



March 1, 2018

Mr. Miguel Hamarat
Climax Molybdenum Company, Henderson Mine
1746 County Road 202
Empire, CO 80438

Re: **#1333.0 - Henderson Mill
TSF Flood Storage**

Dear Miguel:

As requested, we have evaluated the availability of flood storage capacity in the Henderson tailing storage facility (TSF) using information from the pond surveys. The fall survey of the beach and pool area was performed in October through December. Figure 1 is the pond contour map that was generated by Wheeler from the fall survey point data. The survey shows that the average dam crest elevation of 1 Dam at the end of the spigot deposition season is about 8878.1 feet, which is a 1.4-foot increase from last year. The minimum elevation surveyed along the dam crest was 8876.8 feet. This information, as well as other characteristics of the TSF, is summarized in the table in the upper right-hand corner of the TSF map drawing. Table 1 and Figure 2 is the elevation-capacity data for the impoundment that was generated from the fall 2017 contour map. Note that this data is representative of the TSF at the time of the pool survey and changes continuously as additional tailing is deposited.

One of the primary uses of the survey data is to evaluate the flood storage capacity conditions in the water system. As summarized on Figure 1, at the approximate time of the fall survey there was a total system surcharge storage capacity of about **9,466 acre-feet** in the system. This capacity includes both the TSF and East Branch Reservoir and is based on 0.5 feet of residual freeboard below the minimum dam crest elevation of 8,876.8' and a water level of 8,865.0'. The flood storage requirement for the system is **3,582 acre-feet**. This requirement is based on hydrologic modeling of the probable maximum precipitation (PMP) event. The available flood storage capacity in the system at the time of the survey

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significantly exceeds the storage requirement. However, this excess capacity will decrease throughout the coming year as additional inflows to the system occur and a portion of the storage space is filled with deposited tailing.

A relatively accurate determination of the flood storage capacity in the impoundment can be made at the time of the pond surveys. An operations model has been developed to track water levels and estimate the flood storage availability in the system between surveys. This model is updated by Henderson personnel or Wheeler on a monthly basis. One of the reports generated by this model is the attached TSF Water Level Report (Figure 3). This graph shows the actual water level in the TSF as compared to the "High-High" level in the pond, which is defined as the level corresponding to 3,582 acre-feet of available capacity. Note that the actual water level did not exceed the High-High level at any time in 2017. This shows that the required flood storage space was maintained in the system throughout the 2017 calendar year.

If you have any questions regarding the enclosed information, or if you require additional information, please call.

Sincerely,

W. W. Wheeler and Associates, Inc.

A handwritten signature in black ink, appearing to read "Steven M. Maly".

Steven M. Maly, P.E.

CC: Dillon Benbow, Henderson Mill (via e-mail)
Geoff Niggeler, Henderson Mill (via e-mail)
Tim Haynes, Henderson Mill (via e-mail)
Katie Kruger, Freeport McMoRan (via e-mail)

TABLE 1
Henderson TSF
Elevation-Area-Capacity

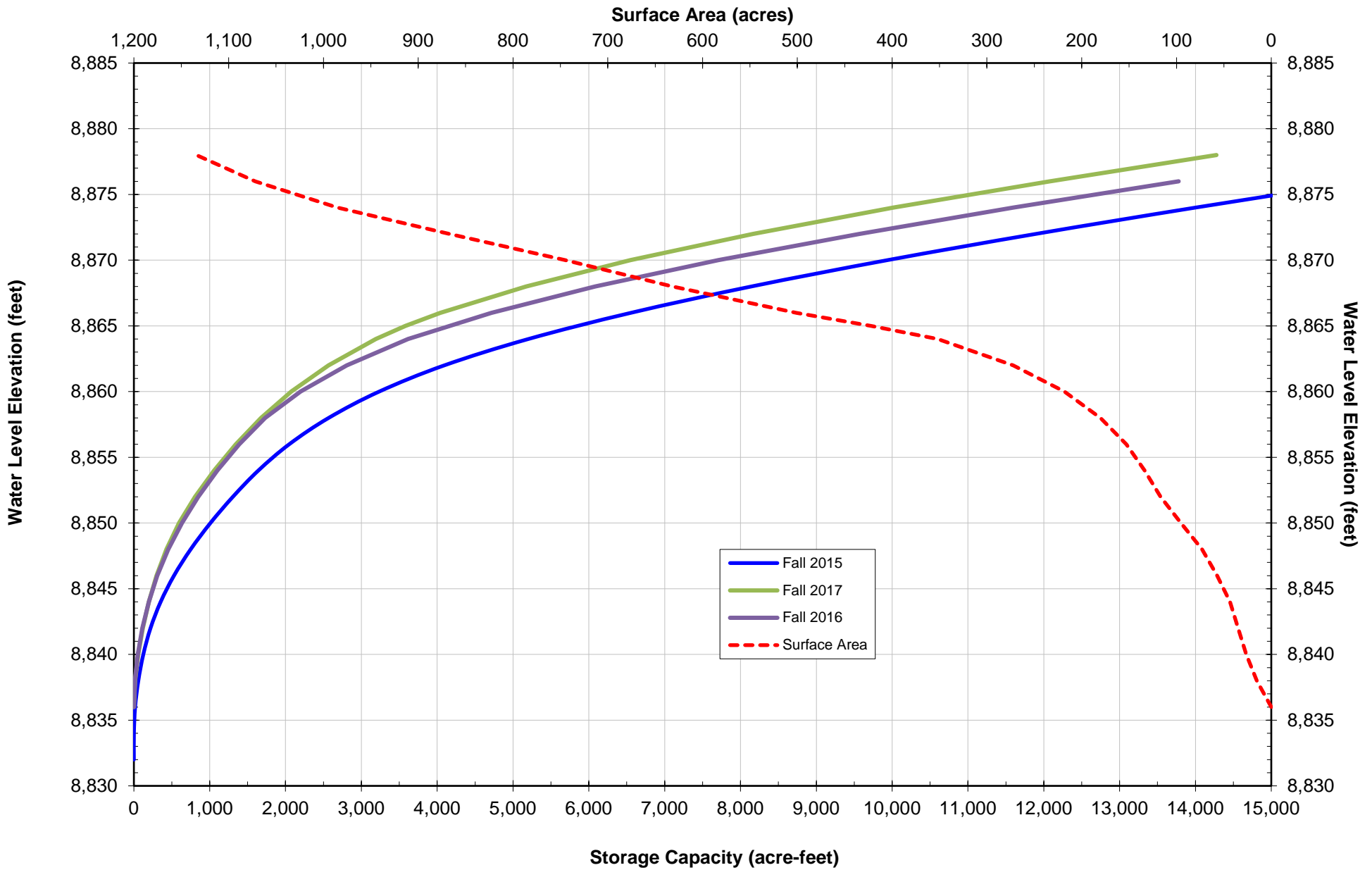
Survey Data:

Bathymetric Oct. 25, 2017
Beach Oct. 26 and Nov. 30, 2017, Dec. 14 on 3 Dam

Elevation-Area-Capacity Table			
Water Elevation	Surface Area		Storage Capacity
(feet)	(sq. ft.)	(acres)	(ac-ft)
8,836.0	0	0.00	0.0
8,838.0	666,619	15.30	15.3
8,840.0	1,151,415	26.43	57.0
8,842.0	1,523,680	34.98	118.5
8,844.0	1,895,954	43.53	197.0
8,846.0	2,487,464	57.10	297.6
8,848.0	3,180,685	73.02	427.7
8,850.0	4,150,851	95.29	596.0
8,852.0	5,082,093	116.67	808.0
8,854.0	5,826,965	133.77	1,058.4
8,856.0	6,656,668	152.82	1,345.0
8,858.0	7,851,938	180.26	1,678.1
8,860.0	9,506,863	218.25	2,076.6
8,862.0	11,859,786	272.26	2,567.1
8,864.0	15,333,431	352.01	3,191.4
8,865.0	18,388,499	422.14	3,578.4
8,866.0	21,829,544	501.14	4,040.1
8,868.0	27,521,359	631.80	5,173.0
8,870.0	32,453,104	745.02	6,549.8
8,872.0	37,765,171	866.97	8,161.8
8,874.0	42,914,526	985.18	10,014.0
8,876.0	46,685,281	1,071.75	12,070.9
8,878.0	49,401,612	1,134.10	14,276.8

* All other values are interpolated from this table.

**Figure 2 - Henderson TSF
Elevation Area Capacity**



**Figure 3 Henderson TSF
Water Pool Levels**

