



**TECHNICAL REVIEW AND EVALUATION
OF APPLICATION FOR
AIR QUALITY PERMIT NO. 63722**

BHP Copper Inc. – Miami Unit

I. INTRODUCTION

This Class II renewal permit is issued to BHP Copper, Inc. for the continued operation of a solvent extraction/electrowinning (SX/EW) facility in Miami in Gila County. This permit renews and supersedes Permit No. 53139.

A. Company Information

1. Facility Name: BHP Copper Inc. – Miami Unit
2. Facility Location: Adjacent to town of Miami
Miami, Gila County, AZ 85539
3. Mailing Address: PO Box 790
Miami, AZ 85539

B. Attainment Classification

The facility is located in an area which is classified maintenance for sulfur dioxide (SO₂), non-attainment for particulate matter with an aerodynamic diameter less than or equal to 10 microns (PM₁₀), and attainment or unclassified for all other criteria pollutants.

II. PROCESS DESCRIPTION

A. SX/EW Process

The SX/EW plant recovers acid-soluble copper from pregnant leach solution (PLS). The solvent extraction portion of the process contains a train of mixer-settlers, some of which are extractor cells and some of which are stripper cells. In the extractor cells, the copper is removed from the PLS by mixing it with a kerosene diluent containing an organic extraction reagent. The blended organic loaded with copper is separated from the aqueous portion of the PLS by gravity with the barren aqueous portion, now referred to as raffinate, returning to the leach process or separate waste process, and the copper-laden blended organic moving to the stripper cells.

In the stripper cells, copper is stripped from the loaded organic by mixing with barren or “lean” aqueous electrolyte from the electrowinning process. The high acid content of the barren electrolyte causes the stripping action. In the stripper cells the now copper-laden, or pregnant electrolyte, is routed to the electrowinning process in the tank house while the barren organic is returned to the extractor cells for reuse.

During the electrowinning process electrical current is passed through the pregnant electrolyte in the tank house cells. Within the cells the pure copper is plated onto

cathodes as the copper gains electrons from the current. In order to balance the electron flow, hydrogen ions and oxygen gas are freed at the anode. The hydrogen combines with free sulfates forming more acid in the lean electrolyte. The lean electrolyte is then returned to the stripper cells as described previously.

The facility utilizes a 10.46 MMBtu/hr natural gas-fired boiler to support SX/EW operations.

III. EMISSIONS

Table 1: Non-Fugitive Emissions

Pollutant	Emissions (tons per year)
VOC	27.39
NO _x	4.49
CO	3.77
PM	2.51
PM ₁₀	2.51
PM _{2.5}	2.51
H ₂ SO ₄ *	2.17
SO ₂	0.03

* 2.17 tpy H₂SO₄ is also included in PM/PM₁₀/PM_{2.5}

IV. APPLICABLE REGULATIONS

Table 2 displays the applicable requirements for each permitted piece of equipment along with an explanation of why the requirement is applicable

Table 2: Verification of Applicable Regulations

Unit	Control Device	Rule	Verification
SX/EW Plant	Low vapor pressure solvents, surfactants, foam, blankets, thermal retention balls, other means approved by Director means	A.A.C. R18-2-702 A.A.C. R18-2-730	These operations are subject to Standards for Unclassified Sources A.A.C. R18-2-730

Unit	Control Device	Rule	Verification
Boiler	Not applicable	40 CFR 60, Subpart Dc	These New Source Performance Standards (NSPS) are applicable to each steam generating unit with a maximum design heat input capacity of 100 MMBtu/hr or less, but greater than or equal to 10 MMBtu/hr, constructed after June 9, 1989.
Emergency Generator	Not applicable	40 CFR 60 Subpart III, - 4205(a) thru (e), - 4207(b), - 4211(c), - 4211(f), - 4211(f)(1), - 4211(f)(2), - (f)(2)(i). - 4211(f)(2)(ii), - 4211(f)(2)(iii), - 4211(f)(3), - 4211(f)(3)(i), - 4211(g), - 4214(b), -4214(d)	This emergency compression ignition engine is subject to NSPS due to its date of manufacture and horsepower capacity.
Emergency Pump Engine	Not applicable	A.A.C. R18-2-719.C.1 A.A.C. R18-2-719.E A.A.C. R18-2-719.F A.A.C. R18-2-719.H 40 CFR 63 Subpart ZZZZ, - .6603(a), Table 2d Item 4, - 6605(a), (b) -6625(e), (f), (h) & (i), - 6640(f), -(f)(1), - (f)(2), - (f)(2)(i), -(f)(2)(ii), - (f)(2)(iii), - (f)(4), - (f)(4)(ii), -6655, - -6655(e), - 6655(f), - 6655(f)(2)	This emergency compression ignition engine is not subject to an NSPS due to its early date of manufacture. It is subject to these State Rules and National Emission Standards for Hazardous Air Pollutants (NESHAP).
Fugitive dust sources	Water Trucks Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	This standard is applicable to any spray painting operation.
Demolition/renovation operations	Not applicable	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.
Mobile sources	Not applicable	A.A.C. R18-2-801	These are applicable to off-road mobile sources, which either move while emitting air pollutants or are frequently moved during the course of their utilization.

V. PREVIOUS PERMIT CONDITIONS

Permit No. 53139 was issued on October 13, 2011, for the continued operation of this facility. A subsequent Minor Permit Revision, No. 62395, was issued on July 14, 2015, for the addition of two emergency engines and removal of the gasoline storage tank. Table 3 below summarizes the conditions contained in the two aforementioned permits and details if the condition was kept, revised, deleted, and/or streamlined.

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Table 3: Permit No. 53139

Section No.	Determination			Comments
	Revised	Kept	Delete	
Attachment A				
All	X			General Provisions - Revised to represent most recent template language.
Attachment B				
I.A.1	X			Added ALT-082 opacity measurement option
II		X		Citation revised at II.A.1 and II.A.2
III		X		
IV	X			Condition IV of Revision 62395, kept but renumbered as Condition VI of Renewal Permit, and Condition VI.B.1.c.(9) was added
V	X			Condition V of Revision 62395, kept but renumbered as Condition VII of Renewal Permit
VI				Condition VI of Revision 62395, kept but renumbered as Condition VIII of Renewal Permit
VII	X			Condition VII of Revision 62395, kept but renumbered as Condition IV of Renewal Permit
VIII	X			Condition VIII of Revision 62395, kept but renumbered as Condition V of Renewal Permit
Attachment C				
EW Circuit	X			Total square footage surface area updated per renewal application value.

VI. MONITORING REQUIREMENTS

A. SX/EW

The Permittee is required to keep records of the number of cells in operation and the current density, as well as records of what control measures are used to limit emissions from the SX/EW process.

B. Boiler

The Permittee is required to keep daily records of natural gas usage in the boiler.

C. Emergency Engine not Subject to NSPS

1. The Permittee is required to keep a record of the lower heating values and sulfur content of the diesel fuel fired in the engine.
2. The Permittee is required to conduct a quarterly EPA Reference Method survey of visible emissions emanating from the ICE when in operation. If the opacity of the emissions observed appears to exceed the standard, the Permittee is required to conduct a certified EPA Reference Method 9 observation. The Permittee shall keep records of the initial survey and any EPA Reference Method 9 observations

performed. These records shall include the emission point observed, name of observer, date and time of observation, and the results of the observation.

If the observation results in a Method 9 opacity reading in excess of 40 percent, the Permittee shall report this to ADEQ as excess emission and initiate appropriate corrective action to reduce the opacity below 40 percent. The Permittee shall keep a record of the corrective action performed.

3. The Permittee is required to keep records of the maintenance conducted on the engine.

D. Emergency Engine Subject to NSPS

The Permittee is required to install a non-resettable hour meter prior to startup of the engine and record the time of operation of the engine in emergency and non-emergency service through the non-resettable hour meter.

E. Fugitive Dust

1. The Permittee is required to keep record of the dates and types of dust control measures employed.
2. The Permittee is required to show compliance with the opacity standards by having a Method 9 certified observer perform a monthly survey of visible emission from fugitive dust sources. The observer is required to conduct a 6-minute Method 9 observation if the results of the initial survey appear on an instantaneous basis to exceed the applicable standard.
3. The Permittee is required to keep records of the name of the observer, the time, date, and location of the observation and the results of all surveys and observations.
4. The Permittee is required to keep records of any corrective action taken to lower the opacity of any emission point and any excess emission reports.

F. Periodic Activities

1. The Permittee is required to record the date, duration and pollution control measures of any abrasive blasting project.
2. The Permittee is required to record the date, duration, quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.
3. The Permittee is required to maintain records of all asbestos related demolition or renovation projects. The required records include the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents.

G. Mobile Sources

The Permittee is required to keep records of all emission related maintenance performed on the mobile sources.

VII. COMPLIANCE HISTORY

There have been two facility inspections and four file/report reviews performed for this facility during the term of the previous permit, resulting in one air quality enforcement case.

While conducting a facility inspection on January 25, 2012, the ADEQ inspector observed that the gasoline storage tank did not appear to have a submerged filling device or acceptable equivalent, and the Permittee was unable to provide records of the typical Reid vapor pressure, average temperature, and true vapor pressure of the gasoline storage tank as required by the permit. Case No. 129915 was opened and a NOC was issued. The Annual Compliance Certification for period ending September 30, 2012, reports the gasoline storage tank has been emptied, taken out of service and no gasoline dispensing facility is in use on site. The Case No. 129915 was dismissed on July 14, 2014.

No other cases or alleged violations appear to be associated with this facility or place identification number at this time.

VIII. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
ARS	Arizona Revised Statutes
A/ft ²	amps per square foot
Btu	British thermal unit
CDX	Central Data Exchange
CEDRI	Compliance and Emissions Data Reporting Interface
CFR	Code of Federal Regulations
CI	compression ignition
CO	Carbon Monoxide
EPA	Environmental Protection Agency
EW	electrowinning
FERC	Federal Energy Regulatory Commission
ft ²	square foot
H ₂ SO ₄	sulfuric acid
HAP	Hazardous Air Pollutant
hp	Horsepower
ICE	Internal Combustion Engine
MMBtu/hr	Million British Thermal Units per hour
NERC	North American Electric Reliability Corporation
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO _x	Nitrogen Oxides
NSPS	New Source Performance Standards
NSR	New Source Review
PLS	Pregnant Leach Solution
PM	Particulate Matter
PM ₁₀	Particulate Matter Nominally less than 10 Micrometers
PM _{2.5}	Particulate Matter Nominally less than 2.5 Micrometers
PSD	Prevention of Significant Deterioration
PTE	Potential-to-Emit

SO₂..... Sulfur Dioxide
SX/EW..... Solvent Extraction Electrowinning
TPY..... Tons per Year
VOC..... Volatile Organic Compound
yr..... Year

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