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Date Check Rec'd 3/28/88
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By: Jackson

40-8698
RETURN ORIGINAL TO PDR, HQ.

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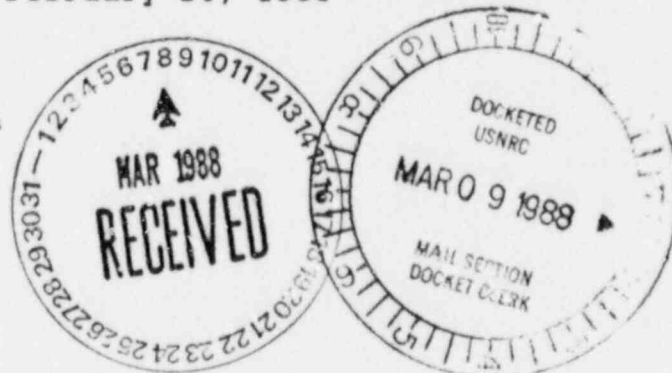
(801) 788-2720

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February 24, 1988

Edward Hawkins
Uranium Recovery Field Office
U.S. Nuclear Regulatory Commission
Box 25325
Denver, CO 80225

Re: SUA-1371
Docket No. 40-8698



Dear Mr. Hawkins:

Plateau Resources Limited submits this request for a license amendment with the \$150 fee in response to your recommendations in your December 29, 1987 letter to Plateau. This license amendment revises license condition 33 E to read:

The licensee shall, within 30 days of issuance of this amendment, utilize the following threshold values:
arsenic = 0.022 mg/l, selenium = 0.022 mg/l and pH = 6.8
standard units to determine if a significant change has occurred between the background values established in subsection (C) and the wells specified in subsection (B) and within this 30-day period, notify the USNRC, Uranium Recovery Field Office, of the finding. Should a significant change occur, the licensee shall within an additional 60 days propose, in the form of a license modification, a compliance monitoring program which defines the extent and concentration of hazardous constituents in the regulated unit.

The requested modifications change the arsenic threshold value from 0.0125 mg/l to 0.022 mg/l and changes the selenium threshold value from 0.0025 mg/l to 0.022 mg/l. Other changes were recommended to the NRC Uranium Recovery Field Office in our letters dated October 7, 1987 and December 8, 1987. Since those changes were not approved, Plateau is limiting this requested modification to a change in the arsenic and selenium threshold values.

The reasons for the requested changes are presented below:

- 1) Three out of 52 background concentrations for arsenic exceed the NRC proposed arsenic threshold value. Those values are indicated by an asterisk on the enclosed copy of the

Certified By

Mary C. Hood

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groundwater data used to establish background concentrations. Similarly 11 out of 52 background selenium concentrations exceed the NRC proposed selenium threshold. Those values are indicated by double asterisk on the enclosed data sheets. Both the arsenic and selenium threshold values proposed by the NRC fall within the natural background variations observed for both elements. Since the threshold values proposed by the NRC are intended to demonstrate a significant change from background concentrations, the threshold values need to be raised to fall outside the range of naturally occurring background concentrations in the groundwater samples.

2) Background concentrations of arsenic and selenium are indicated by the results from all the monitoring wells presented on the attached data sheet because:

- a) No significant differences in arsenic or selenium concentrations were observed between background and compliance wells.
- b) Observed concentrations exceeded the proposed threshold values in both the background monitoring well and in the compliance wells.
- c) The tailings disposal system has not been used since 1983.
- d) If seepage were being detected in the monitoring wells, the elevated concentrations would remain elevated until corrective actions could be implemented to minimize the seepage. In contrast the higher concentrations measured in Plateau's wells did not remain high for several months and nothing was done to the tailings area that would affect seepage.


3) The problem of naturally occurring background concentrations exceeding the NRC threshold values is illustrated in the July 29, 1987 memorandum from Gary Konwinski (Docket File No. WM-187). A copy is attached. The proposed NRC threshold value based on 25% of the drinking water standard was 0.003 mg/l for selenium. Yet in the groundwater data set presented on page 2 of the memorandum the selenium background values of 0.003, 0.003, 0.003, 0.004, and 0.005 equal or exceed the threshold value of 0.003. Thus the proposed NRC threshold value will not distinguish naturally occurring background concentrations from samples that would have high selenium concentrations from seepage. The same is true with the proposed threshold values for Plateau.

4) The threshold values proposed by Plateau in this license amendment request were selected to be close to but above the background concentrations in the groundwater monitoring wells. In addition the threshold values need to be minute, compared to the average concentrations in the tailings to allow for

detection of small amounts of tailings seepage. To meet those criteria Plateau proposes threshold values calculated by adding the average background concentration to the maximum background concentration measured throughout the year. Thus for arsenic the 0.005 mg/l average background was added to the 0.017 mg/l maximum value to obtain the threshold value of 0.022 mg/l. Similarly for selenium the 0.002 mg/l average background was added to the 0.020 mg/l maximum value to obtain a threshold concentration of 0.022 mg/l. That method of selecting threshold values should provide reasonable assurance that background concentrations will not exceed the threshold value. At the same time the 0.022 mg/l threshold value is small compared to the 1.75 mg/l average arsenic concentrations in tailings and the selenium concentration of 20 mg/l (Final Generic Environmental Impact Statement on Uranium Milling (NUREG-0706) table 5.3, p 5-5). Thus the threshold value proposed by Plateau should easily detect the presence of any seepage from the tailings.

For the reasons presented above Plateau Resources Limited requests the change in license condition 33 E.

Sincerely,

A handwritten signature in dark ink, appearing to read 'Noel Savignac', written in a cursive style.

Noel Savignac

enc.

cc. Roger Berg
Bill Collins

PLATEAU RESOURCES LIMITED GROUND WATER DATA

Date	Well	As	Se	pH
4-85	RM1	<0.005	0.004*	7.43
	RM4	0.012	<0.001	8.20
	RM5	0.017*	0.002	7.95
	RM6	<0.005	0.020*	7.58
5-85	RM1	0.009	0.010*	7.40
	RM4	<0.005	0.007*	7.65
	RM5	0.006	0.009*	7.60
	RM6	0.016*	0.009*	7.90
6-85	RM1	<0.005	<0.001	7.80
	RM4	<0.005	0.003*	8.20
	RM5	<0.005	<0.001	7.90
	RM6	<0.005	<0.001	7.80
7-85	RM1	<0.005	<0.001	8.10
	RM4	<0.005	<0.001	8.00
	RM5	<0.005	<0.001	7.82
	RM6	<0.005	<0.001	7.70
8-85	RM1	<0.005	<0.001	7.87
	RM4	<0.005	<0.001	8.10
	RM5	<0.005	<0.001	7.80
	RM6	<0.005	<0.001	8.25
9-85	RM1	<0.005	<0.001	7.67
	RM4	<0.005	<0.001	8.50
	RM5	<0.005	<0.001	8.04
	RM6	<0.005	<0.001	8.40
10-85	RM1	<0.005	<0.001	8.15
	RM4	<0.005	<0.001	8.11
	RM5	<0.005	<0.001	8.20
	RM6	<0.005	<0.001	8.43
11-85	RM1	<0.005	<0.001	7.87
	RM4	<0.005	<0.001	8.28
	RM5	<0.005	<0.001	8.16
	RM6	<0.005	<0.001	8.46
12-85	RM1	<0.005	<0.001	7.82
	RM4	<0.005	<0.001	8.09
	RM5	<0.005	<0.001	7.80
	RM6	<0.005	<0.001	8.21
1-86	RM1	0.005	0.001	7.87
	RM4	0.005	0.001	8.53
	RM5	0.005	0.001	7.86
	RM6	0.005	0.001	8.29

2-86	RM1	<0.005	<0.001	7.85
	RM4	<0.005	<0.001	8.18
	RM5	<0.005	<0.001	7.80
	RM6	<0.005	<0.001	8.43
3-86	RM1	0.005	0.007 *	7.76
	RM4	0.005	0.002	7.99
	RM5	0.005	0.001	7.82
	RM6	0.005	0.002	8.36
4-86	RM1	<0.005	<0.001	8.04
	RM4	0.005	0.005 *	8.17
	RM5	0.005	0.005 *	7.86
	RM6	0.005	0.009 *	8.04
Averages	RM1	0.005 + 0.001	0.002 + 0.003	7.82 + 0.22
	RM4			8.15 + 0.22
	RM5			7.89 + 0.16
	RM6			8.14 + 0.31



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION IV
URANIUM RECOVERY FIELD OFFICE
BOX 20238
DENVER, COLORADO 80228

JUL 29 1987

URFO:GRK
Docket File WH-187
040WH187301E

MEMORANDUM FOR: Docket File No. WH-187

FROM: Gary R. Konwinski, Project Manager
Licensing Branch 1
Uranium Recovery Field Office, Region IV

SUBJECT: METHODOLOGY FOR DETERMINING BACKGROUND
CONCENTRATIONS OF INDICATOR SPECIES

Introduction

At the direction of URFO, several licensees have submitted background values for indicator species at designated background wells. This data is generally accompanied by similar data for point of compliance (POC) wells. These data consist of analytical results for arsenic, selenium and pH. Lower limits of detection have been specified for arsenic and selenium which are within laboratory capability. This data will ultimately be utilized to determine if a statistically significant change has taken place in the water qualities at the various wells. The determination of a statistically significant change is necessary for compliance with 40 CFR 192. The ultimate goal of the detection monitoring system is to determine if leakage from the mill tailings is occurring. Also, the data collected will be utilized in establishing ground-water protection standards.

Within the body of this memorandum, the staff will explain that under certain situations data sets may not lend themselves to determining if a statistically significant change has taken place. In these situations, the staff will propose threshold values for the indicator parameters which, if exceeded, will in fact signal that ground-water protection standards are to be established and a corrective action program may need to be developed.

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Background Determination

As contained in the various source material licenses, background water quality is based upon monthly sampling of the indicator species for a period of 1 year. Most licensees have collected this data and submitted it for incorporation into their source material licenses. A staff review of this data indicates that three forms of data exist: absolute values for which a mean and standard deviation can be calculated, values determined to be less than detection limits and a combination of the two. Examples of these data sets are shown below:

Example Data Sets

<u>Absolute Values with a Mean and Standard Deviation</u>			<u>Values Less than Detection Limits</u>			<u>Combination of the two</u>		
<u>As</u>	<u>Se</u>	<u>pH</u>	<u>As</u>	<u>Se</u>	<u>pH</u>	<u>As</u>	<u>Se</u>	<u>pH</u>
0.006	0.001	7.0	<0.005	<0.001	7.0	<0.005	<0.001	7.0
0.005	0.002	7.2	<0.005	<0.001	7.2	0.006	<0.001	7.0
0.006	0.001	7.1	<0.005	<0.001	7.1	0.007	0.002	7.0
0.010	0.001	7.1	<0.005	<0.001	7.1	<0.005	0.001	7.1
0.011	0.002	7.2	<0.005	<0.001	7.2	0.007	0.001	7.2
0.007	0.003	7.2	<0.005	<0.001	7.3	0.006	<0.001	7.1
0.007	0.003	6.9	<0.005	<0.001	7.4	0.007	0.003	6.9
0.008	0.004	6.8	<0.005	<0.001	7.2	0.005	0.001	6.9
0.006	0.001	7.0	<0.005	<0.001	7.2	<0.005	0.001	7.0
0.005	0.002	7.0	<0.005	<0.001	7.3	0.005	0.001	7.0
0.005	0.004	7.1	<0.005	<0.001	7.0	<0.005	0.002	6.9
0.005	0.005	7.0	<0.005	<0.001	7.1	<0.005	0.002	6.9
Mean	0.007	7.1	0.005	0.001	7.2	0.006	0.002	7.0
Std. Deviation	0.002	0.1	0	0	0.1	0.001	0.001	0.1
Popu- lation	12	12	12	12	12	12	12	12

These data sets are representations of actual monitoring data. As can be noted from the data set which is made up completely of absolute values, a

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meaningful mean and standard deviation can be calculated and therefore, a standard deviation. However, this is not the case when all values are less than detection limits. In this situation, the staff has determined that, in keeping with common statistical practice, less than detection limit values will be set at the detection limit. This solves the problem with a mean concentration; however, the dilemma of not having a meaningful standard deviation persists ("calculated" standard deviation of 0). Due to this, a standard deviation cannot be determined and, therefore, many commonly utilized statistical methods would be invalid with this data set. In the situation where there exists a combination of absolute values and values less than detection limits, a mean and standard deviation may be determined, although they are probably skewed. In this situation, values less than detection limits would once again be set at the detection limit.

Comparison of the three types of data involves an infinite variety of data sets. Many of the data sets represent quantitative comparisons for which statistical procedures will apply. There are, however, those cases where questionable comparisons will be made between point of compliance and background data sets. Such comparisons will exist when a minimal number of absolute values for indicator species exist. For instance, in the case where 12 data points exist of which 10 are absolute values and 2 are less than detection limits, a reasonably reliable number can be determined. At some point in between these two extremes there exists an invalid comparison. To overcome the uncertainty associated with this situation, the staff has determined that at least one half of the 12 data points must be equal to or greater than the appropriate detection limit and, therefore, represent absolute values. Utilizing this approach, it will be possible to determine the appropriateness of using a statistical procedure or use a threshold value.

Determination of Leakage

As is defined in the NRC proposed rules, published in the July 8, 1986 Federal Register, the licensee's proposed statistical procedure has to be capable of determining a statistically significant change at the 95 percent confidence level. The determination of a statistically significant change, in most methods, utilizes the mean, variance and population of two data sets. However, as can be seen, where the values are less than detection limits, no variance can be determined. To cope with this situation, the staff has determined that a threshold value should be utilized. This value for the indicator parameters of arsenic and selenium can be set at a meaningful percentage of the drinking water

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standard. This method is consistent with the staff's establishment of the lower limits of detection which are 10 percent of the respective drinking water standards. Utilizing 25 percent of the drinking water standard, as a threshold value, yields the results shown below:

<u>Indicator Species</u>	<u>LLD 10% of Drinking Water Standard</u>	<u>25% of Drinking Water Standard</u>	<u>Drinking Water Standard</u>
Arsenic	0.005 mg/l	0.013 mg/l	0.05 mg/l
Selenium	0.001 mg/l	0.003 mg/l	0.01 mg/l

Exploring this concept further for arsenic and selenium, it should be noted that 25 percent of the drinking water standard, based upon the previously cited data, very nearly equals the mean of the data set plus two standard deviations. Therefore, as is stated in the NRC proposed rule making, a finding of compliance at the 95 percent confidence level can, in effect, be made when utilizing the 25 percent of the drinking water standard method, due to two standard deviations being roughly equal to a corresponding 95 percent confidence value. Similarly, utilizing the previously cited data sets as compared to corresponding POC well data indicates that at 25 percent of the drinking water standard a statistically significant change has taken place. It is with this concept in mind that the staff will utilize 25 percent of the drinking water standard as threshold values for indicator parameters of arsenic and selenium where the data set supports this method.

The threshold concept also has some utilization when considering pH at acid leach mills. For instance, a change between a background pH of 7.6 standard units with a standard deviation of 0.2 standard units and a point of compliance well with a pH of 7.2 standard units and a standard deviation of 0.2 standard units, represents a statistically significant change. Geochemically, however, pH readings above neutral are not often associated with the movement of the type of hazardous constituents encountered at uranium milling operations. The staff would therefore recommend that in cases where a statistically significant change would be noted, while the pH remains within the neutral range, a threshold value of 6.8 standard units be utilized. In cases where an alkaline leach was used, the data supports utilization of standard statistical methods.

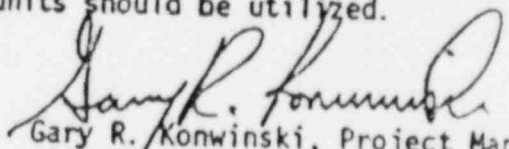
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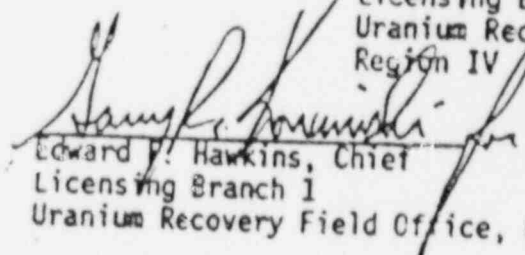
Conclusion

Based upon the preceeding data sets and discussions, the staff concludes that all values reported to be less than specified lower limits of detection should utilize the detection limit as an absolute value. Furthermore, in data sets where more than half of the values are less than detection limits, the threshold limit concept should be utilized to determine if leakage has taken place. The staff would also conclude that in data sets where all chemical values are below detection limits, the 25 percent of drinking water standard be utilized as a threshold level to indicate appropriate regulatory action.

The staff also concludes that in cases where a statistically significant change in pH is probable, observation should be made of the relationship with neutrality. At acid leach facilities where the pH remains above neutral while there is a finding of a statistically significant change, a threshold value of 6.8 standard units should be utilized.


Gary R. Konwinski, Project Manager
Licensing Branch 1
Uranium Recovery Field Office
Region IV

Approved by:


Edward P. Hawkins, Chief
Licensing Branch 1
Uranium Recovery Field Office, Region IV

Case Closed: 040MM187301E