



# Department of Environmental Quality



To protect, conserve and enhance the quality of Wyoming's environment for the benefit of current and future generations.

Dave Freudenthal, Governor

John Corra, Director

December 15, 2009

Mr. Angelo Kallas,  
CAMECO RESOURCES  
PO BOX 1210  
GLENROCK, WY 82637

RE: Third Quarter 2009 Excursion Monitoring Reports, Cameco Resources, PERMIT #633 and PERMIT #603

Dear Mr. Kallas:

Enclosed please find the review of the Third Quarter 2009 Excursion Monitoring Reports for the Highland (Permit #603) and Smith Ranch (Permit #633) permits. Several of the wells reviewed show evidence of being affected by mining fluids and are threats to go on excursion.

Cameco Resources is encouraged to provide LQD with information showing that the company is aware of these wells and is taking steps to prevent an excursion. The LQD is also concerned that the additional volume of water affected by mining in these areas may affect the restoration schedule and surety estimate.

If you have any questions please feel free to contact me at (307) 777-7064 or by email at [single@wyo.gov](mailto:single@wyo.gov).

Sincerely

Steve Ingle  
Land Quality Division  
District I

Cc: Pam Rothwell, Assistant Supervisor, District I  
Doug Mandeville, NRC

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## MEMORANDUM

To: Pam Rothwell, Permit Coordinator

From: Steve Ingle, District I

Date: December 9, 2009

Subject: Cameco Resources (CR), Third quarter excursion monitoring report, Permit #633 and Permit #603

The following is a review of the third quarter excursion monitoring report for CR's Smith Ranch and Highland Projects. The NOV issued for IM-8 required CR to revise their standard operating procedures to identify potential problem areas within wellfields and take corrective actions. The items identified in the review are compiled below.

### Smith Ranch

Wellfield 4 does not appear to have been operating during this quarter, because the water levels in the monitoring wells are relatively constant. During the quarter the overlying aquifer in the K-Wellfield had rising water levels. The water level change in the K-Wellfield may be due to communication between the production zone and the overlying aquifer. The reported upper control limit (UCL) for conductivity in the overlying unit in the K-Wellfield may be incorrectly shown on the tables.

MD205	Water levels only, no UCL's
MD210	Water levels only, no UCL's
MS201	Water levels only, well may be dry
MS310	Elevated chloride with values up to 19 mg/l (UCL 22), the water level is constant.
M229A	Chloride values range from 14-16 mg/l (UCL 19 mg/l) and alkalinity ranges from 172-190 mg/l (UCL 177 mg/l)
M442	The alkalinity UCL was exceeded in all samples except 1 during the quarter, chloride values are elevated, but below the UCL.
M452	Elevated chloride and alkalinity, no UCL's were exceeded during the quarter, but the values are approaching the UCL's
M1521-M1525	These wells may have been affected by mining fluids, due to elevated alkalinity
MU1501	Water levels only
MU1524	Water levels only
KM004	Exceeds the conductivity UCL on several occasions
KM006A	Exceeds the conductivity UCL on one occasion during the quarter
KM007	Exceeds the conductivity UCL on two occasions during the quarter
KM009	Exceeds the conductivity UCL on one occasion during the quarter
KMO10A	Exceeds the conductivity UCL on three occasions during the quarter
KMO11	Exceeds the conductivity UCL on all five samples during the quarter
KMO12	Exceeds the conductivity UCL on all five samples during the quarter
KMO13	Exceeds the conductivity UCL on all five samples during the quarter
KMO14	Exceeds the conductivity UCL on all five samples during the quarter

KMO15	Exceeds the conductivity UCL on all five samples during the quarter
KMO16	Exceeds the conductivity UCL on all five samples during the quarter
KMO17	Exceeds the conductivity UCL on all five samples during the quarter
KMO18	Exceeds the conductivity UCL on all five samples during the quarter
KMO20	Exceeds the conductivity UCL on two occasions during the quarter
KMO21	Exceeds the conductivity UCL on three occasions during the quarter
KMO22	Exceeds the conductivity UCL on three occasions during the quarter
KMO23A	Exceeds the conductivity UCL on all five samples during the quarter
KMO24A	Exceeds the conductivity UCL on four samples during the quarter
KMO25A	Exceeds the conductivity UCL on four samples during the quarter
KMO26A	Exceeds the conductivity UCL on all five samples during the quarter
KMO27	Exceeds the conductivity UCL on four samples during the quarter
KMO29	Has a different UCL for conductivity. The UCL listed for KMO04-KMO26A and KMO31 may be incorrect.
KMU003	Water levels only, very high conductivity UCL.
KMU009	Water levels only
KMU013A	Water levels only, no UCL's

### Highland

CM15	On excursion for the entire period. Uranium is below detection limit 0.1 mg/l. Please use a lower detection limit to demonstrate that uranium is below the mcl of 0.03 mg/l. During the quarter the water levels in this well have been gradually declining, which appears to have resulted in an improvement in the water quality.
CM17	Missed sample?
CM32	On excursion for the entire period. Please use a lower detection limit to demonstrate that uranium is below the mcl of 0.03 mg/l. Slight improvement.
CM33	Chloride exceeds the UCL (UCL 18) Chloride 26 mg/l
CM38	Chloride below the UCL, but elevated.
CMO1	Water levels only.
CMO3	Chloride below the UCL, but elevated.
CMO4	Chloride below the UCL, but elevated.
CMO5	Chloride below the UCL, but elevated.
CMO6	Chloride below the UCL, but elevated.
CMO7	Chloride exceeds the UCL(UCL 18) Chloride 26 mg/l.
CMO8	Chloride below the UCL, but elevated.
CMO9	Chloride exceeds the UCL(UCL 14) Chloride 16 mg/l and 19 mg/l.
CMO10	Chloride below the UCL, but elevated.
CMU15	Chloride above the UCL (UCL 18 mg/l) Chloride 41 mg/l. Alkalinity and Conductivity elevated, but below the UCL.
CMU28	All UCL parameters elevated.
DM2	Only water levels taken for the quarter.
DM3	Alkalinity has exceeded the UCL for all samples during the quarter, Chloride exceeded the UCL on 9/08/2009, verification samples showed chloride was at or below the UCL. However, chloride was elevated the entire quarter.

DM16 Alkalinity has exceeded the UCL for all samples during the quarter. Chloride exceeded the UCL on the July 7, 2009 sampling, chloride in the verification samples was at the UCL. Chloride remains at the UCL.

DM24 Chloride and alkalinity are elevated, but below the UCL's.

EMO2 This is the only overlying aquifer well monitored for UCL's. Wells EMO3-EMO18 were monitored for water levels only. The August 21, 1991 text needs to be cited

FM8 Excursion verification samples were taken in July and August. 7/07/2009 on excursion, not identified. 7/20/2009, on excursion not identified (no verification samples until 7/22 and 7/23 which exceeds the 24-hour verification sampling), off excursion based on verification. 8/10/2009 on excursion (verification samples on 8/11 and 8/12, showed the well off excursion). Further investigation regarding this well has been reported separately.

FM9 Alkalinity exceeds UCL, chloride elevated.

FM29 Alkalinity exceeded the UCL for two samples during the quarter, chloride elevated, but below the UCL

FMO2 Elevated chloride.

FMO1 Water level only

FMO4-FMO7 Water levels only.

FM09-FMO11 Water levels only

FMO12 Elevated chloride and alkalinity

FMO13-FMO20 Water levels only

FMO21 Elevated chloride

FMU2-FMU6 Water levels only

FMU8 Water levels only

FMU17 Water levels only

FMU19, FMU20 Water levels only

HM20 Elevated chloride and alkalinity.

HMO1 Water levels only

HMO9 Elevated chloride

HMU5 Chloride more than doubled from 4 mg/l to 10 in the 9/24/2009 sample, in addition to increases in alkalinity and conductivity

IM8 On excursion. See NOV for details. The values in the 9/23/2009 sample are below the UCL's.

IM9 Elevated chloride.

IM10 Elevated chloride and alkalinity

IM14 Elevated chloride

IMU2, IMU3 Water levels only

JMO26 Elevated chloride

JMO002-JMO004 Water levels only

JMO008 Water levels only

JMO009 Elevated chloride, conductivity exceeds UCL for all samples

JMO014 Water level only

JMO015 Check conductivity UCL

JMT001 and JMT002 are not shown on any maps

CMP2 Water level only

CMP22-23	Water level only
CMP28	Water level only
CMP31	Water level only
CMU1	On excursion for chloride and alkalinity for the entire quarter
CMU12	On excursion for chloride and alkalinity
CMU13	Chloride exceeds the UCL
CMU2	On excursion for chloride and alkalinity
CMU3	On excursion for chloride and alkalinity
CRMW1	Chloride exceeds the UCL, uranium 1.2 mg/l
CRMW2	Chloride and alkalinity exceed the UCL, uranium 2.5 mg/l
CRMW3	Chloride and alkalinity exceed the UCL, uranium 1.4 mg/l
CRMW4	Chloride exceeds the UCL
CRMW5	Chloride exceeds the UCL
CRMW6	Chloride exceeds the UCL, uranium 0.4 mg/l

## **CONCLUSION**

The list above contains wells that appear to have been affected by lixiviant. CR needs to describe the steps that are being taken to prevent a potential excursion. The additional volume of groundwater affected by lixiviant is also a concern to LQD. The additional volumes of groundwater that may have been affected by lixiviant movement may extend the time and effort necessary to restore the mining units. The additional volume of groundwater needed to be restored may need to be accounted for in the surety estimate.

The water levels are provided as depth below surface. The water levels need to be provided as mean sea level. CR needs to provide the water levels as mean sea level.