### WHAT IS SULFURIC ACID MIST?

Acid mist is generated in electrowinning tankhouses when oxygen bubbles that are formed during electroplating burst at the surface of the electrolyte. When these bubbles burst, they cause the small droplets of electrolyte containing sulfuric acid to become airborne. These airborne particles are sulfuric acid mist.

# WHY DO WE HAVE TO MANAGE ACID MIST?

Acid mist must be managed according to this BMP to ensure Freeport-McMoRan Morenci Inc’s (Morenci) compliance with all State and Federal environmental and safety regulations. Morenci’s Title V Air Quality Permit requires specific controls to be used to minimize acid mist emissions from each tankhouse. Additionally, acid mist is managed to prevent exposures to employees above the Threshold Limit Value (TLV) set by Mine Safety & Health Administration (MSHA). As such every tankhouse employee should ensure that the best practices outlined in this procedure are followed.

**WHAT BEST PRACTICES DOES MORENCI UTILIZE TO CONTROL ACID MIST?**

Morenci uses several best practices that, when combined, are very effective at controlling acid mist emissions from the electrowinning tankhouses. Following is a brief description of each best practice currently in use by Morenci:

### Permitted Surfactants: Surfactants reduce the surface tension of the electrolyte in the tankhouse. Reduction in the surface tension causes less acid mist droplets to be formed when the oxygen bubbles burst at the surface.

### Mist Balls: Mist balls are small plastic balls that float on the surface of the electrolyte in each electrowinning cell. These mist balls help prevent acid mist droplets from becoming airborne when oxygen bubbles burst at the surface of the cell.

### Cell Discharge Covers: Cell discharge covers are plastic plates that cover the drain line from each electrowinning cell. These covers prevent acid mist droplets from becoming airborne when the oxygen bubbles burst at the surface of the cell.

**Tankhouse Crane Curtains:** Curtains on the Stargo Tankhouse are installed to contain acid mist within the building.

**WHAT PERSONAL PROTECTIVE EQUIPMENT (PPE) MUST I WEAR IN THE TANKHOUSE?**

In order to minimize personnel exposure to acid mist, Morenci requires that all employees wear a respirator while on the cell line in addition to their standard safety equipment. The respirators should be fitted with a cartridge designed to capture acid gases.

**WHAT DO I NEED TO DO TO CONTROL ACID MIST AT THE TANKHOUSE?**

In order to ensure that acid mist is being adequately controlled in each tankhouse the following procedures for each best practice must be followed:

**Permitted Surfactants:** Surfactants should be added to the electrolyte at each tankhouse on a daily basis per the plants operating specifications. These specifications may change periodically to ensure the surfactant levels are controlled in a way to prevent foaming and other upsets in the tankhouses and SX plants.

**Mist Balls:** Morenci’s best practice is to maintain three layers of mist balls on each cell. Each tankhouse must verify mist ball coverage daily and add balls to all cells that have inadequate coverage in a timely manner.

**Cell Discharge Covers**: Cell discharge covers must be kept on each electrowinning cell. Each tankhouse must verify cell drain covers are in place and immediately replace all missing covers. Additionally, cell discharge covers should be kept as a stock item in the main warehouse.

**Tankhouse Crane Curtains:** Curtains on the Stargo Tankhouse crane repair area must be maintained on a regular basis to effectively enclose the tankhouse.

**EMPLOYEE TRAINING**

All personnel shall receive training or at the least have access to this BMP when working in the electrowinning tankhouses on Morenci property.

The Supervisor and/or Department Environmental Representative must provide this training.

**QUESTIONS OR NEED HELP? CONTACT:**

**Your Division Representatives/Environmental Rep**

**Enviro Service Office: 865-6000**