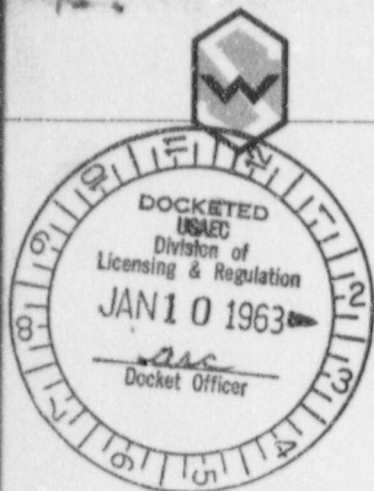


DOCKET NO. 40-3698

DLR File Copy

**SUSQUEHANNA - WESTERN, INC.**

777 GRANT STREET • DENVER 3, COLORADO • TAbOR 5-7681



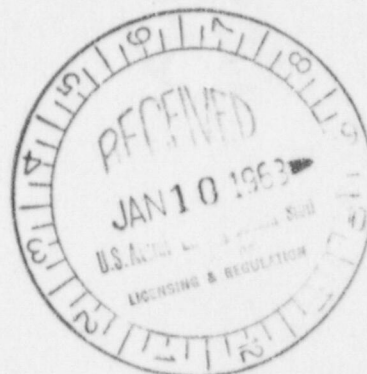
January 7, 1962

1963

Mr. Donald A. Nussbaumer, Chief  
Source & Special Nuclear Materials Branch  
Division of Licensing and Regulation  
United States Atomic Energy Commission  
Washington 25, D. C.

Dear Mr. Nussbaumer:

Re: DLR:DFH 40-3698



The accompanying letter from our construction consultants, O. W. Walvoord, Inc., contains their evaluation of the construction characteristics of the recycle pond at our Riverton mill which was described in our correspondence of November 29, 1962.

In respect to their comment concerning the lack of positive protection against "over topping", we propose to provide a spillway apron or overflow pipe which will limit the liquid freeboard to not less than the two and one half (2½) foot level. The overflow, if any, will be discarded within the original tailings pond area.

We request, therefore, that our AEC Source Material License No. SUA-652 be amended as follows:-

"The licensee is hereby authorized to dispose of mill tailings in accordance with the procedures described in his letters dated November 29, 1962 and January 7, 1963."

9811020146 620107  
PDR ADOCK 04003698  
C PDR

Sincerely yours,  
SUSQUEHANNA-WESTERN, INC.

Copy Provided  
Compliance 1/11/63  
PA

*E. A. Lang*  
E. A. Lang, Manager  
Metallurgical Operations

**ACKNOWLEDGED**

EAL/JCG/rmp

cc: W. B. Tobey

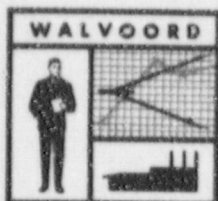
L 195

FROM: <b>Susquehanna-Western, Inc.</b> <b>Denver 3, Colorado</b>		DATE OF DOCUMENT <b>1-7-63</b>		DATE RECEIVED <b>1-10-63</b>		NO.: <b>195</b>	
		LTR. <b>x &amp; encl.</b>		MEMO:		REPORT:	
						OTHER:	
TO: <b>D. Hushaumer</b> <b>L&amp;E</b>		ORIG.: <b>x</b>		CC: <b>3</b>		OTHER:	
		ACTION NECESSARY <input type="checkbox"/>		CONCURRENCE <input type="checkbox"/>		DATE ANSWERED:	
		NO ACTION NECESSARY <input type="checkbox"/>		COMMENT <input type="checkbox"/>		BY:	
CLASSIF.: <b>U</b>		POST OFFICE		FILE CODE:			
		REG. NO: <b>105701348</b>		<b>40-3698</b>			
DESCRIPTION: (Must Be Unclassified)		REFERRED TO		DATE		RECEIVED BY	
Ltr. req. amendment to lic. SUA-652 to cover disposal of mill tailings in accord. w/procedures described in ltrs. of 11-29-62 & 1-7-63.		Hushaumer;		1-10-63			
ENCLOSURES: (4 cys. rec'd)		w/file cy. & folder					
		1-compliance cy.					
		1-extra					
Ltr. dtd. 12-27-62 fm O. W. Walvoord, Inc. which contains their evaluation of the construction characteristics of the recycle ponds at Riverton mill, etc...							
REMARKS: Mail Room Distribution: 1-PDR Copy							
						ACKNOWLEDGED	

U. S. ATOMIC ENERGY COMMISSION MAIL CONTROL FORM

FORM AEC-3263  
(9-60)





**O.W. WALVOORD, INC.**

Denver, Colo.

DOCKET NO. 40-3698

LR File Copy

CONSULTATION

DESIGN

CONSTRUCTION

Please Reply To: 301 Detroit Street  
Denver 6, Colorado  
December 27, 1962

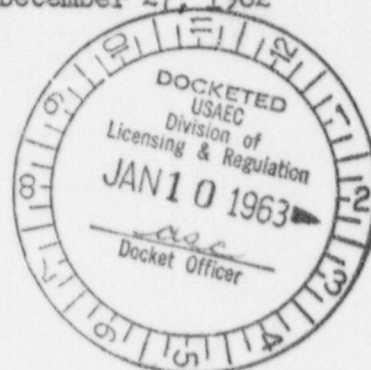
Susquehanna Western, Incorporated  
777 Grant Street  
Denver, Colorado

Attention: Mr. E. A. Lang

Subject: Recycle Pond at Riverton, Wyoming

Dear Mr. Lang,

As requested by you, we have reviewed the earth dike structure shown on drawing 62-10 (Revision 2) and we note the following details:



The maximum height of the dike is 12 feet above its base. The proposed freeboard of 2 1/2 feet would produce a maximum head of 9 1/2 feet. The upstream slope is 3:1, and the downstream slope is 1 1/2:1. The entire surface area within the dam and along the crest is lined with polyethylene film. The plan dimensions of the pond are 1,218 feet x 200 feet. The original structure was built in 1958, and has functioned adequately since that time.

The recycle pond structure is a small low earthen dam of the simple embankment type and made from rolled fill. Lacking detailed knowledge of the classification and properties of this fill, it is difficult to make any absolute statements regarding its performance. However, assuming that the material is suitable for earth dam construction (a fact that would appear to be supported by its four year life) we can make some generalized comments.

An excellent guide to the design of small earthen dams is contained in "Low Dams," a manual of design published by the National Resources Committee. A few abstractions from this source may best illustrate how closely the subject structure meets their general recommendations.

"Stable embankments may be secured with most materials suitable for dam construction, if: the upstream slope is built not steeper than 2 1/2 (horizontal) to 1 (vertical); downstream slope not steeper than 2 to 1; and the top width is made preferably 10 feet but not less than 7 feet. These specifications are applicable

to dams which impound water to a normal depth of not more than 15 feet under extreme flood flow conditions." (p 140)

"Freeboard is defined as the vertical distance from the top of the embankment to the reservoir surface during maximum flood conditions. This distance should be sufficient to prevent waves from overtopping the dam or from reaching portions of the crest which may be weakened by erosion or by frost disturbance.

The required allowance for waves is based on the effect of a wind of maximum velocity blowing down the reservoir toward the dam and is expressed by Stephenson in the equation:

$$h = 1.5 (D)^{1/2} + 2.5 - (D)^{1/4},$$

in which  $h$  is the height of the wave in feet from trough to crest, and  $D$  is the length of reservoir, or exposure, in miles. Although only one-half of this height is above the mean water level, the full height is ordinarily used to allow for the run of the waves up the slope of the dam. For reservoirs less than one-fourth of a mile long, a minimum freeboard of 2 feet is recommended.

"The minimum freeboard for safety against frost disturbance depends on the depth to which frost action is noticeable. It will vary from nothing in the south to 6 feet or more in the most northerly parts of the country; 3 feet is a common value for most of the northern half of the United States." (p 144-145)

It appears from the foregoing discussion that the structure meets all recommendations except for the suggested downstream slope of 2:1.

The present slope of 1 1/2:1 would seem acceptable, however, in view of the fact that the pond is lined with an impervious film of polyethylene which eliminates the seepage of water through the structure. Being located in a relatively arid area the danger of slope erosion by rainfall is not too great. If a problem of slope erosion should develop, planting sod or spreading a layer of gravel should prove effective.

It is of interest to note that the freeboard recommended is 2 feet for wave action and 3 feet for frost action. This compares very favorably with your 2 1/2 feet dimension inasmuch as the film lining should prevent seepage through the dike and, therefore, there should be no frost disturbance.

We note, however, that this structure will function primarily as a water storage pond and that no provision has been made for a



Mr. E. A. Lang  
Susquehanna Western  
December 27, 1962  
Page 3

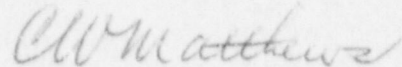
spillway apron or overflow pipe to provide positive protection against "over topping." A simple spillway could be constructed in the East dike by lowering a 10 foot length of the crest to freeboard height, and lining it with polyethylene film.

The overflow would still be retained within the dike walls of the original dam and could be reclaimed by pumps if desired. More important, however, would be the fact that the external walls of the reservoir would be further protected and there would be little or no danger of the adjacent areas being flooded.

We are pleased to offer these comments and hope that they may be helpful to you. We shall be pleased to further discuss this matter with you at your convenience.

Yours very truly,

O. W. Walvoord, Inc.



C. W. Matthews

CWM:jgf  
cc - 10 Mr. Lang, Susquehanna Western  
1 OWW Inc.