

BUREAU OF AIR POLLUTION CONTROL

901 South Stewart Street, Suite 4001 • Carson City, Nv 89701-5249
 phone: 775-687-9350 • www.ndep.nv.gov/baqp • fax: 775-687-6396

Facility ID No. A0005

Permit No. AP1041-2221

MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: BARRICK GOLDSTRIKE MINES INC. (HEREINAFTER REFERRED TO AS *THE PERMITTEE*)

Mailing Address: P.O. BOX 29, ELKO, NEVADA 89803

Physical Address: 27 MILES NORTH OF CARLIN, NEVADA

General Facility Location:

SECTIONS 1-4, T 35N, R 49E

SECTIONS 12-15, 21-28, AND 33-36, T 36N, R 49E

SECTIONS 7-9, 16-21, AND 28-32, T 36N, R 50E, MDB&M (HA 61: BOULDER FLAT) (EUREKA COUNTY)

NORTH 4,538.50 km, EAST 552.10 km; UTM ZONE 11 (NAD 83)

Thermal Unit List: (11 Thermal Units)

A. System 61 – Carbon Reactivation Kiln and Solutions

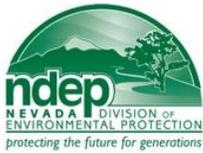
TU	4.008	Carbon Reactivation Kiln Drum
TU	4.009	Pregnant Tank A
TU	4.010	Pregnant Tank B
TU	4.011	Barren Tank A
TU	4.012	Barren Tank B

B. System 67 – Mercury Retort Circuit

TU	4.019	Mercury Retort #1
TU	2.020	Mercury Retort #2
TU	4.021	Mercury Retort #3

C. System 68 – Refinery

TU	4.022	East Furnace
TU	4.023	West Furnace
TU	4.024	Electrowinning Cells



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Section I. General Conditions

The Permittee must comply with, but is not limited to, all conditions of Nevada Administrative Code (NAC) 445B.3611-3689 “Nevada Mercury Air Emissions Control Program”, inclusive.

A. Records Retention. NAC 445B.3679.2(a)

The Permittee of a Mercury Operating Permit to Construct shall retain records of all required monitoring data and support information for (5) years after the date of the sample collection, measurement, report or analysis. Supporting information includes, without limitation, all records regarding calibration and maintenance of the monitoring equipment and all original strip-chart recordings for continuous monitoring instrumentation.

B. Severability. NAC 445B.3679.2(b)

Each of the conditions and requirements of the Mercury Operating Permit to Construct is severable and, if any are held invalid, the remaining conditions and requirements continue in effect.

C. Compliance/Noncompliance. NAC 445B.3679.2(c)

The Permittee must comply with all conditions of the Mercury Operating Permit to Construct. Any noncompliance constitutes a violation and is grounds for:

1. An action for noncompliance;
2. The revoking and reissuing, or the terminating of the Mercury Operating Permit to Construct by the Director; or
3. The reopening or revising of the Mercury Operating Permit to Construct by the holder of the Mercury Operating Permit to Construct as directed by the Director.

D. Defense to Noncompliance. NAC 445B.3679.2(d)

The need to halt or reduce activity to maintain compliance with the conditions of the Mercury Operating Permit to Construct is not a defense to noncompliance with any conditions of the Mercury Operating Permit to Construct.

E. Cause. NAC 445B.3679.2(e)

The Director may revise, revoke and reissue, reopen and revise, or terminate the Mercury Operating Permit to Construct for cause.

F. Property Rights/Exclusive Privilege. NAC 445B.3679.2(f)

The Mercury Operating Permit to Construct does not convey any property rights or any exclusive privilege.

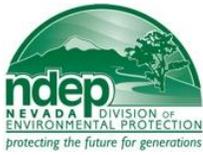
G. Information Request from Director. NAC 445B.3679.2(g)

The Permittee shall provide the Director, in writing and within a reasonable time, with any information that the Director requests to determine whether cause exists for revoking or terminating the Mercury Operating Permit to Construct or to determine compliance with the conditions of this Mercury Operating Permit to Construct.

H. Right to Entry. NAC 445B.3679.2(h)

The Permittee shall allow the Director or any authorized representative of the Director, upon the presentation of credentials, to:

1. Enter upon the premises of *the Permittee* where:
 - a. The thermal unit that emits mercury is located;
 - b. Activity related to mercury emissions is conducted; or
 - c. Records are kept pursuant to the conditions of the Mercury Operating Permit to Construct.
2. Have access to and copy, during normal business hours, any records that are kept pursuant to the conditions of the Mercury Operating Permit to Construct;
3. Inspect, at reasonable times, any facilities, practices, operations, or equipment, including any equipment for monitoring or controlling air pollution, that are regulated or required pursuant to the Mercury Operating Permit to Construct; and
4. Sample or monitor, at reasonable times, substances or parameters to determine compliance with the conditions of the Mercury Operating Permit to Construct or applicable requirements.



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Section I. General Conditions (continued)

I. Certify True and Accurate. NAC 445B.3679.2(i)

A responsible official of the stationary source shall certify that, based on information and belief formed after reasonable inquiry, the statements made in any document required to be submitted by any condition of the Mercury Operating Permit to Construct are true, accurate and complete.

J. Yearly Reporting. NAC 445B.3679.3(b)(c)(d)

The Permittee will submit yearly reports including, but not limited to, throughput, production, fuel consumption, hours of operation, emissions and mercury co-product. These reports will be submitted on the form provided by the Bureau of Air Pollution Control for all emission units/systems specified on the form. The completed form must be submitted to the Bureau of Air Pollution Control no later than March 1 annually for the preceding calendar year, unless otherwise approved by the Bureau of Air Pollution Control.

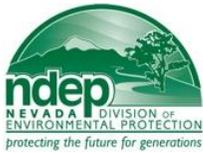
K. Facilities Operation. NAC 445B.227

The Permittee may not:

1. Operate a stationary source of air pollution unless the control equipment for air pollution that is required by applicable requirements or conditions of the Mercury Operating Permit to Construct is installed and operating.
2. Disconnect, alter, modify or remove any of the control equipment for air pollution or modify any procedure required by an applicable requirement or condition of the Mercury Operating Permit to Construct.

L. Excess Emissions. NAC 445B.232

1. Scheduled maintenance or testing or scheduled repairs which may result in excess emissions of regulated air pollutants prohibited by NAC 445B.001 to 445B.3689, inclusive, must be approved by the Director and performed during a time designated by the Director as being favorable for atmospheric ventilation.
2. The Director must be notified in writing of the time and expected duration at least 24 hours in advance of any scheduled maintenance which may result in excess emissions of regulated air pollutants prohibited by NAC 445B.001 to 445B.3689, inclusive.
3. The Director must be notified in writing or by telephone of the time and expected duration at least 24 hours in advance of any scheduled repairs which may result in excess emissions of regulated air pollutants prohibited by NAC 445B.001 to 445B.3689, inclusive.
4. The Director must be notified of any excess emissions within 24 hours after any malfunction or upset of the process equipment or equipment for controlling pollution or during startup or shutdown of such equipment. The telephone number for the notification is (775) 687-9350.
5. *The Permittee*, as the owner or operator of an affected facility, shall provide the Director, within 15 days after any malfunction, upset, startup, shutdown, or human error which results in excess emissions, sufficient information to enable the Director to determine the seriousness of the excess emissions. The information must include at least the following:
 - a. The identity of the stack or other point of emission, or both, where the excess emissions occurred.
 - b. The estimated magnitude of the excess emissions expressed in units of the applicable limitation on emission and the operating data and methods used in estimating the magnitude of the excess emissions.
 - c. The time and duration of the excess emissions.
 - d. The identity of the equipment causing the excess emissions.
 - e. If the excess emissions were the result of a malfunction, the steps taken to remedy the malfunction and the steps taken or planned to prevent the recurrence of the malfunction.
 - f. The steps taken to limit the excess emissions.
 - g. Documentation that the equipment for controlling air pollution, process equipment, or processes were at all times maintained and operated, to a maximum extent practicable, in a manner consistent with good practice for minimizing emissions.



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Section I. General Conditions (continued)

M. Construction Requirements. NAC 445B.250

1. Early Reduction Credit (ERC), New, or Modified Thermal Units

The *Permittee* shall provide the Director written notification of:

- a. The date that construction or reconstruction of an affected facility is commenced, postmarked no later than 30 days after such date. This requirement shall not apply to mass-produced facilities which are purchased in completed form.
- b. The anticipated date of initial startup of an affected facility, postmarked not more than 60 days and not less than 30 days prior to such date.
- c. The actual date of initial startup of an affected facility, postmarked within 15 days after such date.

N. Annual Testing. NAC 445B.3679.3

Before the conclusion of each calendar year, *the Permittee* shall:

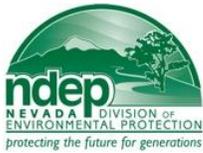
1. Conduct and record a Method 29 (or alternative test method approved by the Director) compliance test for mercury on the exhaust stacks of **Systems 61, 67, and 68** consisting of three valid runs. Each of the three test runs must collect a sample volume of 1.7 dry standard cubic meters (60 dscf) or be conducted for up to two hours in an effort to collect this sample volume (NAC 445B.3679.3).
2. Prior to, or during the Method 29 (or alternative test method approved by the Director) compliance tests, conduct and record a material assay from **Systems 61, 67, and 68**. One representative sample shall be taken for each test run. Total mercury content shall be determined using EPA Method 7471B (cold vapor atomic adsorption analysis) (or alternative test method approved by the Director) (NAC 445B.3679.3).
3. Conduct tests of performance under such conditions as the Director specifies to the operator of the plant based on representative performance of the affected facility. The owner or operator shall make available to the Director such records as may be necessary to determine the conditions of the test of performance. Operations during periods of startup, shutdown and malfunction must not constitute representative conditions of a test of performance unless otherwise specified in the applicable standard (NAC 445B.252.3).
4. Give notice to the Director 30 days before the test of performance to allow the Director to have an observer present. A written testing procedure for the test of performance must be submitted to the Director at least 30 days before the test of performance to allow the Director to review the proposed testing procedures (NAC 445B.252.4).
5. Furnish the Director within 60 days after completing the performance tests a written and electronic report of the results of the performance tests. All information and analytical results of testing and sampling must be certified as to the truth and accuracy and as to their compliance with NAC 445B.001 to 445B.3689 (NAC 445B.252.8).

O. SIP Article 2.5.4 Federally Enforceable SIP Requirement.

Breakdown or upset, determined by the Director to be unavoidable and not the result of careless or marginal operations, shall not be considered a violation of these regulations.

P. Expiration and Extension. NAC 445B.3687

1. If construction will occur in one phase, a mercury operating permit to construct for a new or modified thermal unit that emits mercury expires if construction is not commenced within 18 months after the date of issuance thereof or construction of the thermal unit that emits mercury is delayed for 18 months after initiated. The Director may extend the date on which the construction may be commenced upon a showing that the extension is justified.
2. If construction will occur in more than one phase, the projected date of the commencement of construction of each phase of construction must be approved by the Director. A mercury operating permit to construct expires if the initial phase of construction is not commenced within 18 months after the projected date of the commencement of construction approved by the Director. The Director may extend only the date on which the initial phase of construction may be commenced upon a showing that the extension is justified.



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Section I. General Conditions (continued)

Q. Nevada Mercury Control Program Implementation Requirements

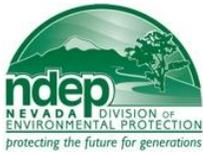
1. The NvMACT for **Systems 61, 67, and 68**, each must be implemented not later than 24 months after the issuance of this mercury operating permit to construct (NAC 445B.3679.3(a)(2)(I)).
 - a. The issuance date for **System 66C** is **September 29, 2010**.
 - b. The issuance date for **Systems 61, 67, and 68** is month date year.
2. The Permittee shall provide the Director written notification of:
 - a. The date of implementation of NvMACT for **Systems 61, 67, and 68** each pursuant to NAC 445B.3679.3(a)(2)(i) postmarked within 15 days after such date. (NAC 445B.3679.2(g))

R. Annual Reporting.

The Permittee shall:

1. Report mercury co-product on an annual basis (NAC 445B.3679(3)(d)).
2. Report the level of mercury emissions on an annual basis, which must be based on mercury emissions test data (NAC 445B.3679(3)(c)).

******* End of General Conditions *******



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Section II. Specific Operating Conditions

A. Thermal Unit #TU4.008 through TU4.012 location North 4,536.20 km, East 554.61 km, UTM (Zone 11)

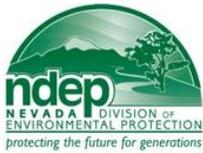
A. System 61 – Carbon Reactivation Kiln and Solutions		
TU	4.008	Carbon Reactivation Kiln Drum
TU	4.009	Pregnant Tank A-side
TU	4.010	Pregnant Tank B-side
TU	4.011	Barren Tank A-side
TU	4.012	Barren Tank B-side

1. Air Pollution Equipment

- a. Exhaust gases from **TU4.008 through TU4.012** shall be ducted to a control system with 100% capture consisting of:
 - i. **Venturi Wet Scrubber (WS-001)**
 - ii. **Condensation Tower (CT-001)**
 - iii. **6.0-ton Carbon Bed (CA-001)**
 - iv. **1.65-ton Carbon Bed (CA-002)**
- b. Stack parameters
 - i. Height: 100 feet
 - ii. Diameter: 0.958 feet
 - iii. Temperature: approximately 157.9°F
 - iv. Exhaust gases from **TU4.008 through TU4.012** shall have a maximum volume flow rate of 3,500 dry standard cubic feet per minute (DSCFM).
 - v. Exhaust gases from **TU4.008 through TU4.012** are ducted to 1 stack.

2. Operating Requirements

- a. Limitations of Operation (NAC 445B.3679(3))
 - i. The **A-side Pregnant and Barren Tanks (TU4.009 and TU4.011)** and the **B-side Pregnant and Barren Tanks (TU4.010 and TU4.012)** shall not operate simultaneously.
 - ii. The maximum allowable throughput rate of **stripped carbon** for **TU4.008** shall not exceed **3.0** tons per any one-hour period.
 - iii. The maximum allowable throughput rate to the **A-side Pregnant and Barren Tanks (TU4.009 and TU4.011)** shall not exceed **250** gallons per minute of solution.
 - iv. The maximum allowable throughput rate to the **B-side Pregnant and Barren Tanks (TU4.010 and TU4.012)** shall not exceed **250** gallons per minute of solution.
 - v. The Interim mercury emission limit for **System 61** during the demonstration period for establishment of the final mercury emission limit as established in Section II.A.3.e. is **5.0 x 10⁻³** grains per dry standard cubic foot (gr/dscf) for **System 61**.
 - vi. **TU4.008 through TU4.012** each may operate a total of **8,760** hours per calendar year.
- b. Work Practices Standards (NAC 445B.3679(3))
 - i. Inspect the drum lining of **TU4.008** for cracks twice per calendar year.
 - ii. **Venturi Wet Scrubber (WS-001):**
 - (a) The pressure drop across **WS-001** shall be maintained at or above **7.0** inches of water.
 - (b) The water flow rate of **WS-001** shall be maintained at or above **27.0** gallons per minute.
 - iii. **Condensation Tower (CT-001)**
 - (a) Water flow rate to **CT-001** shall be maintained at or above **50** gallons per minute (gpm).
 - (b) The exhaust gas temperature exiting **CT-001** shall be maintained at or below **100** °F.



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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU4.008 through TU4.012(continued)

2. Operating Requirements (continued)

b. Work Practices Standards (NAC 445B.3679(3)) (continued)

iv. **6-ton Carbon Bed (CA-001):**

- (a) **CA-001** shall contain at least **6.0** tons of sulfur impregnated carbon during all times of operation.
- (b) The pressure drop across **CA-001** shall be measured to determine the optimal operational value(s). Once the optimal operational values have been determined, the pressure drop across **CA-001** shall be maintained within these optimal values.
- (c) Replace the sulfur-impregnated carbon in **CA-001** according to the following schedule:
Representative carbon samples will be taken using a grain sampler to obtain a composite sample. The depth of the samples will be recorded. The percentage of mercury by weight will be calculated as the average loading from the samples. The loading capacity of the sulfur-impregnated carbon is 20% by weight. Sampling will be conducted quarterly, at the same sample depths, until 50% of the loading capacity is reached. Upon reaching 50% of the loading capacity, sampling of the carbon will occur monthly until 90% of the loading capacity is reached. The carbon will be replaced with an equivalent or better performing carbon no later than 30 days after reaching 90% of the loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 2. EPA method 7471B-Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 3. An alternative test method as approved by the Director.

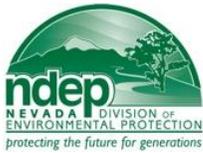
v. **1.65-ton Carbon Bed (CA-002):**

- (a) **CA-002** shall contain at least **1.65** tons of sulfur impregnated carbon during all times of operation.
- (b) The pressure drop across **CA-002** shall be measured to determine the optimal operational value(s). Once the optimal operational values have been determined, the pressure drop across **CA-002** shall be maintained within these optimal values.
- (c) Replace the sulfur-impregnated carbon in **CA-002** according to the following schedule:
Representative carbon samples will be taken from near the inlet and exit of **CA-002**. The depth of the samples will be recorded. The percentage of mercury by weight will be calculated as the average loading from the samples. The loading capacity of the sulfur-impregnated carbon is 20% by weight. Sampling will be conducted quarterly, at the same sample depths, until 50% of the loading capacity is reached. Upon reaching 50% of the loading capacity, sampling of the carbon will occur monthly until 90% of the loading capacity is reached. The carbon will be replaced with an equivalent or better performing carbon no later than 30 days after reaching 90% of the loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 2. EPA method 7471B-Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 3. An alternative test method as approved by the Director.

3. **Monitoring, Recordkeeping, Reporting, and Testing** (NAC 445B.3379.3)

a. Compliance Testing

Within 180 days of the implementation of NvMACT for **System 61** as required in Section I.Q, the *Permittee* shall conduct and record a performance test for mercury on the exhaust stack of **System 61** consisting of three valid runs utilizing US EPA Method 29 of 40 CFR part 60 Appendix A.



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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU4.008 through TU4.012 (continued)

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3) (continued)

b. Monitoring

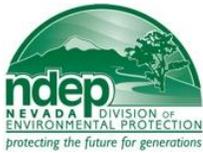
The *Permittee* shall:

- i. Prior to implementation of NvMACT for **System 61**, install, operate, calibrate, and maintain instrumentation to measure and record the following:
 - (a) The flow rate of solution to **TU4.009 through TU4.012** each, in gallons per minute.
 - (b) The pressure drop across **WS-001**, in inches of water.
 - (c) The water flow rate to **WS-001**, in gallons per minute.
 - (d) The water flow rate to **CT-001**, in gallons per minute.
 - (e) The exhaust gas temperature exiting the **CT-001**, in degrees Fahrenheit.
 - (f) The differential pressure across **CA-001** and **CA-002** each, in inches water column.
- ii. Monitor the daily throughput rate of **stripped carbon** for **TU4.008** in tons.
- iii. Monitor the throughput rate of **solution** to the **A-side Pregnant and Barren Tanks (TU4.009 and TU4.011)**, once during each day of operation.
- iv. Monitor the throughput rate of **solution** to the **B-side Pregnant and Barren Tanks (TU4.010 and TU4.012)**, once during each day of operation.
- v. Monitor the daily hours of operation for **TU4.008 through TU4.012** each.
- vi. Monitor the pressure drop across **WS-001** once, during each day of operation.
- vii. Monitor the water flow rate to **WS-001** once, during each day of operation.
- viii. Monitor the water flow rate to **CT-001** once, during each day of operation.
- ix. Monitor the exhaust gas temperature exiting **CT-001** once, during each day of operation.
- x. Monitor the differential pressure across **CA-001** and **CA-002**, each, once during each day of operation.
- xi. Monitor the sulfur-impregnated carbon in **CA-001** for percentage of mercury by weight, quarterly until reaching 50 percent capacity then monthly until reaching 90 percent.
- xii. Monitor the sulfur-impregnated carbon in **CA-002** for percentage of mercury by weight, quarterly until reaching 50 percent capacity then monthly until reaching 90 percent.

c. Recordkeeping

The required monitoring established in Section A.3.b.i through Section A.3.b.xii above shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping.

- i. The calendar date of any required monitoring.
- ii. The total daily throughput rate of **stripped carbon** in tons for **TU4.008**, for the corresponding date.
- iii. The total daily hours of operation for **TU4.008 through TU4.012** each for the corresponding date.
- iv. The corresponding average hourly throughput rate in tons per hour for **TU4.008**. The average hourly throughput rate will be determined from the total daily throughput rate (ii) and the total daily hours of operation (iii) above.
- v. The throughput rate in gallons per minute of **solution** to the **A-side Pregnant and Barren Tanks (TU4.009 and TU4.011)**, once during each day of operation, for the corresponding date.
- vi. The throughput rate in gallons per minute of **solution** to the **B-side Pregnant and Barren Tanks (TU4.010 and TU4.012)**, once during each day of operation, for the corresponding date.
- vii. The findings and dates of the twice per calendar year inspections of the drum on **TU4.008**.
- viii. The pressure drop in inches of water across **WS-001** once, during each day of operation, for the corresponding date.
- ix. The water flow rate in gallons per minute to **WS-001** once, during each day of operation, for the corresponding date.
- x. The water flow rate in gallons per minute to **CT-001** once, during each day of operation, for the corresponding date.
- xi. The exhaust gas temperature in degrees Fahrenheit exiting **CT-001** once, during each day of operation, for the corresponding date.
- xii. The differential pressure across **CA-001** and **CA-002**, each, in inches water column once during each day of operation, for the corresponding date.
- xiii. The percentage of mercury by weight in **CA-001**, for the corresponding date.



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Section II. Specific Operating Conditions (continued)

A. Thermal Unit #TU4.008 through TU4.012 (continued)

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3) (continued)

c. Recordkeeping (continued)

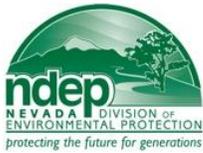
- xiv. The depth of the carbon sample location, in **CA-001** for the corresponding date.
- xv. The date, time, and weight of each carbon replacement in **CA-001**.
- xvi. The percentage of mercury by weight in **CA-002** for the corresponding date.
- xvii. The depth of the carbon sample location, in **CA-002** for the corresponding date.
- xviii. The date, time, and weight of each carbon replacement in **CA-002**.

d. Reporting

- i. The *Permittee* will promptly report to the Director any deviations from the requirements of the Operating Permit to Construct. The report to the Director will include probable cause of all deviations and any action taken to correct the deviations. For this Operating Permit to Construct, prompt is defined as submittal of a report within 15 days of said deviation. This definition does not alter any reporting requirements as established for reporting of excess emissions as required under NAC 445B.232 and under condition I.L. of this permit.
- ii. The *Permittee* shall establish differential pressure operational range values for **CA-001** and **CA-002**, each within 6-months of the notification of implementation of NvMACT for **System 61**. The operational range values shall be reported to the Director and maintained on site for inspection.

e. Performance Testing

- i. Upon the date of implementation of NvMACT, *the Permittee*, shall begin a performance demonstration period for the establishment of a mercury emissions limit for **System 61**, which shall consist of (6) consecutive Method 29 source tests at approximate 6-month intervals. The performance demonstration period shall provide emissions data for the establishment of a final NvMACT mercury emission limit for **System 61**.
- ii. *The Permittee* shall submit a test protocol and receive NDEP protocol approval for each performance demonstration test. Performance tests must be performed at conditions that the Director deems representative of normal operations. Only NDEP-validated tests may be used for the establishment of a final NvMACT mercury emission limit for **System 61**.
- iii. *The Permittee* shall provide in each validated performance test report the records of all operating parameters and work practice standards required in the Phase-2 Mercury Operating Permit to Construct as monitored and recorded during each corresponding test of performance. Material sampling must be performed pursuant to the NDEP approved protocol.
- iv. Within 30-days of receiving a complete stack test report, the Director shall complete a review of the stack test report and provide written notification to *the Permittee* with determination of applicability for the performance demonstration, pursuant to the NDEP approved test protocol.
- v. The final NvMACT mercury emission limit shall be calculated as the maximum test value from the (6) corresponding NDEP-validated performance demonstration tests plus one standard deviation in gr/dscf mercury. The standard deviation value shall be calculated from the (6) corresponding NDEP-validated performance demonstration test values.
- vi. The final NvMACT mercury emission limit shall be the applicable mercury emission limit permit requirement for the Phase-2 Mercury Operating Permit to Construct expressed as gr/dscf mercury.
- vii. A validated performance demonstration test may be used for the purpose of annual mercury emissions testing.



BUREAU OF AIR POLLUTION CONTROL

Facility ID No. A0005

Permit No. AP1041-2221

MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions (continued)

B. Thermal Units TU4.019 through TU4.021 location North 4,536.18km, East 554.53 km, UTM (Zone 11)

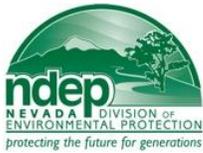
B. System 67 – Mercury Retort Circuit		
TU	4.019	Mercury Retort #1
TU	4.020	Mercury Retort #2
TU	4.021	Mercury Retort #3

1. Air Pollution Equipment

- a. Exhaust gases from **TU4.019 through 4.021** shall be ducted to a control system with 100% capture consisting of:
 - i. **Retort Separator.** Each retort has its own retort separator.
 - ii. **Chilled Contact Condenser System** (Each retort has its own contact condenser.)
 - iii. **Chilled Secondary Condenser** (CC-001)
 - iv. **Wet Gas Coalescer**
 - v. **Heater**
 - vi. **Carbon Filter** (CA-003)
- b. Stack parameters
 - i. Height: 68 feet
 - ii. Diameter: 1 foot
 - iii. Temperature: approximately 85°F
 - iv. Exhaust gases from **System 67** shall have a maximum volume flow rate of 329 dry standard cubic feet per minute (DSCFM).
 - v. Exhaust gases from **System 67** are ducted to 1 stack.

2. Operating Requirements

- a. Limitations of Operation (NAC 445B.3679(3))
 - i. The maximum batch weight for **TU4.019 through TU4.021**, each, shall not exceed **0.6** ton of **precious metal bearing material**. Precious metal bearing material shall consist only of the following:
 - (a) Material that is loaded with gold along with various other metals (such as silver, copper, and mercury) and substances that is produced by electrowinning, the Merrill-Crowe process, flotation and gravity separation processes, and other gold concentration and precipitation processes;
 - (b) Material collected from the wash down of any equipment or surfaces contacted with precious metals that have accumulated through the concentration methods employed by the Permittee;
 - (c) Baghouse bags and filter press bags containing precious metal from the refinery process/building.
 - ii. Mercury emissions from **TU4.019 through TU4.021**, each, shall not exceed **1.0x10⁻⁴** grains per dry standard cubic foot (gr/dscf).
 - iii. **TU4.019 through TU4.021** each may operate a total of 8,760 hours per calendar year.



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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions (continued)

B. Thermal Unit #TU4.019 through TU4.021 (continued)

2. Operating Requirements (continued)

b. Work Practice Standards (NAC 445B.3679(3))

i. **Mercury Retort**

- (a) During heating **TU4.019 through TU4.021**, each, shall be placed under negative gauge pressure at or above **5.0** inches of water.
- (b) During operation of **TU4.019 through TU4.021**, each, precious metal bearing material shall not exceed the retort pan volume utilized for the design of the NvMACT emissions controls. The NvMACT volume of each retorting pan shall be maintained on site.
- (c) **TU4.019 through TU4.021** each shall automatically shut off if the corresponding gauge pressure for a single retort falls below **5** inches of water.
- (d) Baghouse bags and filter press bags will be retorted in ash collecting canisters.

ii. **Contact Condensers**

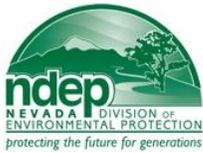
- (a) The water temperature at the outlet of each **Contact Condenser** shall be maintained at or below **100 °F**.
- (b) Condensed mercury from each **Contact Condenser** shall be collected at least monthly.
- (c) **TU4.019 through TU4.021** each shall automatically shut off by interlock if the water temperature at the outlet of a retort's corresponding **Contact Condenser** is above **100 °F**.

iii. **Secondary Condenser (CC-001)**

- (a) The maximum exhaust gas temperature at the outlet of **CC-001** shall be maintained at or below **50 °F**.
- (b) Condensed mercury from **CC-001** shall be collected at least monthly.
- (c) **TU4.019 through TU4.021** each shall automatically shut off if the exhaust gas temperature at the outlet of **CC-001** is above **50 °F**.

iv. **Carbon Filter (CA-003)**

- (a) The **CA-003** shall contain no less than **2,400** pounds of sulfur impregnated carbon.
- (b) The pressure differential across the **CA-003** shall not exceed **3.0** inches of water.
- (c) Sample the sulfur-impregnated carbon in **CA-003** as follows:
 1. The carbon in **CA-003** may be sampled from a sampling canister or by grab-sample. The carbon filter will include sampling canisters that will contain the equivalent carbon depth as the carbon filter. These canisters will receive a slip stream of the process gas during operation of **System 67**. The Permittee also has the option to directly collect representative composite carbon samples (grab-samples) from **CA-003**.
 2. The canister and grab-sample carbon sampling methods specified above may only be alternated at the point of complete carbon replacement in **CA-003**.
- (d) The percentage of mercury by weight from the carbon sample shall be calculated. The loading capacity of the sulfur-impregnated carbon is 20% by weight. A sample of carbon will be analyzed quarterly until 50% of the carbon loading capacity is reached. Upon reaching 50% of the carbon loading capacity, the sampling of carbon will occur monthly until 90% of the carbon loading capacity is reached. The carbon in the carbon filter will be replaced with an equivalent or better performing carbon no later than 30 days after reaching 90% of the carbon loading capacity.
- (e) Analyze the collected carbon samples for mercury utilizing one of the following methods:
 1. EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 2. EPA method 7471B- Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 3. An alternative test method as approved by the Director.
- (f) Any sulfur impregnated carbon replaced in **CA-003** shall be replaced with only the original manufacturer's design specification carbon or equivalent performing carbon, or better.



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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions (continued)

B. Thermal Unit #TU4.019 through TU4.021 (continued)

3. Compliance, Monitoring, Recordkeeping, and Reporting (NAC 445B.3379.3) (continued)

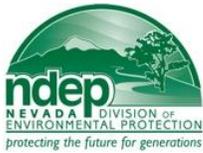
a. Compliance/Performance Testing

Within 180 days of the implementation of NvMACT for **System 67** as required in I.Q. of this section, **the Permittee** shall conduct and record a performance test for mercury on the exhaust stack of **System 67** consisting of three valid runs utilizing US EPA Method 29 of 40 CFR part 60 Appendix A.

b. Monitoring

The *Permittee* shall:

- i. Prior to implementation of NvMACT for **System 67**, install, operate, calibrate, and maintain instrumentation to measure and record the following:
 - (a) The negative gauge pressure of **TU4.019 through TU4.021**, each, in inches of water.
 - (b) The water temperature at the outlet of each **Contact Condenser**, in degrees Fahrenheit.
 - (c) The exhaust gas temperature at the outlet of **CC-001**, in degrees Fahrenheit.
 - (d) The pressure differential across the **CA-003**, in inches of water.
- ii. Prior to implementation of NvMACT for **System 67** install, operate, calibrate, and maintain a vacuum interlock on each retort in **System 67** that will shut off a retort's heating element if a retort's corresponding gauge pressure falls below **5.0** inches of water.
- iii. Prior to implementation of NvMACT for **System 67** install, operate, calibrate, and maintain a water temperature interlock at the outlet of each **Contact Condenser** that will shut off the retort heating element if the water temperature at the outlet of the **Contact Condenser** is above **100 °F**.
- iv. Prior to implementation of NvMACT for **System 67** install, operate, calibrate, and maintain an exhaust temperature interlock at the outlet of the **CC-001** that will shut off the retort heating elements if the exhaust temperature at the outlet of the **CC-001** is above **50 °F**.
- v. Monitor the batch weight of **precious metal bearing material** for each retort in **System 67**, in tons, for each batch.
- vi. Monitor the hours of operation for **TU4.019 through TU4.021** each, for each batch.
- vii. Monitor the gauge pressure on **TU4.019 through TU4.021** each, once per batch, during operation at top temperature stage.
- viii. Monitor the water temperature at the outlet of each **Contact Condenser**, once per batch, during operation at top temperature stage.
- ix. Monitor the exhaust gas temperature at the outlet of the **CC-001**, once per batch, during operation at top temperature stage.
- x. Monitor the mercury drained from the condensers in **System 67**, monthly.
- xi. Monitor the pressure drop across the **Carbon Filter (CA-003)** once per batch, during operation at top temperature stage.
- xii. Monitor the **Carbon Filter (CA-003)** for percentage of mercury by weight, quarterly until reaching 50 percent capacity and then monthly until reaching 90 percent capacity.



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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions (continued)

B. Thermal Unit #TU4.019 through TU4.021 (continued)

3. Compliance, Monitoring, Recordkeeping, and Reporting (NAC 445B.3379.3) (continued)

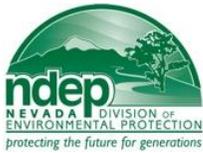
c. Recordkeeping

The required monitoring, established in Section B.3.b.i through xii, shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping:

- i. The calendar date of any required monitoring.
- ii. The total batch weight of **precious metal bearing material**, for **TU4.019 through TU4.021** each, per batch, in tons, for the corresponding date.
- iii. The total hours of operation, for **TU4.019 through TU4.021** each, per batch, for the corresponding date.
- iv. The gauge pressure in inches of water for **TU4.019 through TU4.021** each once per batch, for the corresponding date.
- v. The water temperature in degrees Fahrenheit at the outlet of each **Contact Condenser**, once per batch, for the corresponding date.
- vi. The exhaust gas temperature in degrees Fahrenheit at the outlet of **CC-001**, once per batch, for the corresponding date.
- vii. The total amount of mercury collected from the condensers for **TU4.019 through TU4.021**, in pounds, monthly, for the corresponding date.
- viii. The pressure drop in inches of water across **CA-003**, once per batch, for the corresponding date.
- ix. The percentage of mercury by weight in the sulfur-impregnated carbon, for the corresponding date.
- x. The date and weight of each replacement of the sulfur-impregnated carbon bed.
- xi. The original manufacturer's design specifications for the sulfur impregnated carbon used in **CA-003** shall be kept on site.
- xii. The date, time, and corrective action taken for an interlock shut-down, for the corresponding date.

d. Reporting

Permittee will promptly report to the Director any deviations from the requirements of the Operating Permit to Construct. The report to the Director will include probable cause of all deviations and any action taken to correct the deviations. For this Operating Permit to Construct, prompt is defined as submittal of a report within 15 days of said deviation. This definition does not alter any reporting requirements as established for reporting of excess emissions as required under NAC 445B.232 and under condition I.L. of this permit.



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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions (continued)

C. Thermal Unit # 4.022 through 4.024 location North 4,536.19 km, East 554.55 km, UTM (Zone 11)

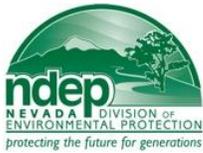
C. System 68 – Refinery		
TU	4.022	East Furnace
TU	4.023	West Furnace
TU	4.024	Electrowinning Cells

1. Air Pollution Equipment

- a. Exhaust gases from **TU4.022 through TU4.024** shall be ducted to a control system with 100% capture consisting of:
 - i. **Baghouse (BH-001)** - on the exhaust stream of **TU4.022 and TU4.023**.
 - ii. **Carbon Bed (CA-004)** - on the exhaust stream of **TU4.022 through TU4.024**.
- b. Stack parameters
 - i. Height: 88 feet
 - ii. Diameter: 1.667 feet
 - iii. Temperature: Approximately 117.5°F
 - iv. Exhaust gases from **TU4.022 through TU4.024** shall have a maximum volume flow rate of 9,100 dry standard cubic feet per minute (DSCFM).
 - v. Exhaust gases from **TU4.022 through TU4.024** are ducted to 1 stack.

2. Operating Requirements

- a. Limitations of Operation (NAC 445B.3679(3))
 - i. The maximum allowable batch weight for **TU4.022 and TU4.023** each shall not exceed **1,200** pounds of **retorted precious metal bearing material**.
 - ii. The maximum allowable throughput rate for **TU4.024** shall not exceed **35** gallons per minute of **solution**.
 - iii. The Interim mercury emission limit during the demonstration period for establishment of the final mercury emission limit as established in Section II.C.3.e. for **System 68** is **5.0 x 10⁻³** grains per dry standard cubic foot (gr/dscf).
 - iv. **TU4.022 through TU4.024** each may operate a total of **8,760** hours per calendar year.
- b. Work Practice Standards (NAC 445B.3679(3))
 - i. All **precious metal bearing material** shall be retorted prior to furnace smelting.
 - ii. The pressure differential across **BH-001** shall be maintained between **3 and 8** inches of water.
 - iii. The pressure drop across **CA-004** shall be measured to determine the optimal operational value(s). Once the optimal operational values have been determined, the pressure drop across **CA-004** shall be maintained within these optimal values.
 - iv. **CA-004** shall contain no less than **6,600** pounds of sulfur-impregnated carbon.



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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section II. Specific Operating Conditions (continued)

C. Thermal Unit # 4.022 through 4.024 (continued)

2. Operating Requirements (continued)

b. Work Practice Standards (NAC 445B.3679(3)) (continued)

- v. Replace the sulfur-impregnated carbon in **CA-004** according to the following schedule:
Representative carbon samples will be taken from near the inlet and exit of **CA-004**. The depth of the samples will be recorded. The percentage of mercury by weight will be calculated as the average loading from the samples. The loading capacity of the sulfur-impregnated carbon is 20% by weight. Sampling will be conducted quarterly, at the same sample depths, until 50% of the loading capacity is reached. Upon reaching 50% of the loading capacity, sampling of the carbon will occur monthly until 90% of the loading capacity is reached. The carbon will be replaced with an equivalent or better performing carbon no later than 30 days after reaching 90% of the loading capacity. The required mercury analysis shall be performed utilizing one of the following methods:
 - (a) EPA method 6020-Inductively Coupled Plasma-Mass Spectrometry;
 - (b) EPA method 7471B- Mercury in Solid or Semisolid Waste (Manual Cold-Vapor Technique); or
 - (c) An alternative test method as approved by the Director.

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3)

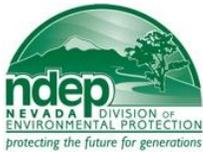
a. Compliance/Performance Testing

Within 180 days of the implementation of NvMACT for **System 68** as required in I.Q. of this section, **the Permittee** shall conduct and record a performance test for mercury on the exhaust stack of **System 68** consisting of three valid runs utilizing US EPA Method 29 of 40 CFR part 60 Appendix A.

b. Monitoring

The Permittee shall:

- i. Prior to implementation of NvMACT for **System 68**, install, operate, calibrate, and maintain instrumentation to measure and record the following:
 - (a) The throughput of **solution** to **TU4.024**, in gallons per minute.
 - (b) The pressure drop across **BH-001**, in inches of water.
 - (c) The pressure drop across **CA-004**, in inches of water.
- ii. Monitor the batch weight of **retorted precious metal bearing material** for **TU4.022** and **TU4.023** each, in pounds, for each batch.
- iii. Monitor the throughput of **solution** in gallons per minute for **TU4.024**, once per day during operation.
- iv. Monitor the hours of operation of **TU4.022 through TU4.024** each, during each day of operation.
- v. Monitor the pressure drop across **BH-001**, once per day during operation.
- vi. Monitor the pressure differential across **CA-004**, once per day during operation.
- vii. Monitor the sulfur-impregnated carbon in **CA-004** for percentage of mercury by weight, quarterly until reaching 50 percent capacity then monthly until reaching 90 percent.



BUREAU OF AIR POLLUTION CONTROL

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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

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Section II. Specific Operating Conditions (continued)

C. Thermal Unit #TU 4.022 through TU 4.024 (continued)

3. Monitoring, Recordkeeping, Reporting, and Testing (NAC 445B.3379.3)

c. Recordkeeping

The required monitoring, established in Section C.3.b.i through vii, shall be maintained in a contemporaneous log containing, at a minimum, the following recordkeeping:

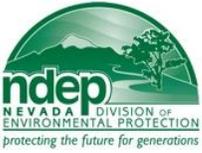
- i. The calendar date of any required monitoring.
- ii. The total batch weight of **retorted precious metal bearing material** for **TU4.022** and **TU4.023** each per batch, in pounds, for the corresponding date.
- iii. The throughput of **solution** for **TU4.024** in gallons per minute, once per day, during operation for the corresponding date.
- iv. The total daily operating hours for **TU4.022 through TU4.024** each, for the corresponding date.
- v. The pressure drop in inches of water across **BH-001**, once per day, during operation, for the corresponding date.
- vi. The pressure drop in inches of water across **CA-004**, once per day, during operation, for the corresponding date.
- vii. The percentage of mercury by weight in the sulfur-impregnated carbon in **CA-004**, for the corresponding date.
- viii. The depth of the sample location, for the corresponding date.
- ix. The date, time, and weight of each replacement of the sulfur-impregnated carbon.

d. Reporting

- i. **Permittee** will promptly report to the Director any deviations from the requirements of the Operating Permit to Construct. The report to the Director will include probable cause of all deviations and any action taken to correct the deviations. For this Operating Permit to Construct, prompt is defined as submittal of a report within 15 days of said deviation. This definition does not alter any reporting requirements as established for reporting of excess emissions as required under NAC 445B.232 and under condition I.L. of this permit.
- ii. The **Permittee** shall establish differential pressure operational range values for **CA-004** within 6-months of the notification of implementation of NvMACT for **System 68**. The operational range values shall be reported to the Director and maintained on site for inspection.

e. Performance Testing

- i. Upon the date of implementation of NvMACT, **the Permittee**, shall begin a performance demonstration period for the establishment of a mercury emissions limit for **System 68**, which shall consist of (6) consecutive Method 29 source tests at approximate 6-month intervals. The performance demonstration period shall provide emissions data for the establishment of a final NvMACT mercury emission limit for **System 68**.
- ii. **The Permittee** shall submit a test protocol and receive NDEP protocol approval for each performance demonstration test. Performance tests must be performed at conditions that the Director deems representative of normal operations. Only NDEP-validated tests may be used for the establishment of a final NvMACT mercury emission limit for **System 68**.
- iii. **The Permittee** shall provide in each validated performance test report the records of all operating parameters and work practice standards required in the Phase-2 Mercury Operating Permit to Construct as monitored and recorded during each corresponding test of performance. Material sampling must be performed pursuant to the NDEP approved protocol.
- iv. Within 30-days of receiving a complete stack test report, the Director shall complete a review of the stack test report and provide written notification to **the Permittee** with determination of applicability for the performance demonstration, pursuant to the NDEP approved test protocol.
- v. The final NvMACT mercury emission limit shall be calculated as the maximum test value from the (6) corresponding NDEP-validated performance demonstration tests plus one standard deviation in gr/dscf mercury. The standard deviation value shall be calculated from the (6) corresponding NDEP-validated performance demonstration test values.
- vi. The final NvMACT mercury emission limit shall be the applicable mercury emission limit permit requirement for the Phase-2 Mercury Operating Permit to Construct expressed as gr/dscf mercury.
- vii. A validated performance demonstration test may be used for the purpose of annual mercury emissions testing.



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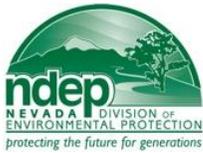
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MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

******* End of Specific Operating Conditions *******

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BUREAU OF AIR POLLUTION CONTROL

Facility ID No. A0005

Permit No. AP1041-2221

MERCURY OPERATING PERMIT TO CONSTRUCT: PHASE II

Issued to: Barrick Goldstrike Mines Inc.

Section III. Amendments

DRAFT

This permit:

1. Is non-transferable. (NAC 445B.287.3)
2. Will be posted conspicuously at or near the stationary source. (NAC 445B.318.5)
3. Any party aggrieved by the Department's decision to issue this permit may appeal to the State Environmental Commission (SEC) within ten days after the date of notice of the Department's action. (NRS 445B.340)

Signature _____

Issued by: Rob Bamford
Supervisor, Permitting Branch
Bureau of Air Pollution Control

Phone: (775) 687-9330 **Date:** _____