

STATE OF
COLORADO

Cazier - DNR, Tim <tim.cazier@state.co.us>

Response to Finding Regarding Sprinklers

1 message

Florquist, Brigitte <BFlorquist@anglogoldashanti.com>

Wed, Jul 8, 2015 at 9:43 AM

To: "Cazier - DNR, Tim" <tim.cazier@state.co.us>

Cc: "Hanks, Chris" <CHanks@anglogoldashanti.com>, "Gorman, Jonathan" <JGorman@anglogoldashanti.com>

Good Morning Mr. Cazier,

Please find attached; CC&V Response to DRMS finding from the Inspection dated June 17, 2015 regarding the possibility of sprinklers on Arequa Valley Leach Facility causing off site damage. A hard copy will follow via USPS.

Regards,

Getta

Brigitte Florquist

Administrator

Environmental Resources



Tel: 719-689-4029

Fax: 719-689-3254

Email: bflorquist@anglogoldashantina.com

Consider the environment. Think before you print.

This email, and its attachments, is subject to important warnings and disclaimers which are legally incorporated into this email in terms of Section 11(3) of the South African Electronic Communications and Transactions Act, 25 of 2002. The full text of the warnings and disclaimers, together with the company details and directors is available by clicking on <http://www.anglogoldashanti.co.za/additional/generalinfo/emaildisclaimer.htm>

**Response to Sprinklers on AVLF.pdf**

2079K



Cripple Creek & Victor Gold Mining

A Joint Venture · ANGLGOLD ASHANTI (COLORADO) CORP., Manager

Operations Office

P.O. Box 191 · 100 North 3rd Street
Victor, Colorado 80860
(719) 689-2977 – Fax (719) 689-3254



SENT CERTIFIED, RETURN RECEIPT REQUESTED
7014-2870-0001-3417-6067

8 July 2015

Mr. Timothy Cazier, P.E.
Environmental Protection Specialist
Colorado Department of Natural Resources
Division of Reclamation, Mining and Safety
Office of Mined Land Reclamation
1313 Sherman Street, Room 215
Denver, Colorado 80203

Re: Permit No. M-1980-244; Cripple Creek & Victor Gold Mining Company (“CC&V”);
Cresson Project; – Response on possibility of sprinklers on Arequa Valley Leach Facility
(AVLF) may be causing off site damage.

Dear Mr. Cazier:

Cripple Creek & Victor Gold Mining Co. (CC&V) is writing to you with regard to the following finding from the 17 June 2015 DRMS inspection report issued on 24 June 2015:

INSPECTION TOPIC: Off-Site Damage

PROBLEM/POSSIBLE VIOLATION: Problem: Sprinklers may be causing an off-site odor

CORRECTIVE ACTIONS: The Operator shall submit the following requested information related to the sprinkler/snow-making machine evaporation operation: 1) cyanide concentration, 2) concentration of other constituents (including those that may be contributors to the detected odor), 3) estimated daily volume of solution emitted through the sprinklers/snow-making machines, and 4) confirmation that the emitted solution is barren.

CORRECTIVE ACTION DUE DATE: 7/24/15

The answers to the questions requested in the corrective action related to the use of sprinklers and the snow machines to evaporate water off the VLF were provided by Jeff Winterton, Process Manager, and Laurin Colby, Chief Site Metallurgist at CC&V. Their responses are in red following the questions:

- 1) Cyanide concentration, is **nominally 100 ppm NaCN.**
- 2) Concentration of other constituents (including those that may be contributors to the detected odor). **The attached spreadsheet shows results from recent third-party analyses of barren solution**

collected from the VLF. Results indicate that the bulk of the total dissolved solids in solution consist of metallic cations and simple anions. To the best of CC&V's knowledge none of the likely/indicated compounds have strong odors.

3) Estimated daily volume of solution emitted through the sprinklers/snow-making machines, ~3.6M gallons per day is being pumped through the sprinklers/ evaporators. The bulk of the flow through the sprinklers/evaporators falls back onto the pad. The exact amount of evaporation is difficult to measure because it is dependent on changing weather conditions. Reported values in the literature suggest losses in similar circumstances are on the order of 5%. This agrees with bulk observations of recent solution flows.

4) Confirmation that the emitted solution is barren. The majority of the emitted solution is barren. Enrichment solution is also emitted in some areas of the pad. Both solutions are chemically similar and have the same nominal cyanide concentrations. The only difference is that enrichment solution bypasses the recovery plant before being returned to the pad and therefore has a higher gold concentration.

The wetted area around the wobblers has been monitored and does not extend off the VLF.

There is no analytical proof that what people have smelled is Cyanide as we have not received any description of the odor and/or times when the issue occurred. Without knowing the specific time, location and date of the complaint, it is really difficult for CC&V respond more fully to this inquiry.

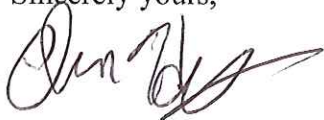
The use of wobblers / sprinklers as an alternative to drip lines on the VLF is discussed in the MLE-2 Amendment 10 Project Description.

Solution typically will be applied using drip irrigation; however, there may be periods when sprinkler-type wobblers will be used to apply solution to the ore. (Project Description 2012: Volume 1, 7-13).

CC&V has used similar solution management strategies in the past without any indication of offsite odor.

Please contact me at (719)-689-4048 should you have questions or wish to discuss this response to DRMS's Corrective Action.

Sincerely yours,



Chris Hanks
Chief Environmental Coordinator

cc: Jonathan Gorman

Enclosure

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Duplicate Identifier	Sample Identifier	Acidity, Total (mg/l as CaCO3)	Reason for No Sample	Alkalinity, Bicarbonate (mg/l as CaCO3)	Alkalinity, Carbonate (mg/l as CaCO3)	Alkalinity, Total (mg/l as CaCO3)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	0	ADR-BARREN	0		0	38.8	190
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	0	ADR-BARREN					184
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25	0	ADR BARREN					

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Aluminum, Dissolved (mg/l as Al)	Aluminum, Total (mg/l as Al)	Antimony, Dissolved (mg/l as Sb)	Antimony, Total (mg/l as Sb)	Arsenic, Dissolved (mg/l as As)	Arsenic, Total (mg/l as As)	Barium, Dissolved (mg/l as Ba)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	0.046	0.106	-0.005	-0.005	0.012	0.014	0.103
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	0.093	0.177					0.098
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Barium, Total (mg/l as Ba)	Beryllium, Dissolved (mg/l as Be)	Beryllium, Total (mg/l as Be)	Boron, Total (mg/l as B)	Cadmium, Dissolved (mg/l as Cd)	Cadmium, Total (mg/l as Cd)	Calcium, Dissolved (mg/l as Ca)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	0.107	-0.001	-0.001	-0.02	0.004	0.005	408
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	0.117				0.004	0.005	407
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Calcium, Total (mg/l as Ca)	cation and anion sum meq/l	Chloride, Total in Water mg/l	Chromium, Dissolved (mg/l as Cr)	Chromium, Total (mg/l as Cr)	Cobalt, Dissolved (mg/l as Co)	Cobalt, Total (mg/l as Co)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	416	68.377	232	0.007	0.008	0.453	0.453
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	413	69.89	214				
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company

Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Copper, Dissolved (mg/l as Cu)	Copper, Total (mg/l as Cu)	Cyanide Free, mg/l	Cyanide, Total (mg/l as CN)	Fluoride, Total (mg/l as F)	Gold Total mg/l as Au	Gold, Dissolved, mg/l
AngloGold Ashanti (C) ADR BARREN										
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	0.261	0.261	62.1	84.7	1.4	0.006	0.006
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	0.86	0.885	51.5	55.1	1.49	0.015	0.015
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Hardness, Total (mg/l as CaCO3)	Hydroxide ion mg/l	Iron, Dissolved (mg/l as Fe)	Iron, Total (mg/l as Fe)	Lead, Dissolved (mg/l as Pb)	Lead, Total (mg/l as Pb)	Magnesium, Dissolved (mg/l as Mg)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	1030	42.5	0.106	0.342	-0.001	0.006	1.93
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	1030		0.094	0.155			2.7
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Magnesium, Total (mg/l as Mg)	Manganese, Dissolved (mg/l as Mn)	Manganese, Total (mg/l as Mn)	Mercury, Total (mg/l as Hg)	Molybdenum, Dissolved (mg/l as Mo)	Molybdenum, Total (mg/l as Mo)	Nickel, Dissolved (mg/l as Ni)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	2.04	0.566	0.819	0.0005	6.79	6.99	0.071
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	2.83	0.401	1.09	0.0019			
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Nickel, Total (mg/l as Ni)	Nitrate Nitrogen, Total (mg/l as N)	Nitrite Nitrogen, Total (mg/l as N)	Nitrogen, Ammonia, Total (mg/l as N)	Oil and Grease Visual (No=0, Yes=1)	Oxygen, Dissolved mg/L	pH, Field, Standard Units
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	0.073	257	-0.05	25.8	0	5.12	10.5
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25		271	-0.05	27.4	0	5.72	10.4
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25					0		10.24

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	pH, Lab, Standard Units	Potassium, Total mg/l as K)	Selenium, Dissolved (mg/l as Se)	Selenium, Total (mg/l as Se)	SILICON, DISSOLVED (MG/L AS SI)	Silicon, Total as Si, mg/l	Silver, Dissolved (mg/l as Ag)
AngioGold Ashanti (C) ADR BARREN		05/13/2015	12:20	10	20.9	0.041	0.042	14.7	14.7	0.009
AngioGold Ashanti (C) ADR BARREN		06/02/2015	12:25	9.97	20.5	0.04	0.04	14.5	14.5	0.026
AngioGold Ashanti (C) ADR BARREN		07/01/2015	11:25							

Cripple Creek & Victor Gold Mining Company

Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Silver, Total (mg/l as Ag)	Sodium, Total (mg/l as Na)	Specific Conductance (umhos/cm @ 25C)	Specific Conductance, Field (umhos/cm @ 25C)	Strontium, Dissolved (mg/l as Sr)	Strontium, Total (mg/l as Sr)	Sulfate, Total (mg/l as SO4)
AngloGold Ashanti (C)ADR BARREN		05/13/2015	12:20	0.012	271	3280	2770	5.71	5.72	323
AngloGold Ashanti (C)ADR BARREN		06/02/2015	12:25	0.027	265	3200	2970			389
AngloGold Ashanti (C)ADR BARREN		07/01/2015	11:25				2650			

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Sum of Anions, Total in Water, meq/l	Sum of Cations & Anions, % Difference	Sum of Cations, Total in Water, meq/l	Temperature, Water (Degrees Centigrade)	Temperature, Water (Degrees Fahrenheit)	THIOCYANATE, TOTAL (MG/L AS SCN)	Total Dissolved Solids, mg/l
AngloGold Ashanti (C)ADR BARREN	05/13/2015	12:20	36.6	-2.7	34.7	13.9	57	8.04	2650	
AngloGold Ashanti (C)ADR BARREN	06/02/2015	12:25	37.248	-5.59	32.642	15	59	8.2	2910	
AngloGold Ashanti (C)ADR BARREN	07/01/2015	11:25				15.2	59.4			

Cripple Creek & Victor Gold Mining Company
Water Quality Monitoring Data

Facility Name	Site Number	Sample Date	Sample Time	Total Suspend Solids, mg/l	Vanadium, Dissolved (mg/l as V)	Vanadium, Total (mg/l as V)	Weak Acid Dissociable Cyanide, mg/l	Zinc, Dissolved (mg/l as Zn)	Zinc, Total (mg/l as Zn)
AngloGold Ashanti (C) ADR BARREN		05/13/2015	12:20	-10	0.013	0.013	67.2	-0.05	-0.05
AngloGold Ashanti (C) ADR BARREN		06/02/2015	12:25	-10			53	0.074	0.086
AngloGold Ashanti (C) ADR BARREN		07/01/2015	11:25						