

ENVIRONMENTAL STEWARDSHIP

CYANIDE MANAGEMENT



Case Study
PIONEERING REAL-TIME CYANIDE
MEASUREMENT →

CERTIFIED the new
EMIGRANT OPERATION
for the first time



**ONE OF THE INITIAL
14 SIGNATORIES**
to The International Cyanide Management Code

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Approach

Today's gold deposits tend to be "invisible," or in more technical terms, disseminated submicroscopic gold. At such low concentrations, chemical extraction is the only viable method of recovering the gold from the ore, with the most effective and economical chemical being sodium cyanide. While safer than alternative chemical agents and a critical ingredient in the manufacturing of hundreds of everyday goods, cyanide can pose health risks to humans, animals and plant life. The right to health has been identified as a salient human rights risk associated with our business activities.

Our commitment to safely and responsibly manage cyanide is stated in our [Sustainability and Stakeholder Engagement Policy](#), and the minimum requirements all sites must meet are stated in our Hazardous Materials Management Standard.

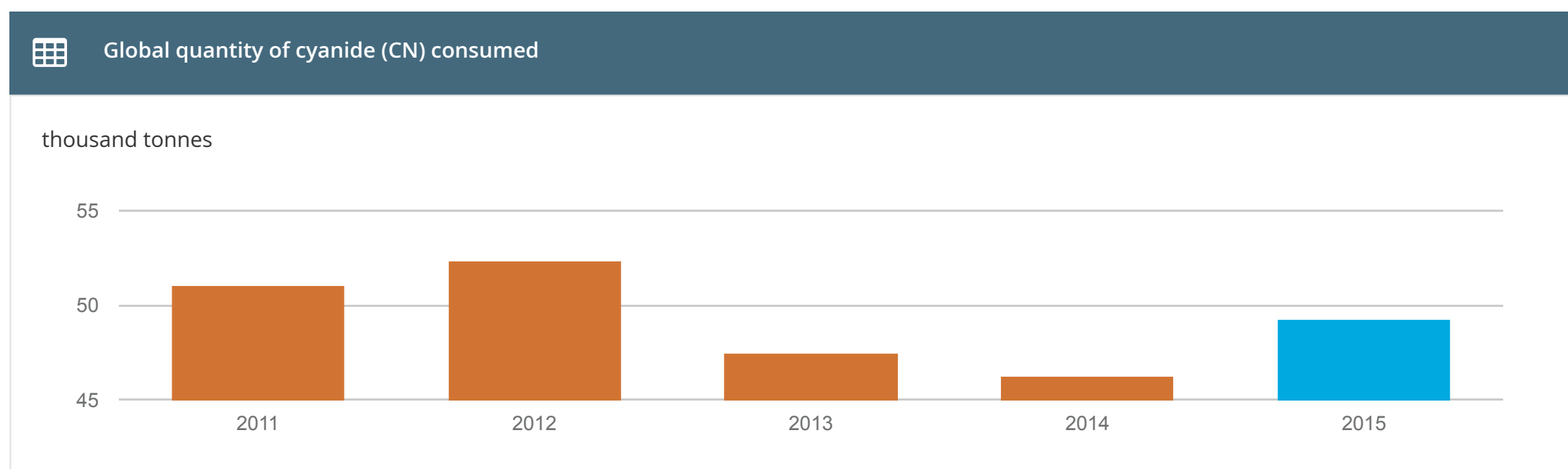
All our gold processing facilities that use cyanide are required to be certified to the [International Cyanide Management Code](#) (ICMC or the Code). The Code comprises nine principles intended to improve the lifecycle management of cyanide, reduce exposure of workers and surrounding communities from harmful levels of cyanide, minimize impacts to the environment, and enhance response actions to cyanide releases.

In 2005, Newmont became one of the 14 initial signatories to the Code, which provides the framework for managing cyanide at our operations. Compliance with the Code requires independent third-party verification through an audit process and recertification every three years. We also require new operations that use cyanide to process ore to conduct the initial certification audit within 12 months of commercial production. This requirement is more stringent than that of the Code, which allows new sites and facilities to achieve certification within three years. In addition, sites engage internal and external auditing teams to review Code compliance in the years between formal audit cycles.

Details of our compliance records and copies of the audit documents for each of our mines that use cyanide for processing can be found on the [Code website](#).

2015 Performance

In 2015, Newmont operations used 49,200 tonnes of sodium cyanide. Quantities vary each year due to mineral variations in our ore bodies as well as processing variables.



At year-end 2015, 10 of the 11 Newmont operations that use cyanide were certified as compliant with the Code. The remaining site, Tanami in Australia, was audited late in the year and is expecting its re-certification certificate to be delivered in early 2016 in accordance with the Code certification process. In December, the new Emigrant heap leach facility – which is part of the greater Carlin operation – was certified for the first time. Updated information on certifications is available on the [ICMI website](#).

We rate cyanide-related incidents on a severity scale of one to five, and consider Levels 1 and 2 incidents to be relatively minor and Levels 3 to 5 incidents to be more significant. In 2015, we experienced three Level 3, two Level 4, and no Level 5 cyanide-related incidents.

Our Nevada operations experienced four cyanide incidents:

- A Level 3 incident occurred at the Twin Creeks operation when a pipe carrying treated water to the mill ruptured. Most of the release was contained, the pipe was repaired, and the impacted soils were treated.
- A Level 4 incident at the Carlin operating complex involved a break in a pipeline that caused a cyanide solution to spray out of containment. Pressure sensors on the line notified plant operators, and it was immediately shut down.
- Carlin also had two Level 3 incidents. One occurred when a fuse on a power pole shut down pumps resulting in an overflow of solution out of containment. The other incident occurred when a tank overflowed due to a broken valve.

The Level 4 cyanide incident at Yanacocha was a Level 2 environmental incident due to the containment of the solution within the facility, but was not classified as such because it was a Level 4 [safety incident](#) where a worker was hospitalized after being exposed to cyanide due to an uncontrolled discharge of cyanide solution when an outflow pipe from the cyanide storage tank was unclogged without the risks associated with the task being adequately assessed. The worker fully recovered and returned to work, and we provided a detailed report to the Industry Advisory Group (IAG) for the ICMC.

During all these events, the solution did not leave the property, and there was no threat to communities or wildlife. All incidents were reported to the appropriate regulatory authorities, where required, and were cleaned up and remediated.

Future Focus

In 2016, we will conduct recertification audits at the Lone Tree operation in Nevada. All certified operations will map Cyanide Code requirements to ISO 14001 environmental management system requirements.

PIONEERING REAL-TIME CYANIDE MEASUREMENT

Timely and accurate chemical analysis is a critical part of safely and effectively managing cyanide's use in gold mining. Cyanide measurement is challenging – particularly at low concentrations – because it is chemically reactive and easily affected by changes in acidity, temperature, trace metal content, and the presence of sulfur or sulfur compounds.



Common methods for testing the presence of cyanide in precious metal process solutions and treated water involve distillation, oxidization or modifying the pH. Additionally, these methods generally require that the sample be sent to a lab for testing, and it may take several days to get the results. Because chemical or biological reactions can change the composition of test samples when removed from their natural environment, the accuracy of the testing can be questionable.

Newmont has been working with a proven technology – called gas-diffusion – and adapting it to slurries and complex gold process solutions so monitoring can be done at the critical points in the field for real-time results. Along with analysis times at just over a minute, gas-diffusion allowed samples show a high degree of accuracy without the sample degradation problems often associated with other testing methods.

Newmont deployed this technology at a number of sites in 2015, and this work continues across our operations. While ISO and ASTM – two international voluntary standards organizations – have certified the gas-diffusion testing method, Newmont is working with regulatory authorities to recognize the method as the standard for cyanide testing and reporting.