

# Dry Tailings Management Plan

As Required By: Air Quality Control Permit No. 55223

January 2018

**Prepared by:**

Rosemont Copper Company



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## Monitoring and Reporting Schedule

Task Schedule	Purpose/Description/ Timing	Permit Pg. No.	Generic Year				
			D	W	AN	SA	A
Permit Renewal (i.e., permit issuance date = Jan 31, 2013; permit renewal date = Jan 31, 2018)	Submit application for renewal at least 6 months, but not more than 18 months, prior to the date or permit expiration	3			X		
Annual Emissions Inventory Questionnaire	Due by March 31 <sup>st</sup> or 90 days after the Director makes the inventory form available each year	4					X
Semiannual Compliance Certification (period from October 1 <sup>st</sup> to March 31 <sup>st</sup> )	Describes the compliance status of the source with respect to each permit condition; due by May 15 <sup>th</sup>	4				X	
Semiannual Compliance Certification (period from April 1 <sup>st</sup> to September 30 <sup>th</sup> )	Describes the compliance status of the source with respect to each permit condition; due by November 15 <sup>th</sup>	4				X	
Semiannual Outstanding Compliance Schedule (period from February 1 <sup>st</sup> to July 31 <sup>st</sup> )	Progress report on outstanding compliance schedules; provide within 15 days, i.e. August 15 <sup>th</sup>	5				X	
Semiannual Outstanding Compliance Schedule (period from August 1 <sup>st</sup> to January 31 <sup>st</sup> )	Progress report on outstanding compliance schedules; provide within 15 days, i.e. February 15 <sup>th</sup>	5				X	
Excess emissions notification	Within 24 hours of discovery	6			X		
Detailed report on excess emissions	Within 72 hours of the notification	6			X		
Permit deviation notification/reporting	Within 2 working days of discovery	7			X		
Excess emissions or permit deviation that cannot be corrected within 72 hours	Submit a compliance schedule to the Director within 21 days of such occurrence	8			X		
* Visual Observation Plan	Due to ADEQ at least 30 days prior to start of operations (i.e., pit excavation)	18			X		
Opacity Monitoring of Dry Stack Tailings Facility (start during buttress construction)	Twice daily per VOP (Max. opacity = 40%)	39	X				
Opacity Monitoring of tailings conveyor system	Weekly (Max. opacity = 20%)	39		X			

Task Schedule	Purpose/Description/ Timing	Permit Pg. No.	Generic Year				
			D	W	AN	SA	A
Operational unpaved roads	Record lengths of unpaved service roads or unpaved haul roads	40			X		
* General monitoring and dust control	Record activities	39, 40, 41	X				
Dry Tailings Management Plan	Submit at least 180 days prior to start of dry stack tailings deposition in the mineral tailings and/or submit as part of a significant permit amendment	41			X		
Review of Dry Tailings Management Plan	Determine effectiveness in controlling emissions; by January 31 <sup>st</sup>	42					X
Inspect tailings area at least once daily during period of high winds for easily erodible areas	Winds at or above 15 mph or gusts at or above 20 mph (as recorded by official Meteorological Station)	42	X				
Record all meteorological data, all tailings inspections, all control measures used and corrective actions	Winds at or above 15 mph or gusts at or above 20 mph (as recorded by official Meteorological Station)	42		X			
Water used for dust control	Record per shift basis	43, D.7.3		X			
* Develop Public Access Restriction Plan	Submit plan at least 90-days prior to construction of the mine	49			X		
* Implement Public Access Restriction Plan	Within 30 days after approval of Director of ADEQ	49			X		
Meteorological Monitoring Plan Quality Assurance Project Plan (QAPP)	Submit plan within 180 days of permit issuance (complete)	50			X		
Meteorological Monitoring Station	Install station within 90 days prior to startup of mine operations (pit excavation)	50			X		

Task Schedule	Purpose/Description/ Timing	Permit Pg. No.	Generic Year				
			D	W	AN	SA	A
** PM <sub>10</sub> Monitoring Plan	Submit plan within 180 days of permit issuance (complete)	51			X		
** PM <sub>10</sub> Monitoring Station	Install station within 90 days prior to startup of mine operations (pit excavation)	51			X		
*** Dust Control on Haul Roads	Record precip/evap, traffic volume, material tons moved, water usage and dust suppressant usage and application frequency	D	X		X		

D = Daily; W = Weekly; AN = As Needed; SA = Semi-annually; A = Annually; VOP = Visual Observation Plan; \* = Including, but not specific to, dry stack tailings area; \*\* = If required; \*\*\* = Haul road monitoring requirements depend on method selected

## Revision Log

Revision Number	Revision Lead	Purpose of Revision	Revision Date
0	DK	(1) Removed appendices (only made reference to Dust Control Plan and Visual Observation Plan); (2) Included statement regarding 45-day period to update plan following permit issuance following a renewal; (3) Updated text regarding vehicles speeds; and (4) Fixed section reference on page 13.	01/2018

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# 1.0 PLAN OBJECTIVE AND DESCRIPTION

This *Dry Tailings Management Plan* (Plan) was developed in response to a requirement in the Arizona Department of Environmental Quality (ADEQ) Class II Air Quality Control Permit No. 55223 (Permit, Air Quality Control Permit) issued to the Rosemont Copper Company (Rosemont) for the Rosemont Copper Project (Project) on January 31, 2013 (ADEQ, 2013). The Plan requirements are listed in Attachment "B", Condition VIII.B.1.b.(5)(a) on page 41 of 60 of the Permit.

HudBay Minerals, Inc. (Hudbay) acquired Rosemont and its parent company, Augusta Resources, in July 2014. The Rosemont Project has an address of 21900 S. Sonoita Highway, Vail, Arizona 85641, which is approximately 30 miles southeast of Tucson, west of State Highway 83, in Pima County, Arizona. Air Quality Control Permit No. 55223 is a Class II synthetic minor permit.

The *Dry Tailings Management Plan* is due to ADEQ at least 180 days prior to the start of dry tailings deposition in the mineral tailings area (Dry Stack Tailings Facility [DSTF]) (see Attachment "B", Condition VIII.B.1.b.(5)(a) on page 41 of 60 of the Permit), and (as stated in the Permit) submitted as part of any significant permit revision. This Plan has been prepared, and is being submitted, as part of a renewal and amendment to Permit No. 55223. Additionally, per Attachment "B", Condition VIII.B.1.d.(4)(c) on page 42 of 60 of the Permit, an annual review of the Plan is required for its effectiveness in controlling fugitive dust emissions. (Note: This Plan will also be updated within 45 days of the issuance of permit renewals.)

This Plan is also part of a submittal to the U.S. Forest Service (USFS, Forest Service) as part of document submittals in support of a Mine Plan of Operations (MPO). Any documents produced as part of the annual effectiveness review of this Plan, as noted above, will be shared with the Forest Service as part of the annual report for that year.

Monitoring under this Plan will begin once construction of the perimeter buttresses begins (Active Mining Phase). These buttresses are associated with the Dry Stack Tailings Facility (DSTF). Monitoring will be discontinued following final placement of tailings in the DSTF. Section 2.0 of this Plan provides a general description of the construction and operation of the DSTF.

## 1.1 PLAN OBJECTIVE

The objective of this Plan is to:

- Minimize the generation of fugitive dust from the tailings.

## 1.2 PLAN DESCRIPTION

The Plan is required to address the following operational requirements (note: list of requirements reordered) (see Attachment "B", Condition VIII.B.1.b.(5)(b) 1), 2), 3) and 4), on page 41 of 60):

- Tailings "facility" dust control during perimeter buttress construction;
- Tailings "facility" dust control during normal non-perimeter buttress construction operations;
- Tailings "facility" dust control at all other times; and
- Additional tailings "facility" dust control and monitoring methods during periods of high winds.

Discussion of these four (4) operational scenarios is provided in Section 3.0 – Operational Dust Control Measures. As appropriate, the tailings conveyor system from the Tailings Filter Plant to the DSTF is included in these scenarios.

As needed, three (3) separate roadway dust control programs can be incorporated into the four (4) operational scenarios listed above. These roadway dust control programs were designed to ensure that at least a 90% control of PM<sub>10</sub> emissions is achieved on haul roads (see Dust Control Plan, Attachment "D" of the Permit). A 90% control of PM<sub>10</sub> emissions is considered sufficient to ensure that

no greater than 40% opacity is measured for fugitive emissions generated from a non-point source (see Attachment "D" of the Permit, Section D.2.2).

For reference, and exclusive of the tailings conveyor system, the opacity limitation for activities associated with the DSTF is 40% (see Attachment "B", Condition VIII.B.1.a(1) on page 39 of 60 of the Permit). The opacity limitation for a process source, including the tailings conveyor system, is 20%. (see Attachment "B", Condition IV.D.1.a on page 28 of 60 of the Permit).

Rosemont's Visual Observation Plan (VOP) specifies observation points, or Fugitive Lookout Points, where visible emission surveys are to be taken that are associated with the DSTF. Section 4.0 of this Plan summarizes the opacity monitoring procedures associated with the DSTF. Section 5.0 provides a list of general dust control methods. Section 6.0 summarizes the monitoring and reporting requirements. Sections 7.0 through 9.0 cover Adaptive Management, Data Management, and References, respectively.

However, with regard to meeting opacity limits, in Attachment "B", on page 18 of 60 of the Air Quality Control Permit, Condition II.A.9.a, states the following:

*The Permittee shall not cause or permit the airborne diffusion of visible emissions, including fugitive dust, beyond the property boundary line within which the emissions become airborne. Within actual practice, the airborne diffusion of visible emissions across property lines shall be prevented by appropriately controlling the emissions at the point of discharge, or ceasing entirely the activity or operation which is causing or contributing to the emissions.*

This condition, however, shall not apply when wind speeds exceed twenty-five (25) miles per hour as estimated by a certified visible emissions evaluator "Method 9" using the Beauford Scale of Wind-Speed equivalents, or as recorded by a U.S. Weather Bureau Station or a U.S. military installation.

This exception does not apply to the demolition, destruction, transport, or pulverization of structures containing friable asbestos materials, and all dust-producing activities associated with such sources shall be halted when the wind is causing or contributing visible emissions to cross beyond the property lines within which the emissions discharge.

Additionally, any disregard of, neglect of, or inattention to other controls required by the Air Quality Control Permit, during any time when this wind speed condition is in effect, shall automatically waive the exception and such relaxation of controls shall be a violation to the generation of airborne particulate matter from undisturbed land. See page 18 of 60 of the Permit. [Attachment "B", Condition II.A.9.c.]

With regard to the Dust Control Plan mentioned above and referenced throughout this Plan, page 17 of 60 of the Permit, Attachment "B", Condition II.A.5 states the following:

*The Permittee shall comply with the dust control plan included in Attachment "D" of this permit to control particulate matter emissions from activities identified in the dust control plan. The Permittee may implement proposed changes to the dust control plan upon submission to the Director if necessary to further minimize fugitive dust. Nothing in this permit prohibits the Permittee from implementing additional dust control measures not set forth in the dust control plan.*

The VOP mentioned above not only includes observation points for the tailings facility but for the entire Project site itself. Observations will be conducted by an EPA Certified Method 9 Observer. Visual observations have two distinctions, point source and fugitive. Point source emissions generated from stationary sources include pollution control equipment that generate process related stack emissions, including source fugitive emissions that are not collected by a capture system such as vent hoods and dust collectors. The second distinction is non-point source fugitive emissions that include all other activities such as mobile sources and windblown fugitives.



If the instantaneous opacity of any emission unit/source appears to exceed the applicable standard, a six-minute EPA Reference Method 9 observation of the plume is required "if practicable". The observation points identified in the VOP may not necessarily be the observation points that will be used for conducting EPA Reference Method 9 observations. Since compliance with the EPA reference method requires opacity to be viewed from specific distances and angles with the sun in a specific location relative to the observer, it is more than likely that the observer will need to relocate to a more appropriate position to conduct an EPA Reference Method 9 observation. If the specifics of the reference method can be met, the six-minute reading will be conducted as soon as practicable on visible emission observation forms.

Regarding the visual observations, the protocol will be followed in accordance with the Permit in Attachment "B", Conditions II.B.3, II.B.4, and II.B.5 on page 19 of 60 (see VOP for observation and reporting requirements).

Additionally, the VOP includes locations near the property boundary. As specified on page 19 of 60 of the Permit, Attachment "B", Condition II.C.5 states the following:

*The Permittee shall conduct a daily visible emissions survey at places where the facility fugitive dust generating activities are within 300 feet of the property boundary line in accordance with EPA Reference Method 22. When such emissions are observed to cross the property boundary line, the Permittee shall follow the excess emissions reporting procedures in Section XII of Attachment "A" of this permit. (see page 6 of 60 of Air Quality Control Permit)*

## 2.0 GENERAL TAILINGS OPERATION

The Rosemont Project includes placement of tailings from the sulfide ore processing (grinding and flotation) circuit in a DSTF. Tailings slurry from the processing circuit is sent to a thickener tank and then to a tailings filter plant where the tailings are dewatered. Once dewatered, the filtered or “dry stack” tailings are then transported by conveyor and placed in the DSTF via a stacking system. Upon exiting the filter plant, the filtered tailings will have a moisture content (by dry weight) of 18% or less (ADEQ, 2015). After placement, dozers may be utilized to smooth the surface of the deposited tailings and prepare a working surface. Motor graders or other equipment may also be used to further flatten the tailings surface as needed to facilitate conveyor movement and operation.

The dry stack tailings, upon production start-up, will be placed behind a perimeter buttress constructed out of overburden and waste rock (non-ore materials) removed from the Open Pit and transported to the DSTF via haul trucks. Figure 1 provides a typical perimeter buttress section.

As noted, the buttress construction materials (waste rock) are transported to the DSTF via large haul trucks. The perimeter buttress is designed to accommodate two-way truck traffic and is approximately 150 feet wide at the crest. The waste rock is end-dumped in nominal 50-foot lifts. The waste rock is not compacted except by incidental compaction due to equipment traffic. Tailings placed inside the facility is also not compacted except as necessary to provide a sufficient platform for the stacking equipment (Figure 2).

The outer surface of the buttress will be reclaimed as operations proceed as shown on Figure 3.

## 3.0 OPERATIONAL DUST CONTROL MEASURES

Operation of the DSTF is continuous and at times will require simultaneously incorporating dust control measures for the operations and activities outlined in Section 2.0 – General Tailings Operation. The following activities are covered in this section:

- Section 3.1 – Tailings facility dust control during perimeter buttress construction;
- Section 3.2 – Tailings facility dust control during normal non-perimeter buttress construction operations;
- Section 3.3 – Tailings facility dust control at all other times; and
- Section 3.4 – Additional tailings facility dust control and monitoring methods during periods of high winds.

The dust control methodologies outlined herein are designed to ensure that at least a 90% control of PM<sub>10</sub> emissions is achieved.

Travel to and from the open pit to the dry stack perimeter buttresses, and along the perimeter buttresses themselves, will be on unpaved haul roads that are subject to the dust control provisions found in the approved Dust Control Plan (see Permit, Attachment “D”). There are three (3) dust control programs associated with haul roads. All three (3) programs are also designed to ensure that at least a 90% control of PM<sub>10</sub> emissions is achieved. These programs can be incorporated, as needed, into any of the operational dust control measures described herein. These haul road dust control programs include the flexibility to alternate from one dust control program to another or to use a separate haul road dust control program for an individual application.

### 3.1 TAILINGS FACILITY DUST CONTROL DURING PERIMETER BUTTRESS CONSTRUCTION

Buttress construction will consist of placing waste rock along the outside perimeter of the DSTF. Waste rock material used in the buttress construction will be normal, run-of-mine (ROM) material consisting of a wide range of particle sizes. The haul trucks will end-dump the waste rock (Figure 3) and dozers will be used to grade the material.

Section D.3 of the Dust Control Plan covers the control of fugitive dust emissions from open areas and storage piles. As noted in Section D.3.1, ore and waste rock areas are excluded from these requirements due to these material types being characterized as having a low silt content. The D<sub>50</sub> of the waste rock is anticipated to be around 12-inches (CNI, 2008). In addition to the large particle sizes, it is anticipated that recently blasted rock will also have a moisture content of about 4% (by weight). However, in the event dust suppression is needed during the end dumping/grading operation, water can be applied via sprays/cannons mounted on water trucks.

The waste rock material forming the perimeter buttress will initially be placed at the material's angle of repose. The outer shell of the DSTF will be reshaped during operations to have inter-bench slopes of approximately 3H:1V and will incorporate the construction of drainage benches.

Material haulage will be on compacted earthen roads on top of the perimeter buttresses. These roads will be approximately 125 feet wide to accommodate two-way, haul truck traffic. At a minimum, the top of the perimeter buttress will be about 150 feet wide to accommodate both the roadway and safety berms. Haul truck traffic to and from the DSTF will be on the buttresses and not directly on the dry stack tailings. Haul roads will require adequate dust control, i.e., watering or application of chemical dust suppressant, or both.

General (light-duty) vehicle traffic will be limited to 35 mph traveling on the Property (see Attachment “B”, Condition VIII.B.1.c. on page 41 of 60 of the Permit). General (light-duty) vehicle speeds shall be limited to 35 MPH on roads with adequate dust control and 15 MPH on Forest Service roads.

Additionally, Rosemont also anticipates limiting general (light-duty) vehicle speeds to 15 MPH when travelling directly on top of the dry stack tailings.

### **3.2 TAILINGS FACILITY DUST CONTROL DURING NORMAL NON-PERIMETER BUTTRESS CONSTRUCTION OPERATIONS**

The tailings material will be placed in lifts by a stacking system and the top surface graded as needed to provide a suitable surface for the conveyor and stacking system, and to minimize dust generation. (As planned, the surface of the tailings will be below the elevation of the adjacent perimeter waste rock buttress [Figures 1 through 3]. This will provide some protection of the tailings surface against wind erosion, especially at the edges of the tailings surface.)

Section D.3 of the Dust Control Plan describes the control of fugitive dust emissions from open areas and storage piles. The exposed dry stack tailings surface is regulated under these requirements. Dust control on active operational areas on the surface of the dry stack tailings will be undertaken as necessary, and as dictated by climatic conditions. Controls may include the application of water, chemical binders, or other dust suppressants.

Travel speeds will be limited to control dust and traffic will be restricted, as practicable, on areas that are inactive or that have been treated with a dust suppressant/binder. Access to such areas may be minimized by the construction of berms or other barriers.

Periodic inspections of inactive open areas on the tailings surface will be performed to evaluate the condition of the tailings. As needed to control fugitive dust emissions, a chemical dust suppressant/binder and/or water will be applied via sprays/cannons mounted on a water truck. As noted in Section D.3.2 of the Dust Control Plan, practices, which may be applied to control fugitive dust include the use of an adhesive soil stabilizer, landscaping, detouring, or other acceptable means.

### **3.3 TAILINGS FACILITY DUST CONTROL AT ALL OTHER TIMES**

This section includes dust control associated with the following activities/operations:

- Conveyor System
- Reclamation

#### **3.3.1 Conveyor System**

Tailings will be generated from the sulfide ore processing (grinding and flotation) circuit in the mill concentrator area. Tailings slurry from the processing circuit is sent to a thickener tank for initial dewatering and then to a filter plant. In the filter plant, the tailings are further dewatered to a moisture content out of the Filter Plant of 18% or less by dry weight (ADEQ, 2015).

Once dewatered, the moist “dry” stack tailings are then placed on a fixed conveyor to a transfer station and then transferred to one of two movable conveyor systems. Each of these movable conveyor systems is redundant; one will operate while the other will be idle, under-going system changes or servicing.

As envisioned, at the end of each redundant system, a shiftable conveyor will be equipped with a tripper car that will allow material to be removed from the conveyor anywhere along its length. The tripper car will transfer material to the spreader unit. Due to the moisture content of the tailings coming out the filter plant, the generation of dust along the conveyor and final distribution point is not anticipated. However, water sprays, with or without a dust suppressant/binder, may be added as practicable (and if necessary) along the conveyor.

#### **3.3.2 Reclamation**

Reclamation activities include the following operations:

- Resloping/regrading the outer perimeter buttress
- Resloping/regrading the outer perimeter buttress and top of the tailings surface, and
- Adding cover materials to the outer surfaces (waste rock and cover soil).

Dust control during resloping of the outer waste rock shell of the DSTF from angle of repose to the final graded contour is covered under Section 3.1 above. Dust control during any as needed regrading of the top tailings surface to match final reclamation contours would generally be accomplished by the application of water via sprays/cannons mounted on water trucks and by additional densification as needed. Dust control during grading operations on the tailings surface would comply with requirements for open areas and storage piles found in Section D.3 of the Dust Control Plan.

Additionally, waste rock will be placed on the final regraded tailings surface followed by the placement of growth media. The placement of waste rock on the top surface of the dry stack tailings surface would first be preceded by road plating with enough waste rock material in order to accommodate the large haul trucks. Dozers would be used to push the waste rock end dumped by the haul trucks out from these temporary access roads. These temporary access roads would be spaced for efficient operations. Again, moisture conditioning and dust control during these activities would generally be accomplished, as needed, with water applied via sprays/cannons mounted on water trucks.

### **3.4 ADDITIONAL TAILINGS FACILITY DUST CONTROL AND MONITORING METHODS DURING PERIODS OF HIGH WINDS**

When wind speeds are at or above 15 mph, or gusts at or above 20 mph, as measured at the official Meteorological Station, or other appropriate measuring location, the entire top surface of the DSTF shall be physically inspected, at least once per day, to determine locations where easily erodible areas exist (see Attachment "B", Condition VIII.B.1.d.(4)(b) on page 42 of 60 of the Permit). Water and/or dust suppressant/binders will be added to these erodible areas as soon as practicable. The water/dust suppressant/binder will be applied to the tailings surface via sprays/cannons mounted on a water truck.

Additional dust control measures during high winds may include, as practicable, the following:

- Adjustment of the tailings filter moisture content to the higher end of the acceptable moisture range;
- Moisture conditioning of the dry stack tailings along the portable conveyor;
- Use of binders on the tailings;
- Restrict traffic and activities on the DSTF to only that essential for tailings placement operations; and
- Reduce equipment travel speeds on the surface of the DSTF.

## **4.0 OPACITY MONITORING PROCEDURES**

### **4.1 EPA CERTIFIED OBSERVER**

Observers must be EPA Method 9 certified in accordance with EPA Reference Method 9 (40 CFR 60, Appendix A) (Attachment "B", Condition VIII.B.1.a.(1) on page 39 of 60 of the Permit).

Additionally, "[u]pon start-up of operations, the Permittee shall have a person on site certified in EPA reference Method 9 for the observation and evaluation of visible emissions." (Attachment "B", Condition II.A.1. on page 17 of 60 of the Permit.)

### **4.2 OBSERVATION METHODOLOGY AND LIMITS**

The opacity limitation for a process source, including the tailings conveyor system, is 20% (Attachment "B", Condition IV.D.1.a on page 28 of 60 of the Permit).

Additionally, "[o]pacity of emissions from any fugitive dust non-point source shall not be greater than 40% measured in accordance with the Arizona Testing Manual, 'EPA' Reference Method 9." (Attachment "B", Condition VIII.B.1.a.(1) on page 39 of 60). This opacity limitation includes the DSTF (tailings, waste rock surfaces). "The Permittee shall not cause, allow or permit visible emissions from any fugitive dust point source, in excess of 20 percent opacity." (Attachment "B", Condition VIII.B.1.a.(2) on page 39 of 60).

The methodology for opacity monitoring and the opacity limits are discussed in the Visual Observation Plan (VOP). In addition to Method 9 opacity monitoring, the VOP also includes Method 22 monitoring of activities within 300 feet of the property boundary. [Attachment "B", Condition II.C.5 on page 19 of the Permit.]

### **4.3 OPACITY MONITORING SURVEY LOCATIONS AND FREQUENCY**

The VOP shows the locations of the fugitive dust lookout points. The following monitoring frequency is discussed in the VOP.

- A weekly visual survey of visible emissions (opacity) from process fugitive emissions (the tailings conveyor system) shall be performed per Attachment "B", Condition III.E.2 on page 26 of 60 of the Permit. The survey shall be conducted by a certified Method 9 observer per the VOP.
- A weekly visual survey of visible emissions (opacity) from the fugitive dust sources (along the tailings conveyor system) shall be performed per Attachment "B", Condition VIII.B.1.d.(3)(a) on page 41 of 60 of the Permit. The survey shall be conducted by a certified Method 9 observer per the VOP.
- At a minimum of twice daily, a survey of visible emissions (opacity) from the DSTF shall be performed per Attachment "B", Condition VIII.B.1.d.(3)(b), on page 42 of 60 of the Permit. The survey shall be conducted by a certified Method 9 observer per the VOP.
- At a minimum of once daily when wind speeds are at or above 15 MPH, or gusts at or above 20 MPH, the dry stack tailings areas shall be inspected for easily erodible areas. [per Attachment "B", Condition VIII.B.1.d.(4)(b) on page 42 of 60 of the Permit].

## 5.0 GENERAL DUST CONTROL METHODS

The following procedures for general dust control methods are listed in Attachment “B”, Conditions VIII.B.1.a.(4)(a) through VIII.B.1.a.(4)(i) on pages 39 and 40 of 60 in the Permit. Records shall be maintained of the dates on which any of the activities listed were performed and the control measures that were utilized (Attachment “B”, Condition VIII. B.1.d.(2) on page 41 of 60 of the Permit).

- Keep dust and other types of air contaminants to a minimum in an open area where construction operations, repair operations, demolition activities, clearing operations, leveling operations, or any earth moving or excavating activities are taking place, by good modern practices such as using an approved dust suppressant or adhesive soil stabilizer, paving, covering, landscaping, continuous wetting, detouring, barring access, or other acceptable means;
- Keep dust to a minimum from driveways, parking areas, and vacant lots where motor vehicular activity occurs by using an approved dust suppressant, or adhesive soil stabilizer, or by paving, or by barring access to the property, or by other acceptable means;
- Keep dust and other particulates to a minimum by employing dust suppressants, temporary paving, detouring, wetting down or by other reasonable means when a roadway is repaired, constructed, or reconstructed;
- Take reasonable precautions, such as wetting, applying dust suppressants, or covering the load when transporting material likely to give rise to airborne dust;
- Take reasonable precautions, such as the use of spray bars, wetting agents, dust suppressants, covering the load, and hoods when crushing, handling, or conveying material likely to give rise to airborne dust;
- Take reasonable precautions such as chemical stabilization, wetting, or covering when organic or inorganic dust producing material is being stacked, piled, or otherwise stored;
- Operate stacking and reclaiming machinery utilized at storage piles at all times with a minimum fall of material, or with the use of spray bars and wetting agents;
- Any other method as proposed by the Permittee and approved by the Director; and
- Operate mineral tailings piles by taking reasonable precautions to prevent excessive amounts of particulate matter from becoming airborne. Reasonable precautions shall mean wetting, chemical stabilization, revegetation or such other measures as are approved by the Director.

Additional general dust control requirements listed in Attachment “B”, Condition VIII.B.1.b.(2), (3), and (4) on page 40 of 60 in the Permit, include:

- Water, or an equivalent control, shall be used to control visible emissions from haul roads and storage piles;
- The Permittee shall comply with the dust control measures identified in the Dust Control Plan specified in Attachment “D” of the Permit; and
- The Permittee shall use appropriate means, such as berms, signs or other effective procedures, to restrict traffic usage to the treated areas. Should there be a rock spill on a roadway such that traffic is blocked, the Permittee shall clean up the spill; under no circumstances is traffic to be diverted to untreated areas to avoid the spill. This condition does not prohibit cleanup equipment from using untreated areas in the course of cleanup activities.

## 6.0 MONITORING AND REPORTING

Monitoring and reporting components for this portion of the Air Quality Control Permit are listed below.

### 6.1 MONITORING

The following monitoring and record keeping are required by the Permit:

- Records of all monitoring information shall include, but is not limited to, the following (Attachment “A”, Condition XIII.A on page 11 of 60 of the Permit):
  - The date, place as defined in the Permit, and time of sampling or measurements;
  - The date(s) analyses were performed;
  - The name of the company or entity that performed the analyses;
  - A description of the analytical techniques or methods used;
  - The results of such analyses; and
  - The operating conditions as existing at the time of sampling or measurement.
- Records shall be kept of tonnage of ore and waste rock mined on a daily basis. Records of each day’s mined rock total shall be available in a central log no later than 5:00 pm the following business day (Attachment “B”, Condition II.C.2 on page 19 of 60 of the Permit).
- Opacity monitoring as detailed in Section 4.3 and discussed in prior sections.
- Record the lengths of active unpaved service roads and unpaved haul roads such that the total lengths of operational unpaved roads do not exceed the estimates in the permit conditions (Attachment “B”, Condition VIII.B.1.a.(5) on page 40 of 60 of the Permit)
- Maintain records on the activities (dates) conducted for the general dust control methods listed on pages 39 and 40 in Attachment “B”, Conditions VIII.B.1.a.(4)(a) through (4)(i) (Attachment “B”, Condition VIII.B.1.d.(2) on page 41 of 60 of the Permit).
- Records shall be kept to demonstrate compliance with training and posting of speed limits for general (light-duty) vehicle traffic travelling on the Property (see Sections 3.1 and 3.2 above and Attachment “B”, Condition VIII.B.1.c.(1) on page 41 of 60 of the Permit). In summary, general (light-duty) vehicle speeds shall be limited to 35 MPH on roads with adequate dust control and 15 MPH on Forest Service roads. Additionally, Rosemont also anticipates limiting general (light-duty) vehicle speeds to 15 MPH when travelling directly on top of the dry stack tailings.
- When wind speeds are at or above 15 MPH, or gusts are at or above 20 MPH, a record of the following shall be kept (Attachment “B”, Condition VIII.B.1.e.(2) on page 42 of 60 of the Permit):
  - Meteorological data;
  - All tailings inspections; and
  - All control measures used and corrective actions taken to demonstrate compliance with opacity limitations.
- Record watering schedules per shift basis (Attachment “B”, Condition VIII.B.1.e.(3) on page 43 of 60 of the Permit and per Section D.7.3 of Dust Control Plan).



- Record initial and subsequent application of dust suppressants per Sections D.7.1 and D.7.2 of the Dust Control Plan.
- Recording the following information may be required depending on the selected haul road dust control plan (see Dust Control Plan):
  - Meteorological conditions (precipitation, evaporation);
  - Traffic volume along select roads sections; and
  - Tonnage of material moved along certain road sections.

## 6.2 REPORTING

Notwithstanding exceedances, Permit reports to ADEQ will include the following reports on the specified timelines.

- Compliance Schedule (submit to Director of ADEQ within 21 days of any excess emission or permit deviation that cannot be corrected with 72 hours (Attachment “A”, Condition XII.D. on page 8 of 60 of the Permit). The compliance schedule shall include:
  - Schedule of remedial measures; and
  - Enforceable sequence of actions with milestones, leading to compliance with permit terms or conditions that have been violated.
- Semiannual Compliance Certification (period from October 1st to March 31st; due by May 15th) (Attachment “A”, Condition VII.A. on page 4 of 60 of the Permit)
- Semiannual Compliance Certification (period from April 1st to September 30th; due by November 15th) (Attachment “A”, Condition VII.A. on page 4 of 60 of the Permit)
- Semiannual Outstanding Compliance Schedule (February 1st to July 31st; although not specified - provide within 15 days, i.e., by August 15th) (Attachment “A”, Condition VII.A. on page 4 of 60 of the Permit)
- Semiannual Outstanding Compliance Schedule (August 1st to January 31st; although not specified – provide within 15 days, i.e., by February 15th) (Attachment “A”, Condition VII.A. on page 4 of 60 of the Permit)
- The semiannual summary reports shall (Attachment “B”, Condition II.C.6. on page 20 of 60 of the Permit):
  - Identify each monitoring activity
  - State whether monitoring was conducted as required by the permit;
  - List any deviations with dates, nature of the deviation and any explanation and/or corrective action; and
  - Identify any exceedances to excursions of relevant standards.
- Dry Tailings Management Plan (Attachment “B”, Condition VIII.B.1.b.(5)(a) on page 41 of 60 of the Permit). This Plan is due:
  - 180 days prior to start of dry tailings deposition in the minerals tailings area; and/or
  - Submitted with significant permit amendment.

- Review of the Dry Tailings Management Plan's effectiveness (Attachment "B", Condition VIII.B.1.d.(4)(c) on page 42 of 60 of the Permit). Review of the Plan is due:
  - January 31st of each year (covering January 1st to December 31st of previous year)
- If review of the Dry Tailings Management Plan demonstrates ineffectiveness in controlling emissions, a Revised Dry Tailings Management Plan is required (Attachment "B", Condition VIII.B.1.d.(4)(c) on page 42 of 60 of the Permit). Revisions to the Plan are due:
  - April 1st (if Plan shows ineffectiveness in controlling emissions)

If necessary, the revised Dry Tailings Management Plan shall show improved methods/techniques for reducing emissions in order to minimize or prevent further violations (Attachment "B", Condition VIII.B.1.d.(4)(c) on page 42 of 60 of the Permit). The annual review shall take into account the following:

- Past compliance issues (both resolved and unresolved);
- Validated complaints reported to the Department (ADEQ); and
- Proposed methods of avoiding the above issues/validated complaints in the future.

Additional reporting includes:

- Annual Emissions Inventory Questionnaire (due by March 31st or 90 days after Director "of ADEQ" makes the inventory form available each year) (Attachment "A", Condition VI.A. on page 4 of 60 of the Permit)
- Visual Observation Plan (due to ADEQ at least 30 days prior to start of operations, i.e. pit excavation) (Attachment "B", Condition II.B.1. on page 18 of 60 of the Permit).

Reporting under the Permit and under this Plan also covers mitigation and monitoring measure (Mitigation Measure) requirements of the U.S. Forest Service's (USFS, Forest Service) Coronado National Forest (Coronado) Final Environmental Impact Statement (FEIS; USFS, 2013) for the Rosemont Copper Project (Project). These Mitigation Measures are listed below:

- OA-AQ-02 – Dust control for unpaved roads (page B-77 of the FEIS)
- OA-AQ-03 – Dust control for open areas and storage piles (page B-78 of the FEIS)
- OA-AQ-11 – Opacity Monitoring (pages B-82 and B-83 of the FEIS)

Semi-annual reports (and other reporting as needed) prepared for ADEQ regarding compliance with these Mitigation Measures will be shared with the Forest Service.

As noted in Section 1.0, this Plan will require updating within 45 days of the issuance of permit renewals.

## 7.0 ADAPTIVE MANAGEMENT

The adaptive management process will be incorporated into the implementation of operational dust control measures. This process will ensure that the most practicable dust control measures are utilized and that the intent of the Plan is being met. The three key general components of adaptive management are:

- Testing assumptions – collecting and using monitoring data to determine if current assumptions are valid;
- Adaptation – making changes to assumptions and monitoring program to respond to new or different information obtained through the monitoring data and project experience; and
- Learning – documenting the planning and implementation processes and its successes and failures for internal learning.

Elements that may be modified as part of the adaptive management process for this Plan include, but are not limited to, the following:

- Inclusion and implementation of improved methods/techniques for reducing emissions

As stated in Section 6.2 above, this Dry Tailings Management Plan shall be reviewed annually for effectiveness in controlling fugitive emissions (Attachment "B", Condition VIII.B.1.d.(4)(c) on page 42 of 60 of the Permit). This review is due to the Director of ADEQ air permit division by January 31st, which covers the reporting period from January 1st through December 31st of the previous year.

If the review of the Plan shows ineffectiveness in controlling emissions, a revised Plan shall be submitted for approval by April 1st following the annual review. The revised Plan shall show improved methods/techniques for reducing emissions in order to minimize or prevent further violations. The annual review shall take into account the following:

- Past compliance issues (both resolved and unresolved);
- Validated complaints reported to the Department (ADEQ); and
- Proposed methods of avoiding the above issues/validated complaints in the future.

With regard to the Dust Control Plan, Attachment "B", Condition II.A.5. on page 17 of 60 of the Permit, states the following:

*The Permittee shall comply with the dust control plan included in Attachment "D" of this permit to control particulate matter emissions from activities identified in the dust control plan. The permittee may implement proposed changes to the dust control plan upon submission to the Director if necessary to further minimize fugitive dust. Nothing in this permit prohibits the Permittee from implementing additional dust control measures not set forth in the dust control plan*

## 8.0 DATA MANAGEMENT

Records will either be kept in hardcopy format or electronically. These records will be used as a basis of reporting and compliance verification.

Regarding document retention (Attachment “A”, Condition XIII.B. on page 11 of 60 of the Permit):

*The Permittee shall retain records of all required monitoring data and support information for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings or other data recordings for continuous monitoring instrumentations, and copies of all reports required by the permit.*

Additionally, regarding document retention (Attachment “B”, Condition II.C.4. on page 19 of 60 of the Permit):

*All records, analyses, and reports required by this permit shall be retained for a minimum of five years from the date of generation. The most recent two years of data shall be kept on-site. All records shall be made available for inspection by authorized department personnel during normal working hours.*

Regarding the format of document retention (Attachment “A”, Condition XIII.C. on page 11 of 60 of the Permit):

*All required records shall be maintained either in an unchangeable electronic format or in a handwritten logbook utilizing indelible ink.*

## 9.0 REFERENCES

Arizona Administrative Codes (A.C.C.).

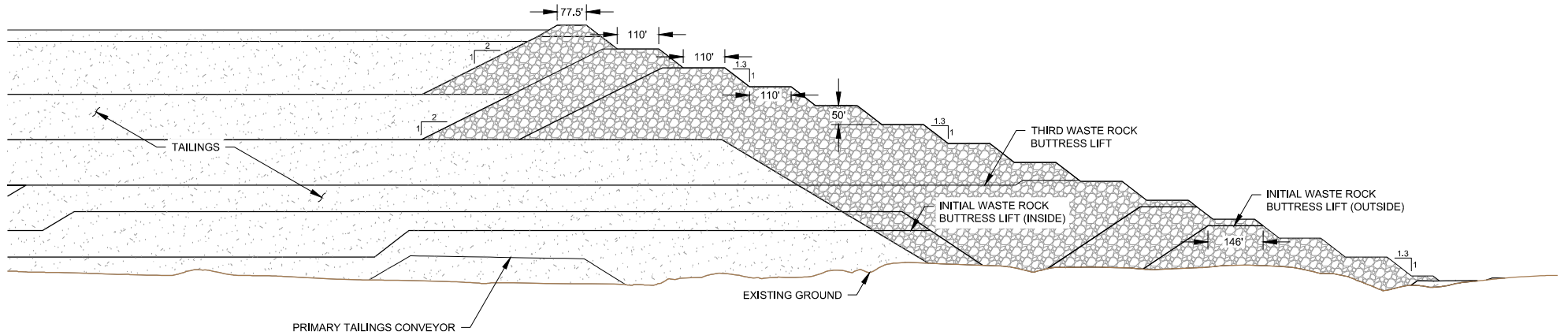
ADEQ (2015), Aquifer Protection Permit No. P-106100, amended August 26, 2015.

ADEQ (2013), Air Quality Class II Synthetic Minor Permit #55223 (includes Dust Control Plan). January 31, 2013.

Call & Nichols, Inc. (CNI) (2008). *Feasibility-Level Geotechnical Study for the Rosemont Deposit*. Prepared for August Resources. Report dated February 2008.

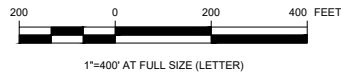
USFS, 2013. *Final Environmental Impact Statement for Rosemont Copper Project, Appendix B Mitigation and Monitoring Plan*. December 2013

## FIGURES

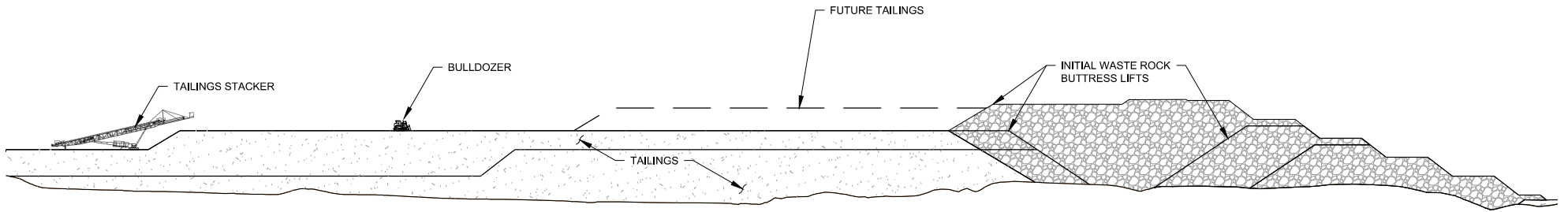




**NOTES:**

- SCALE BAR MEASURES 1.5" ON A FULL SIZE PLOT (ANSI-A).

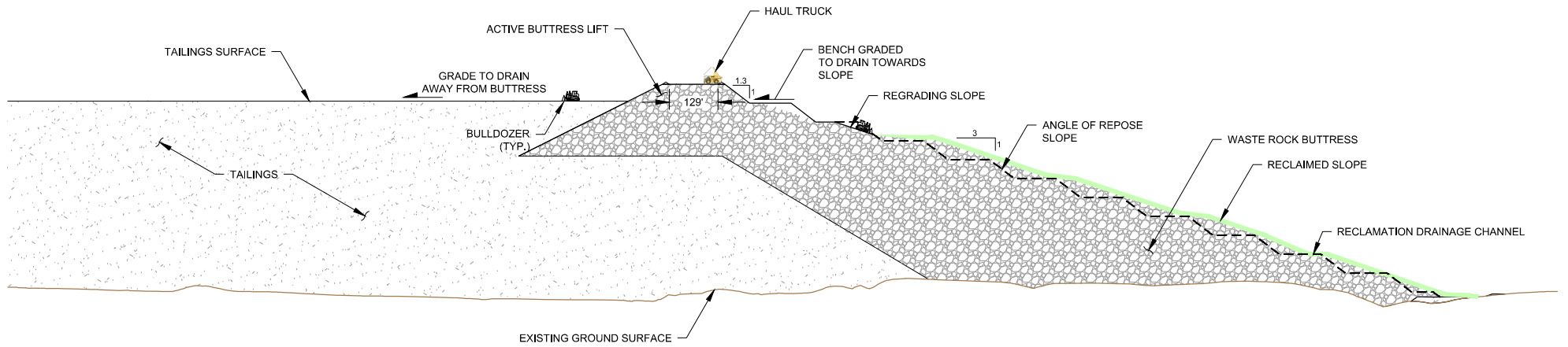


PROJECT						ROSEMONT COPPER PROJECT					
TITLE						TAILINGS WASTE ROCK PERIMETER BUTTRESS TYPICAL SECTION					
CLIENT											
DESIGNED BY	JT	LOCATION	PROJECT NUMBER	FIGURE NUMBER	REVISION						
DRAWN BY	RS	DV101	349.11	1	A						
ACTIVITY CODE	N/A	XREF NUMBER	N/A								



PROJECT						ROSEMONT COPPER PROJECT					
TITLE						TAILINGS STACKER AND EQUIPMENT TRACKING ON TAILINGS (NOT TO SCALE)					
CLIENT						 					
DESIGNED BY	JT	LOCATION	PROJECT NUMBER	FIGURE NUMBER	REVISION						
DRAWN BY	RS	DV101	00349.11	2	A						
ACTIVITY CODE	N/A	XREF NUMBER	N/A								





PROJECT						ROSEMONT COPPER PROJECT					
TITLE						CONCURRENT RECLAMATION OF OUTER BUTTRESS SLOPE					
CLIENT											
DESIGNED BY	JT	LOCATION	PROJECT NUMBER	FIGURE NUMBER	REVISION						
DRAWN BY	RS	DV101	349.11	3	A						
ACTIVITY CODE	N/A	XREF NUMBER	N/A								