



State of Utah

GARY R. HERBERT
Governor

GREG BELL
Lieutenant Governor

Department of
Environmental Quality

Amanda Smith
Executive Director

DIVISION OF AIR QUALITY
Cheryl Heying
Director

DAQE-IN0105710028-11

February 2, 2011

Chris Kaiser
Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, UT 84095

Dear Mr. Kaiser:

Re: Intent to Approve: Modify Approval Order DAQE-AN0105710023-08 to Allow for Material Movement Increase and Add a Crusher
Project Number: N010571-0028

The attached document is the Intent to Approve for the above-referenced project. The Intent to Approve is subject to public review. Any comments received shall be considered before an Approval Order is issued. The Division of Air Quality is authorized to charge a fee for reimbursement of the actual costs incurred in the issuance of an Approval Order. An invoice will follow upon issuance of the final Approval Order.

Future correspondence on this Intent to Approve should include the engineer's name as well as the DAQE number as shown on the upper right-hand corner of this letter. The project engineer for this action is Nando Meli Jr., who may be reached at (801) 536-4052.

Sincerely,

Martin D. Gray, Manager
New Source Review Section

MDG:NM:kw

cc: Mike Owens
Salt Lake Valley Health Department

STATE OF UTAH

Department of Environmental Quality

Division of Air Quality

**INTENT TO APPROVE: Modify Approval Order DAQE-
AN0105710023-08 to Allow for Material Movement Increase and
Add a Crusher**

**Prepared by: Nando Meli Jr., Engineer
Phone: (801) 536-4052
Email: nmeli@utah.gov**

INTENT TO APPROVE NUMBER

DAQE-IN0105710028-11

Date: February 2, 2011

**Kennecott Utah Copper LLC
Mine & Copperton Concentrator**

**Source Contact:
Mr. Zeb Kenyon, Engineer
Phone: (801) 569-6035**

**Martin D. Gray, Manager
New Source Review Section
Utah Division of Air Quality**

ABSTRACT

Kennecott Utah Copper LLC (KUC) has requested some modifications to the language in their AO for the Bingham Canyon Mine (BCM) to allow for an increase in the material movement limit from 197,000,000 to 260,000,000 tons of ore and waste rock combined per 12-month period. Currently, the AO contains the three PM₁₀ State Implementation Plan limits. They are the 197,000,000 ton material movement limit and two related limits for mobile source sulfur emissions. (One limit restricts SO₂ emissions to 97 TPY and the other limit restricts the sulfur content in the fuel to 0.03 lbs per million BTU heat input.). The sulfur emission limits will not be modified.

NSR does not regulate fugitive and tail pipe emissions by establishing limits on those emissions. KUC has voluntarily requested an emissions cap on the PM₁₀, SO₂, and NO_x that will include facility wide emissions. KUC has also voluntarily requested the implementation of a new PM₁₀ ambient monitor.

KUC is proposing to upgrade two existing baghouses at the C6/C7 and C7/C8 transfer points. The upgrade will result in a decrease in particulate matter from point sources. The point source emission increases and decreases associated with this modification are estimated as follows: PM₁₀ = -8.04 TPY, PM_{2.5} = -3.13 TPY, NO_x = 0.05 TPY, SO₂ = 0.0001 TPY, CO = 0.21 TPY, and VOC = 0.01 TPY. The potential to emit emissions from KUC BCM accounts for those emissions escaping the pit influence boundary. For emission sources located within the pit influence boundary, a pit escape factor of 20% was included in the calculation of PM₁₀ emissions. An escape factor of 21% was included in the calculation of PM_{2.5} emissions. The PTE for point sources in TPY at the BCM are estimated as follows: PM₁₀ = 6.28, PM_{2.5} = 2.60, NO_x = 1.17, SO₂ = 0.0002, CO = 10.6, and VOC = 0.20.

The NOI for the above-referenced project has been evaluated and has been found to be consistent with the requirements of UAC R307. Air pollution producing sources and/or their air control facilities may not be constructed, installed, established, or modified prior to the issuance of an AO by the Executive Secretary of the Utah Air Quality Board.

A 30-day public comment period will be held in accordance with UAC R307-401-7. A notification of the intent to approve will be published in the Salt Lake Tribune and Deseret News on February 6, 2011. During the public comment period the proposal and the evaluation of its impact on air quality will be available for the public to review and provide comment. A hearing will be held on Tuesday, February 22, 2011 at 6:00 pm. It will be held at the Utah Air Quality Board room #1015, located at 195 North 1950 West Salt Lake City, Utah. The hearing will be held in accordance with R307-401-7, UAC. The proposed conditions of the AO may be changed as result of the comments received. Any comments received during the public comment period and the hearing will be evaluated. The proposed conditions of the AO may be changed as a result of the comments received.

Name of Permittee:

Kennecott Utah Copper LLC
4700 Daybreak Parkway
South Jordan, UT 84095

Permitted Location:

Mine & Copperton Concentrator
8362 W 10200 S
Bingham Canyon, UT 84006

UTM coordinates: 407,000 m Easting, 4,493,000 m Northing, UTM Zone 12
SIC code: 1021 (Copper Ores)

Section I: GENERAL PROVISIONS

- I.1 All definitions, terms, abbreviations, and references used in this AO conform to those used in the UAC R307 and 40 CFR. Unless noted otherwise, references cited in these AO conditions refer to those rules. [R307-101]
- I.2 The limits set forth in this AO shall not be exceeded without prior approval. [R307-401]
- I.3 Modifications to the equipment or processes approved by this AO that could affect the emissions covered by this AO must be reviewed and approved. [R307-401-1]
- I.4 All records referenced in this AO or in other applicable rules, which are required to be kept by the owner/operator, shall be made available to the Executive Secretary or Executive Secretary's representative upon request, and the records shall include the two-year period prior to the date of the request. Unless otherwise specified in this AO or in other applicable state and federal rules, records shall be kept for a minimum of two (2) years. [R307-401-8]
- I.5 At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any equipment approved under this AO, including associated air pollution control equipment, in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Executive Secretary which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source. All maintenance performed on equipment authorized by this AO shall be recorded. [R307-401-4]
- I.6 The owner/operator shall comply with R307-150 Series. Inventories, Testing and Monitoring. [R307-150]
- I.7 The owner/operator shall comply with UAC R307-107. General Requirements: Unavoidable Breakdowns. [R307-107]

Section II: SPECIAL PROVISIONS

II.A The approved installations shall consist of the following equipment:

II.A.1 KUC Bingham Mine

KUC operates the BCM. KUC removes ore from the BCM by drilling, blasting, crushing and hauling.

II.A.2 Main In-pit Crusher

Main in-pit crusher
Main in-pit crusher baghouse

II.A.3 **Second In-pit Crusher**

Second in-pit crusher
Second in-pit crusher baghouse

II.A.4 **Portable Crusher**

One portable crushing and screening unit used to crush material for road base
Maximum crusher capacity 700 tons per hour

II.A.5 **Conveyors**

Conveyors and two transfer points with baghouses

II.A.6 **Lime Silos**

Lime silos with fabric type bin vent control units

II.A.7 **Sample Preparation Equipment**

Sample preparation equipment with baghouse

II.A.8 **SX/EW plant**

SX/EW plant with electrowinning acid mist eliminator

II.A.9 **Degreasers**

Various degreasing parts washers

II.A.10 **Gasoline Fueling Stations**

II.A.11 **Emergency Generators**

Five Liquefied Petroleum gas-fired emergency generators

1) Lark Gate

 Maximum rating 160 Brake Horsepower (BHP)

2) Truck dispatch office

 Maximum rating 105 BHP

3) Mine office

 Maximum rating 75 BHP

- 4) Galena Gulch
 - Maximum rating 72 BHP
- 5) Dinkeyville Hill
 - Maximum rating 71 BHP

II.B Requirements and Limitations

II.B.1 Limitations and Test Procedures

II.B.1.a Emissions at all times from the indicated emission points after primary control shall not exceed the following rates and concentrations:

A. Main In pit Crusher Baghouse Vent

Pollutant	lb/hr	grains per dry standard cubic foot (dscf) (68°F, 29.92 in Hg)
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PM ₁₀	1.77	0.016
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B. Second In pit Crusher Baghouse Vent

Pollutant	lb/hr	grains per dry standard cubic foot (dscf) (68 F, 29.92 in Hg)
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PM ₁₀	0.77	0.007
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C. Controlled Drop Point Baghouse Vent @ Tunnel Exit Near Copperton (C6/C7)

Pollutant	lb/hr	grains per dry standard cubic foot (dscf) (68°F, 29.92 in Hg)
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PM ₁₀	0.31	0.007
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D. Controlled Drop Point Baghouse Vent @ Copperton (C7/C8)

Pollutant	lb/hr	grains per dry standard cubic foot (dscf) (68°F, 29.92 in Hg)
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PM ₁₀	0.19	0.007. [R307-401-8]
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II.B.1.b Stack testing to show compliance with the emission limitations stated in the above condition shall be performed as specified below:

A.	Emissions Point	Pollutant	Testing Status	Test Frequency
	Main In-pit Crusher Baghouse Vent	PM ₁₀	*	#
	Controlled Drop Point Baghouse Vent @ Tunnel Exit Near Copperton (C6/C7)	PM ₁₀	*	#
	Controlled Drop Point Baghouse Vent @ Copperton (C7/C8)	PM ₁₀	*	#
	Second In-pit Crusher Baghouse Vent	PM ₁₀	**	#

B. Testing Status

* The initial testing has already been performed.

Test every three years. If a unit is not in operation when a test is due, KUC may request an extension for the test.

** Initial compliance for the second in-pit crusher is required. The initial test date shall be performed within 60 days after start of operation and in no case later than 180 days after the initial startup of the new emission source.

C. Notification

The Executive Secretary shall be notified at least 30 days prior to conducting any required emission testing. A source test protocol shall be submitted to DAQ when the testing notification is submitted to the Executive Secretary.

The source test protocol shall be approved by the Executive Secretary prior to performing the test(s). The source test protocol shall outline the proposed test methodologies, and stack to be tested. A pretest conference shall be held, if directed by the Executive Secretary.

D. Sample Location

The emission point shall be designed to conform to the requirements of 40 CFR 60, Appendix A, Method 1, or other methods as approved by the Executive Secretary. An Occupational Safety and Health Administration (OSHA) or Mine Safety and Health Administration (MSHA) approved access shall be provided to the test location.

E. Volumetric Flow Rate

40 CFR 60, Appendix A, Method 2 or other testing methods approved by the Executive Secretary.

F. PM_{10}

For stacks in which no liquid drops are present, the following methods shall be used: 40 CFR 51, Appendix M, Methods 201, 201a, or other testing methods approved by the Executive Secretary. All particulate captured shall be considered PM_{10} .

For stacks in which liquid drops are present, methods to eliminate the liquid drops should be explored. If no reasonable method to eliminate the drops exists, then the following methods shall be used: 40 CFR 60, Appendix A, Method 5, 5a, 5d, or 5e as appropriate. The portion of the front half of the catch considered PM_{10} shall be based on information in Appendix B of the fifth edition of the EPA document, AP-42, or other data acceptable to the Executive Secretary.

The back half condensables shall also be tested using the method specified by the Executive Secretary. The back half condensables shall not be used for compliance demonstration but shall be used for inventory purposes.

G. Calculations

To determine mass emission rates (lb/hr, etc.) the pollutant concentration as determined by the appropriate methods above shall be multiplied by the volumetric flow rate and any necessary conversion factors determined by the Executive Secretary, to give the results in the specified units of the emission limitation. [R307-401-8]

H. Source Operation

For a new source/emission point, the production rate during all compliance testing shall be no less than 90% of the production capacity of the equipment. If the maximum production capacity has not been achieved at the time of the test, the following procedure shall be followed:

- 1) Testing shall be at no less than 90% of the production rate achieved to date.
- 2) If the test is passed, the new maximum allowable production rate shall be 110% of the tested achieved rate. This new allowable maximum production rate shall remain in affect until successfully tested at a higher rate. This process may be repeated until the maximum AO production rate is achieved.

For an existing source/emission point, the production rate during all compliance testing shall be no less than 90% of the maximum production achieved in the previous three years. [R307-401-8]

II.B.1.c Visible emissions from the following emission points shall not exceed the following values:

A.	Main In-pit crusher baghouse vent	7% opacity
B.	Second In-pit crusher baghouse vent	7% opacity
C.	Controlled drop point baghouse vent @ tunnel exit near Copperton (C6/C7)	7% opacity
D.	Controlled drop point baghouse vent @ Copperton (C7/C8)	7% opacity
E.	All other conveyor transfer points	10% opacity
F.	Lime silos	10% opacity
G.	Sample preparation equipment with baghouse	10% opacity
H.	Drilling	10% opacity
I.	LP gas-fired emergency generators	10% opacity
J.	Portable screening equipment	10% opacity
K.	Portable crushing equipment	15% opacity
L.	Electrowinning Plant with electrowinning acid mist eliminator	15% opacity
M.	All other points except as defined in other conditions of this AO	10% opacity

Opacity observations of emissions from stationary sources shall be conducted according to 40 CFR 60, Appendix A, Method 9.

For sources that are subject to NSPS, opacity shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. [R307-201]

II.B.1.d For sources that are subject to NSPS, opacity shall be determined by conducting observations in accordance with 40 CFR 60.11(b) and 40 CFR 60, Appendix A, Method 9. For purposes of determining initial compliance, the minimum total time of observations shall be three (3) hours (30 six-minute averages) for the performance test or other set of observations (meaning those fugitive-type emission sources subject only to an opacity standard). It is the responsibility of the owner/operator of the source to supply these observations to the Executive Secretary.

A currently certified observer must be used for these observations. Emission points that are subject to the initial observations are:

- A. All crushers
- B. All screens
- C. All conveyor transfer points

Initial observations are required on any new or relocated crushing and screening unit. [40 CFR 60 Subpart A]

II.B.1.e The following production, emission and/or hours of operation limits shall not be exceeded:

- A. Total material moved (ore and waste) shall not exceed 260,000,000 tons per rolling 12-month period*.
- B. Annual emissions of SO₂ shall not exceed 97 TPY.
- C. Maximum total mileage per calendar day for ore and waste haul trucks shall not exceed 30,000 miles.
- D. Minimum design payload per ore or waste haul truck shall not be less than 240 tons.
- E. Maximum number of wheels per ore or waste haul truck shall not exceed 6 wheels.
- F. Height of mine waste dumps shall not exceed 1000 feet.
- G. The surface area of the Solvent Extraction/Electrowinning Plant mixer/settlers shall not exceed 1,100 ft².

*Total ore and waste limitation shall be applied to dry tons of new material mined at the production shovels face.

Compliance with the 12-month period limits shall be determined on a rolling 12-month total. KUC shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months.

Records of daily total mileage shall be kept for all periods when the mine is in operation. Daily total mileage shall be determined by daily mileage reports. Haul truck miles are tracked with a computer based mine control system. The program contains a mine map with the location of each shovel, active dump area and haul truck support facility. The map is updated daily to incorporate new global positioning system data. Road distances between each of these potential haul truck destinations are automatically calculated. The Dispatch system also tracks haul truck locations throughout the mine using beacons and automatically transmits updated data to MMC as it becomes available. With this data, the system continuously calculates and compiles haulage distances for each truck and the entire haul truck fleet. [R307-401-8]

II.B.1.f The following site-wide emission limits at the BCM shall not be exceeded:

- A. 7,350 tons of NOX, PM₁₀ and SO₂ combined per rolling 12-month period.
- B. 6,205 tons of NOX, PM_{2.5} and SO₂ combined per rolling 12-month period.

Compliance with the 12-month period limits shall be determined on a rolling 12-month total. KUC shall calculate a new 12-month total by the twentieth day of each month using data from the previous 12 months. [R307-401-8]

- II.B.1.g KUC shall notify the Executive Secretary in writing when the installation of the equipment listed in Condition II.A.3 has been completed and is operational. To insure proper credit when notifying the Executive Secretary, send your correspondence to the Executive Secretary, attn: Compliance Section.

AOs issued by the Executive Secretary in accordance with the provisions of R307-401 will be reviewed 18 months after the date of issuance to determine the status of construction, installation, modification, relocation or establishment. In 18 months from the date of this AO, the Executive Secretary shall be notified in writing on the status of the plant construction and installation of the equipment. If a continuous program of construction, installation, modification, relocation or establishment is not proceeding, the Executive Secretary may revoke the AO. [R307-401]

II.B.2 **Equipment Requirements**

- II.B.2.a The Main In-pit Crusher baghouse shall control process streams from the crusher. This baghouse shall be sized to handle at least 12,898 Dry Standard Cubic Feet per Minute (DSCFM) for the existing conditions. All exhaust air from the crusher shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
- II.B.2.b The Second In-pit Crusher baghouse shall control process streams from the second crusher. This baghouse shall be sized to handle at least 12,898 DSCFM for the existing conditions. All exhaust air from the crusher shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
- II.B.2.c The lime silos fabric bin vent control units shall control process streams from the lime silos. This control unit shall be sized to handle at least 616 DSCFM for the existing conditions. All exhaust air from the lime silos shall be routed through the control unit before being vented to the atmosphere. [R307-401-8]
- II.B.2.d The Controlled Transfer Drop Point C6/C7 baghouse shall control process streams from the drop point. This baghouse shall be sized to handle at least 5,120 DSCFM for the existing conditions. All exhaust air from the C6/C7 transfer drop point shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
- II.B.2.e The Controlled Transfer Drop Point C7/C8 baghouse shall control process streams from the drop point. This baghouse shall be sized to handle at least 3,168 DSCFM for the existing conditions. All exhaust air from the C7/C8 transfer drop point shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]
- II.B.2.f The Sample Preparation baghouse shall control process streams from the sample preparation building crushing and grinding equipment. This baghouse shall be sized to handle at least

4,269 DSCFM for the existing conditions. All exhaust air from the sample preparation crusher and grinder shall be routed through the baghouse before being vented to the atmosphere. [R307-401-8]

II.B.2.g The Electrowinning Acid Mist Eliminator shall control process streams from the electrowinning cells. This mist eliminator shall be sized to handle at least 8,000 Actual CFM for the existing conditions. Except during service, inspection, and cathode harvest, all exhaust air from the electrowinning cells shall be routed through the mist eliminator before being vented to the atmosphere. [R307-401-8]

II.B.2.h The solvent extraction tanks and the stripping mixer/settlers shall be covered at all times except during inspection, sampling, and adjustment. [R307-401-8]

II.B.3 **Roads and Fugitive Dust**

II.B.3.a KUC shall abide by a fugitive dust control plan acceptable to the Executive Secretary for control of all dust sources associated with the BCM. The fugitive dust control plan shall be updated and submitted on an annual basis to the Executive Secretary by February 1 of every year. This plan shall contain sufficient controls to prevent an increase in PM₁₀ emissions above those modeled for this AO. The limitations and conditions in the fugitive dust control plan shall not be changed without prior approval by the Executive Secretary.

The haul road length or speed or any other parameters used to calculate the emissions that would change the emissions if changed shall not be increased above the limitations set in the fugitive dust control plan without prior approval in accordance with R307-401, UAC. [R307-309]

II.B.3.b The facility shall abide by all applicable requirements of UAC R307-205 and R307-309 for Fugitive Emission and Fugitive Dust sources. The provisions of R307-205 and 309 shall not apply to any sources for which limitations for fugitive dust or fugitive emissions are assigned pursuant to R307-401 or R307-305 nor shall they apply to agricultural or horticultural activities. [R307-309]

II.B.3.c Control of disturbed or stripped areas is required at all times (24 hours per day every day) for the duration of the project/operation until the area is reclaimed. Records of treatment and/or reclamation shall be kept for all periods when the plant is in operation. [R307-309]

II.B.3.d Visible fugitive dust emissions from haul-road traffic and mobile equipment in operational areas shall not exceed 20% opacity at any point. Visible emission determinations shall use procedures similar to Method 9. The normal requirement for observations to be made at 15-second intervals over a six-minute period, however, shall not apply. Visible emissions shall be measured at the densest point of the plume but at a point not less than 1/2 vehicle length behind the vehicle and not less than 1/2 the height of the vehicle. [R307-309]

II.B.3.e Water sprays or commercial dust suppression sprays shall be installed at the following points that are not enclosed or have baghouses to control fugitive emissions:

- A. All stationary conveyor transfer points
- B. The portable road base crusher and screening unit shall have water spray at the

input to the crusher and at the discharge points from the crusher.

The sprays shall operate whenever dry conditions warrant or as determined necessary by the Executive Secretary. [R307-309]

II.B.3.f The accessible surfaces of all uncovered storage piles shall be sprayed with water or dust suppressants to minimize generation of fugitive dusts, as dry conditions warrant or as determined necessary by the Executive Secretary. Records of water and/or commercial dust control treatment shall be kept for all periods when the plant is in operation. [R307-309]

II.B.3.g KUC shall provide to the Executive Secretary for approval a plan to keep opacity on active waste slopes at less than 20% opacity. Average opacity emissions from the active waste dump push slopes shall not exceed 20%. To insure that 20% opacity is not exceeded, the waste dump slopes shall be monitored by KUC.

If the 20% opacity limitation cannot be met on any waste dump slope, action shall be initiated to prevent excesses of 20% opacity by applying additional and/or alternate control measures, as defined in the fugitive dust control plan, as approved by the Executive Secretary.

Opacity observations shall be conducted in accordance with 40 CFR 60, Appendix A, Method 9 with the following exceptions:

Opacity observations shall only be taken while a batch of dumped material is in motion. One reading shall consist of an accumulation of three (3) minutes of trigger opacity observations taken over the material in motion. [R307-309]

II.B.3.h If KUC or the Executive Secretary determines that the trigger opacity is being exceeded and existing alternate control measures have been exhausted, KUC shall meet with the Executive Secretary, or the Executive Secretary's staff. The meeting will be held to discuss additional or modified fugitive dust controls/operational practices and an implementation schedule for such within five (5) working days after verbal notification by either party. [R307-309]

II.B.3.i KUC shall use frequent watering or commercial dust suppressant to control road dust from all trafficked roads and areas in the mine. KUC shall submit an annual road dust control report, in conjunction with the fugitive dust control plan, by February 1 of each calendar year, containing as a minimum the following:

- A. A description of what dust control measures are planned for the coming year
- B. A report of what dust control measures were actually completed during the past year
- C. Specific elements of the report will include:
 - 1) A map of all trafficked areas and roads associated with the mine, indicating which areas are planned for treatments with water and/or commercial dust suppressant.
 - 2) If used, a description of the commercial dust suppressant and how it will be applied (application rate, application frequency, dilution rate, special application procedure, scarification, etc.).

- 3) A list of equipment dedicated either full or part time to the work area and for road dust control (# of water trucks, water capacity, # graders, etc.).
- 4) A quantification of how much dust suppressant (gallons, tons) was applied the previous year and when and where it was applied.
- 5) A quantification of how much watering was accomplished the previous year (gallons, water truck operating hours). [R307-309]
- 6) A map outlining the pit influence boundary. [R307-309]

II.B.3.j Wet drilling shall be performed for all blast holes. [R307-309]

II.B.4 **Monitoring Requirements**

II.B.4.a KUC shall operate an ambient monitoring station as described in this AO. The monitoring plan will be periodically reviewed and revised as necessary. [R307-401]

The air monitoring installation and set-up shall be completed within 90 days of the AO issuance. KUC shall complete the calibration and equipment testing within 30 days of the final set-up and installation date.

The air monitoring station shall remain in operation until the BCM material moved has achieved a minimum of 90 percent of the permitted limitation, 260,000,000 TPY. If after the 90 percent limitation has been achieved and that three consecutive years of monitoring data indicates compliance with the NAAQS, KUC may petition DAQ to remove the air monitoring station. [R307-401]

II.B.4.b KUC shall operate and maintain one (1) monitoring site in the vicinity of one of the top five highest modeled ground level emission concentrations. The monitor shall be sited in a location impacted by the highest modeled concentration of emissions near the lower Butterfield Canyon area. This site is along the mines southwest property boundary. The exact location of the monitoring site shall be approved by the DAQ and meet all of the citing requirements established by the DAQ. [R307-401]

II.B.4.c KUC shall utilize air monitoring and quality assurance procedures which are equal to or exceed the requirements described in the EPA Quality Assurance Manual including revisions 40 CFR Parts 53 and 58.

The air monitoring shall track the long-term impacts of emissions from the facility. Should monitoring data indicate that project emissions are producing ambient air impacts that could produce an exceedance of the NAAQS, additional air monitoring or analyses will be required. If this situation occurs, an additional data assessment plan shall be developed that is mutually acceptable to both DAQ and KUC.

KUC shall monitor the following parameters listed below:

Site Name:	TBD
UTM Coordinates	TBD

Parameter	PM ₁₀
Frequency	Every 3rd day

Note: PM₁₀ is defined as particulate matter less than 10 microns in aerodynamic diameter.

Any ambient air monitoring changes proposed by KUC must be approved in writing by the Executive Secretary or representative. [R307-401]

II.B.4.d KUC shall submit quarterly data reports within 45 days after the end of the calendar quarter and an annual data report within 90 days after the end of the calendar year.

The quarterly report shall consist of a narrative data summary and a submittal of all data points in EPA-AIRS record format. The data shall be submitted in compact disk (CD) format. The narrative data summary shall include:

- A. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site locations in relation to the mine and the general area;
- B. A hard copy of the individual data points;
- C. The quarterly and monthly arithmetic means for PM₁₀ and wind speed;
- D. The first and second highest 24-hour concentrations for PM₁₀;
- E. The quarterly and monthly wind roses;
- F. A summary of the data collection efficiency;
- G. A summary of the reasons for missing data;
- H. A precision and accuracy (audit) summary;
- I. A summary of any ambient air standard exceedances; and
- J. Calibration information.

The annual data report shall consist of a narrative data summary containing:

- A. A topographic map of appropriate scale with UTM coordinates and a true north arrow showing the air monitoring site locations in relation to the mine and the general area;
- B. A pollution trend analysis;
- C. The annual arithmetic means for PM₁₀ and wind speed;
- D. The first and second highest 24-hour concentrations for PM₁₀;
- E. The annual wind rose;
- F. An annual summary of data collection frequency;
- G. An annual summary of precision and accuracy (audit) data;
- H. An annual summary of any ambient standard exceedance;
- I. Annual mine material moved in TPY; and
- J. Recommendations on future monitoring.

The Executive Secretary may audit, or may require KUC to contract with an independent firm to audit, the air monitoring network, the laboratory performing associated analysis, and any data handling procedures at unspecified times. On the basis of the audits and subsequent reports, the UDAQ may recommend or require changes in the air monitoring system and associated activities in order to improve precision, accuracy, and data completeness. [R307-401]

Section III: APPLICABLE FEDERAL REQUIREMENTS

In addition to the requirements of this AO, all applicable provisions of the following federal programs have been found to apply to this installation. This AO in no way releases the owner or operator from any liability for compliance with all other applicable federal, state, and local regulations including UAC R307.

NSPS (Part 60), A: General Provisions
NSPS (Part 60), OOO: Nonmetallic Mineral Processing Plants
NSPS (Part 60), LL: Metallic Mineral Processing Plants

PERMIT HISTORY

The final AO will be based on the following documents:

Incorporates	Additional Information dated January 26, 2011
Incorporates	Additional Information dated January 24, 2011
Incorporates	Additional Information dated January 10, 2011
Incorporates	Additional Information dated January 3, 2011
Incorporates	Additional Information dated December 4, 2010
Incorporates	Additional Information dated November 18, 2010
Incorporates	Additional Information dated November 16, 2010
Incorporates	Additional Information dated October 21, 2010
Incorporates	Additional Information dated October 12, 2010
Incorporates	NOI dated August 17, 2010
Supersedes	DAQE-AN-1-5710023-08 dated August 13, 2008

ADMINISTRATIVE CODING

The following information is for UDAQ internal classification use only:

Salt Lake County
CDS A
NSPS (Part 60), Nonattainment or Maintenance Area, PM₁₀ SIP / Maint Plan, Title V (Part 70) Major source

Appendix A

Emission Calculation Methodology

The purpose of this appendix is to provide a clear and detailed method for KUC to perform compliance monitoring of the rolling 12-month total emissions from the KUC BCM. The resulting calculated emissions will be used to determine compliance with the rolling 12-month total emissions limitations contained in the AO.

The emissions from BCM sources will be estimated annually using the methodology summarized below.

Point sources: Point sources are defined as emission sources controlled by baghouses or bin vent filters and are emitted through a stack. Emissions from point sources will be estimated using the following equation –

PM₁₀ Emissions with Primary Control (TPY) = PM₁₀ Emission Factor (gr/dscf) x Air Flow (dscfm) x 60 min/hr x 1/7000 x (1 ton/2000 lb)

PM_{2.5} Emissions with Primary Control (TPY) = (0.15/0.51) x PM₁₀ Emissions with Primary Control (TPY)

The emission factor used in the calculations shall be based on the most recent stack test results. For sources located within the pit influence boundary, a 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

Material Movement Sources: Material movement emission sources include truck offloading ore at the in-pit crusher, ore offloading at the stockpile, in-pit transfer points, conveyor stacker transfer point, coarse ore stacker, reclaim tunnel, truck loading and truck offloading waste rock. Emissions from material movement sources will be estimated using the methodology from AP-42, Fifth Edition, Section 13.2.4 – Equation 1. Until more recent data is available, the calculations will use a moisture content of 4 percent and average wind speed of 7 miles per hour.

$$E = k \times 0.0032 \frac{\left(\frac{u}{5}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}}$$

k =	PM ₁₀	PM _{2.5}
	0.35	0.053

E = emission factor

k = particle size multiplier (dimensionless)

U = mean wind speed, meters per second (m/s) (miles per hour [mph])

M = material moisture content (%)

For sources located within the pit influence boundary, a 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

Disturbed Areas: Emissions from disturbed areas will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-4 and using the following equation –

$$E = 0.18 \times A \times \left(\frac{365 - p}{365} \right)$$

E = PM₁₀ Emissions (TPY)

A = Area Disturbed (acres/year)

p = Days of precipitation greater than 0.01 inches per year

PM_{2.5} Emissions with Primary Control (TPY) = (0.053/0.35) x PM₁₀ Emissions with Primary Control (TPY)

If no recent data is available, the calculations will assume 106 days with precipitation greater than 0.01 inches. If annual acreages of disturbed areas are not available, KUC will estimate annual emissions with worst case disturbed areas of 265 acres within the pit influence boundary and 310 acres outside the pit influence boundary.

For acreages disturbed within the pit influence boundary, a 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

Haulroads: Emissions from haulroads will be estimated using the methodology from AP-42, Fifth Edition, Section 13.2.2. For portion of haulroads within the pit influence boundary, a 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E = k \times \left(\frac{s}{12} \right)^a \times \left(\frac{W}{3} \right)^b \times \left(\frac{365 - p}{365} \right)$$

	PM ₁₀	PM _{2.5}
k =	1.5	0.150
a =	0.9	0.9
b =	0.45	0.45

E: emission factor (lb/VMT)

VMT = vehicle miles traveled

k, a, b: dimensionless constants from Table 13.2.2-2

s: silt content (%) of road surface

W: mean vehicle weight (tons); = (wt.loaded + wt.unloaded / 2)

p: number of days with at least 0.01 inches of precipitation per year; not used for calculating hourly emissions

Low grade Coarse Ore Storage Pile: Emissions from disturbed areas will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-1.

$$E = 0.72 \times u \times \left(\frac{0.35}{0.74} \right) \times A$$

E: PM₁₀ Emissions (lb/hr)

u: Wind Speed (mph)

A: Size of Storage Pile (Acres)

PM_{2.5} Emissions with Primary Control (TPY) = (0.053/0.35) x PM₁₀ Emissions with Primary Control (TPY).

A 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

If annual acreage for the pile is not available, KUC will estimate annual emissions with worst case storage pile acreage of 10 acres within the pit influence boundary.

Front-end Loaders: Emissions from the front-end loaders will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-1. For portion of operations within the pit influence boundary, a 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E_{PM_{10}} = \frac{0.119 \times 0.75 \times \left(\frac{1}{M} \right)^{0.9} \times P}{2000}$$

E_{PM10}: PM₁₀ Emissions (ton/year)

M: Moisture Content (%)

P: Annual Process Rate (TPY)

$$E_{PM_{2.5}} = \frac{1.16 \times 0.019 \times \left(\frac{1}{M} \right)^{1.2} \times P}{2000}$$

E_{PM2.5}: PM_{2.5} Emissions (ton/year)

M: Moisture Content (%)

P: Annual Process Rate (TPY)

If annual rates are not available, KUC will estimate annual emissions with worst case 10,350,000 tons of material movement within the pit influence boundary and 1,150,000 tons of material movement outside the pit influence boundary.

Graders: Fugitive emissions from the graders will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-1. For portion of operations within the pit influence boundary, a 20

percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E_{PM_{10}} = \frac{0.051 \times 0.6 \times (S)^2 \times N \times H \times S}{2000}$$

E_{PM10} = PM₁₀ Emissions (tons/year)

S = Speed (mph)

N = Number of Graders

H = Annual Hours of Operation of each grader

$$E_{PM_{2.5}} = \frac{0.04 \times 0.031 \times (S)^{2.5} \times N \times H \times S}{2000}$$

E_{PM2.5} = PM_{2.5} Emissions (tons/year)

S = Speed (mph)

N = Number of Graders

H = Annual Hours of Operation of each grader

Dozers: Fugitive emissions from the track and wheel dozers will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-1. For portion of operations within the pit influence boundary, a 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E_{PM_{10}} = \frac{0.75 \times 1 \times \left(\frac{s^{1.5}}{M^{1.4}} \right) \times H}{2000}$$

E_{PM10} = PM₁₀ Emissions (tons/year)

s = silt content (%)

M = Moisture Content (%)

H = Annual Hours of Operation for dozers

$$E_{PM_{2.5}} = \frac{0.105 \times 5.7 \times \left(\frac{s^{1.2}}{M^{1.3}} \right) \times H}{2000}$$

E_{PM2.5} = PM_{2.5} Emissions (tons/year)

s = silt content (%)

M = Moisture Content (%)

H = Annual Hours of Operation for dozers

Blasting: Fugitive emissions from the blasting operations will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-1. A 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E_{PM_{10}} = \frac{0.52 \times 0.000014 \times (A)^{1.5} \times N}{2000}$$

E_{PM10} = PM₁₀ Emissions (tons/year)

A = Blasting Area per blast (ft²)

N = Number of blasts in a year

$$E_{PM_{2.5}} = \frac{0.03 \times 0.000014 \times (A)^{1.5} \times N}{2000}$$

E_{PM2.5} = PM_{2.5} Emissions (tons/year)

A = Blasting Area per blast (ft²)

N = Number of blasts in a year

Drilling: Fugitive emissions from the drilling operations will be estimated using the methodology from AP-42, Fifth Edition, Section 11.9-1. A 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E = \frac{1.3 \times \left(\frac{0.35}{0.74} \right) \times N}{2000}$$

E = PM₁₀ Emissions (tons/year)

N = Number of holes drilled in a year

PM_{2.5} Emissions with Primary Control (TPY) = (0.053/0.35) x PM₁₀ Emissions with Primary Control (TPY).

Road base crushing and screening: Fugitive emissions from the road base crushing and screening operations will be estimated using the methodology from AP-42, Fifth Edition, Section 11.19.2-2. A 20 percent escape factor will be applied to the PM₁₀ emissions with primary control and a 21 percent escape factor will be applied to the PM_{2.5} emissions with primary control.

$$E = \frac{EF \times \text{tons of material handled}}{2000}$$

	PM ₁₀ EF (lb/ton)	PM _{2.5} EF (lb/ton)
Tertiary Crushing	0.00054	0.00010
Screening	0.00074	0.00005
Transfer Points	0.000046	0.000013

Haul trucks and Support Equipment: Tailpipe emissions from the haul trucks and support equipment will be estimated using the hours of operation for each piece of equipment and an emission factor based on its EPA certified tier rating. Emission factors will be obtained from the most current version of EPA approved NONROAD model and related guidance.

APPENDIX B

BCM Fugitive Dust Control Plan

PROPOSED BCM FUGITIVE DUST CONTROL PLAN MEASURES

1.0 Introduction

In compliance with the NOI submitted to the Utah Division of Air Quality on August 17, 2010 (proposal to modify BCM AO DAQE-AN0105710023-08) and R307-309, the following report describes dust control measures proposed for the BCM.

2.0 Proposed Dust Control Measures

- Total material moved of ore and waste rock combined at the mine shall not exceed 260,000,000 tons under the AO.
- Maximum daily total mileage for ore and waste haul trucks shall not exceed 30,000 miles.
- Primary ore and waste haul truck fleet shall have a minimum design payload of 240 tons and a maximum of 6 wheels each.
- Mine waste dumps to not exceed a height of 1,000 feet.
- Active ore and waste haulage roads within the Pit Influence Boundary (see attached map) shall be water sprayed and/or treated with commercial dust suppressant as conditions warrant. Additionally, crushed road base material shall be applied as necessary to active ore and waste haulage road within the Pit Influence Boundary to enhance the effectiveness of fugitive dust control measures.
- Commercial dust suppressant shall be applied to active ore and waste haulage roads outside of the Pit Influence Boundary (see attached map) no less than twice per year.
- Use of 5-mile ore conveyors, reduces fugitive emissions by displacing transport by truck.
- Integration of higher capacity haul trucks results in a decrease in round trips and vehicle miles traveled reducing fugitive emissions.
- KUC shall report annually volume of water applied, commercial dust suppressant activity, road base placement, and dust suppression fleet composition.

2.1 Active Haul Roads

Opacity observations shall be conducted as specified in the BCM AO. If observations are determined to be in excess of those allowed by the AO, dust control measures will be implemented.

Within Pit Influence Boundary:

Dust control measures proposed at the BCM include continued water application on active ore and waste haul roads within the Pit Influence Boundary, as governed by continual monitoring of road and meteorological (dry) conditions. A portable road base crushing and screening unit has been permitted, tested and operating since October 2006 to crush road base material. Based on testing and application of the road base material, results observed general road quality and surfaces improved while reducing fine particulate matter. Rock is screened to approximately 2-inch diameter during winter months and to 1.5-inch diameter for the remainder of the year. KUC will continue to operate the road base crusher and place material as necessary on haul roads within the Pit Influence Boundary. KUC will annually report roads that received road base application.

Outside Pit Influence Boundary:

Commercial dust suppressant shall be applied on active ore and waste haul roads outside of the Pit Influence Boundary no less than two times per year. The attached Pit Influence Boundary map details these areas.

The crushing and conveying department will continue to water roads along the conveyor as conditions warrant. In addition, the crushing and conveying department at the Copperton Concentrator utilizes a 4,000 gallon capacity water truck which is primarily dedicated to dust control measures associated with the conveyor belt between the mine and the ore stockpile.

2.2 Active Access Roads

Continued use of commercial dust suppressant is planned for unpaved access roads that receive minimal haul truck traffic and elevated light vehicle traffic. The application of the commercial dust suppressant will be through the use of contractors as in previous years and under close KUC operations supervision. The dust suppressant may be reapplied as necessary.

2.3 Dust Suppression Fleet

The active dust suppression fleet will consist of:

- Five (5) 50,000 gallon trucks (two 58,500 gallons and three 52,000 gallons)
- One (1) 4,000 gallon truck
- One (1) 3,600 gallon truck
- One (1) 1,800 gallon truck

KUC uses graders to perform road maintenance as well as other operational functions. The number of graders used for road maintenance at any given time varies as road conditions warrant. Experience has determined that rapid removal of mud slurry after a storm event eliminates a saturation source for the road base and also helps to ultimately reduce fugitive emissions caused when the slurry dries. In this effort the mine uses 90-ton trucks as road service vehicles to haul the mud off the haul road and import new road surface material. A loader is used to load the 90-ton trucks.

ACRONYMS

The following lists commonly used acronyms and associated translations as they apply to this document:

40 CFR	Title 40 of the Code of Federal Regulations
AO	Approval Order
BACT	Best Available Control Technology
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CDS	Classification Data System (used by EPA to classify sources by size/type)
CEM	Continuous emissions monitor
CEMS	Continuous emissions monitoring system
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent - 40 CFR Part 98, Subpart A, Table A-1
COM	Continuous opacity monitor
DAQ	Division of Air Quality (typically interchangeable with UDAQ)
DAQE	This is a document tracking code for internal UDAQ use
EPA	Environmental Protection Agency
GHG	Greenhouse Gas(es) - 40 CFR 52.21 (b)(49)(i)
GWP	Global Warming Potential - 40 CFR Part 86.1818-12(a)
HAP or HAPs	Hazardous air pollutant(s)
ITA	Intent to Approve
LB/HR	Pounds per hour
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOI	Notice of Intent
NO _x	Oxides of nitrogen
NSPS	New Source Performance Standard
NSR	New Source Review
PM ₁₀	Particulate matter less than 10 microns in size
PM _{2.5}	Particulate matter less than 2.5 microns in size
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
R307	Rules Series 307
R307-401	Rules Series 307 - Section 401
SO ₂	Sulfur dioxide
Title IV	Title IV of the Clean Air Act
Title V	Title V of the Clean Air Act
TPY	Tons per year
UAC	Utah Administrative Code
UDAQ	Utah Division of Air Quality (typically interchangeable with DAQ)
VOC	Volatile organic compounds