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Our Reference: VA101-1/13-A.01
Continuity Nbr.: VA07-00359

March 14, 2007

Mr. Ron Martel
Environmental Superintendent
Mount Polley Mining Corporation
P.O. Box 12
Likely, B.C. V0L 1N0

Dear Ron,

Re: HYDOLOGY REVIEW FOR HAZELTINE CREEK, STATION W7

Knight Piésold Ltd. has conducted a review of the historical hydrologic data collected from a continuous analog stage recorder at Hazeltine Creek (Station W7), located within the Mount Polley Mine site area. This review is in support of the application for a discharge permit amendment for the Tailings Storage Facility.

SITE DESCRIPTION

The hydrology of Hazeltine Creek can be generally described as snowmelt driven, with the majority of the annual runoff occurring during the spring snowmelt period. Hazeltine Creek flows in the southeast direction from Polley Lake. Edney Creek confluences with Hazeltine Creek prior to Hazeltine Creek discharging into Quesnel Lake, as shown on Figure 1. The gauging station at W7 is located approximately 2.6 km downstream of Polley Lake, as shown on Figure 2. The hydrology station at W7 drains approximately 27.6 km^2 and the creek at the gauge location is 4 m wide. The gauging station consists of a corrugated steel pipe stilling well and an analog chart type recorder that measures water level as indicated by the movement of a float; a staff gauge located beside the stilling well for manual observation of water levels; and a compound broad crested weir located approximately 2 m downstream of the gauge. The stage recorder and weir are shown in Photo 1 and the staff gauge is shown in Photo 2. A schematic of the compound weir geometry is shown on Figure 3.

The analog stage recorder at W7 was formally installed and operated by the Water Survey of Canada (WSC) in January 1994. The WSC discontinued the station in December 1995, at which time; Mount Polley Mining Corporation (MPMC) took over operation of the site. The site is maintained continuously during non-freeze periods by Mount Polley on-site environmental technicians. The key findings presented are based on data collected from February to December 1995 and March 1997 to November 2006.

METHODS

Over the period of record, two methods have been used to estimate the discharge at W7. The first method utilized a flow meter to perform depth/velocity transects. A minimum of twenty measurements were performed per transect with a lower limit cut-off of a 5 cm cell width. Depth, cell spacing and velocity were used to calculate the discharge. The discharge measurements were correlated to the stage data and used to develop a rating curve for W7.

The second method utilized theoretical weir equations to characterize the discharge through the weir.

The general weir equation is:

$$Q = CLH^{1.5}$$

The general equation for a trapezoidal weir section is:

$$Q = CLH^{1.5} + 1.38*(\tan(\pi - 2\arctan(run/rise))/2)*H^{2.5}$$

Where Q = discharge (m^3/s);
C = weir coefficient,
L = breath of the weir (m);
H = depth of water flowing over weir (m);
Run/Rise = horizontal to vertical ratio of sloped walls.

RESULTS AND DISCUSSION

The weir equations previously used were found to overestimate the discharge through the weir, as the equations did not account for the horizontal contraction of flow as it passed through the weir, and the equations assumed 4H:1V side slopes of the trapezoidal weir section, where in actual fact the walls slope at 1H:1V. In addition, the weir has a three tier compound configuration, and although the equation was adjusted accordingly, at high flows the first tier flow was incorrectly double counted.

The revised weir equations for estimating discharge through the weir at Hazeltine Creek take into account the contraction of the flow through the first two tiers of the weir and the varying geometry of the compound configuration up to H = 0.73 m. Above this height the geometry cannot be accurately defined by a theoretical weir equation as the channel has natural banks.

Figure 4 illustrates the theoretical stage discharge curve developed from the revised theoretical compound weir equations compared to the stage discharge curve previously developed by MPMC.

The 10 calibration points measured at W7 consist of five discharge measurements obtained between April and September 1995, four in May 2001 and one in October 2006. The exact locations and characteristics of the measurement sites are unknown, but it is our understanding that the measurements were taken just downstream of the weir, and from the available photos this seems like an appropriate gauging site. Figure 5 illustrates a discrepancy between the calibration points and the revised theoretical weir curve, with the calibration points consistently indicating higher flows. This condition could be due to leakage through the weir, error in reading the staff gauge, error in the discharge measurements, error in the estimation of the theoretical weir coefficient, or any combination of the above.

From the perspective of water quality, and the effects of discharging effluent into Hazeltine Creek, it is conservative to use the newly derived theoretical weir equations for estimating discharge at W7. Figure 6 presents the monthly average hydrograph corresponding to the rating curve determined with the weir equations for the stage data collected in 1995 and 1997 to 2001. The flows in December, January and February were estimated by linear interpolation of the daily flow data as the stage recorder was not operational due to ice. The lowest flows occur in late summer/early fall, and the 2-year return period 7-day average low flow was estimated to be 0.0098 m^3/s.

RECOMMENDATIONS

The following are proposed recommendations for a hydrology site work plan for 2007, to provide quality assurance and quality control for the collection and processing of future hydrology data.

- In order to develop a good relation between stage and discharge for Hazeltine Creek at W7 approximately five calibration points, spread over the range of flows should be measured. A minimum of three discharge measurements should be collected in late April/early May, when the maximum stage values occur during freshet. The low flow measurements should be collected in September when stage values are low. Additional discharge measurements throughout the ice free months will help to confirm the validity of the rating curve.
- Calibrate the weir with discharge measurements using a flow meter (salt or dye dilution method) at a suitable location.
- Install a digital stage data logger to produce a more reliable stage record.
- Inspect the weir to assess possible wear or degradation of the weir and measure the weir dimensions to determine whether the theoretical weir equations are valid.
- Investigate potential leakage through the weir.
- Survey the heights of the staff gauge, the weir and the stage recorder to determine relative differences and verify that their positions do not shift from year to year.

We trust that this review meets your requirements for inclusion with the discharge permit amendment. If you have any questions please contact Greg Smyth at your convenience.

Yours truly,

KNIGHT PIESOLD LTD.

Erin Rainey, E.I.T.
Staff Engineer

Greg Smyth
Senior Environmental Scientist

Approved: Ken Brouwer, P.Eng.
Managing Director

Encl:

	Figure 1 Rev 0	Environmental Monitoring Stations
	Figure 2 Rev 0	Hazeltine Creek Weir Geometry at Station W7
	Figure 3 Rev 0	Weir Curve for Hazeltine Creek at W7
	Figure 4 Rev 0	Rating Curve for Hazeltine Creek at W7
	Figure 5 Rev 0	Monthly Hydrograph for Hazeltine Creek at W7
	Photo 1	Hazeltine Creek at hydrology station W7. Looking upstream at the stage recorder and weir
	Photo 2	Hazeltine Creek at hydrology station W7. Looking downstream at the staff gauge.

cc: Pierre Stecko – Minnow Environmental Inc
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5 832 000 N
5 830 000 N
5 828 000 N
5 826 000 N
5 824 000 N
5 822 000 N
5 820 000 N
5 818 000 N
5 816 000 N
5 814 000 N

580 000 E
582 000 E
584 000 E
586 000 E
588 000 E
590 000 E
592 000 E
594 000 E
596 000 E
598 000 E
600 000 E
602 000 E

Little Lake
Morehead Lake
Morehead Creek
6K Creek
Kay Lake
Slum Gulch
Slum Lake
N. Dump Cr.
Mill Site
Mine Drainage Cr.
Polley Lake
Quesnel Lake
Jacobi Lake
Trio Lake
Bootjack Lake
Bootjack Creek
3 Mile Creek
Gavin Creek
Gavin Lake
Edney Tributary SW
Edney Tributary NE
Hazeltine Creek
Raft Creek
Edney Creek
Edney Lake

W7
W11

LEGEND

Monitoring Sites

W2 Water Quality, Aquatic Resources, Hydrology

Scale 750 0 750 1500 2250 3000 3750 m

VANCOUVER B.C.
CAD FILE: M:\1\01\00001\13\VA\Acad\Figs\B07.dwg 1=75000 Plot 1=1(PS) Mar 05 2007 MT

XREF FILE : -

REV.		
0	14MAR'07	ISSUED WITH LETTER VA07-00359

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY MINE

ENVIRONMENTAL MONITORING LOCATIONS

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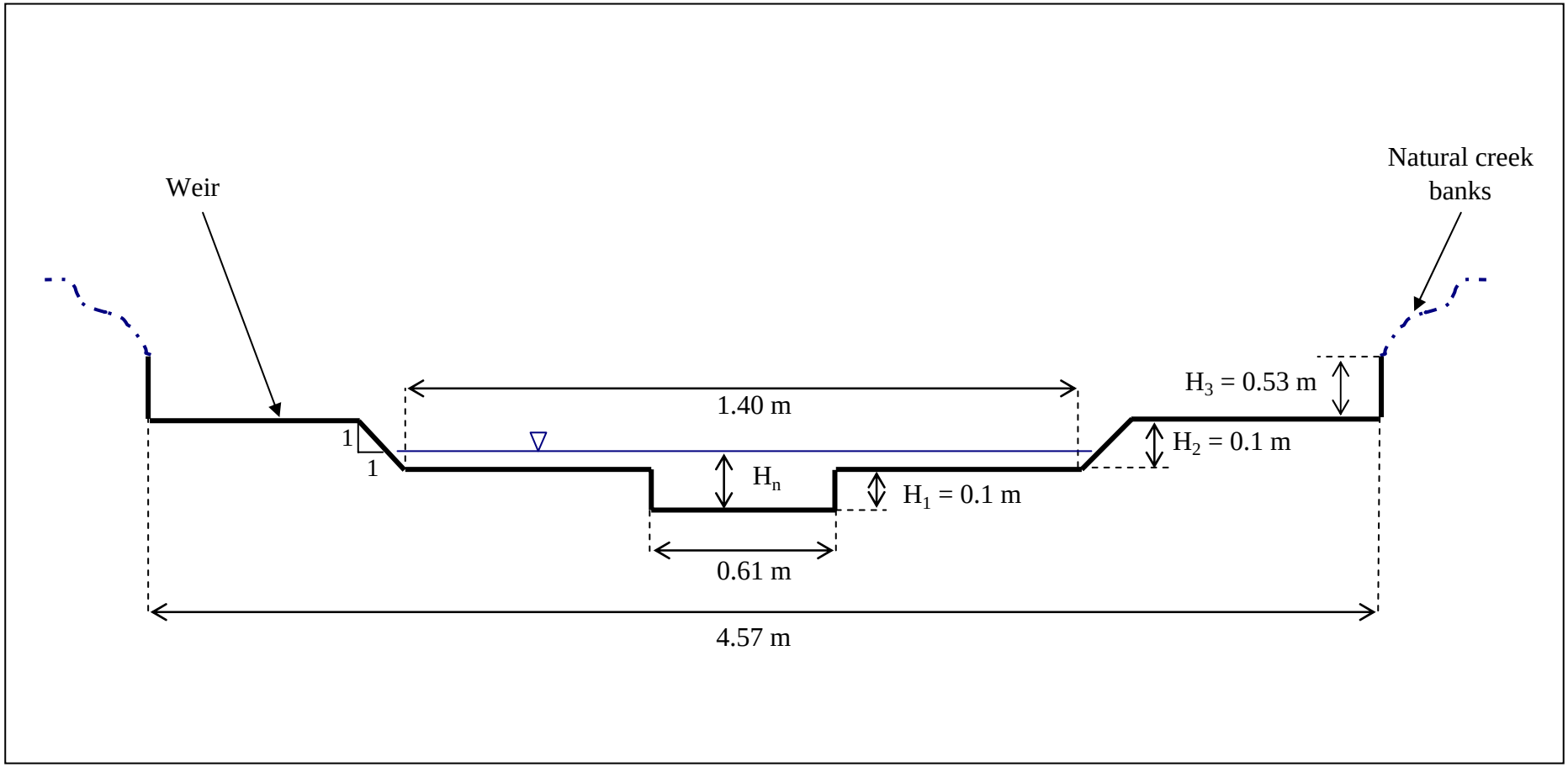
PROJECT/ASSIGNMENT NO.	REF. NO.
VA101-1/13	VA07-00359

FIGURE 1 REV. 0



Notes:
1) Not drawn to scale.

MOUNT POLLEY MINING CORPORATION		
MOUNT POLLEY PROJECT		
HAZELTINE CREEK WEIR GEOMETRY AT STATION W7		
Knight Piésold CONSULTING	PROJECT / ASSIGNMENT NO. VA101-1/13	REF NO. VA07-00359
	FIGURE 2	REV. 0

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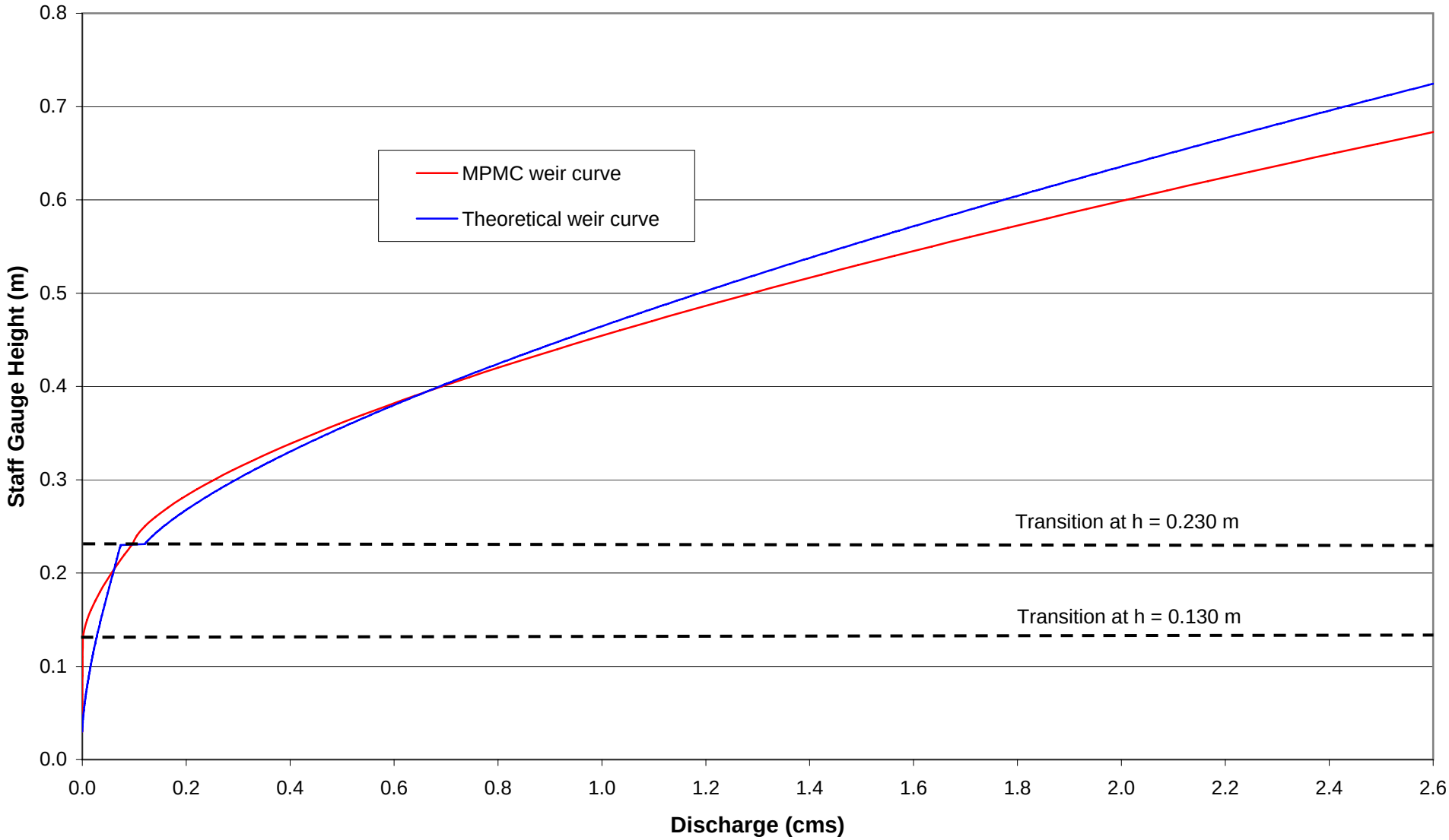

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

WEIR CURVE FOR HAZELTINE CREEK AT W7

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REF NO. VA07-00359

FIGURE 3

REV 0

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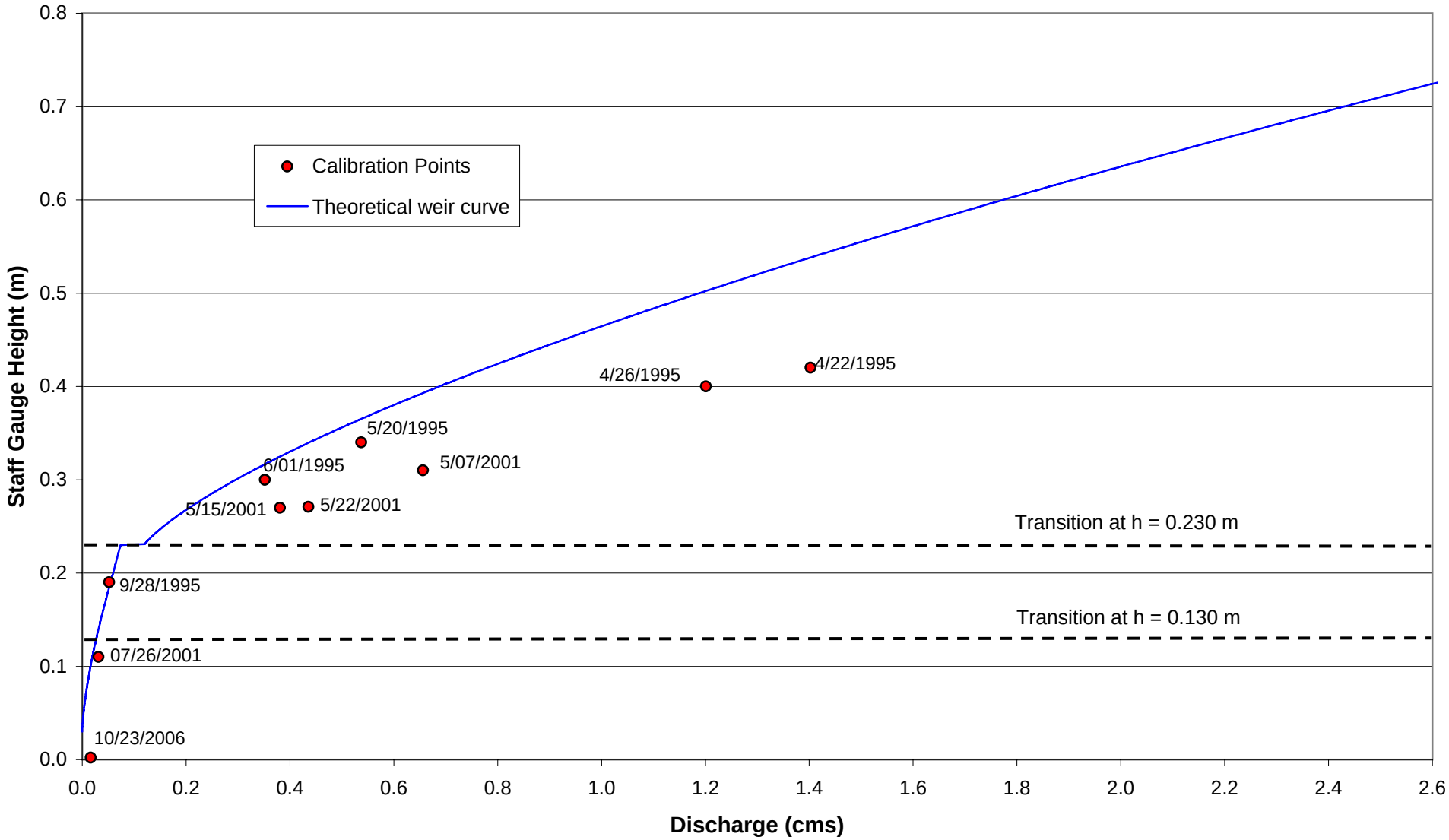

MOUNT POLLEY MINING CORPORATION

MOUNT POLLEY PROJECT

RATING CURVE FOR HAZELTINE CREEK AT W7

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REF NO. VA07-00359

FIGURE 4

REV. 0

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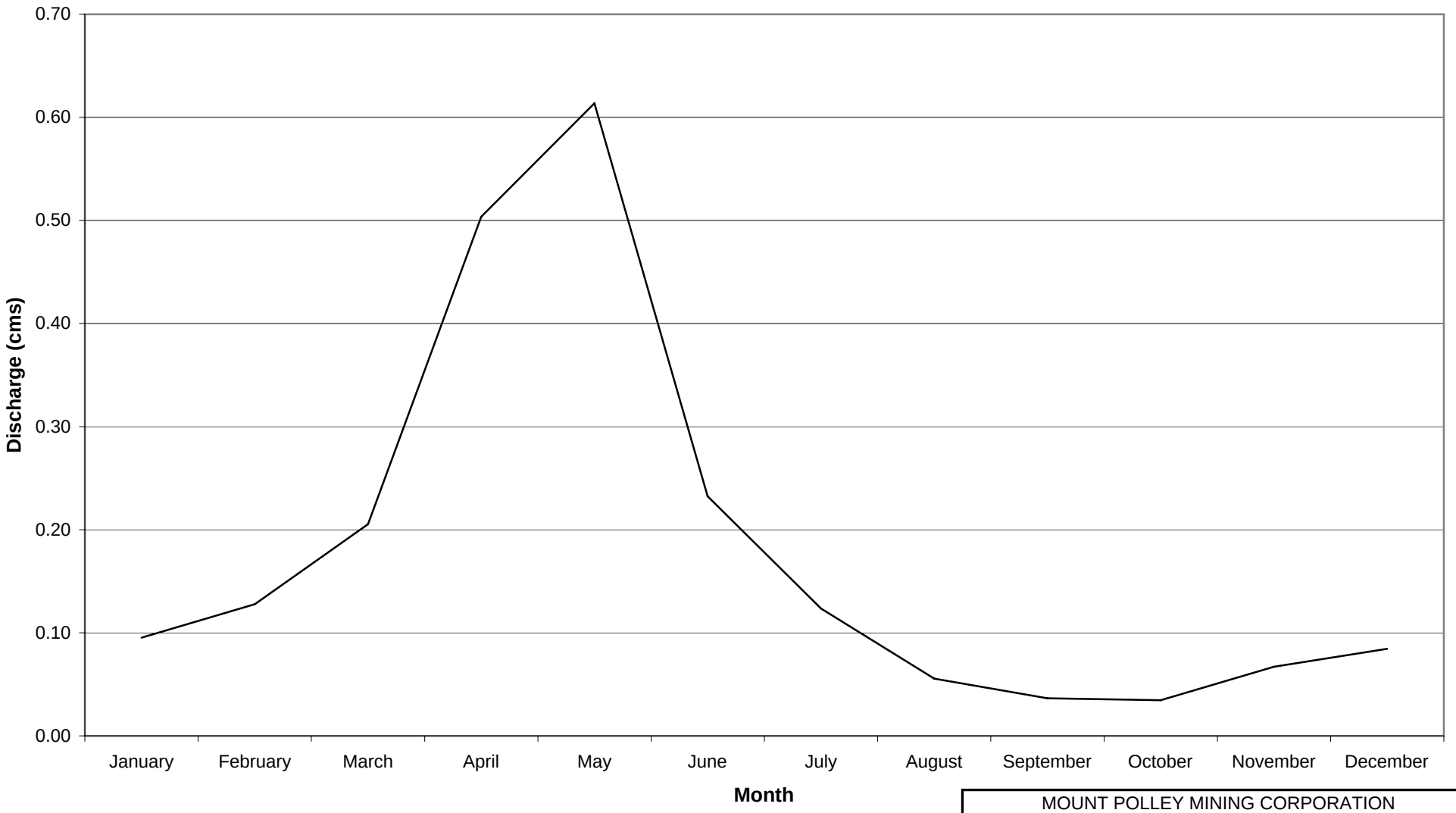

Notes:

1) Based on average flow data from 1995 and 1997-2001.

2) Flows in December, January and February estimated by linear interpolation of daily average flow data.

MOUNT POLLEY MINING CORPORATION

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MONTHLY HYDROGRAPH FOR HAZELTINE CREEK AT W7

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FIGURE 5

REV. 0

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Photo 1 – Hazeltine Creek at hydrology station W7. Looking upstream at the stage recorder and weir.

Photo 2 – Hazeltine Creek at hydrology station W7. Looking downstream at the staff gauge.