

Flambeau Mining Company
N4100 Highway 27
Ladysmith, WI 54848
(715) 532-6690
FAX (715) 532-6885

Kennecott
Minerals

April 10, 1996

Mr. Ken Markart
Wisconsin Department of Natural Resources
PO Box 818
Rhinelander, WI 54501

Dear Mr. Markart:

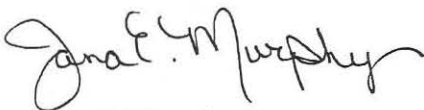
RE: Replacement of Monitoring Well MW-1000P
Flambeau Mining Company

Enclosed is documentation of the replacement of monitoring well MW-1000P by Denny's Drilling under the direction of Erik Sivola, Foth & Van Dyke.

MW-1000P was replaced with monitoring point MW-1000P-R on February 19, 1996. The replacement of MW-1000P was necessary due to its damage on January 15, 1996 during snow removal activity. MW-1000P-R was established in the same location as MW-1000P.

If you should have any questions regarding this submittal, please contact Richard Dachel or myself at 715-532-6690.

Sincerely,



Jana E. Murphy
Supervisor of Environmental Affairs

Enclosure

cc: Larry Lynch, WDNR
Bernice Dukerschein, Rusk Co.
Al Christianson, City of Ladysmith
Tom Riegel, Town of Grant
Melvin Spencer, Rusk Co. Zoning
Jim Hutchison, F&VD (w/o encl)



Foth & Van Dyke

engineers · architects · scientists

March 29, 1996

Mr. Ken Markart
Mine Reclamation Specialist
Wisconsin Department of Natural Resources
107 Sutliff Avenue
P.O. Box 818
Rhineland, WI 54501

Dear Mr. Markart:

Re: Documentation of the Replacement of Monitoring Well WM-1000P at the Kennecott Flambeau Mine, Ladysmith, Wisconsin

As you are aware, on February 19, 1996 the damaged piezometer MW-1000P was replaced by Denny's Drilling from Duluth, Minnesota under the direction of a Foth & Van Dyke hydrogeologist. The replacement monitoring point was labeled MW-1000P-R.

Well Replacement Procedure

The well, MW-1000P, was replaced by removing the existing PVC riser and screen, installing six-inch casing to bedrock and rotary air drilling the casing and existing borehole to two feet beyond the original borehole depth. All drilling tools and equipment were steam-cleaned prior to drilling and the compressed air for drilling was filtered.

Once six-inch casing was installed to the top of bedrock, the existing borehole was drilled to approximately 46 feet or the top of the fine sand seal. The water entering the borehole was then blown out and allowed to recover. After approximately four to five minutes of recovery, the borehole was blown out again. This procedure was repeated five times to wash as much bentonite grout out of the boring as possible before drilling out the existing sand pack.

The sand pack was then drilled out and the borehole was deepened by two feet. The borehole was blown out and rested in the method described above four times to remove as much of the old well construction materials as possible.

The replacement well, MW-1000P-R, was constructed in the same manner as the original monitoring well. The same screen length and slot size were set at the same depth below base grade as MW-1000P. Number 30 Redflint filter sand was brought from the base of the borehole to two feet above the top of the screen. Two feet of fine sand was installed above that point and three-eighths inch hole plug. Chipped bentonite was used as a seal

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Mr. Ken Markart
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and annular space seal. The old protective pipe was reused on the new well. The monitoring well construction form is included in Attachment 1.

Monitoring Well Development

Monitoring well MW-1000P-R was developed by personnel of the Flambeau Mining Company. The well was developed by slowing purging until dry with a bailer. This procedure was repeated 13 times with field readings of pH and conductivity measured toward the end of each development stage. Details of this development procedure are included on the development form in Attachment 1. Details on the field readings and comparisons to the old MW-1000P readings are included in Attachment 2.

If you should have further questions on the construction or development of MW-1000P-R, please contact Jim Hutchison or me at 414-497-2500.

Sincerely,

Foth & Van Dyke



Erik A. Silvola
Project Hydrogeologist



James B. Hutchison, P.E.
Lead Environmental Engineer

EAS:JBH1:lmc

Attachments

cc: Jana Murphy, Flambeau Mining Co.
Richard Dochel, Flambeau Mining Co.

Attachment 1
Monitoring Well Form

Facility/Project Name Flambeau Mining Company	Local Grid Location of Well 39720.80 ft. <input checked="" type="checkbox"/> N. <input type="checkbox"/> S. 38950.44ft. <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Well Name MW-1000P-R
Facility License, Permit or Monitoring Number	Grid Origin Location Lat. _____ Long. _____ or St. Plane _____ ft. N. _____ ft. E.	Wis. Unique Well Number DNR Well Number
Type of Well Water Table Observation Well <input type="checkbox"/> 11 Piezometer <input checked="" type="checkbox"/> 12	Section Location of Waste/Source SE 1/4 of SW 1/4 of Sec. 9, T. 34 N, R. 6 <input checked="" type="checkbox"/> E. <input type="checkbox"/> W.	Date Well Installed <u>0 2 / 1 9 / 9 6</u> m m d d y y
Distance Well Is From Waste/Source Boundary ft.	Location of Well Relative to Waste/Source u <input type="checkbox"/> Upgradient s <input type="checkbox"/> Sidegradient d <input type="checkbox"/> Downgradient n <input type="checkbox"/> Not Known	Well Installed By: (Person's Name and Firm) Denny's Well Drilling
Is Well A Point of Enforcement Std. Application? <input type="checkbox"/> Yes <input type="checkbox"/> No		

- A. Protective pipe, top elevation 1 1 0 2 . 7 3 ft. MSL
 B. Well casing, top elevation 1 1 0 2 . 8 2 ft. MSL
 C. Land surface elevation 1 1 0 0 . 5 ft. MSI
 D. Surface seal, bottom 1 0 9 6 . 5 ft. MSL or 4 . 0 ft.

12. USCS classification of soil near screen:
 GP GM GC GW SW SP
 SM SC ML MH CL CH
 Bedrock

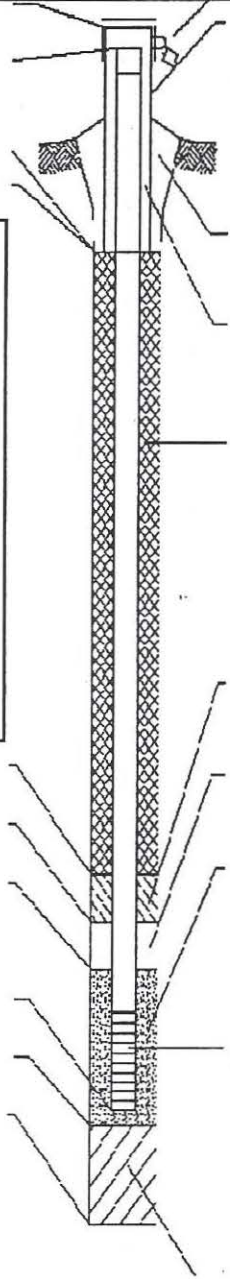
13. Sieve analysis attached? Yes No

14. Drilling method used: Rotary 5 0
 Hollow Stem Auger 4 1
 Other

15. Drilling fluid used: Water 0 2 Air 0 1
 Drilling Mud 0 3 None 9 9

16. Drilling additives used? Yes No
 Describe _____

17. Source of water (attach analysis):



1. Cap and lock? Yes No
2. Protective cover pipe:
 a. Inside diameter: 6.0 in.
 b. Length: 2 2.0 ft.
 c. Material: Steel 0 4
 Other
 d. Additional protection? Yes No
 If yes, describe: _____
3. Surface seal: Bentonite 3 0
 Concrete 0 1
 Other
4. Material between well casing and protective pipe:
 Bentonite 3 0
 Annular space seal
 Other
5. Annular space seal:
 a. Chipped Bentonite 3 3
 b. _____ Lbs/gal mud weight Bentonite-sand slurry 3 5
 c. _____ Lbs/gal mud weight .. Bentonite slurry 3 1
 d. _____ % Bentonite .. Bentonite-cement grout 5 0
 e. 7.23 Ft³ volume added for any of the above
 f. How installed: Tremie 0 1
 Tremie pumped 0 2
 Gravity 0 8
6. Bentonite seal:
 a. Bentonite granules 3 3
 b. 1/4 in. 3/8 in. 1/2 in. Bentonite chips 3 2
 c. _____ Other
7. Fine sand material: Manufacturer, product name & mesh size
 a. 45/50 Red Flint Filter Sand
 b. Volume added 0.34 ft³
8. Filter pack material Manufacturer, product name and mesh size
 a. #30 Red Flint Filter Sand
 b. Volume added 1.70 ft³
9. Well casing: Flush threaded PVC schedule 40 2 3
 Flush threaded PVC schedule 80 2 4
 Other
10. Screen material: PVC
 a. Screen Type: Factory cut 1 1
 Contin. slot 0 1
 Other
 b. Manufacturer Northern Air
 c. Slot size: 0.0 0 6 in.
 d. Slotted length: 5.0 ft.
11. Backfill material (below filter pack): None 1 4
 Other

- E. Bentonite seal, top 1 0 9 6 . 5 ft. MSL or 4 . 0 ft.
 F. Fine sand, top 1 0 5 6 . 5 ft. MSL or 4 6 . 0 ft.
 G. Filter pack, top 1 0 5 4 . 5 ft. MSL or 4 8 . 0 ft.
 H. Screen joint, top 1 0 5 2 . 5 ft. MSL or 5 0 . 0 ft.
 I. Well bottom 1 0 4 7 . 5 ft. MSL or 5 5 . 0 ft.
 J. Filter pack, bottom 1 0 4 5 . 5 ft. MSL or 5 7 . 0 ft.
 K. Borehole, bottom 1 0 4 5 . 5 ft. MSL or 5 7 . 0 ft.
 L. Borehold, diameter 6 . 0 in.
 M. O.D. well casing 2 . 3 4 in.
 N. I.D. well casing 1 . 9 4 in.

I hereby certify that the information on this form is true and correct to the best of my knowledge.

Signature [Signature] Firm Foth & Van Dyke

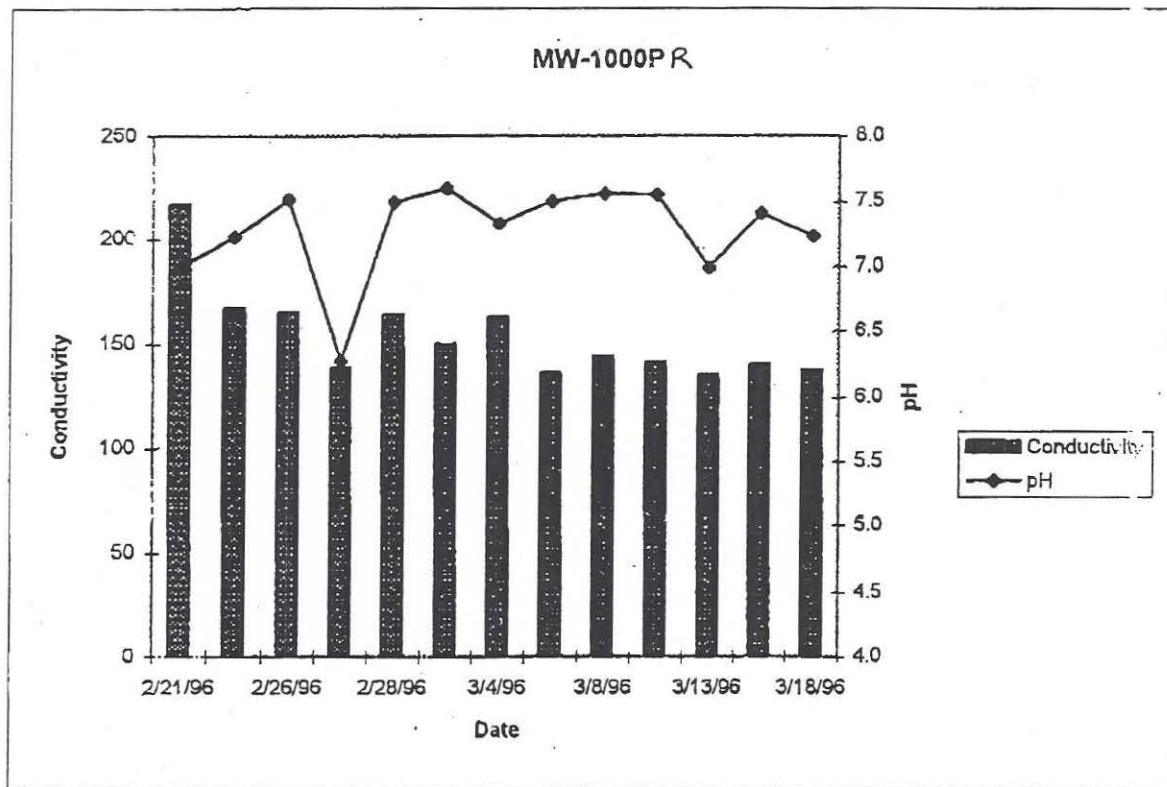
Please complete both sides of this form and return to the appropriate DNR off listed at the top of this form as required by chs. 144, 147 and 160, Wis. Stat., and ch. NR 141, Wis. Ad. Code. In accordance with ch. 144, Wis Stats., failure to file this form may result in a forfeiture of not less than \$10, nor more than \$5000 for each day of violation. In accordance with ch. 147, Wis. Stat., failure to file this form may result in a forfeiture of not more than \$10,000 for each day of violation. NOTE: Shaded areas are for DNR use only. See instructions for more information including where the completed form should be sent.

Attachment 2

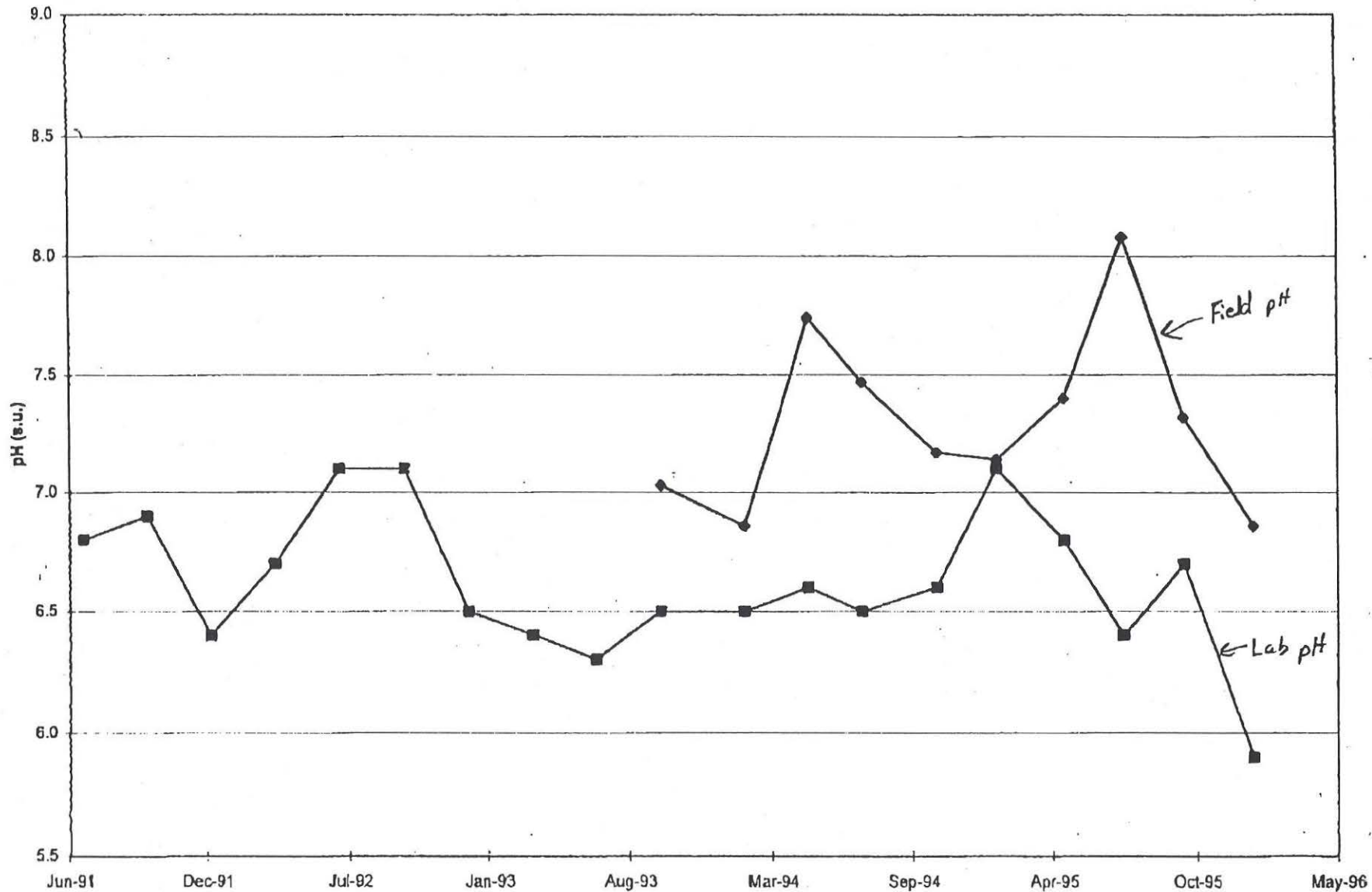
Well MW-1000P-R Development

Development Data for MW-1000P R

Date	Depth to SWL	SWL	Conductivity	pH
2/21/96	32.01	1070.81	217	7.0
2/23/96	32.94	1069.88	187.3	7.2
2/26/96	33.12	1069.7	165.4	7.5
2/27/96	33.82	1069	138.6	6.3
2/28/96	34.20	1088.62	184.4	7.5
3/1/96	34.93	1067.89	150.1	7.6
3/4/96	35.64	1087.18	163.2	7.3
3/6/96	36.50	1088.32	136.7	7.5
3/8/96	34.79	1088.03	144.8	7.6
3/11/96	35.72	1067.1	141.4	7.6
3/13/96	37.16	1065.66	136.1	7.0
3/15/96	37.66	1065.16	140.4	7.4
3/18/96	37.92	1064.9	137.9	7.2



MW-1000P



MAR-18-96 MON 12:50 PM FLAMBARD MINING CO. 244 NW. 100000000

MW-1000P

