide usage, potential improvements in gold recovery, and lowering of cut-off grades, all of which may allow operations to treat ore types that previously may have been uneconomic to process.

New Cyanide Antidote Registered in China

There are a limited number of commercially available cyanide antidotes, but promising research may soon increase the options available. The Chinese company Huiyu Pharmaceutical has recently registered for approval of an antidote for cyanide poisoning. The antidote currently used at all Cyanide Code-certified cyanide production operations in China is manufactured by the People's Army Medicine Science Institute, and is a combination of sodium thiosulfate, sodium nitrate, and methylene blue, and is applied intravenously.

Auditor's Corner: Protection of Birds, other Wildlife, and Livestock

The Auditor's Corner is a continuing feature of The Code. As regular readers know, this column is intended not only for auditors but also for operations preparing for audits or gap analyses. As always, we welcome your suggestions for future topics at info@cyanidecode.org.

This edition discusses the Cyanide Code's expectations for protection of birds, other wildlife, and livestock, as discussed under Standard of Practice 4.4 in ICMI's Guidance for Use of the Mining Operations Verification Protocol. Measures to protect wildlife and livestock are expected, even if the operation has not had wildlife mortalities at its facilities. The Code's first expectation for protecting wildlife and livestock is for weak acid dissociable (WAD) cyanide concentrations to be maintained at 50 milligrams per liter (mg/L) or less in open water in ponds and impoundments where birds, other wildlife and livestock may have access. This typically includes tailings impoundments, and pregnant and barren ponds at heap leach facilities. This concentration is one of the few numerical guidelines included in the Cyanide Code and is based on evidence that solutions with up to 50 mg/L WAD cyanide are typically non-lethal to wildlife.

To meet this 50 mg/L WAD cyanide limit, most operations control cyanide concentrations during processing or by implementing systems such as cyanide destruct systems for the tailings stream, to prevent water in tailings impoundments from reaching the limit.

In open water having WAD cyanide concentrations greater than 50 mg/L, effective measures must be in place to prevent wildlife access. Typical measures to keep out wildlife include fencing to exclude non-avian wildlife and livestock and the use of netting or bird balls to prevent access of birds to open waters. These techniques are commonly used for pregnant and barren ponds at heap leach facilities. At heap leach pads, open solution trenches or channels also must be managed to prevent wildlife exposure. For solution channels, wildlife protection is typically managed through use of French drains or netting.

Ponding of leach solution on the surface of a heap due to conditions such as poor infiltration must also be managed. It is important to eliminate or reduce surface ponding on leach pads, because such ponding can be attractive to birds, especially in dry environments.

Hazing and deterrent techniques such as the use of air cannons are not considered to be acceptable for excluding wildlife, as animals quickly become accustomed to the noise and it loses its effectiveness. While some types of alternative methods for wildlife protection may be acceptable under specific, limited circumstances, demonstrating the effectiveness of alternative methods is difficult. The processes for establishing Code-compliant alternative methods for wildlife protection are discussed in ICMI's Mining Guidance under Standard of Practice 4.4.

For operations with tailings impoundments, it is important to note that because certain types of birds drink tailings water as it flows across the beach of an impoundment, the 50 mg/L limit applies at the discharge to the impoundment in areas where such birds are present. While many operations routinely sample water quality at the decant pond in a tailings impoundment, cyanide concentrations in the decant pond can be much lower than concentrations in the water flowing across the tailings beach prior to entering the decant pond. Thus, it is important that operations also conduct sampling at the discharge point to the tailings impoundment (e.g., at the spigots), or alternately, upstream of the discharge point (e.g., at the outfall from the process plant or cyanide destruction plant). Where an operation has not collected such data at these locations, it may be less complicated for the operation to begin conducting sampling at the discharge point to the tailings impoundment or at an upstream location rather than implementing alternative compliance measures. Regardless, without sufficient analytical data for outflow onto tailings beach areas, the auditor must provide additional information to support a finding of full compliance rather than substantial compliance or non-compliance under Standard of Practice 4.4.

The extent of data necessary for an operation to demonstrate that it has adequate systems in place for wildlife and livestock protection will require judgment by the auditor. Operations must monitor for wildlife mortalities to evaluate whether maintaining WAD cyanide concentrations below 50 mg/L and implementation of exclusion measures, such as bird balls or netting, are effective in preventing wildlife mortalities. For evaluating adherence to the 50 mg/L WAD cyanide limit in recertification audits, the operation must typically provide analytical data demonstrating continuous compliance over the entire audit cycle. If an operation has very recently implemented new systems to lower its WAD cyanide concentration for purposes of Code compliance, it should have sufficient data to demonstrate to an auditor that its new system is fully implemented and capable of consistently meeting the Code's 50 mg/L standard. If the operation does not have data demonstrating that it can consistently meet the standard, the auditor may need to make a finding of substantial compliance subject to submission of additional confirmatory data over a sufficient time period. For initial Code certification audits, some operations may not have collected data or may not have been in compliance with the Code's 50 mg/L limit before becoming a signatory, so a review of long-term historical data may not be possible or useful for an initial audit. However, the operation should be able to demonstrate that it has recently managed its solutions in compliance with the Code by providing data showing that its open solutions consistently meet this recommended limit for a sufficient period prior to the initial audit.

Finally, auditors and operations should note that the 50 mg/L limit does not apply to open-topped process tanks and vessels such as carbon-in-leach (CIL) tanks or to catchment ponds and containments that collect process solutions in an emergency and are emptied as soon as practical. Additionally, the limit is not intended for protection of insects and small animals that cannot be excluded from ponds and impoundments with most fencing or netting.