WMC INTERNATIONAL LTD.
MELIADINE WEST GOLD PROJECT
WATER BALANCE STUDY
2000 DATA REPORT

Submitted to:

WMC International Ltd.
Nepean, Ontario

Submitted by:

AMEC Earth & Environmental Limited
Calgary, Alberta

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CW1525.2

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- Mr. Ben Hubert, WMC's environmental consultant coordinator, for advice and guidance in the planning of the field program and the reporting of the results.

- Mr. Alan Sexton and the other WMC camp staff who provided and coordinated transportation and logistics to facilitate timely execution of the field program, and who also undertook evaporation pan and rain gauge data collection.

- Mr. Murray Jones and Mr. Wade Hanna of the Water Survey of Canada for their assistance in the practical and technical details of the field data collection program.

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1.0 INTRODUCTION

1.1 Background

WMC International Limited has been conducting a gold exploration program near Meliadine Lake in Nunavut since 1995. The project area is located about 30 km northwest of Rankin Inlet on the western edge of Hudson Bay. The exploration results indicated that development of a gold mine could become feasible and that environmental baseline studies should commence. AGRA Earth & Environmental Limited (now AMEC Earth & Environmental Limited, or AMEC) was retained by WMC early in 1997 to conduct a two year water balance study for the Meliadine West Gold Project. The study was subsequently extended to cover a third and fourth year (1999 and 2000).

The results of the 1997, 1998 and 1999 data collection programs are reported in previously issued documents by AGRA/AMEC entitled AWMC International Ltd., Meliadine West Gold Project, Water Balance Study, 1997 Data Report@, April 1998; AWMC International Ltd., Meliadine West Gold Project, Water Balance Study, 1998 Data Report@, December 1998, and AWMC International Ltd., Meliadine West Gold Project, Water Balance Study, 1999 Data Report@, December 1999. These previous Data Reports also provide background information and describe the project area.

The present document reports the results of the year 2000 data collection program.

1.2 Scope of 2000 Program

The data collected over the previous three years may be adequate as a basis for describing baseline conditions. Therefore the 2000 program focussed on maintaining data continuity and filling data gaps, and some of the monitoring conducted in previous years was not continued. The main work components and activities planned and carried out by AMEC for the year 2000 program are summarized in Table 1.1.

The scope for reporting for the current year is somewhat reduced from that of the previous three years. Analyses of the data are limited to that necessary for compilation and reporting the field program results, with limited interpretation and discussion of results. The rationale for this approach is that, while detailed analyses and discussion of results were valuable in earlier years to provide input to project planning and (pre)feasibility assessments, it is considered more cost-effective for the current year to compile the data and defer data analysis until necessary as part of a subsequent Baseline Data Report to present the results from all years of data collection.

TABLE 1.1
2000 Water Balance
Component and Activity Summary

Component	Field Activities	Office Activities
Snow Surveys	• Conduct snow surveys in Lake A37 sub-basin	• Compile and present data
Flow Monitoring	• Decommission 1 existing station • Startup 5 existing stations • Operate stations • Make discharge measurements • Retrieve data • Shut down 5 stations • Make miscellaneous discharge measurements at Lake A37 sub-basin outlets and the Char River	• Compile, compute and present data
Lake Level Monitoring	• Obtain winter ice levels • Survey water levels	• Compile, compute and present data
Precipitation	• Monitor manual rain gauges	• Obtain and compile data
Evaporation	• Install evaporation pan • Operate pan • Shut down pan	• Compile, compute and present data

WMC operated a climate station to monitor precipitation, temperature, relative humidity, net radiation, soil temperature and wind data.

2.0 2000 WORK PROGRAM

2.1 Snow Surveys

Snow surveys were carried out on 13 May 2000 in the Lake A37 sub-basin, in order to provide data which could be used to improve the understanding of the hydrology of this area in which mine development is being considered.

2.2 Hydrometric Monitoring

2.2.1 General

The principal activities involved in the hydrometric monitoring program and the associated dates, were as follows:

Lake Ice Level Measurement	14 – 15 May
Station Startup	12 – 21 June
Station Operation	June - September
Seasonal Shut-Down	17 – 19 September
Data Compilation and Analysis	October - November

2.2.2 Main River Flow Monitoring

Three of the four main river flow monitoring stations established in 1997 were continued:

- Meliadine River at the outlet of Meliadine Lake.
- Meliadine River near the mouth.
- West outlet of Meliadine Lake (discharging into the Diana River basin).

The Diana River station (Diana River near Rankin Inlet) was discontinued. The locations of the main river monitoring stations are shown on Figure 2.1.

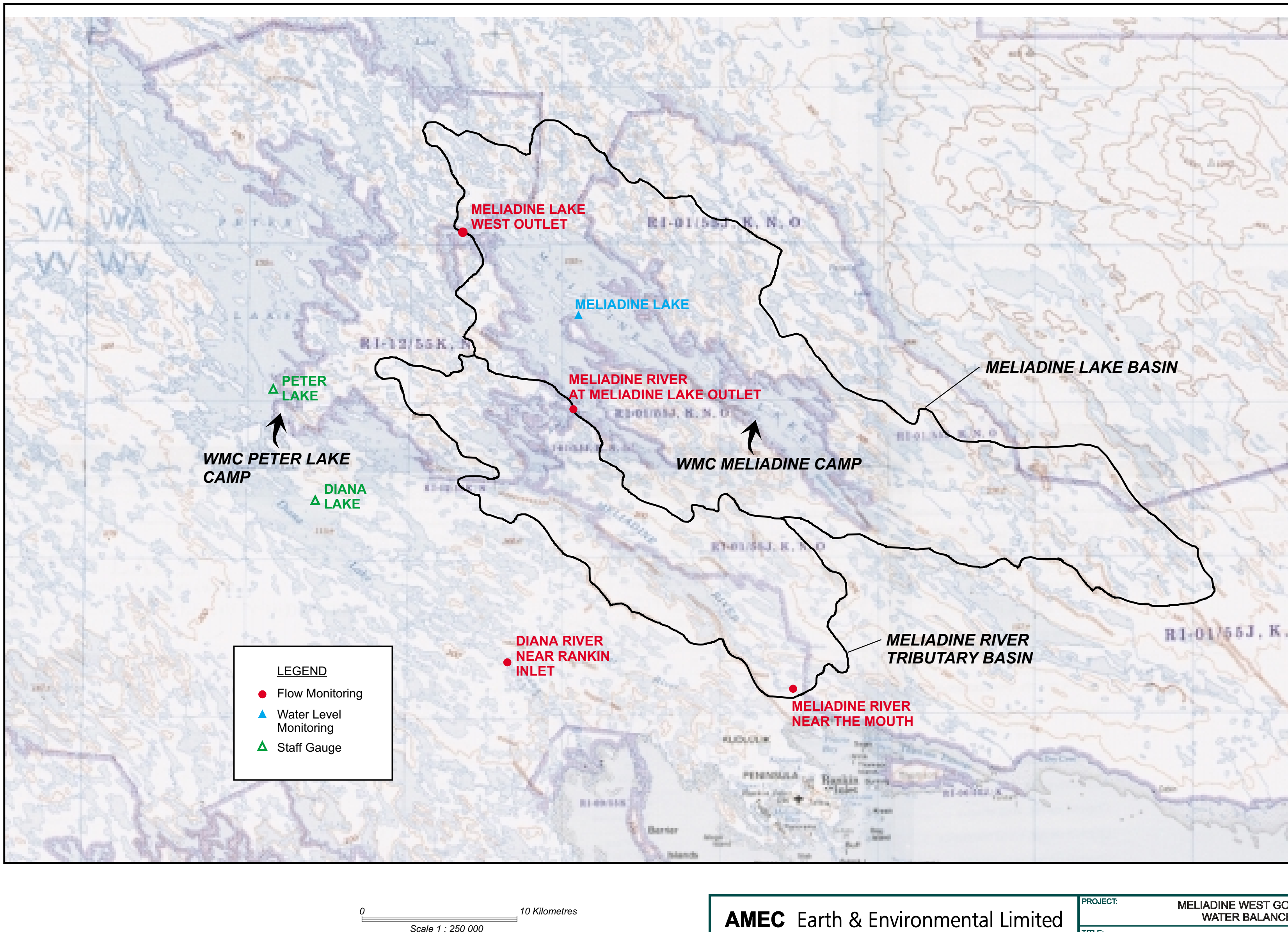
2.2.3 Main Lake Level Monitoring

Water level monitoring on the main lakes were conducted at the following three stations established in 1997:

- Meliadine Lake near Rankin Inlet (automated station)
- Meliadine Lake at main outlet (staff gauge/direct water level survey)
- Meliadine Lake at west outlet (staff gauge/direct water level survey)

Monitoring at Diana Lake and Peter Lake was discontinued in 2000.

The locations of the lake level monitoring stations are shown on Figure 2.1.



AMEC Earth & Environmental Limited	PROJECT: MELIADINE WEST GOLD PROJECT WATER BALANCE STUDY
CLIENT: WMC INTERNATIONAL LIMITED	TITLE: MELIADINE BASIN HYDROMETRIC STATIONS

DATE:	JOB No.:	COREL FILE:	FIGURE No.:	REV.
NOV. 1999	CW1525.10	1525-E03	FIGURE 2.1	A

2.2.4 Peninsula Basin Monitoring

The three monitoring stations operated in the Meliadine Lake peninsula basins in 1999 were continued in 2000. The three stations are:

- Outlet of Lake A1
- Outlet of Lake B7
- Outlet of Lake B2

The locations of these stations as well as previously operated stations are shown on Figure 2.2.

2.2.5 Miscellaneous Monitoring

The term "miscellaneous monitoring" is used to describe occasional or opportunistic monitoring or measurements made at a location of interest, without establishment of a monitoring station. Miscellaneous monitoring of discharge was carried out in 2000 at two locations:

- Char River near Rankin Inlet
- Lake A37 sub-basin outflow to Lake A8 (Pump Lake)

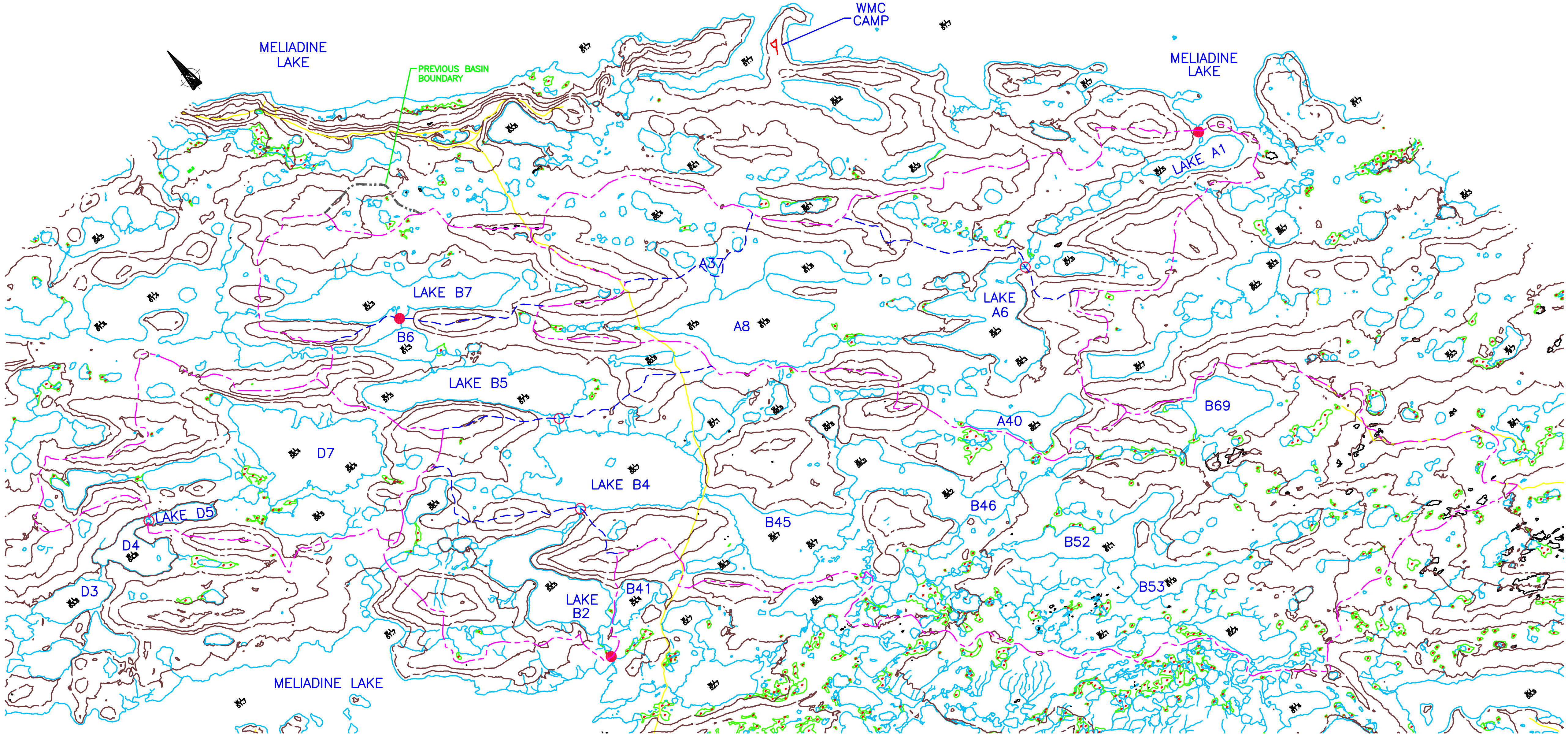
The Char River monitoring was carried out at the existing road crossing, to provide hydrologic data and basic reconnaissance information. This information would be used to develop criteria for design of a suitable all-season crossing for a future mine access road. The location of this monitoring is shown on Figure 2.1. The Lake A37 sub-basin outflow monitoring was done in connection with the snow surveys carried out in this sub-basin, to improve the understanding of the hydrology of this area. The location of the Lake A37 sub-basin is shown on Figure 2.2.

2.3 Drainage Areas

The drainage area for the Char River near Rankin Inlet was measured by delineation of the basin boundary on 1:50,000 scale topographic mapping, and the result incorporated in Table 2.1, with the other main river and lake areas adopted as previously determined.

TABLE 2.1
Main River Basin and Lake Areas (km^2)

Basin Station	Land Surface	Directly Connected Lake Surface	Other Lake Surface (Estimated)	Total Lake Surface	Total Area
Meliadine River at Meliadine Lake Outlet	334	114	121	235	569
Meliadine River Tributary Basin	157	17	53	70	227
Meliadine River at Mouth	491	131	174	305	796
Char River near Rankin Inlet	-	-	-	-	69.0



HYDROMETRIC STATIONS			
NUMBER	NAME	TOTAL DRAINAGE AREA IN km^2	1999–2000 STATUS
A6–5	OUTLET OF LAKE A6	6.493	DISCONTINUED
A1–ML	OUTLET OF LAKE A1	9.391	ACTIVE
B7–6	OUTLET OF LAKE B7	2.393	ACTIVE
B5–4	OUTLET OF LAKE B5	4.687	DISCONTINUED
B4–2	OUTLET OF LAKE B4	20.135	DISCONTINUED
B2–ML	OUTLET OF LAKE B2	22.318	ACTIVE
D5–4	OUTLET OF LAKE D5	3.685	DISCONTINUED

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NOTES:

1. MAP BASE FROM 1:5000 WMC DIGITAL MAPPING BASED ON JULY 1997 AERIAL PHOTOGRAPHY.

LEGEND:

- BASIN BOUNDARY
- SUB–BASIN BOUNDARY
- HYDROMETRIC STATION – ACTIVE
- HYDROMETRIC STATION – DISCONTINUED
- A1 LAKE NUMBER
- CONTOURS (5m)
- LAKES AND STREAMS
- MARSH
- LOCAL ATV TRAIL

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TITLE: PENINSULA BASINS FIGURE 2.2

DATE: NOVEMBER 2000 | JOB No.: CW1525.2 | CAD FILE: 1525–G01.DWG | FIGURE No.: FIGURE 2.2 | REV.: A

The basin area for Lake B7 as previously delineated was identified in the 1999 Data Report, on the basis of anomalous runoff results, as possibly being too large. The boundary for this basin was therefore investigated in the field during the current year program. It was determined that the basin boundary should be re-located so as to exclude a flat area (amounting to 23.38 hectares) along the northeast edge. An alternative explanation for the anomalous runoff results, that Lake B7 might overflow the basin boundary to the northwest, was ruled out on the basis of the observed topography.

The revision to the Lake B7 drainage area affects all of the B Basin stations. The revised peninsula basin and lake areas previously reported are given in Table 2.2, with the revised data identified by bold font. Area data for the Lake A37 sub-basin are also included in Table 2.2.

TABLE 2.2
Peninsula Monitored Basin and Lake Areas

Monitoring Station	Basin	Land Surface (ha)	Monitored Lake Surface (ha)	Other Lakes		Total Lake Surface (ha)	Total Area (ha)	Ratio of Lake to Total Area
				Surface (ha)	Number			
Lake A37	Sub-Basin	**110.49**	**N.A.**	**13.76**	**22**	**13.76**	**124.25**	**0.11**
Lake A6	Sub-Basin	347.15	54.54	123.32	27	177.86	525.01	0.34
	Total Basin	457.64	54.54	137.08	49	191.62	649.26	0.30
	Upstream Basin	457.64				137.08	594.72	0.23
Lake A1	Sub-basin	250.43	16.29	23.15	35	39.44	289.87	0.14
	Total Basin	708.07	16.29	214.77	85	231.06	939.13	0.25
	Upstream Basin	708.07				214.77	922.84	0.23
Lake B7	Sub-Basin	**175.69**	58.10	**5.51**	**17**	**63.61**	**239.30**	**0.27**
	Upstream Basin	**175.69**				**5.51**	**181.20**	**0.03**
Lake B5	Sub-basin	155.11	55.94	18.34	7	74.28	229.39	0.32
	Total Basin	**330.80**	55.94	**81.95**	**25**	**137.89**	**468.69**	**0.29**
	Upstream Basin	**330.80**				**81.95**	**412.75**	**0.20**
Lake B4	Sub-basin	1149.57	85.74	309.52	167	395.26	1544.83	0.26
	Total Basin	**1480.37**	85.74	**447.41**	**193**	**533.15**	**2013.52**	**0.26**
	Upstream Basin	**1480.37**				**447.41**	**1927.78**	**0.23**
Lake B2	Sub-basin	150.60	48.95	18.71	13	67.66	218.26	0.31
	Total Basin	**1630.97**	48.95	**551.86**	**207**	**600.81**	**2231.78**	**0.27**
	Upstream Basin	**1630.97**				**551.86**	**2182.83**	**0.25**
Lake D5	Sub-Basin	238.35	7.02	123.14	18	130.16	368.51	0.35
	Upstream Basin	238.35				123.14	361.49	0.34

Table 2.2 includes the following breakdown of areas:

C land surface area

- surface area of the monitored lake
- surface area and number of other lakes upstream of the monitored lake
- total area of lake surfaces
- total area of sub-basin
- ratio of lake area to total area

The table lists the values for each of the above area categories for the monitored sub-basin, for the total basin including all other upstream monitoring sites if any, and for the total basin upstream of the monitored lake itself. Note that the areas for the sub-basins listed above represent the incremental areas for the sub-basin, not the total areas, which are obtained by adding in the areas of all the upstream sub-basins.

2.4 Evaporation

The Class A evaporation pan previously operated was re-established at the WMC Camp in early July and operated to the end of the season in September. The pan data were used to estimate lake evaporation.

3.0 METEOROLOGICAL DATA

3.1 Regional Historical Precipitation

Updated tabulations of observed monthly and annual rainfall, snowfall, and total precipitation for the Environment Canada Rankin Inlet station, on both a calendar year and a hydrologic year (October - September) basis for the 19-year period of record, are provided in Appendix B.1.

The total 1999-2000 annual observed precipitation for Rankin Inlet, on an hydrologic year basis, is 269.1 mm. This value is 11 percent below the 19-year annual average total precipitation of 302.2 mm. The 1999-2000 total of 269.1 mm consisted of 147.3 mm of rainfall and 121.8 cm of snowfall, representing 19 percent lower and 1 percent higher amounts, respectively, than the 19-year rainfall and snowfall averages. Note that to obtain total precipitation values snowfall in cm is routinely converted by Environment Canada to a numerically equivalent water depth in mm, by assuming a density of 0.1, and added to the rainfall value.

The value of the total precipitation for each hydrologic year of record, the mean, and the ratio of the annual value to the mean are listed in Table 3.1. The data listed in Table 3.1 are shown graphically on Figure 3.1.

The daily rainfall as well as the daily snowfall and daily total precipitation for the Rankin Inlet station for the 1999-2000 hydrologic year are provided in Appendix B.2. All Rankin Inlet data were obtained from Environment Canada (Edmonton office) as digital files.

TABLE 3.1
Rankin Inlet Observed Annual Precipitation
by Hydrologic Year (Oct. - Sept.)

Hydrologic Year	Total Precipitation	Total/Average
81 - 82	271.7	0.90
82 - 83	357.6	1.18
83 - 84	278.4	0.92
84 - 85	369.0	1.22
85 - 86	371.9	1.23
86 - 87	334.7	1.11
87 - 88	216.2	0.72
88 - 89	250.7	0.83
89 - 90	359.8	1.19
90 - 91	387.3	1.28
91 - 92	288.5	0.95
92 - 93	316.1	1.05
93 - 94	207.2	0.69
94 - 95	285.9	0.95
95 - 96	281.8	0.93
96 - 97	172.0	0.57
97 - 98	338.8	1.12
98 - 99	385.4	1.28
99 - 00	269.1	0.89
Average	**302.2**	

Rankin Inlet
Observed Annual Precipitation by Hydrologic Year (Oct. - Sept.)

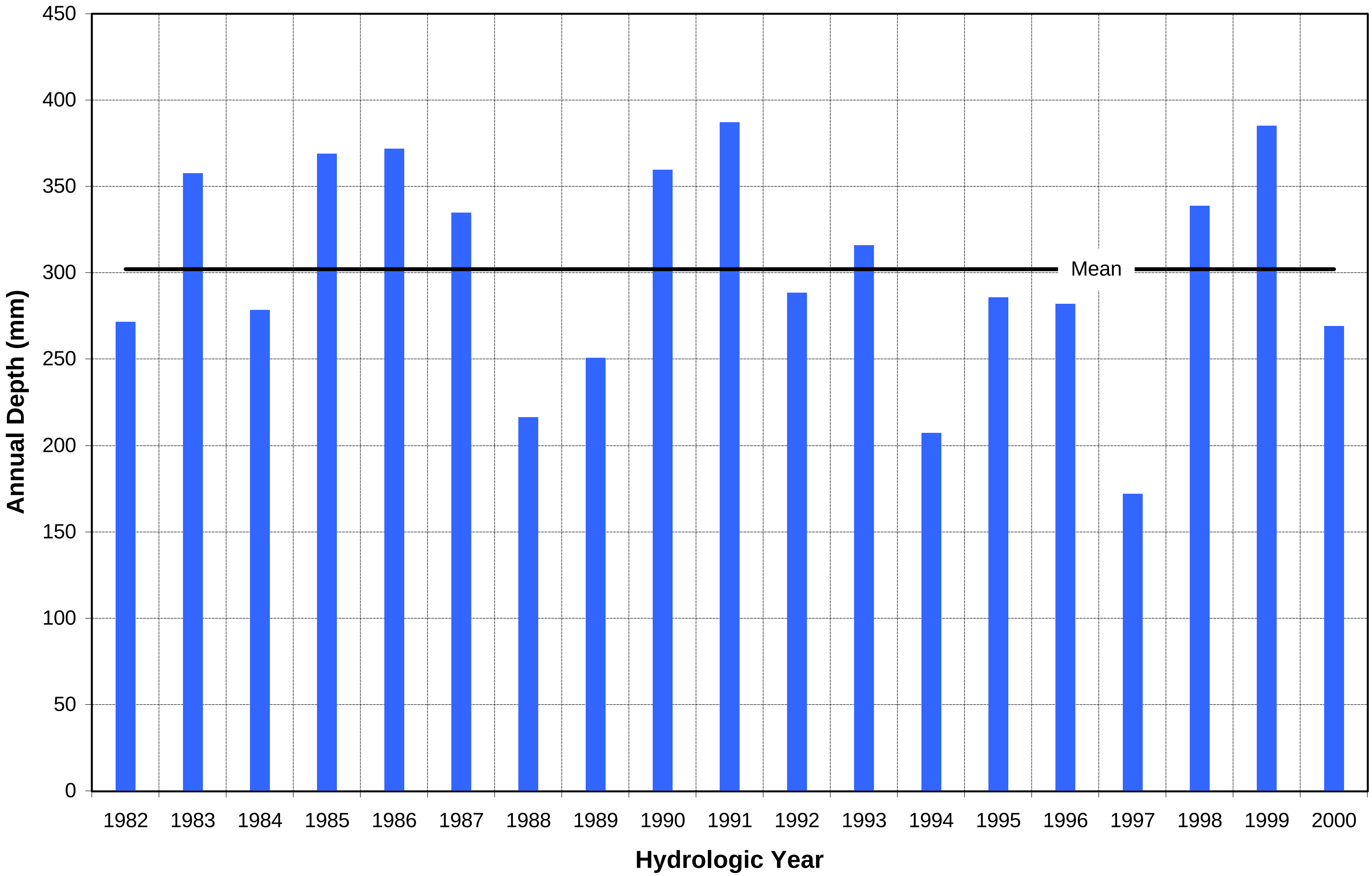

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Figure 3.1

3.2 Project Site Climate Data

3.2.1 Data Observations

The automated climate station installed in 1997 at the Meliadine Camp by Hubert and Associates Ltd. for WMC International continued in operation. The data collected over the 1999-2000 season were downloaded at the beginning of October 2000. Station observations included air temperature, soil temperature, humidity, wind speed and direction, rainfall (tipping bucket plus manual gauge), and net radiation. Data for the summer season June - September were provided to AMEC for inclusion in the current report.

Under AMEC's direction an evaporation pan was installed at the camp by camp staff on 3 July 2000, and observations were made to 19 September when it was decommissioned for the season. A manual rain gauge was operated at the pan as part of the evaporation data collection.

3.2.2 Rainfall Data

Rainfall data for the 1999 season were collected by the Meliadine Camp station, using an automated tipping-bucket rain gauge. Daily manual rain gauge observations were also made at this station, as well as at the evaporation pan station located at the Meliadine Camp. The Rankin Inlet station provided a fourth set of rainfall data. The manual rain gauge at the WMC Peter Lake Camp (see Figure 2.1) was not operated in 2000.

The two manual rain gauge data sets are reported in Table B.4.1 in connection with the evaporation data discussed below. The two rain gauge data sets are practically identical although the evaporation pan gauge data are more complete. The manual gauges were not always read each day; however, rainfall for days without readings were generally noted as accumulated to the day when the next reading was taken, as indicated in the table. Such readings are thus assumed to provide correct values for the total rainfall. However, some periods of missing data also exist.

Rainfall data from the Meliadine Camp tipping bucket station, the evaporation pan manual gauge and the Rankin Inlet station for the common period of record, are listed together to facilitate comparison in Table B.3.1, in Appendix B.2. Comparison of the three data sets is shown graphically on Figure 3.2 as cumulative total rainfall over the period of common record. The comparison shows that the Meliadine Camp tipping bucket gauge data deviate from the Rankin Inlet data by an increasing amount through the season, indicating a systematic under-reporting of data. This is thought to be due to the station problems noted above. The manual gauge data also deviate from the Rankin Inlet data; those deviations appear to be due to missing data and possible errors in interpretation and adjustment of the field notes.

2000 Rainfall Data
Comparison of Station Observations

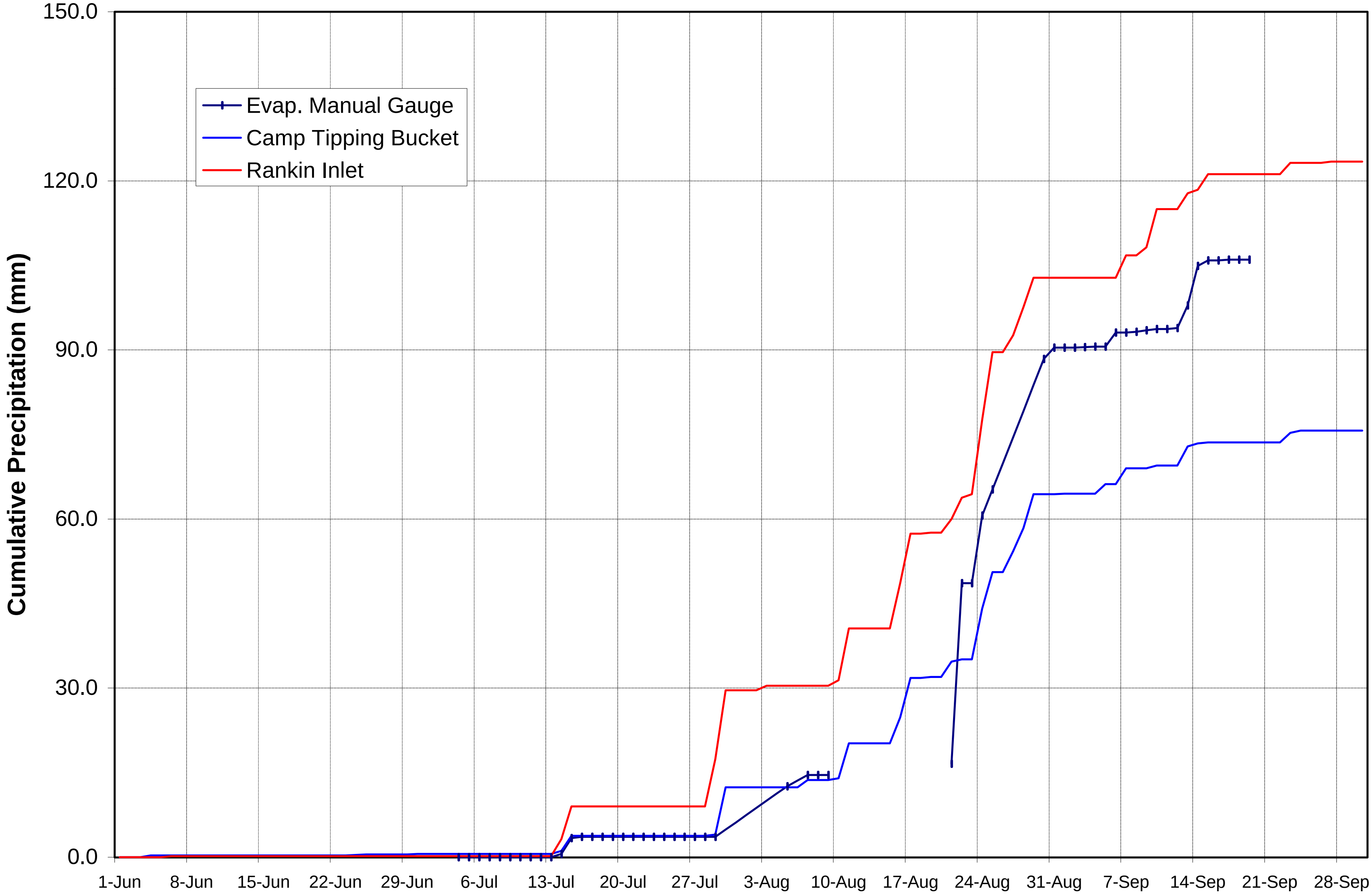

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Figure 3.2

Based on the above, it was concluded that the Rankin Inlet data should be used for the Meliadine West Gold Project water balance for the 2000 season. That data set is given in Table B.2.1 in Appendix B. The total rainfall for the 1 June to 30 September period is therefore 123.4 mm. That amount is considerably less than the unusually high 1999 summer rainfall of 237.4 mm, but is similar to the 1998 summer rainfall amount of 139.9 mm. However the current year had the driest June on record, with only 0.2 mm recorded, compared to an average of 25.0 mm over the 19-year period of record.

3.2.3 Other Climate Data

Besides rainfall, other data recorded at the camp climate station include air temperature, soil temperature, net radiation, relative humidity and wind speed and direction. Daily values recorded for the June - September 2000 season for each of these parameters are shown on Figures 3.3 through 3.7. Monthly mean values are summarized in Table 3.2.

TABLE 3.2
Meliadine Camp Climate Station
Monthly Data Summary June – September 2000

Month	Air Temperature					Mean Soil Temperature (C)	Mean Net Radiation (MJ/m^2/day)	Mean Humidity (%)	Wind Speed		
	Extreme Day		Average*		Mean				Mean	Monthly	Average
	Max (C)	Min (C)	Max (C)	Min (C)	(C)				(km/h)	Max (km/h)	Max* (km/h)
Jun.	13.4	-7.5	5.9	-2.1	1.9	0.0	10.4	86.8	17.8	62.2	36.0
Jul.	26.4	-0.3	18.4	5.6	12.0	7.8	13.5	78.2	12.5	42.1	30.7
Aug.	25.6	1.6	14.9	7.9	11.4	7.9	7.2	85.5	19.4	63.8	39.9
Sep.	15.7	-5.8	5.7	0.5	3.1	2.8	3.8	89.6	23.5	69.1	45.3

* Represents the average of the daily extremes for the month.

3.2.4 Evaporation

3.2.4.1 Evaporation Measurements

The evaporation pan used for the previous seasons was stored over winter at the camp and re-installed on 3 July 2000 allowing observations to start on 4 July. Observations continued through the season to 19 September 2000. The pan water froze on 20 September and the pan was then decommissioned for the season. Monitoring instructions provided to the operators are attached in Appendix A. The evaporation pan data are summarized in Table B.4.1 in Appendix B.4. The cumulative (gross) pan evaporation is shown on Figure 3.8.

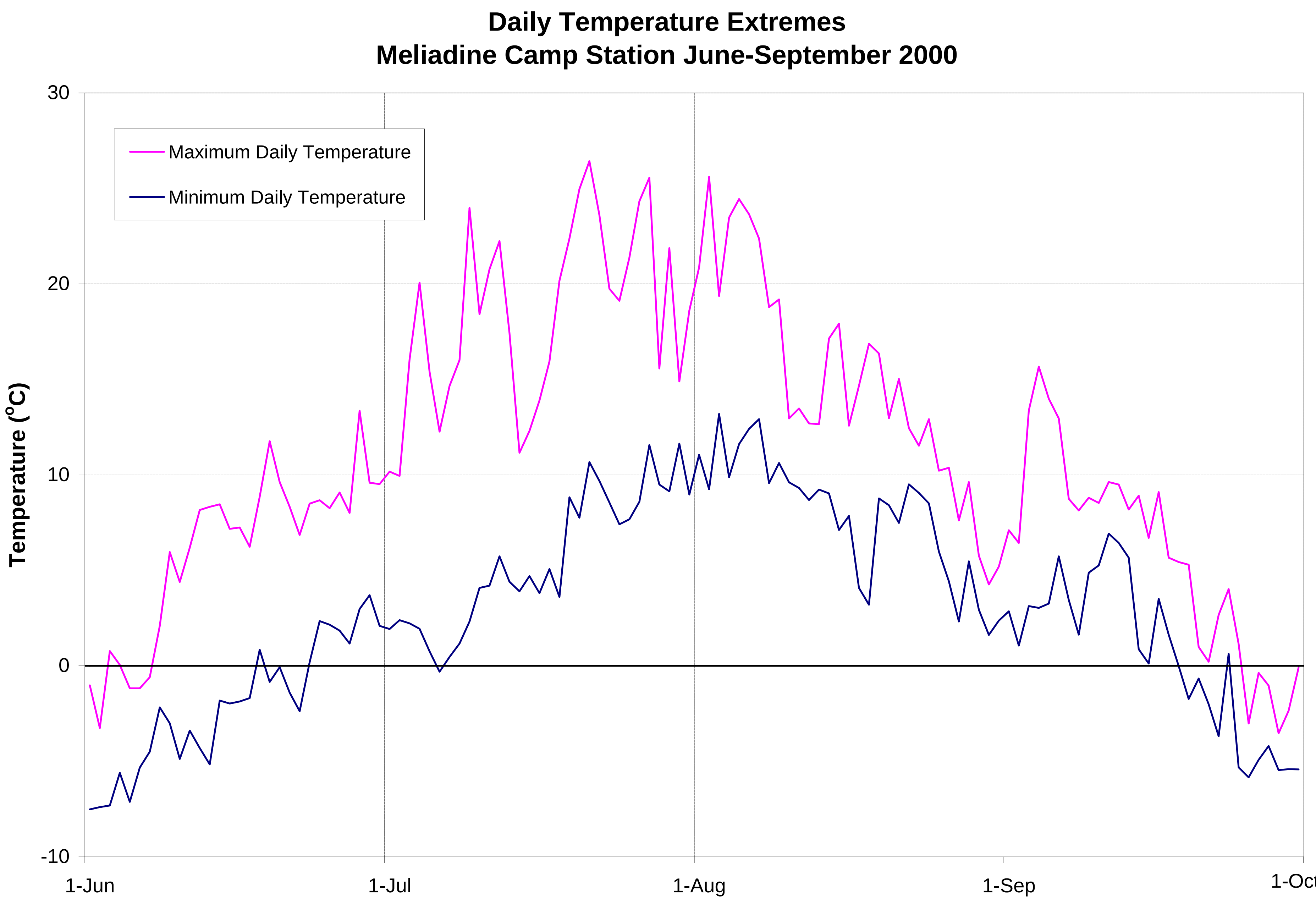

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Figure 3.3

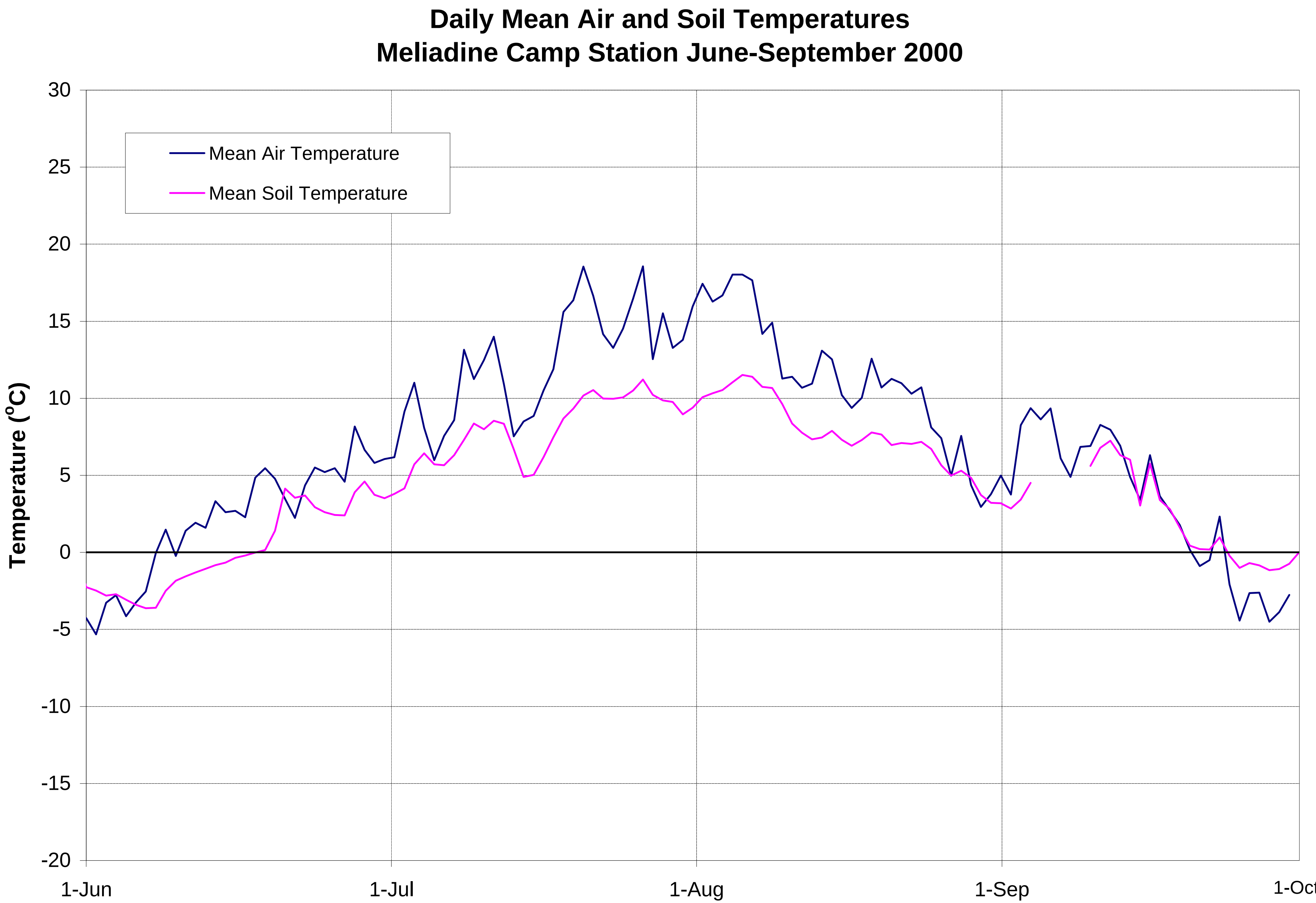

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Figure 3.4

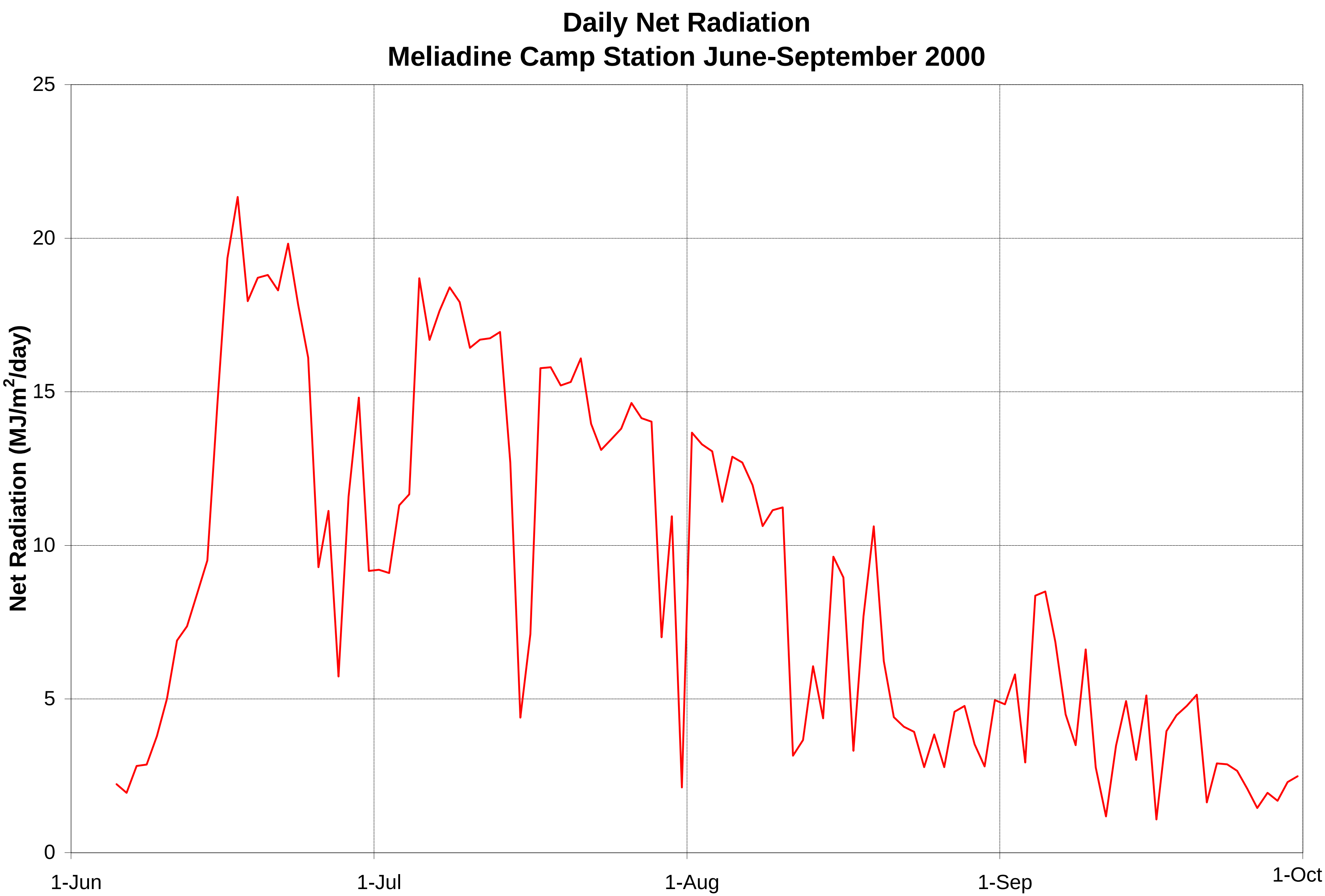

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Figure 3.5

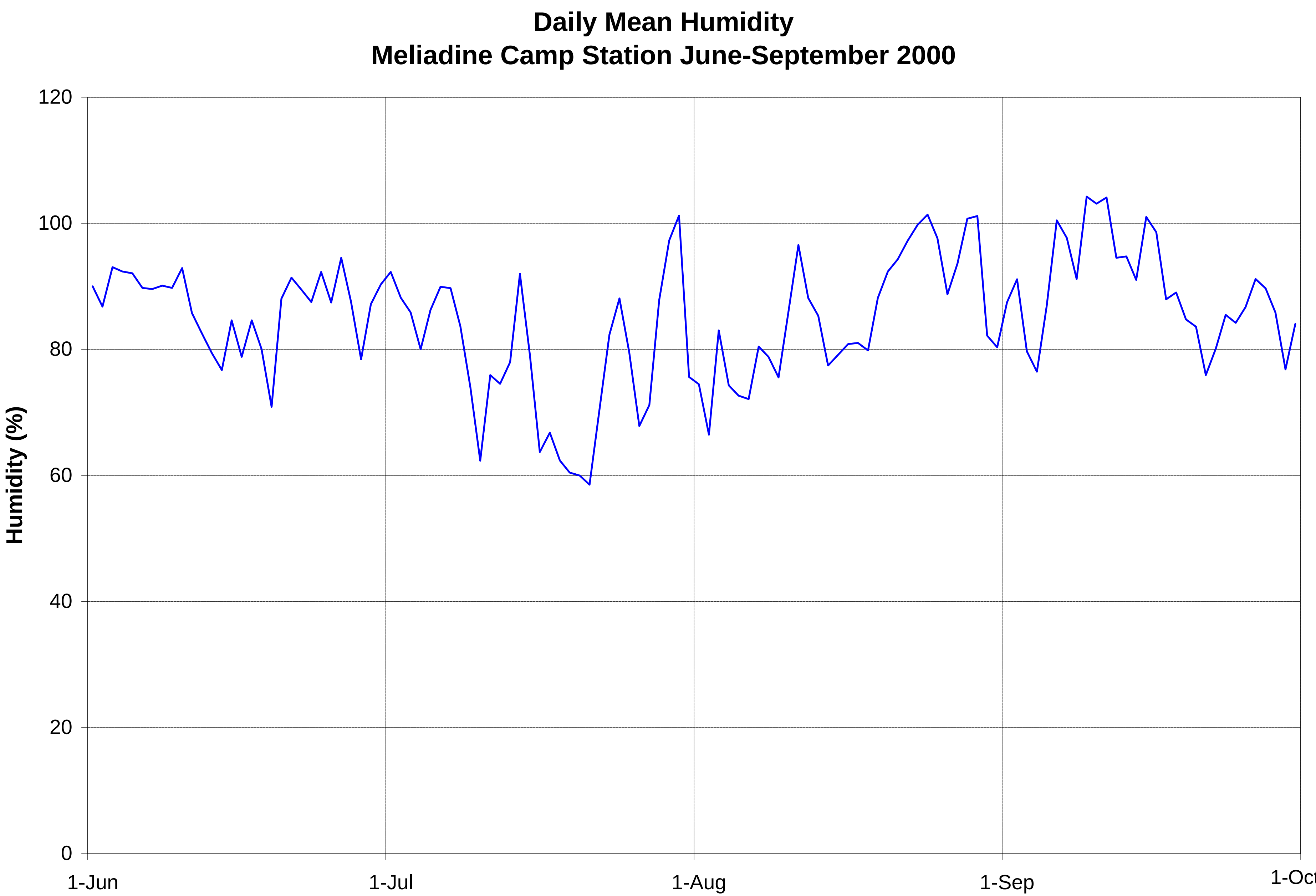

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Figure 3.6

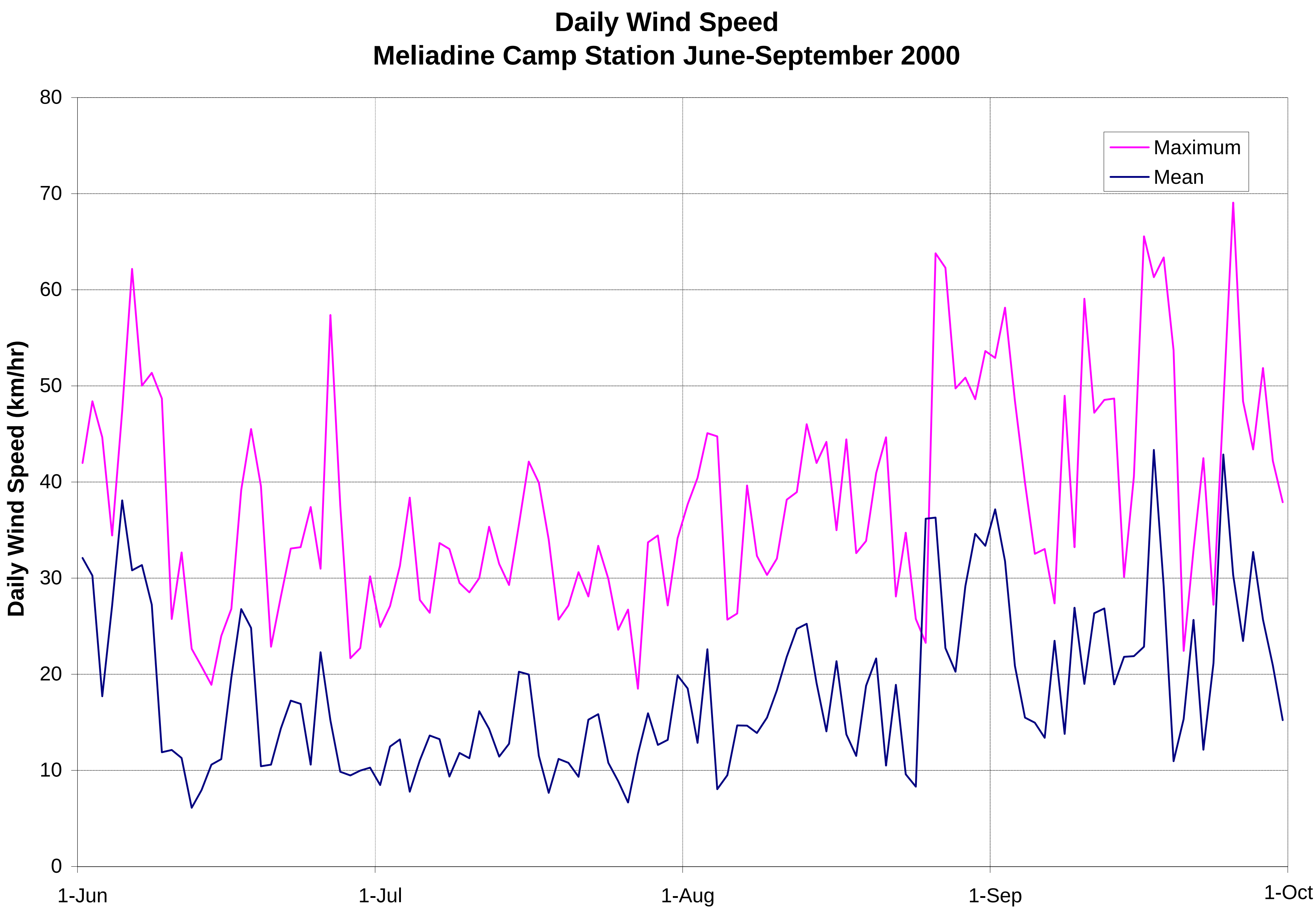

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Figure 3.7

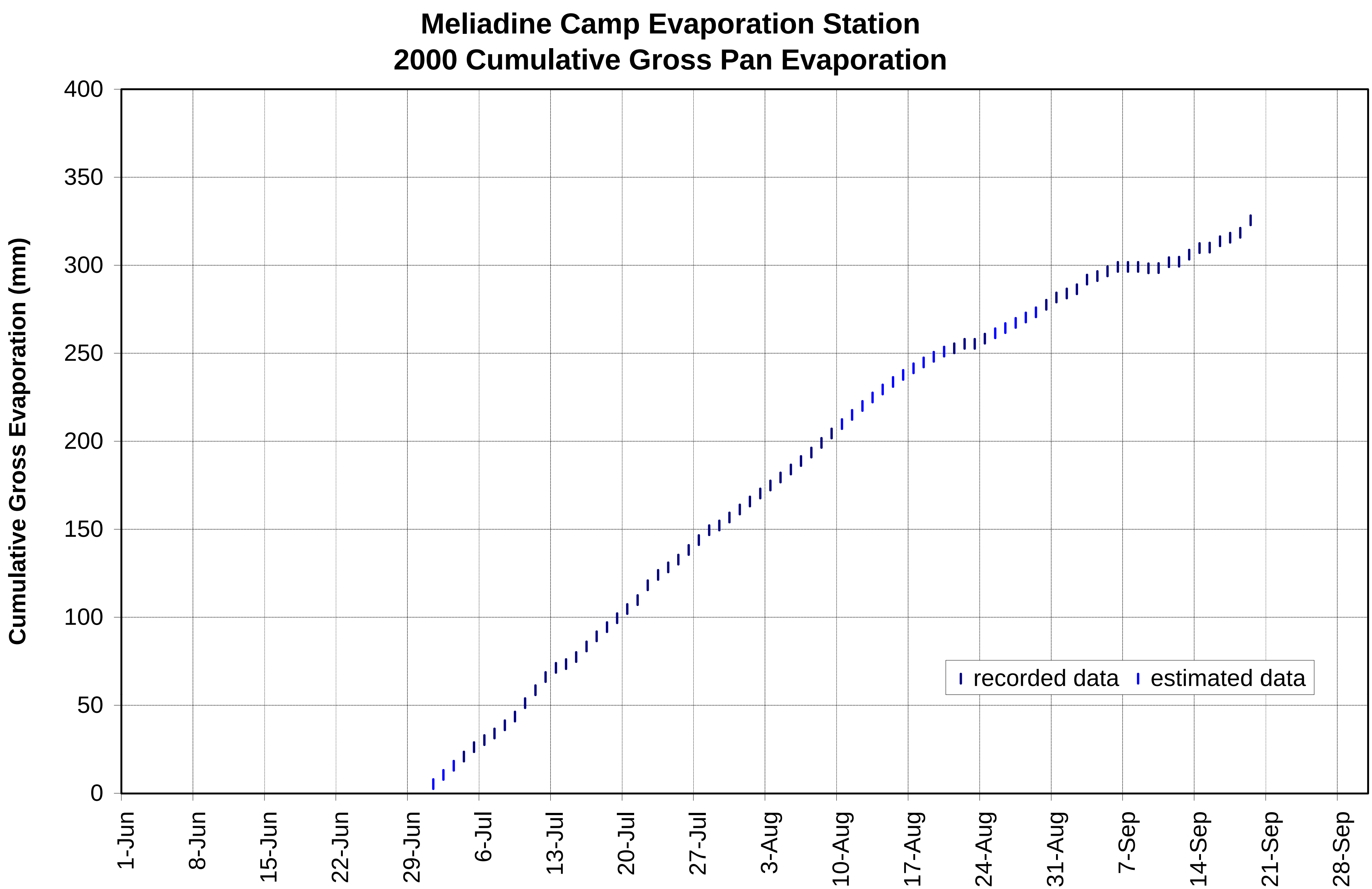

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Figure 3.8

The data reported in Table B.4.1 include both the raw data as recorded and the adjusted data. The raw data included a number of cumulative readings representing periods of several days, some readings with obvious errors such as misplaced decimals, some readings affected by high winds blowing water out of the pan, and days with missing data. The periods for which cumulative data were available were adjusted by distributing the end of period reading evenly over the days which had been accumulated, the obvious decimal place errors were corrected, and the missing and wind affected data were estimated by taking an average from adjacent days.

The pan evaporation for the period 1 July to 3 July was estimated by assuming that the daily evaporation rate for those three days was the same as measured for 4 July (5.2 mm). The evaporation for the period prior to 1 July was estimated by assuming that the daily evaporation rate increased linearly from zero on 14 June, to 5.2 mm on 30 June. The date of 14 June is the estimated representative date on which ice cover on the lakes started to diminish and open water started to appear (see Table 5.3 in Section 5.4 below). The total pan evaporation for the period 14 - 30 June is thus estimated to be 44.2 mm.

Some evaporation was assumed to occur from 20 September to 30 September, even though the pan water froze at night, since open water conditions are estimated to have continued for the lakes in the study area until about the end of September. The pan evaporation for this period was estimated by assuming that the daily evaporation rate decreased linearly from 3.1 mm on 20 September (the average of the preceding five days) to zero on 30 September. The cumulative amount so obtained equals 17.0 mm.

The total gross pan evaporation for the 2000 season was thus 386.7 mm, with a monthly distribution as shown on Figure 3.9. The largest monthly evaporation occurred in July, when 161.2 mm or 42 percent of the annual total occurred.

3.2.4.2 Net Pan Evaporation

The net pan evaporation for the 2000 season is obtained by subtracting the total precipitation during the season from the gross pan evaporation of 386.7 mm. The precipitation for the period 1 June to 30 September, as recorded by the Rankin Inlet station, equals 123.4 mm. The net pan evaporation calculated for the 2000 season thus equals 263.3 mm.

3.2.4.3 Lake Evaporation

Lake evaporation was estimated from the evaporation pan data using the method adopted by Environment Canada (Kohler, Nordenson, and Fox, 1955). That method computes lake evaporation as a function of the pan water temperature, the air temperature, the daily wind run (wind run = wind speed x duration), and the pan evaporation.

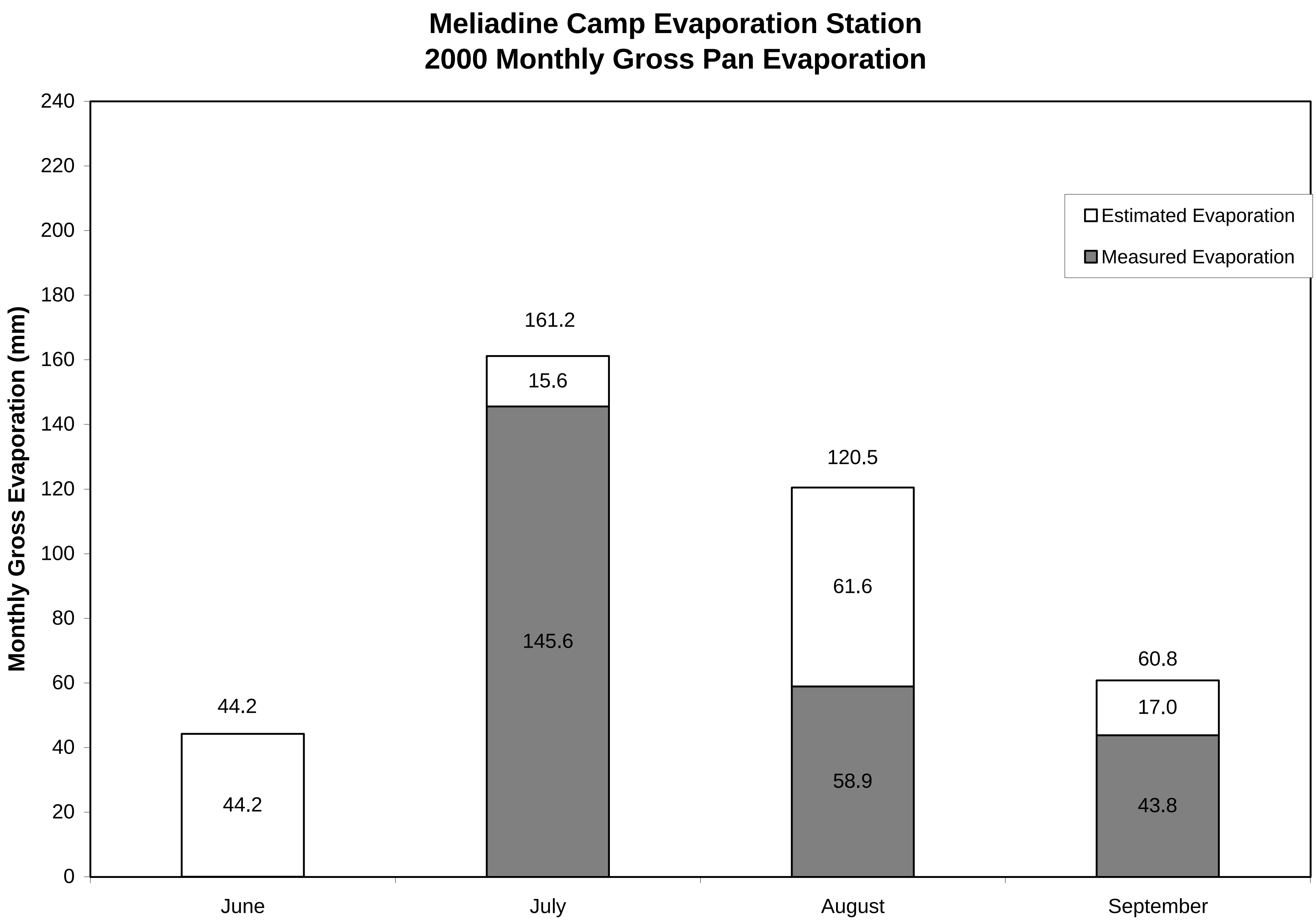

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Figure 3.9

The available data allowed computations to be completed for 30 days over the open-water season. The computational method and results are given in Appendix B.5. The pan coefficient found for the period equals 0.83. That value is almost identical to the value of 0.82 found for the 1999 and 1998 seasons.

The value of 0.83 applied to the complete season provides a total gross lake evaporation of 317.1 mm. Subtracting the total seasonal rainfall of 123.4 mm results in a net lake evaporation of 193.7 mm.

4.0 MONITORING IN THE LAKE A37 SUB-BASIN

4.1 Introduction

The probable area in which initial development of a mine is proposed is in the Tiriganiaq Zone, which is located in the sub-basin draining largely through Lake A37 into Lake A8 (Pump Lake), as shown on Figure 4.1. Mine development may interrupt the natural drainage pattern, requiring water diversion and other water management facilities. It was therefore decided to obtain further data on the hydrologic characteristics of the Lake A37 sub-basin. Monitoring was conducted in the Lake A37 sub-basin for both snowpack water equivalent (snow depth and density), and the snowmelt runoff.

4.2 Snowpack Monitoring

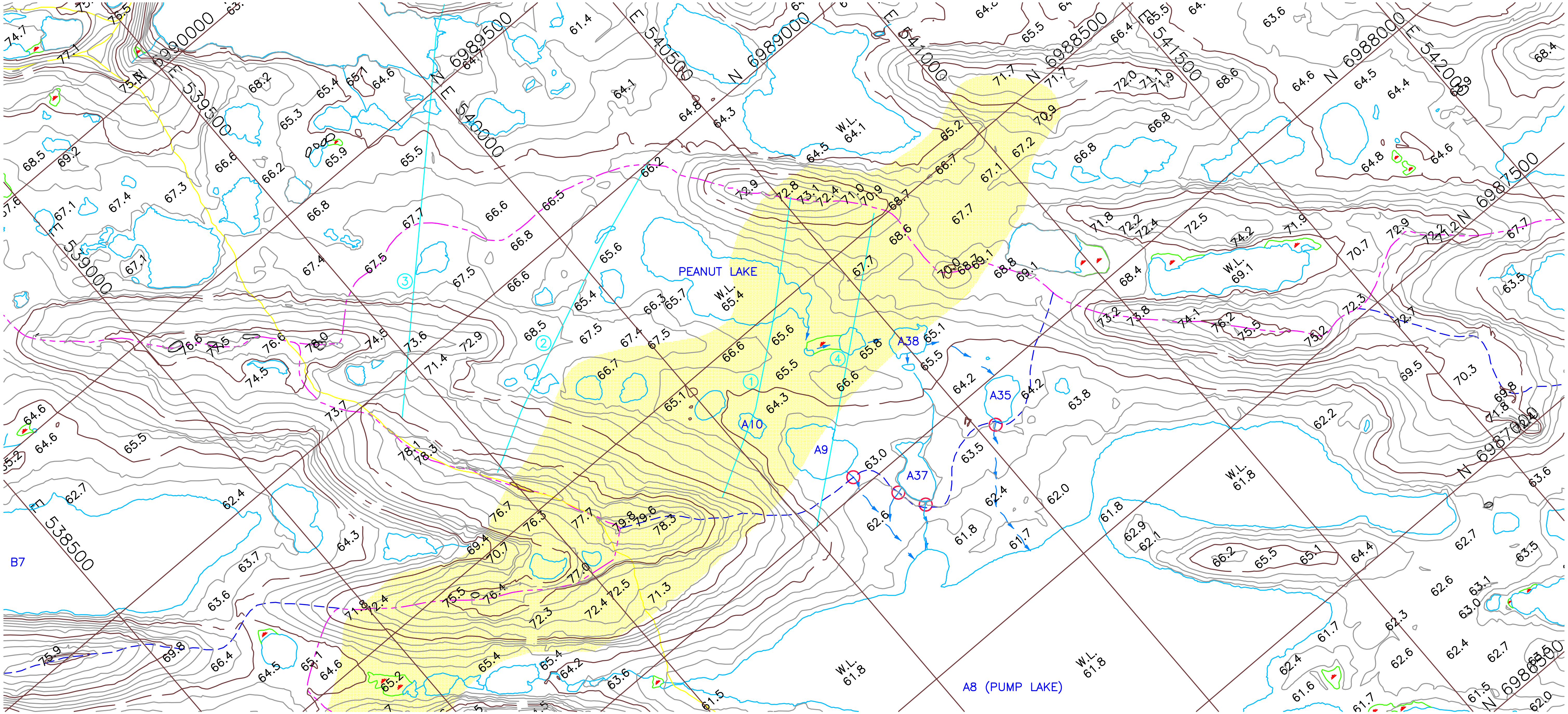
Snow surveys to determine the spring snowpack snow water equivalents (SWE) in the Lake A37 sub-basin were conducted on 13 May 2000. Four transects were located and surveyed, as shown on Figure 4.1.

The measured snow depths and densities and the topography traversed by each transect are shown graphically on Figures 4.2 through 4.5. A complete tabulation of the snow survey data are provided on Tables C.1.1 through C.1.4 in Appendix C.1. The tables include the GPS coordinates for the transect end points as observed in the field.

The Lake A37 sub-basin was analysed using GIS methods and ten terrain units were classified, as described in the AGRA 1998 Data Report. The definition of the terrain units is given in Appendix C.2. The definitions developed in 1998 were retained except that the definition for the "crest" terrain unit (no. 3) was revised slightly to reduce its overall area. The distribution of the terrain units within the Lake A37 sub-basin is shown in Figure 4.6.

The characteristic snow water equivalent (SWE) for each terrain unit was obtained by manually examining the data shown in Figures 4.2 through 4.5 and dividing transects into terrain unit segments. The data points within each terrain unit were then averaged to obtain the characteristic SWE. The results are summarized in Table 4.1.

The snow survey did not provide sufficient data points to characterize SWE values for terrain units 9 and 10, which together account for only 2.2 percent of the Lake A37 sub-basin area. The SWE values for terrain units 9 and 10 were therefore estimated by applying the ratio of the 2000 to 1998 SWE values for unit 4 (equal to 1.7) to the 1998 SWE values for units 9 and 10.



LEGEND:

- BASIN BOUNDARY
- SUB-BASIN BOUNDARY
- MONITORING LOCATION
- A1 LAKE NUMBER
- CONTOURS (5m)
- LAKES AND STREAMS
- OBSERVED FLOW PATH
- MARSH
- TIRIGANIAQ ZONE (APPROX.)
- 4 SNOW SURVEY TRANSECT

1:10,000

0 100 200 m

NOTES:

1. MAP BASE FROM 1:5000 WMC DIGITAL MAPPING BASED ON JULY 1997 AERIAL PHOTOGRAPHY.

AMEC Earth & Environmental Limited

CLIENT: WMC INTERNATIONAL LIMITED

PROJECT: MELIADINE WEST GOLD PROJECT WATER BALANCE STUDY

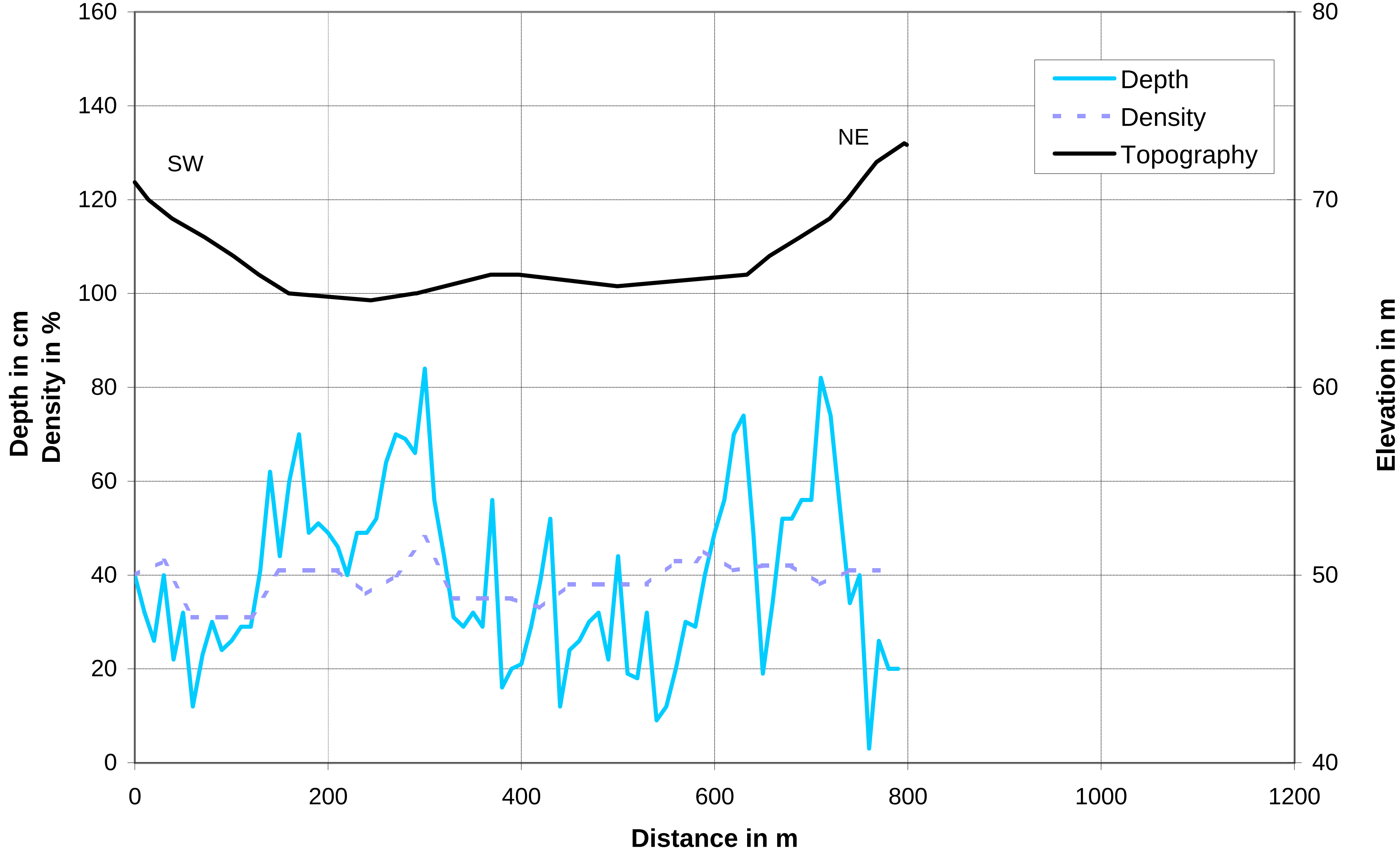
TITLE: LAKE A37 SUB-BASIN FIGURE 4.1

DATE:	JOB No.:	CAD FILE:	FIGURE No.:	REV.
NOVEMBER 2000	CW1525.2	1525-G02.DWG	FIGURE 4.1	A

FIGURE 4.1 – Jan. 26, 2001 2:11pm – poldridge

*PLOT 1:1=B (L)

Snow Survey 2000
Transect 1
Topography, Snow Depth and Density



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Snow2000.xls [T1]
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Figure 4.2

Snow Survey 2000
Transect 2
Topography, Snow Depth and Density

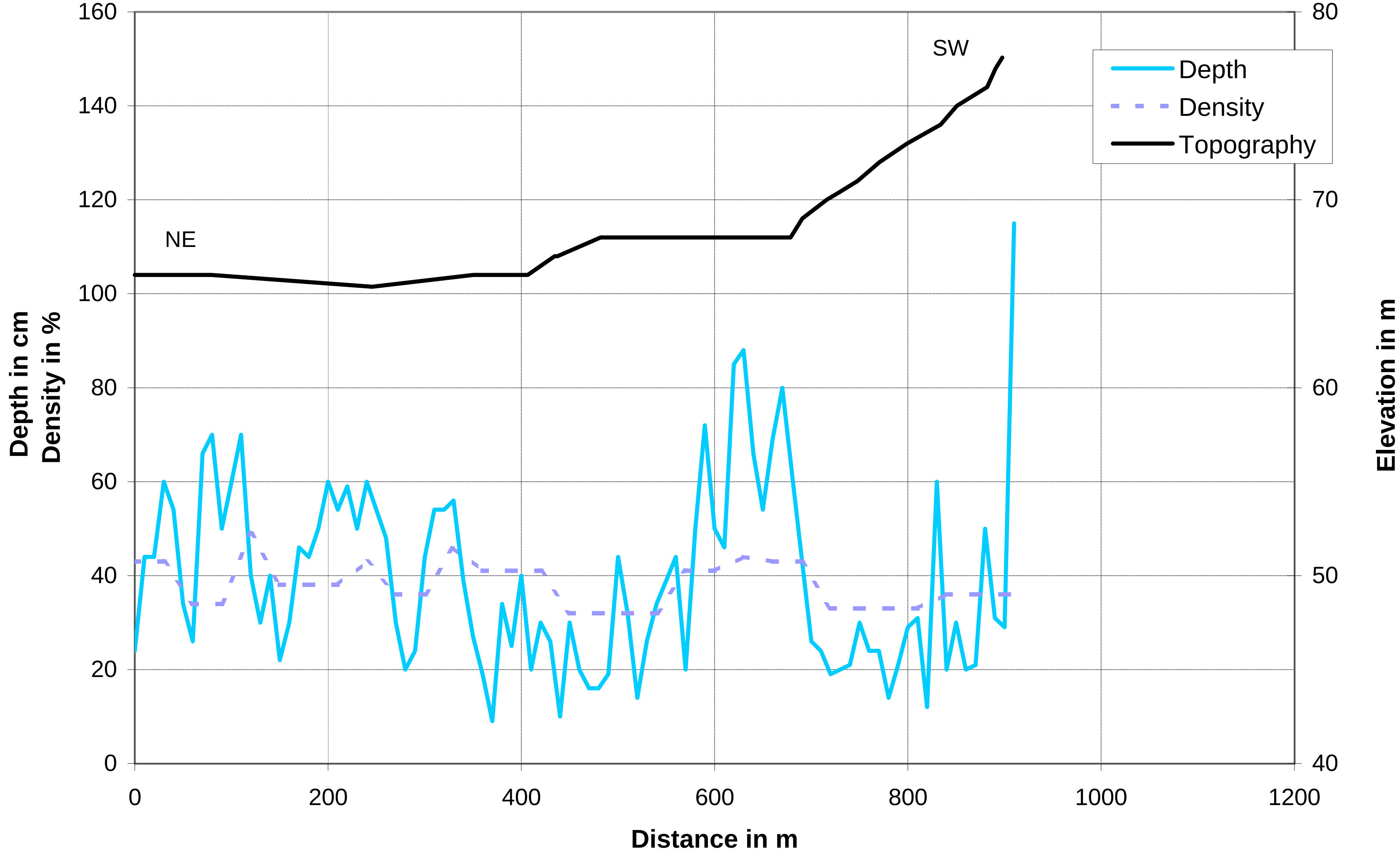

Figure 4.3

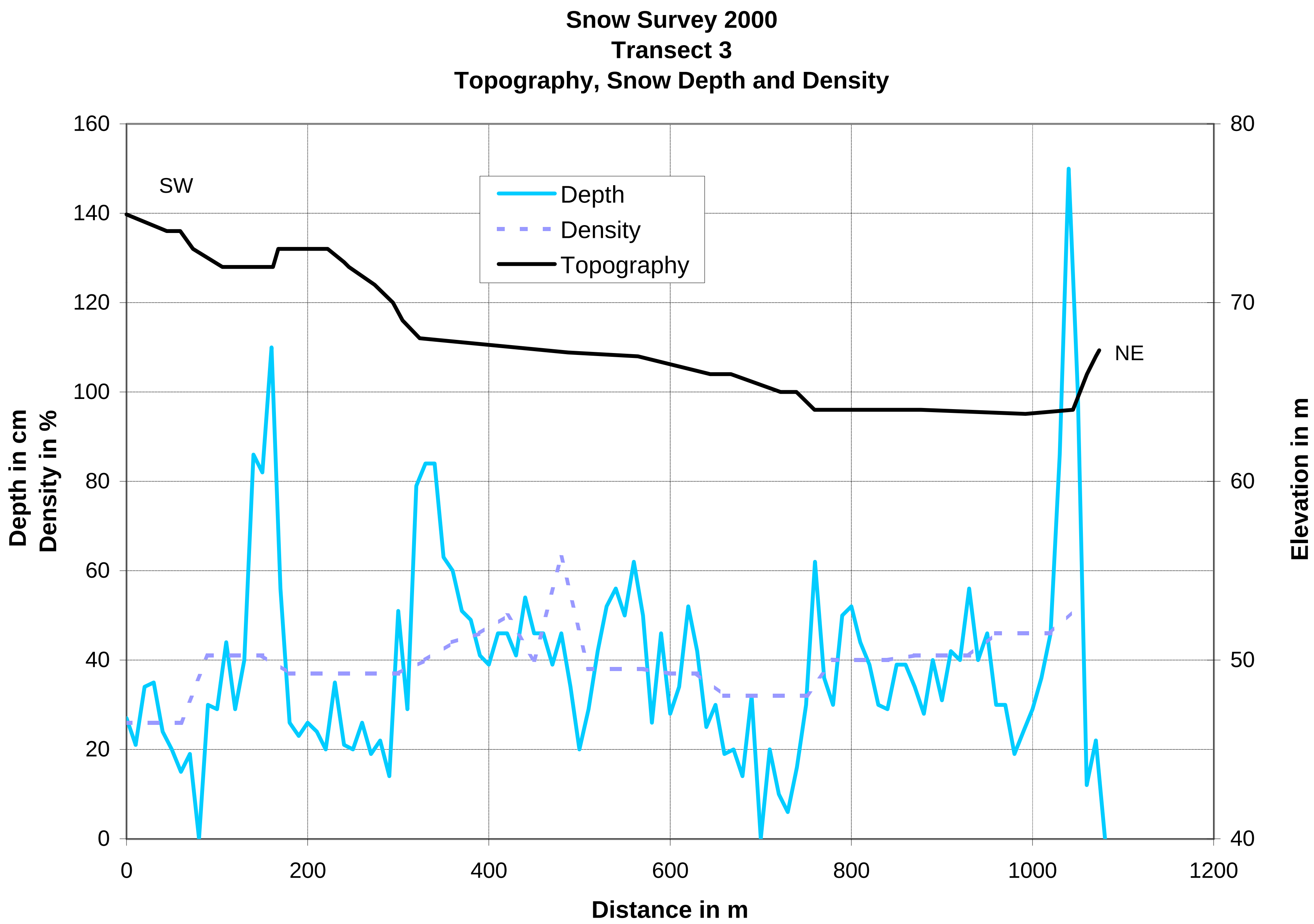

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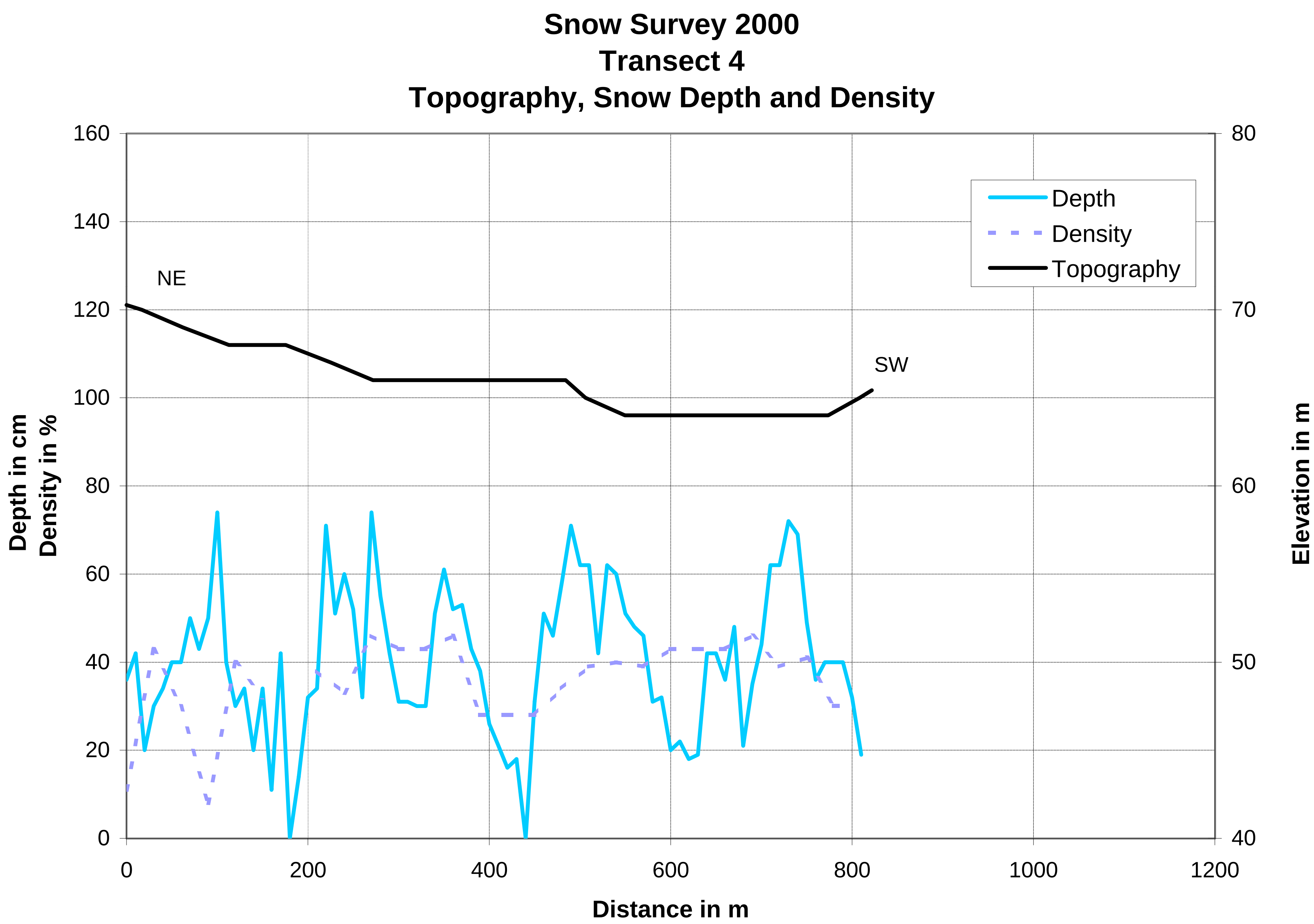
Figure 4.4



Snow Survey 2000
Transect 4
Topography, Snow Depth and Density
Depth in cm
Density in %
Elevation in m
Distance in m
NE
SW
Depth
Density
Topography
0
20
40
60
80
100
120
140
160
40
50
60
70
80
0
200
400
600
800
1000
1200

Figure 4.5

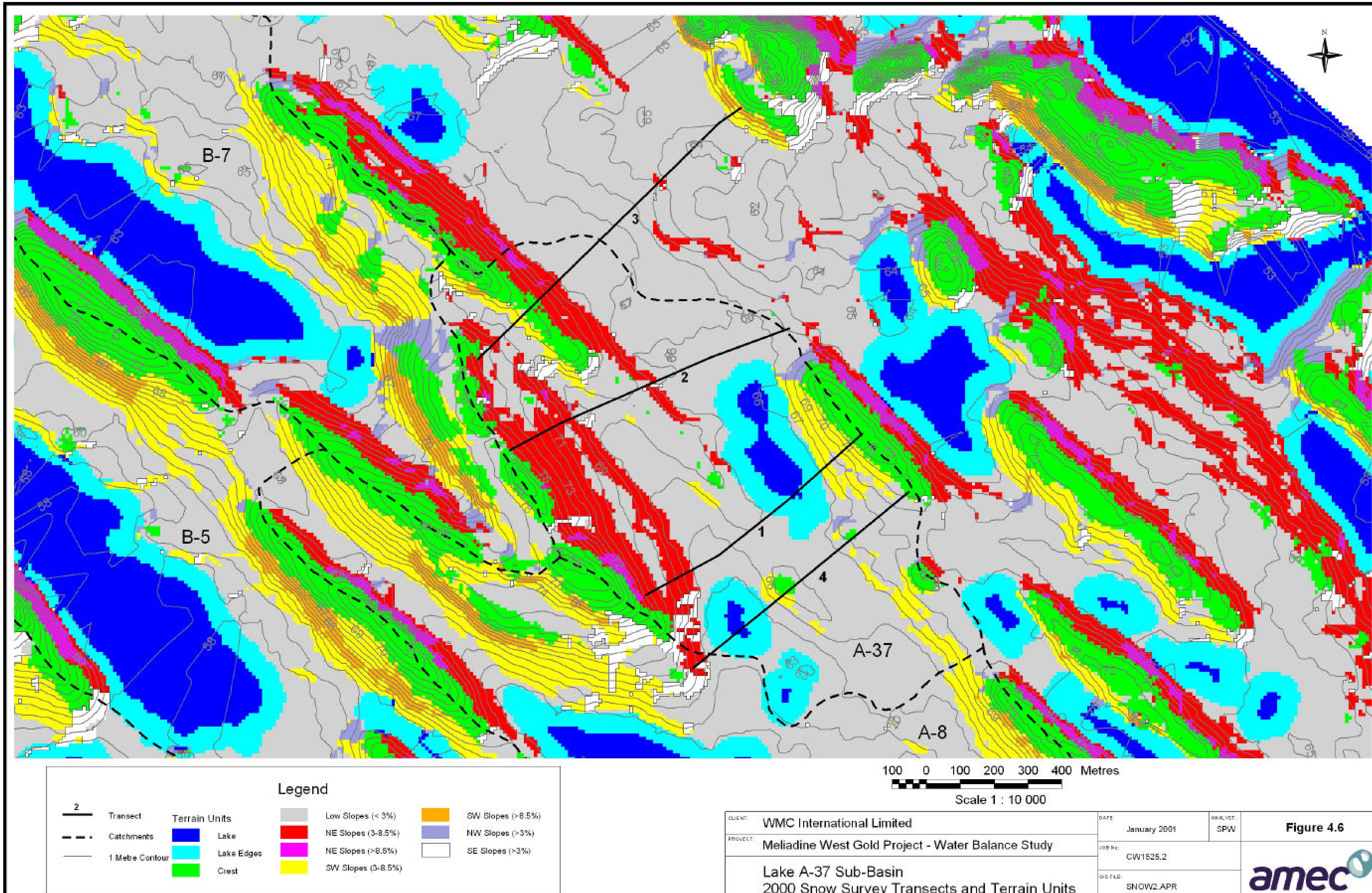


Figure 4.6

Lake A-37 Sub-Basin
2000 Snow Survey Transects and Terrain Units

TABLE 4.1
2000 Snow Survey Results
Terrain Units and Characteristic Snow Water Equivalent (SWE)

Terrain Unit		Snow Course Transect	Start Station	End Station	SWE (mm)	
No.	**Description**				**Mean**	**SD[2]**
1	Lake	1	500	560	85.8	45.1
		4	590	700	137.3	48.7
		Combined	170[1]		**118.3**	**52.7**
2	Lake Edges	1	570	630	211.1	71.4
		3	850	1020	154.8	36.2
		4	710	740	265.5	201.0
		Combined	260[1]		**183.6**	**60.1**
3	Crest	1	760	790	70.7	40.6
		3	180	290	85.1	19.1
		3	1060	1080	58.9	57.3
		Combined	160[1]		**77.9**	**31.1**
4	Low Slopes (<3%)	1	200	490	160.7	84.5
		2	0	640	161.7	79.2
		3	370	840	150.0	68.0
		4	0	480	129.7	71.8
		4	750	810	123.3	43.7
		Combined	1940[1]		**149.5**	**75.3**
5	NE Slopes (3-8.5%)	1	0	190	140.2	68.1
		2	650	870	125.8	86.3
		3	0	130	87.3	49.5
		3	300	360	260.4	85.0
		Combined	600[1]		**136.6**	**86.5**
6	NE Slopes (>8.5%)	2	880	910	**202.5**	**145.1**
7	SW Slopes (3-8.5%)	1	640	750	287.3	165.3
		4	490	580	207.3	42.3
		Combined	230[1]		**250.9**	**129.4**
8	SW Slopes (>8.5%)	3	140	170	335.0	91.4
		3	1030	1050	560.9	172.3
		Combined	50[1]		**431.8**	**169.3**
9	NW Slopes (>3%)	estimated			**554.0**	-
10	SE Slopes (>3%)	estimated			**699.0**	-

Notes:
1. Total length of transects used to obtain characteristic snow values.
2. SD = standard deviation of sample data.

The characteristic SWE values listed in Table 4.1 were checked by comparing the observed total SWE value for all the transect data points with the total SWE value obtained by applying the characteristic SWE values to the transect terrain units. The results agreed to within 98 percent. No adjustments were therefore made to the characteristic SWE values obtained from the transect data.

The characteristic SWE values were applied to the Lake A37 sub-basin according to the distribution of the terrain units, and a snow water volume obtained of 203.36 dam^3, which equals a depth of 163.7 mm over the drainage area of 1.2425 km^2. To obtain the snow water depth for the June 14 start of snow melt runoff, the total precipitation amount of 3.3 mm recorded at Rankin Inlet over the period May 14 to June 14 was added to the above, giving 167.0 mm.

The above procedure was also applied to the other monitored basins, as the GIS and terrain unit data were available from the updated 1998 model. The resulting values are summarized in Table 4.2, along with a comparison to the 1998 results.

Table 4.2
Lake A37 and Peninsula Basins 2000 Snow Water Equivalents (SWE)

Basin	Area km^2	Snow Survey SWE		Post Survey SWE mm	2000 Total SWE mm	1998 Total SWE mm	Ratio of 2000/1998 SWE
		dam^3	mm				
Lake A37	1.2425	203.36	163.7	3.3	167.0	N/A	N/A
Lake A1	9.3913	1673.9	178.2	3.3	181.5	135.6	1.34
Lake B7	2.393	410.25	171.4	3.3	174.7	130.6	1.34
Lake B2	22.3178	4056.43	181.8	3.3	185.1	134.5	1.38

The SWE value obtained for the Lake A37 sub-basin is compared to the snowmelt runoff in the following section. The SWE values obtained for the Lake A1, B7 and B2 basins are discussed further in Section 5.6.

4.3 Snowmelt Runoff Monitoring

Snowmelt runoff was monitored during the snowmelt period in June. Monitoring consisted of spot measurements of the outflow discharged from the sub-basin, over the period 15 June – 20 June. Water level datalogger monitoring stations were not set up.

Outflow from the sub-basin to Lake A8 was observed to occur via the outlets from Lakes A9, A37 and A35, as shown on Figure 4.1. Lake A37 discharged from two outlets: a west outlet which joined the Lake A9 outlet, and an east outlet. The discharge measurement data are summarized in Table 4.3.

TABLE 4.3

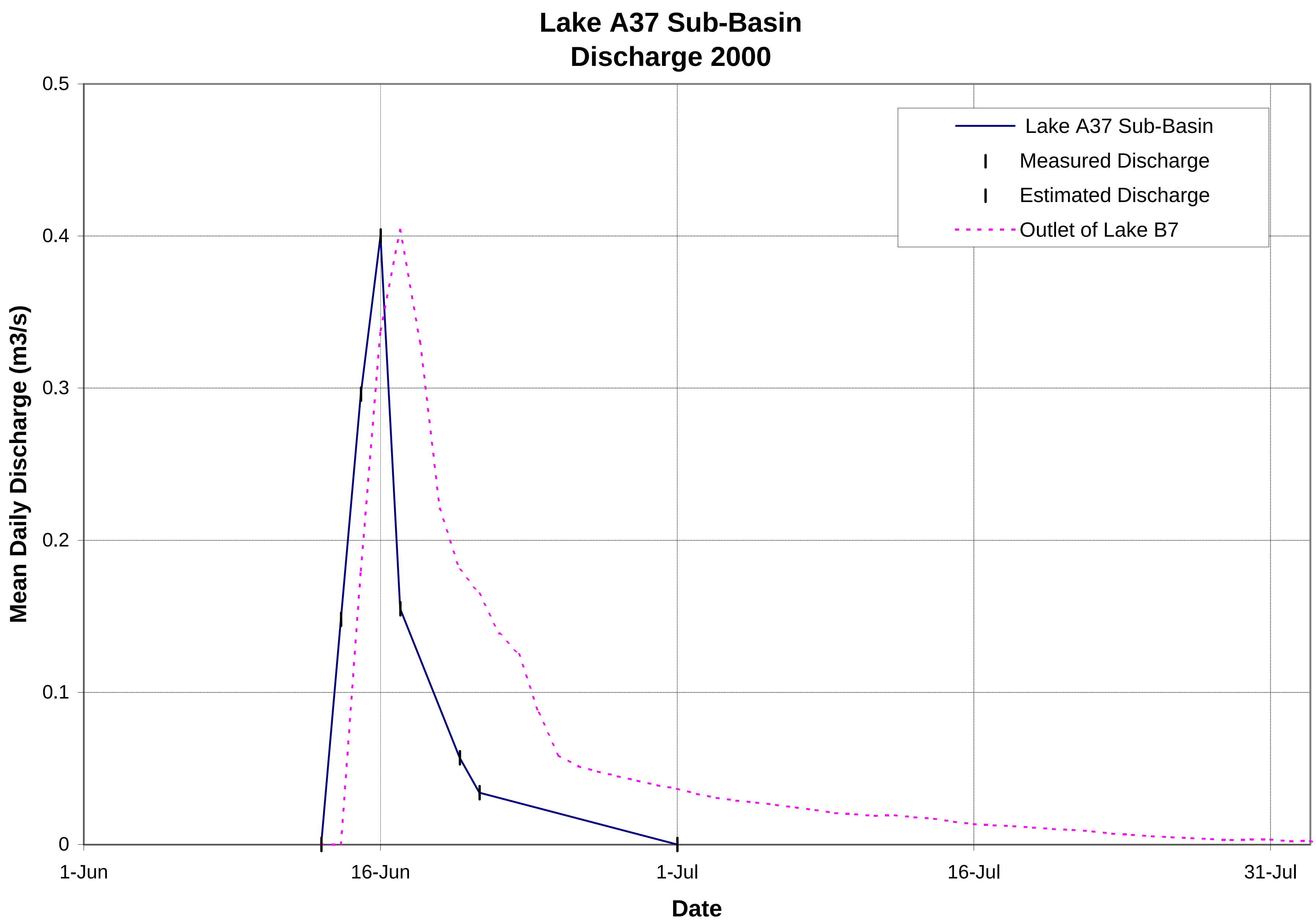
Lake A37 Sub-Basin
Snowmelt Runoff Monitoring Data

Date	Discharge in m^3/s					
	A9	A37 West	A37 East	A35	A37+A35	Total Sub-Basin
15-Jun	0.101	0.011	0.051	0.133	0.195	**0.296**
16-Jun	0.072					
17-Jun	0.070	0.004	0.018	0.063	0.085	**0.155**
20-Jun	0.029	0.001	0.004	0.023	0.028	**0.057**

Observations of the sub-basin during the 21 – 24 July 2000 monitoring showed that outflow was not occurring from any of the outlets of Lakes A9, A35, and A37. This zero outflow condition was also observed on 18 September 2000. It is concluded that the runoff was essentially zero from the Lake A37 sub-basin after completion of snowmelt runoff, i.e., rainfall over the summer (July - September) produced no runoff. It was estimated that snowmelt runoff ceased on 30 June 2000.

The discharge hydrograph for the Lake A37 sub-basin was estimated by interpolation between measured discharges (Table 4.3) and the observed zero outflow conditions, using the discharge hydrograph for Lake B7 as a guide. Lake B7 data were used as Lake B7 is the most comparable lake for which data are available (those data are reported in Section 5.5). The results are shown on Figure 4.7. It was estimated that the last day of zero discharge was 13 June, that discharge started on 14 June, and that the peak occurred on 16 June.

The total snowmelt runoff is estimated from Figure 4.7 to equal 119 dam^3, which corresponds to a yield of 96 mm over the sub-basin drainage area of 1.24 km^2. The estimated runoff amount represents 57 percent of the snow water equivalent available. The peak discharge from the sub-basin was estimated to equal 0.40 m^3/s.



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A37_volume_new.xls[Q]
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Figure 4.7

5.0 HYDROMETRIC MONITORING RESULTS

5.1 Introduction

Hydrometric data collection consisted of monitoring lake levels, lake outflows and river discharges. Regular monitoring was conducted of the following:

Meliadine River Basin

- Meliadine Lake levels
- Meliadine Lake main outlet discharge to Meliadine River
- Meliadine Lake west outlet discharge to Diana River Basin
- Meliadine River discharge at the mouth

Meliadine Lake Peninsula Basins

- Lake A1 - levels and discharges
- Lake B7 - levels and discharges
- Lake B2 - levels and discharges

The station locations and descriptions are provided on standard WSC station description forms, in Appendix E.

Miscellaneous monitoring was conducted of the following:

Lake A37 Sub-Basin - discharges
Char River near the Mouth - discharges

Water level and discharge monitoring were carried out using the same equipment, methods and procedures as in previous years. Photos of monitoring locations and monitoring activities are provided in the photo section of this report.

Water levels (and ice levels and thicknesses) for all of the lakes monitored in 2000 were surveyed relative to local benchmarks in early May prior to the start of snowmelt.

Aquadams were not placed as in previous years, as it was found that discharges in 2000 were relatively well confined and amenable to measurement.

5.2 2000 Monitoring Overview

5.2.1 2000 Data Set

Complete data sets were obtained for all regular monitoring stations. A compilation of the data collected at each of the monitoring stations is provided in Appendix D, and generally includes the items listed as follows.

Site Inspection Summary

The site inspection summary includes information on when the station was visited and inspected, the discharge measurements made for the season, the zero outflow elevation of the outlet, the surveyed direct water levels (DWL) and the datalogger water levels, and the adjustments to be made to the datalogger record.

Rating Curve

The rating curve is a plot of the discharge versus water level elevation relationship (rating curve) and the observed data points on which the curve is based. The data points and rating curves used in previous years are included where applicable.

Water Level Plot

The water level plot is a graph of daily mean water level versus time. The plotted water level values are those listed in the Water Level Table (see below). Superimposed on the plot are the DWL survey observations made during the season. For the peninsula stations, the zero flow elevation is identified which defines the point below which there would be no surface outflow from the lake.

Discharge Plot

The discharge plot is a graph of daily discharges versus time. The plotted discharges are those listed in the Discharge Table (see below). Superimposed on the plot are the discharge measurements made during the season. In addition, the observed daily rainfalls for the area are plotted on the figure to show how the station discharge responded to the rainfall inputs.

Water Level Table

The water level table is a table of daily mean water levels for the period of observations. The tabulated values are those obtained from the datalogger record adjusted by linear interpolation between the adjustment points listed in the Site Inspection Summary. Supplementary water levels obtained by DWL Survey, if included, are shown in italics.

Discharge Table

The discharge table is a table of daily mean discharges for the period of observation. The discharge for each day is obtained from the adjusted daily water level and the rating curve. The daily water levels are those recorded by the datalogger, adjusted by linear interpolation between adjustment points determined by comparing the discharge measurements to the rating curve. The table also reports maximum, mean and minimum values of discharge, and the total volume of water discharged.

Discharge measurement data for the period prior to the start of the datalogger record, as well as the last day (if known) of zero discharge prior to runoff, are included in the table and are shown in italics. The maximum, mean and minimum discharges listed in the table are extracted from the datalogger record only; however the total volume is derived from all the discharge data.

Gauge History

The gauge history is a history of the vertical control surveys at the station including descriptions and elevations of the benchmarks.

5.2.2 Uncertainties and Sources of Error

The uncertainties and sources of error considered applicable to the 2000 program are discussed below.

Vertical Control

No significant errors are considered to have been introduced into the data due to vertical control problems in 2000.

Field Staff Human Error

Field staff human error was not considered to be a significant factor in 2000.

Wind Effects

The Meliadine Lake water level datalogger station is located a considerable distance from the two lake outlets. Wind-induced set up of the lake surface can cause a difference in water level between the datalogger location and the outlets, causing actual outflows to be slightly higher or lower than indicated by the observed level.

Rating Curve Error

The data points of measured discharge versus water level generally do not describe a smooth line relationship, due in part to the factors listed above, but also due to inherent limits in equipment and measurement accuracy plus physical characteristics such as the presence of rocks or vegetative growth on the bed of the channel which can strongly distort local flow patterns.

Only the rating curves for the Lake A1 and Lake B7 outlets were modified on the basis of the additional discharge measurements obtained in 2000. The Lake A1 rating curve was modified slightly on the basis of the additional data points obtained in 2000. The Lake B7 rating curve was modified substantially due to the changed outlet condition from that of previous years (1998 and 1999) when Aquadams were used to confine outlet discharges. The assessment of the 2000 rating curve quality and accuracy is unchanged from the 1999 assessment and is given in Table 5.1.

TABLE 5.1
2000 Rating Curve Accuracy Assessment

Rating Curve Assessment	Estimated Accuracy of Computed Discharges	Station
Excellent	"5%	Meliadine River near the Mouth
Good	"10%	Outlet of Lake B2
Mediocre	"20%	Meliadine River at Outlet Meliadine Lake West Outlet of Meliadine Lake Outlet of Lake A1 Outlet of Lake B7

Estimation of Runoff for Pre-Record and Post-Record Periods

Runoff from the peninsula basins is characterized by a very rapid rise to maximum discharge rates followed by a rapid fall to lower discharges. Discharge usually starts when the lake water level rises to a point where overflow over the snow-blocked outlet channel occurs. The initial discharge gradually increases as it opens a flow channel through the snow and ice. This condition may last from a few hours to a few days. During this period the discharge rating curve is not applicable. Therefore it is generally not possible to capture a continuous record of the initial runoff, and the corresponding portion of the annual runoff volume must be estimated. Similarly, shutdown of the stations before freeze-up requires that subsequent runoff must also be estimated.

5.3 Pre-Season Ice and Water Levels

Ice and water levels were measured for Meliadine Lake and Lakes A1, B7 and B2 on May 14, 2000, prior to snowmelt. The results are summarized in Table 5.2, along with the September 1999 water levels and the associated lake storage changes.

TABLE 5.2
Lake Ice and Water Levels - May 2000

Lake	May 2000 Conditions			Comparison of Change September 1999 - May 2000					
	Ice Thickness m	Ice Level m	Water Level m	Sept. 1999 Water Level m	Water Level Change m	Lake Area km^2	Volume Change		Basin Area km^2
							Lake dam^3	Basin mm	
Meliadine	1.98	3.376	3.224	3.385	-0.161	114	-18354	-32	569
Lake A1	1.75	9.255	9.070	9.408	-0.338	0.1629	-55	-6	9.39
Lake B7	2.00	8.061	7.911	7.982	-0.071	0.581	-41	-17	2.39
Lake B2	1.42	7.515	7.355	7.558	-0.203	0.4895	-99	-4	22.32

5.4 Lake Water Levels

Water levels for Meliadine Lake for the season are given on Figure 5.1. Average daily wind speed data are included to assist in the interpretation of the water level fluctuations. The water level record for the 2000 season actually extends as a continuous record from the spring of 1999, as the station orifice block was relocated to deeper water at the end of the 1999 season, allowing the station to continue to record continuously through the winter. The 12-month water level record from September 1999 to September 2000 is given on Figure D.2.1 in Appendix D. This plot shows that the water level of Meliadine Lake falls throughout most of the winter, indicating more-or-less continuous discharge, as hypothesized in previous data reports.

Water levels for the peninsula lakes (A1, B7 and B2) are shown as a combined plot on Figure 5.2. The levels are shown relative to the zero outflow elevation for each lake. The precipitation data for Rankin Inlet are also shown to assist in interpretation of the water level fluctuations.

5.5 Discharge Hydrographs

A combined plot of the discharges for the three Meliadine Basin discharge stations is provided on Figure 5.3. A combined plot of the discharges for the three peninsula basin stations is provided on Figure 5.4. The minimal rise in the hydrographs after the snowmelt runoff recession indicates that rainfall contributed very little volume if any to the total annual runoff.

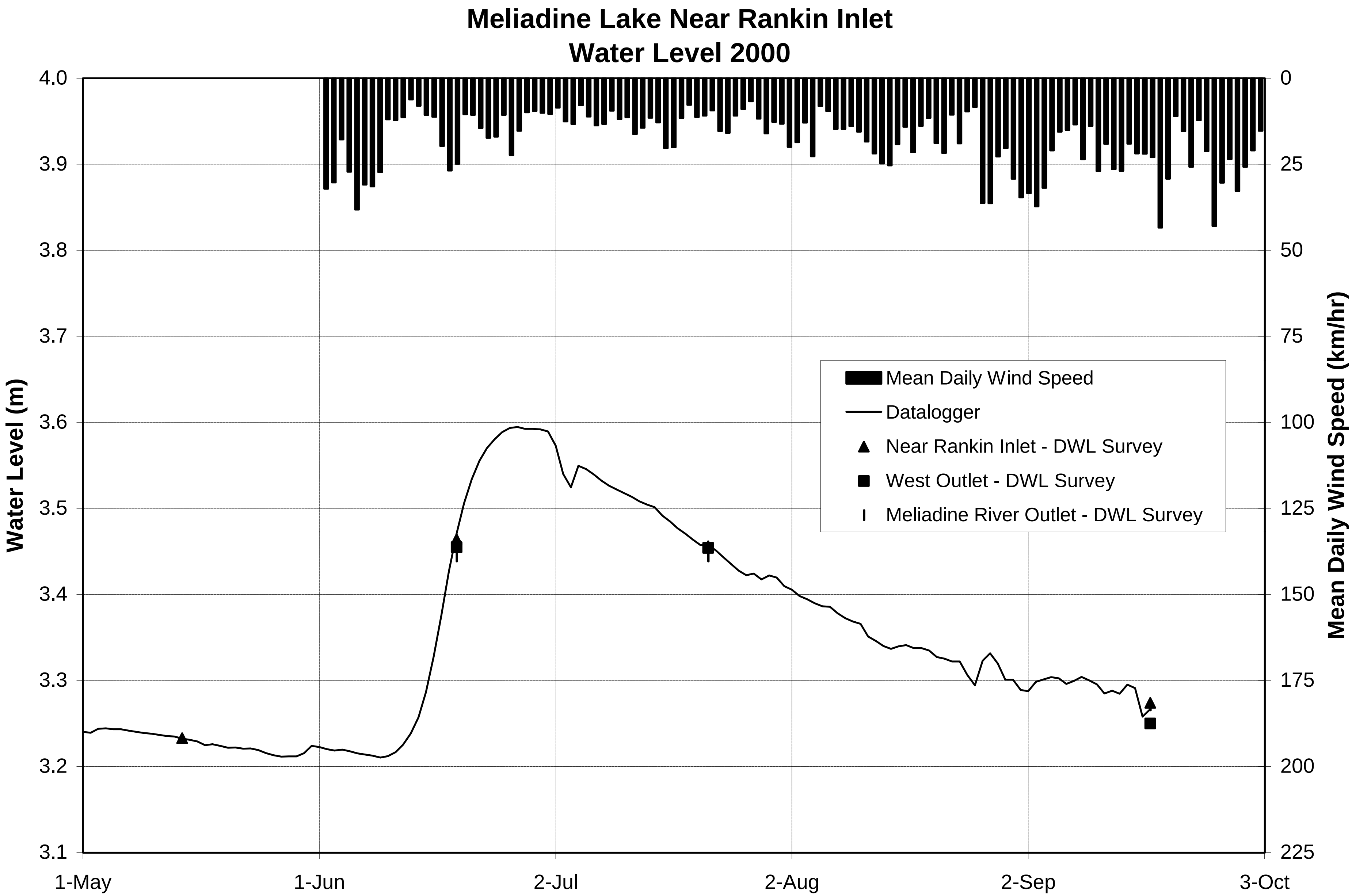

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Figure 5.1

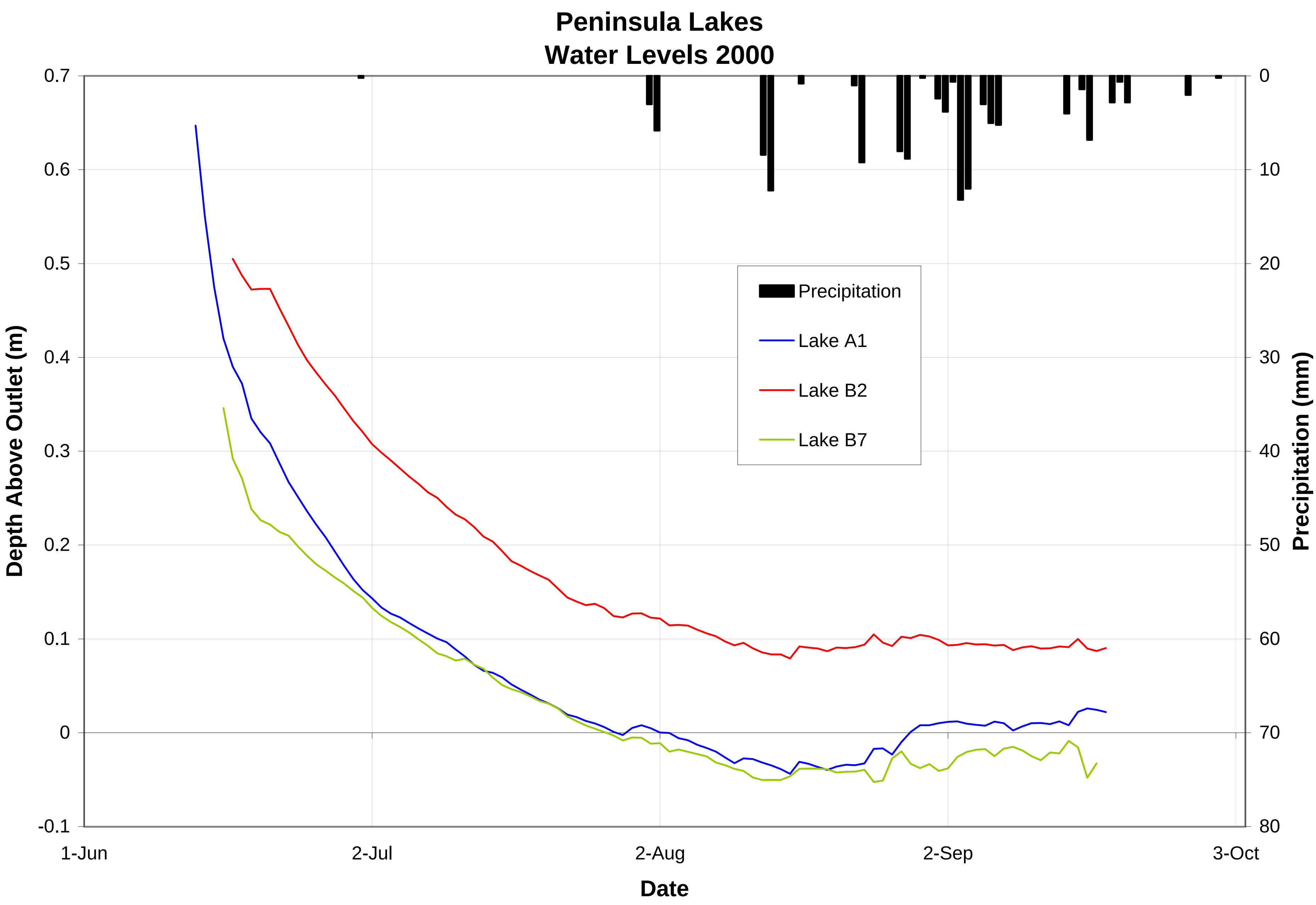

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Figure 5.2

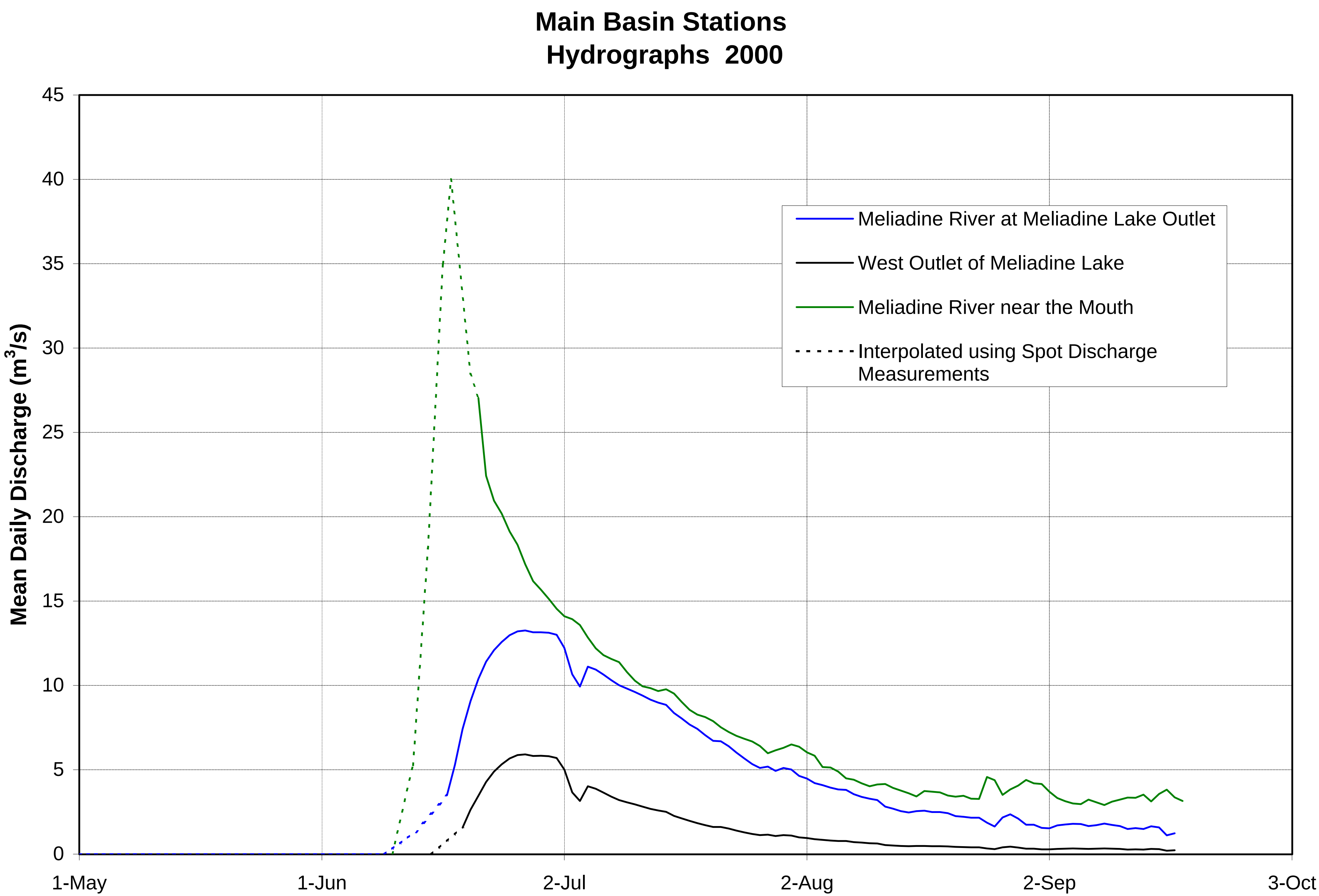

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Figure 5.3

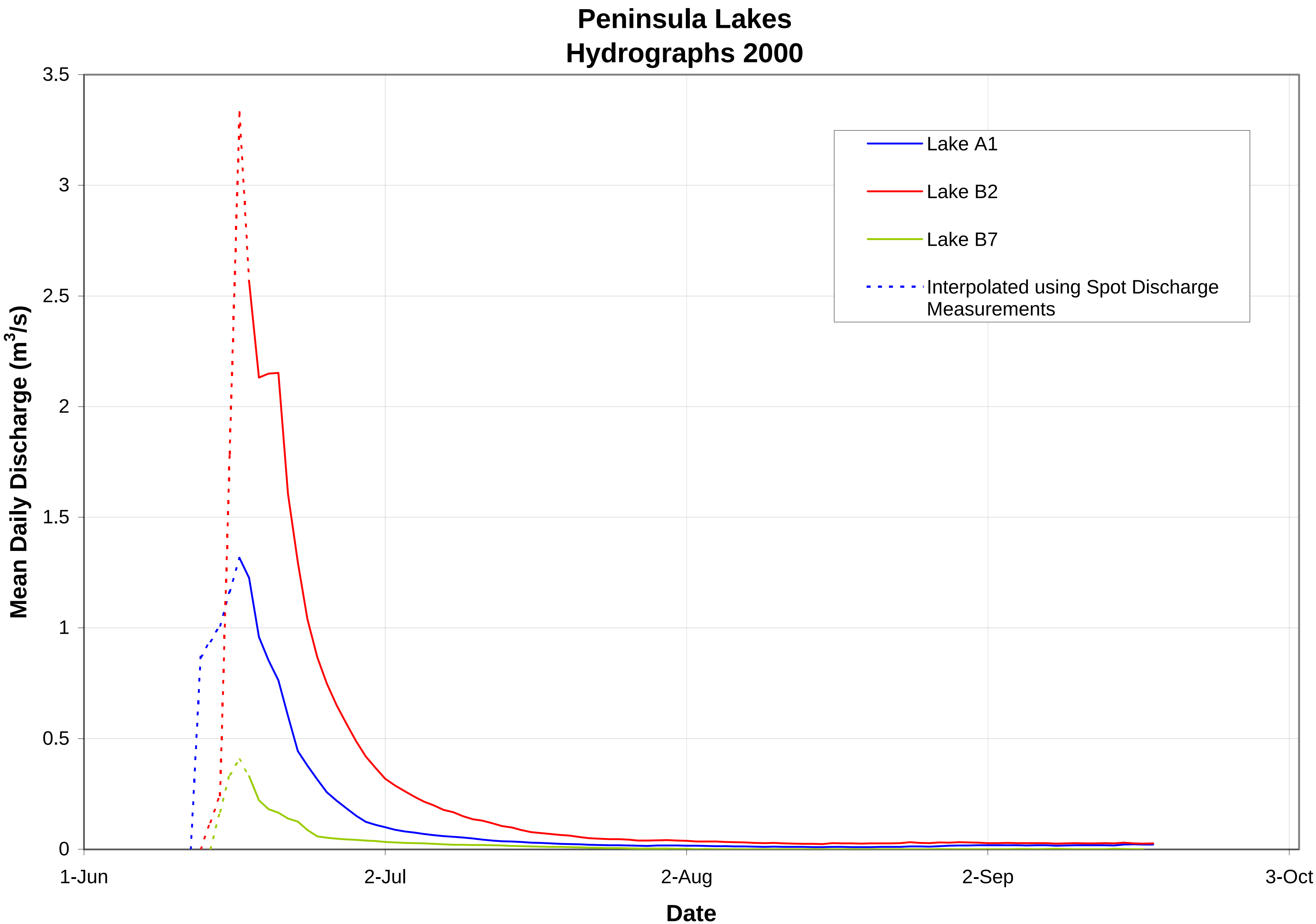

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Figure 5.4

The initial days of the runoff hydrographs were estimated by interpolation using discharge measurement data and information recorded in the field notes. The interpolated portions of the hydrographs are identified by dashed lines on the plots. The data in Appendix B provide further information on the basis for the interpolations. Table 5.3 summarizes the significant dates relating to the start of runoff for all the regular stations as well as for the Char River.

TABLE 5.3
2000 Runoff Startup Dates

Location	Start of Runoff	First Discharge Measurement	Runoff Peak	Datalogger Startup
Meliadine Lake Main Outlet	June 10	June 13	June 27	continuous
Meliadine Lake West Outlet	June 16	June 19	June 27	continuous
Meliadine River near the Mouth	June 11	June 12	June 17	June 14
Outlet of Lake A1	June 13	June 13	June 17	June 13
Outlet of Lake B7	June 15	June 16	June 17	June 18
Outlet of Lake B2	June 14	June 15	June 17	June 15
Char River near the Mouth	June 13	June 14	June 16/17	N.A.

5.6 Annual Discharge Volume and Basin Yield

The annual discharge volume for each station is obtained by computing the volume under the hydrograph and adding estimates for discharges prior to and/or after the monitoring period of record.

Estimate of Pre-Monitoring Runoff

Spot discharge data were collected at all stations over the initial period of runoff prior to the datalogger startup, and thus hydrographs could be constructed starting from the beginning of the runoff period. The initial days of the runoff hydrographs were estimated by interpolation between discharge measurement point data. Consequently no estimate of discharge volume for a pre-monitoring period was needed for the 2000 data.

Estimate of Post-Monitoring Runoff

It was estimated that the peninsula basins, as well as the West Outlet of Meliadine Lake, continued to discharge to the end of October. The two other main basin stations were assumed to discharge until the end of November. The runoff volume during the period from the last monitoring day to the cessation of runoff was thus estimated by assuming a linear decrease in discharges, over the period, to zero.

One exception to the above is the Meliadine River at the outlet of Meliadine Lake, which based on previous and current observations, is believed to continue discharging throughout the winter. The volume so discharged cannot be known until June 2001. However, an estimate of this volume can be made by assuming a constant winter discharge over the period 1 December to 1 June 2001 of about 0.5 m^3/s, based on previously measured values. This discharge is believed to freeze and be stored as ice in the downstream water body.

Total Runoff

The recorded runoff volumes and the estimated volumes for the post-monitoring and winter runoff periods are summarized in Table 5.4.

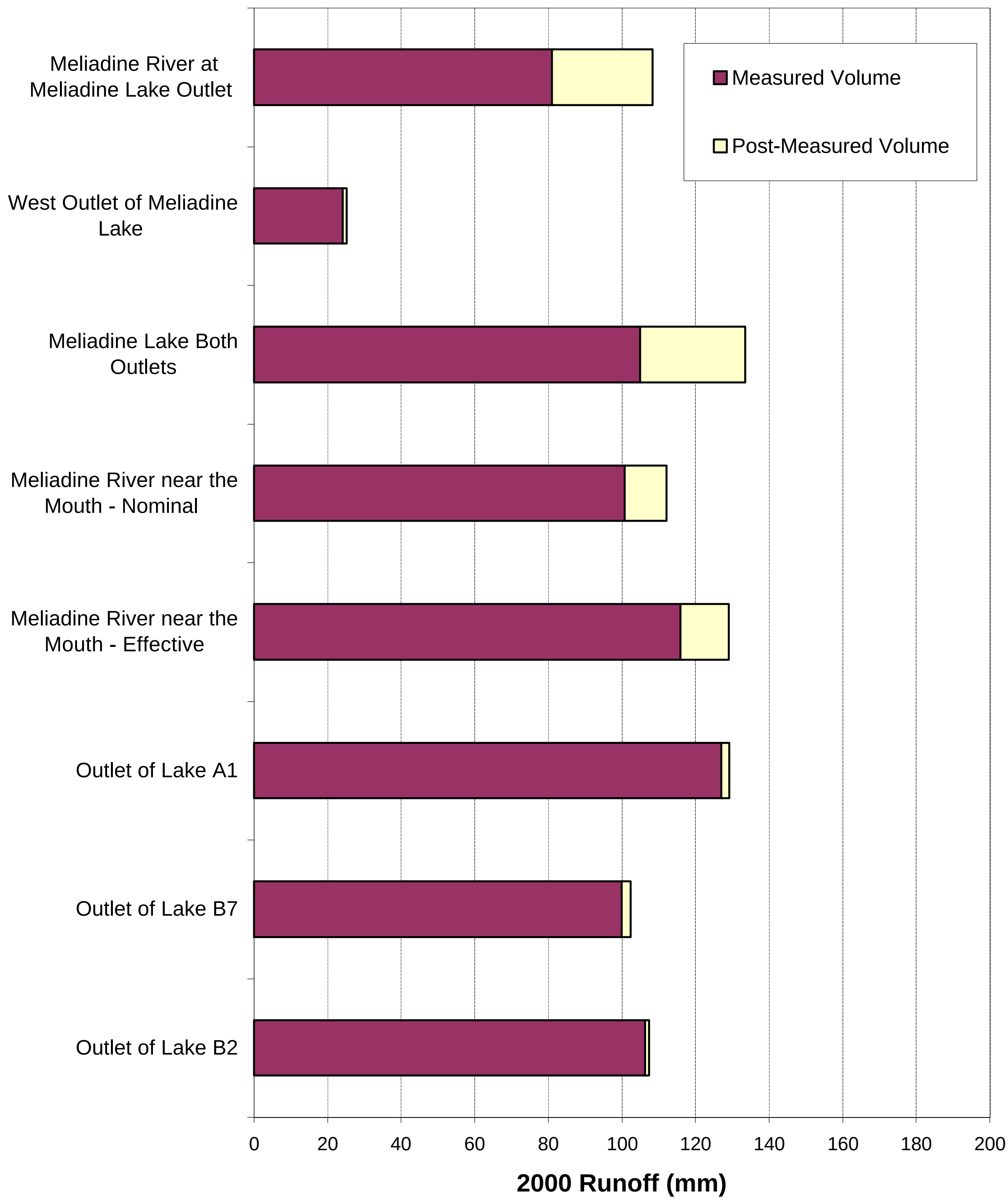
TABLE 5.4
2000 Runoff and Basin Yield Summary

Station Name	Catchment Area (km^2)	Period of Record	Measured Volume (dam^3)	Estimated Volume		Total Volume	
				Post-Record (dam^3)	Winter (dam^3)	(dam^3)	(mm)
MAIN BASIN STATIONS							
Meliadine River at Meliadine Lake Outlet	569	13 June - 18 Sept	46056	7700	7900	61656	108
West Outlet of Meliadine Lake	569	19 June - 18 Sept	13680	646		14326	25
Meliadine Lake Both Outlets	569	13 June - 18 Sept	59736	8346	7900	75982	134
Meliadine River near the Mouth - Nominal	796	12 June - 19 Sept	80161	9057		89218	112
Meliadine River near the Mouth - Effective	689	12 June - 19 Sept	80161	9057		89218	130
PENINSULA STATIONS							
Outlet of Lake A1	9.3913	13 June - 19 Sept	1193	20		1213	129
Outlet of Lake B7	2.3930	16 June - 18 Sept	239	6		245	102
Outlet of Lake B2	22.3178	15 June - 19 Sept	2371	24		2395	107

The total volume is reported both in cubic decametres (dam^3) and in mm of depth over the catchment area. Note that 1 dam^3 of runoff volume is equivalent to a yield of 1 mm of runoff depth from a catchment area of 1 km^2. The runoff volumes for 2000 expressed as basin yields are also shown graphically on Figure 5.5.

In Table 5.4 and Figure 5.5, there are two entries for the Meliadine River near the mouth. The first entry (112 mm) gives the “nominal” yield, the second entry (130 mm) gives the “effective” yield. The nominal yield is that obtained by using the full catchment area of 796 km^2 as measured from the mapping. The effective yield is that obtained by using the effective catchment area, i.e., the measured area reduced in proportion to the diversion of Meliadine Lake outflows through the west outlet. The west outlet in 2000 diverted 19 percent of the annual total Meliadine Lake basin runoff, thus representing the runoff from 107 km^2 of that basin. Therefore, the effective catchment area for the Meliadine River near the mouth for 2000

2000 Runoff Summary



is 796 - 107 = 689 km^2. The resulting effective yield of 130 mm for the Meliadine River near the mouth is close to the yield of 134 mm obtained for Meliadine Lake (both outlets).

The runoff volumes and yields of the three peninsula basins range from 102 mm and 109 mm for Lakes B7 and B2 to 129 mm for Lake A1. It is thought that the result for Lake A1 is the most accurate of the three peninsula lakes, since discharge measurements for Lake A1 were started on the first day of runoff and also a discharge measurement was obtained at or near the peak, whereas for both Lake B7 and Lake B2, the first day of runoff is thought to have been missed and in addition the peak likely occurred between discharge measurements. The above supposition is supported by the similarity in the result of 129 mm for Lake A1 with the 134 mm and 130 mm obtained for Meliadine Lake and the Meliadine River, respectively (adjusted for effective drainage area).

The discrepancy between the basin yield results for the Lake A1 and the B basins suggest that the estimated runoff volume for the B basins could be too low by 15 to 20 percent. On the other hand, the consistency between the two B Basin lakes suggests that the revised Lake B7 drainage area is more accurate than the area used previously (see Section 2.3).

Snowmelt Runoff Ratio

The scope of work for the 2000 program did not include water balance analysis. However, due to the total absence of rainfall from the start of runoff in the middle of June to the middle of July, and the very minimal runoff recorded post mid-July, it can be concluded that the total runoff volume for the year is almost entirely derived from snowmelt. The snowmelt runoff ratios can thus be readily estimated, by assuming that all runoff was derived from snowmelt. The error involved in this approach is estimated to be no more than about 5 percent.

The snowmelt runoff ratios, obtained by comparing the runoff volumes for the Lake A1, B7 and B2 basins to the snowpack SWE values computed for those basins (see Section 4.2), are listed in Table 5.5. Values for the Lake A37 sub-basin (already reported in Section 4.3) are included for completeness.

TABLE 5.5
Snowmelt Runoff and Snow Water Equivalent

Basin	Runoff (mm)	Snowmelt	
		SWE (mm)	Runoff Ratio
Lake A1	129	182	0.71
Lake B7	102	175	0.58
Lake B2	107	185	0.57
Lake A37	96	167	0.57

As noted above, the runoff, and thus the runoff ratio, for Lake A1 is considered the most accurate, and that the runoff volumes for the B basins are thought to be about 20 percent low. The B basin runoff ratios are thus also considered to be about 20 percent too low. However the B basin results are consistent with the Lake A37 sub-basin results. It is concluded that the A37 sub-basin runoff volume may also be low, by the same factor as the B basins. This is consistent with the fact that the Lake A37 discharge hydrograph was estimated using the Lake B7 discharge hydrograph as a guide.

Previous data reports contain estimates of snowmelt runoff ratios in the order of 90 percent. Those estimates were made without data analysis. In view of the Table 5.5 results above, those estimates should now be considered as probably being too high. Note however, that the snowmelt runoff ratio is strongly influenced by the pre-melt lake level, as runoff into the lake must first raise the water level to the outlet overflow elevation, before discharge occurs and is measured as runoff.

5.7 Regional Historical Yields

Comparison of the available four years of runoff for Meliadine Lake with the Rankin Inlet annual (hydrologic year) precipitation, along with the available annual Diana River runoff (unadjusted for inflow from the Meliadine Lake west outlet), is given in Table 5.6 below.

TABLE 5.6
Historical Regional Precipitation and Runoff

Hydrologic Year	Rankin Inlet Precipitation		Diana River Runoff			Meliadine Lake Runoff	
	mm	Fraction of Mean	mm	Fraction of Mean	Runoff Ratio	mm	Runoff Ratio
1989	251	0.85	160	0.80	0.64		
1990	360	1.22	196	0.98	0.54		
1991	387	1.31	263	1.32	0.68		
1992	289	0.98	267	1.34	0.92		
1993	316	1.07	184	0.92	0.58		
1994	207	0.70	135	0.68	0.65		
1995	286	0.97	151	0.76	0.53		
1996	282	0.96					
1997	172	0.58	134	0.67	0.78	78	0.45
1998	339	1.15	203	1.02	0.60	147	0.43
1999	385	1.30	306	1.53	0.79	239	0.62
2000	269	0.91				134	0.50
89-00 Mean	295		200		0.68		
97-00 Mean	291					150	0.51

The precipitation data represent the annual total inputs of accumulated snow starting from the previous October, up to and including the September precipitation for each year. The pattern of high and low years of precipitation is seen to be generally similar to the variation of runoff with a tendency (especially for the Diana River) for runoff to reflect the previous year's precipitation. The ratio of runoff to rainfall for Meliadine Lake was 0.50 for the year 2000. Diana River runoff was not measured in 2000. The data given in Table 5.6 are shown graphically on Figure 5.6.

The average yield for the Meliadine Lake Basin, based on four years of data, equals 150 mm. This is thought to approximate the average yield over the last 12 years, based on the close similarity of the 1997 - 2000 and the 1989 - 2000 average annual precipitation values. The recorded yield of the Diana River averaged 200 mm over the 1989-2000 period of record (1996 and 2000 data missing). This value should be reduced by about 5 percent to 190 mm, to account for the inflow to the basin from Meliadine Lake through the west outlet. However this still indicates a yield which is about 25 percent higher than for the Meliadine Lake basin.

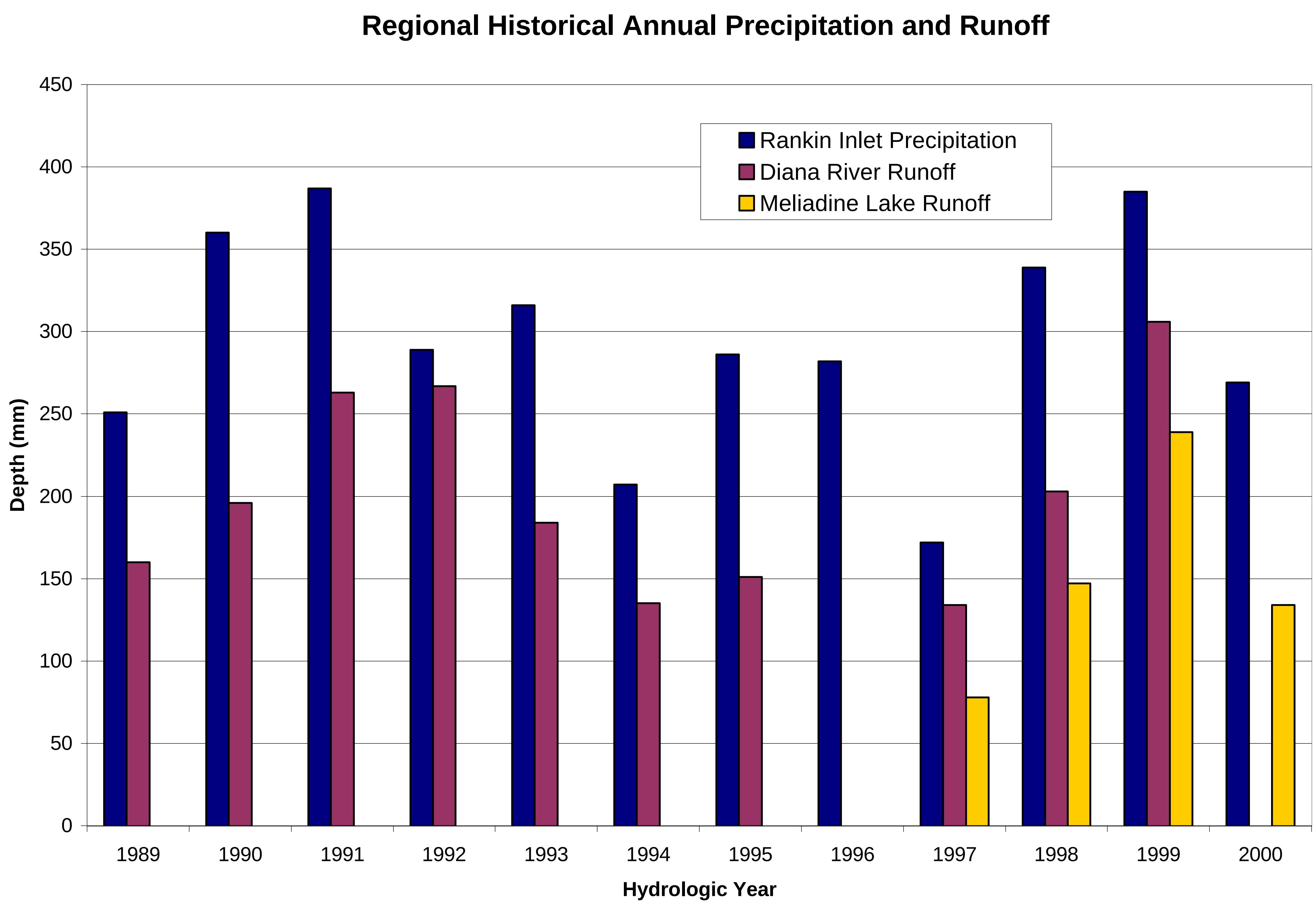


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Figure 5.6

6.0 CHAR RIVER MONITORING

6.1 Introduction

Monitoring of the Char River was conducted on a “miscellaneous” basis (i.e., without establishing a monitoring station) for the 2000 season, to provide data for design of a permanent crossing for an all season access road to the project from Rankin Inlet. Monitoring included site reconnaissance to characterize site conditions and observations of the runoff process. The observations are documented by photographs included in the Photo Section of this report (Photos 1 – 14).

The location of the Char River crossing for the proposed all season road is expected to be the same as the existing road crossing location, about one kilometre upstream of the mouth, as shown on Figure 6.1. This location has been identified as “Char River near Rankin Inlet” for the purpose of the present report.

6.2 Site Description

In the vicinity of the crossing location the river channel is generally incised to a depth of some 3 to 5 metres below the surrounding terrain, as indicated by Photos 9, 10 and 11 and the contours in Figure 6.1. The channel is moderately meandering, and some bank erosion is occurring. The bed material consists of gravels and cobbles (Photos 12 and 13) which are likely transported only at higher discharges. Finer material such as sand is also present, although this is typically deposited only where backwater conditions have created slower flow velocities, such as upstream of the existing road culverts (Photo 14).

The crossing consists of a single metal culvert at river bed level made up of a 1200 mm diameter corrugated steel pipe (CSP) section at its upstream end and a section of 1800 mm diameter riveted steel pipe at the downstream end, with double 1200 mm diameter CSP culverts positioned above the lower one, as shown in Photos 13 and 14. The culverts are in poor condition.

The crossing is reportedly washed out each spring and subsequently reconstructed. The road crossing is apparently reinstated relatively quickly and easily. During the 2000 snowmelt runoff, the road crossing was unusable from June 13 through 19, a period of seven days.

6.3 Runoff Process

It was observed that the runoff process starts with the river channel still filled with snow. The culverts are also filled with snow and/or ice. Water starts to pool on top of the snow and runoff starts by flowing both through and over the snow surface. Since the culverts are largely plugged, the water ponds in front of the culverts until the road embankment is overtopped, and a washout results (see Photos 1 – 5). The channel as well as the culverts are gradually opened up by erosion of the snow and ice by water flow.

6.4 Monitoring Data

The monitoring data collected over the 2000 season are summarized in Table 6.1.

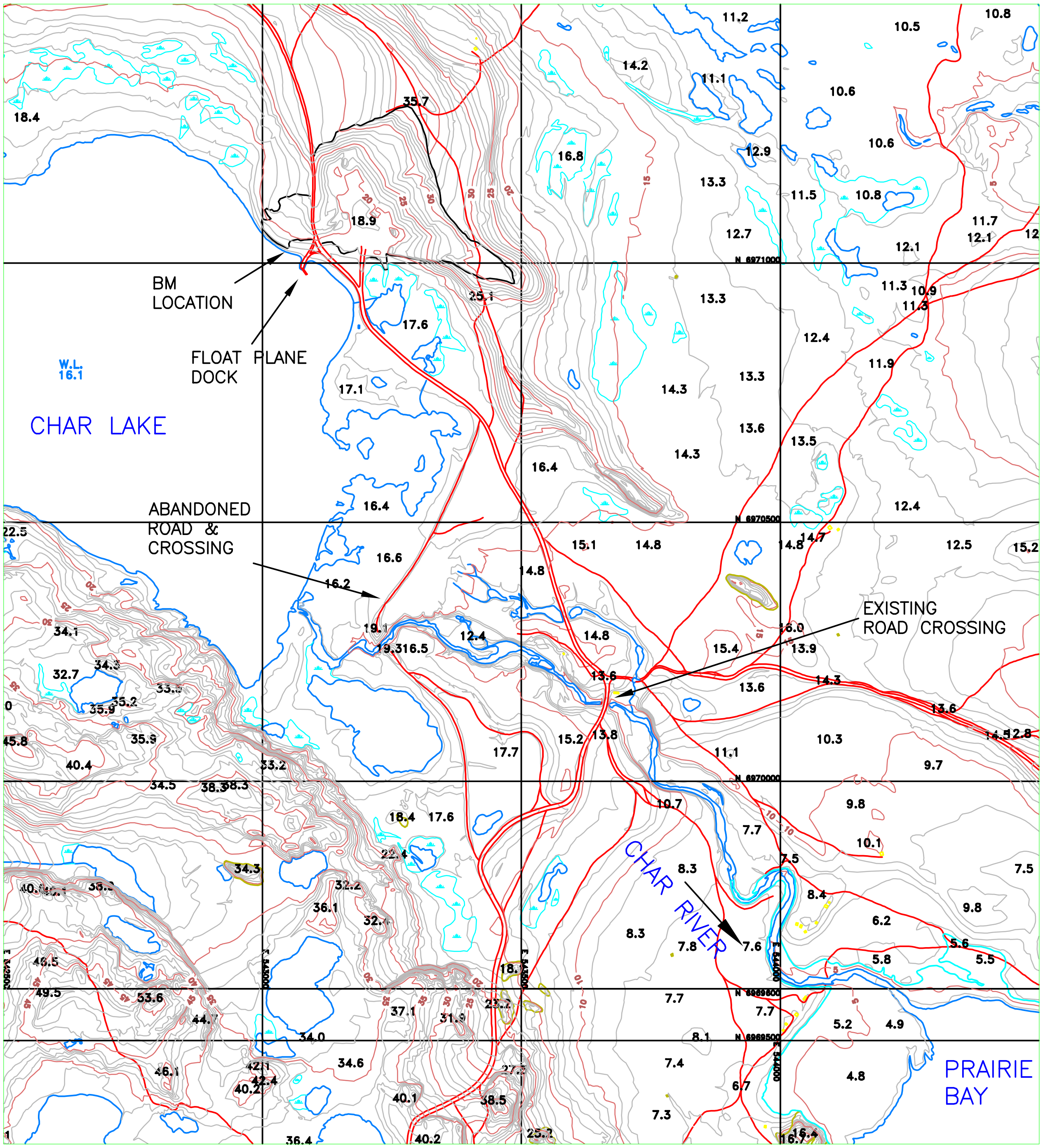
TABLE 6.1
Char River near Rankin Inlet
Monitoring Data

Date	Water Level m	Discharge m^3/s	Comment
12-Jun		0	
13-Jun		5 to 6	estimated
14-Jun	7.000	5.040	ice conditions
16-Jun	7.041	9.450	
18-Jun	7.015	9.000	
21-Jun	6.945	4.360	
24-Jul	6.670	0.130	
19-Sep	6.709	0.259	

The water levels in Table 6.1 refer to the levels of Char Lake, as the discharge at the crossing is governed by the Char Lake outlet, about one km upstream of the crossing location. Benchmarks for vertical control were established near the float plane dock in the lake (see Figure 6.1).

A hydrograph of runoff was constructed based on the tabulated data supplemented with discharge values estimated by comparison with the hydrograph for the Meliadine River near the Mouth. The estimated hydrograph is shown in Figure 6.2. The resulting runoff volume is estimated to equal 8646 dam^3, which corresponds to a yield of 125 mm over the basin area of 69.0 km^2. This yield is only four percent less than the yield of 130 mm obtained for the Meliadine River (see Table 5.4). The estimated hydrograph of runoff is therefore considered to correspond reasonably closely to the actual runoff. The peak discharge is estimated to have occurred on 17 June 2000, on the fourth day of runoff, at a magnitude of 12.5 m^3/s.

The water level and discharge data for the Char River were plotted and a preliminary rating curve obtained, as shown in Figure D.8.1 in Appendix D.



SCALE:
1:12,500
0 100 200 300 400 500 m

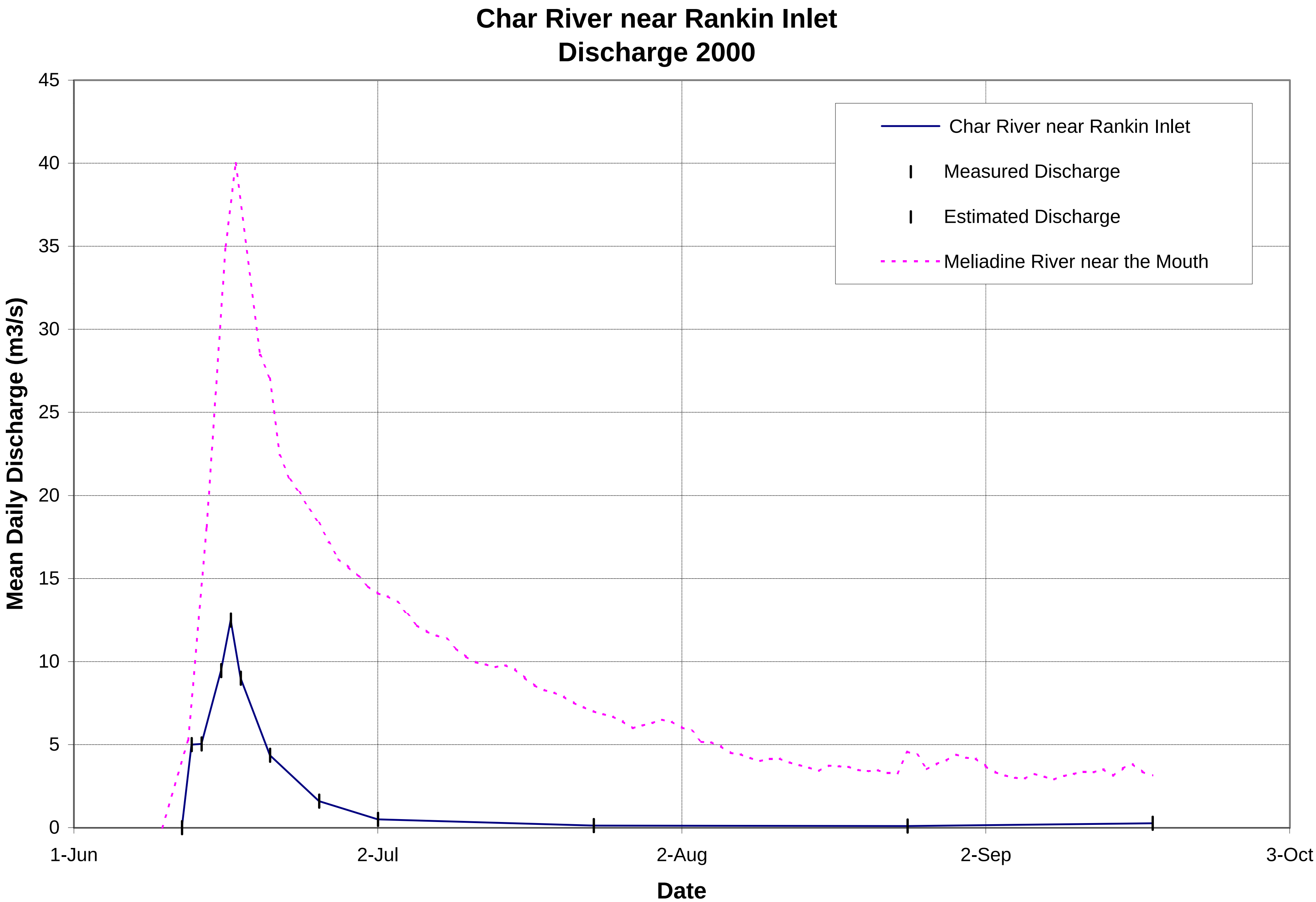
AMEC Earth & Environmental Limited

CLIENT: WMC INTERNATIONAL LIMITED

PROJECT: **MELIADINE WEST GOLD PROJECT**
WATER BALANCE STUDY

TITLE: **CHAR RIVER NEAR RANKIN INLET**
FIGURE 6.1

DATE:	JOB No.:	CAD FILE:	FIGURE No.:	REV.
NOVEMBER 2000	CW1525.2	1525–G03.DWG	FIGURE 6.1	A



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1/26/01

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Figure 6.2

6.5 Discussion

A permanent all-weather crossing at this site should allow for the fact that runoff is initiated while the channel is still filled with snow. This suggests that a bridge structure would be required, with sufficient freeboard to accommodate runoff through a snow-filled channel. That may require raising of the abutment fills and the approach grades.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 Conclusions

Regional Climate

Precipitation for the 2000 hydrologic year (October 1999 through September 2000) was below average. The Rankin Inlet observed total precipitation of 269 mm was 11 percent below the 19-year mean value of 302 mm. The below average result was due to the low rainfall over the summer, especially for the month of June, which was the driest on record; the total snowfall depth over the winter equalled the long-term average.

Meliadine Basin Runoff

The total 2000 runoff for the Meliadine Lake basin was measured to be 134 mm over the catchment area of 569 km^2. This includes an estimated 14 mm of runoff which is expected to discharge from Meliadine Lake over the December 2000 to June 2001 winter period. This winter discharge is expected to freeze as surface icing in the downstream water body. About 25 mm or 19 percent of the total 2000 Meliadine Lake runoff was discharged through the west outlet into the Diana River basin via Peter Lake. Some 108 mm was discharged through the Meliadine River.

The Meliadine River near the mouth discharged a nominal 112 mm of runoff in 2000 based on the total catchment area of 796 km^2. In effect however, when the drainage area is reduced in proportion to the amount of runoff diverted through the west outlet of Meliadine Lake, the runoff becomes 130 mm, which agrees closely with that found for Meliadine Lake.

For the 2000 hydrologic year the ratio of runoff to precipitation (Rankin Inlet) for the Meliadine Lake basin was 0.50.

Peninsula Basins Runoff

The runoff of Lake A1 was measured to be 129 mm, which agrees closely with the values found for the Meliadine Basin. The runoff for Lakes B7 and B2 were measured to be 102 mm and 109 mm, respectively, or some 20 percent lower than for Lake A1. The Lake B7 and B2 values are considered to be lower than actual, due to the limitations of the measurement data at the start of the runoff period. However the relative similarity of the two B basin runoff values supports the validity of the drainage area reduction made for the B7 basin this year.

Char River

Runoff observations and discharge measurements were initiated in 2000 at the Char River road crossing near Rankin Inlet. The estimated runoff hydrograph indicated a peak discharge of

12.5 m^3/s and a total runoff of 125 mm. The existing crossing, consisting of three 1200 mm diameter culverts, was washed out for a period of one week. The crossing is typically washed out each spring due to plugging of the river channel and the culvert barrels with snow.

Lake A37 Sub-Basin

Snow surveys and spot discharge measurements were conducted to obtain a better understanding of the runoff processes in this sub-basin, where mine development is proposed to occur. The estimated runoff hydrograph produced a peak discharge of 0.40 m^3/s and a total runoff volume of 96 mm. It was estimated that no runoff occurred after the cessation of the snowmelt runoff at the end of June.

7.2 Recommendations

Beginning of Runoff

The first week of runoff is the most important for determining the annual runoff volume. However, due to the nature of the runoff process, the standard procedure of using a rating curve applied to water level data cannot be used during the initial period, and the only way to define the hydrograph is by means of estimation and/or interpolation between spot discharge measurements. Based on the monitoring program and field procedures implemented to date, spot discharges measurements are typically obtained at one to three day intervals, leaving considerable uncertainty as to the actual definition of the discharge hydrograph during this period. As a result, it is estimated that the annual runoff volume may be underestimated by up to about 20 percent. It is therefore recommended that consideration be given to obtaining more frequent measurements and thus reducing the need to estimate and interpolate, leading to greater accuracy in the evaluation of runoff volume as well as peak discharge.

One method of obtaining more frequent measurement would be to “streamline” the discharge measurement process, by reducing the number of velocity measurements, especially for the smaller peninsula lake outlet channels. The loss of accuracy should be minimal for small channel widths, and would be a small tradeoff when compared to the extra discharge measurements that could be made.

Another strategy could be to mobilize a second field crew during the startup phase, devoted to conducting discharge measurements at say one specific peninsula basin lake and one main basin station during the first few days of runoff, i.e. during the period when ice conditions make the rating curve approach inapplicable. In that way a closely spaced series of measurements would be obtained which would accurately define the runoff hydrograph for those stations. This information could then be used as a guide or pattern to interpret the shapes of the other hydrographs.

Supplementary Rainfall Data

The manual rain gauge at Peter Lake identified significant variation in the rainfall pattern over the main lake basin area in both 1998 and 1999. This gauge should be reactivated if possible in future years. Ideally, several more rain gauges should be located around the basin to provide data that would allow identification of rainstorm patterns over the basin area.

8.0 CLOSURE

This report contains hydrometric and climate monitoring data collected in 2000 in the Meliadine River basin, limited analysis and interpretation of the data, and conclusions and recommendations for future work.

This report has been prepared for the exclusive use of WMC International Limited.

Respectfully submitted,

AMEC Earth & Environmental Limited	Reviewed by:
Neil van der Gugten, M.A.Sc., P.Eng. Senior Hydrotechnical Engineer	Wes Dick, M.Sc., P.Eng. Reviewer

PHOTOGRAPHS

Photo 1: June 12, 2000. Char River road crossing; ponded meltwater at upstream end; no flow.

Photo 2: June 12, 2000. Char River road crossing; ponded water at downstream end. The lower culvert is completely blocked with snow and ice; the two upper culverts are at least partly blocked.

Photo 3: June 12, 2000. Char River looking downstream from road crossing. Channel is filled with snow.

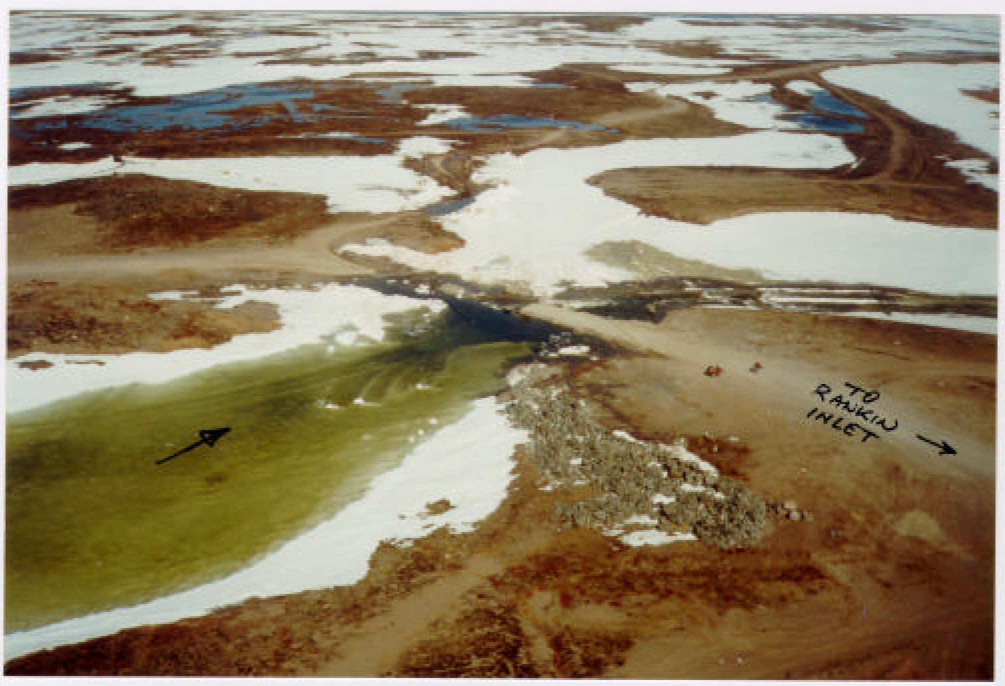


Photo 4: June 13, 2000. Char River at road crossing looking downstream. First day of flow; estimated discharge is 6 m^3/s. Left embankment is being overtopped due to ponding caused by blocked culverts.

Photo 5: June 13, 2000. Char River looking upstream from vicinity of road crossing. Flow occurs both through and over the snow which fills the channel.

Photo 6: June 14, 2000. Char River road crossing looking upstream. Discharge is 5.0 m^3/s. Flow passing through the two upper culverts and over the left embankment.

Photo 7: June 21, 2000. Char River at road crossing; looking at culvert outlet. Road was re-instated on June 20. Discharge is 4.4 m^3/s, through the two upper culverts only; the lower culvert is still blocked.

Photo 8: June 21, 2000. Char River at road crossing, looking at culvert inlet.

Photo 9: July 21, 2000. Char River looking upstream.

Photo 10: July 21, 2000. Char River looking upstream.

Photo 11: July 21, 2000. Char River looking upstream above road crossing at outlet from Char Lake and channel through previous crossing location.

Photo 12: July 24, 2000. Char River at road crossing looking upstream. Discharge is 0.13 m^3/s.

Photo 13: July 24, 2000. Char River road crossing looking upstream at culvert outlet.

Photo 14: July 24, 2000. Char River road crossing looking downstream at culvert inlet.

Photo 15   June 13, 2000. Outlet of Lake A1 a few hours after the beginning of flow.

Photo 16   June 17, 2000. Outlet of Lake A1 after four days of outflow.

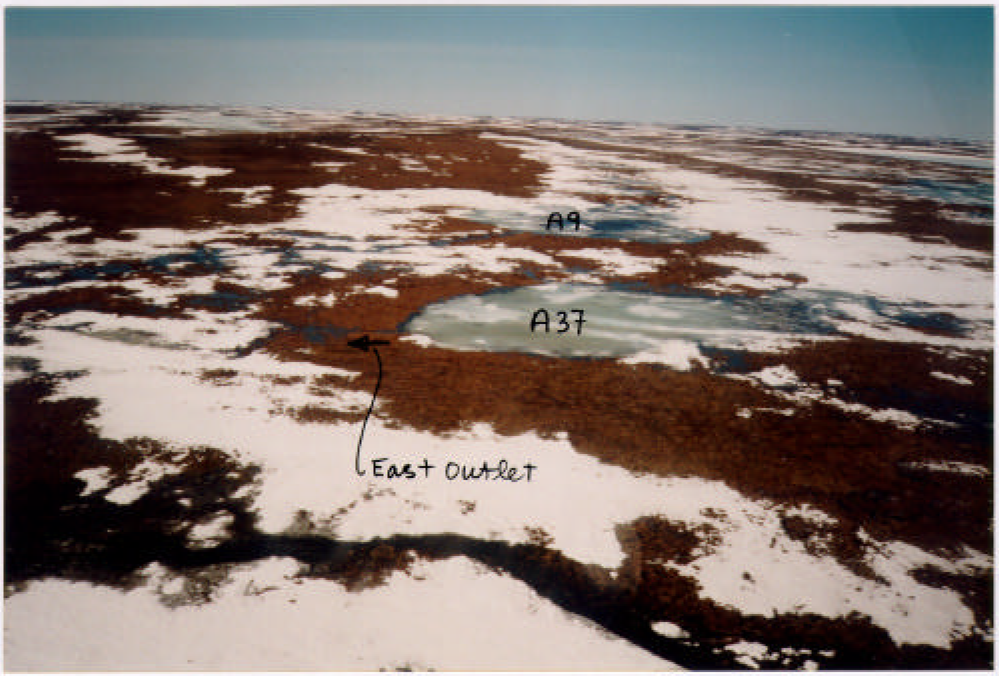


Photo 17 June 15, 2000. Lakes A37 and A9, looking northwest.

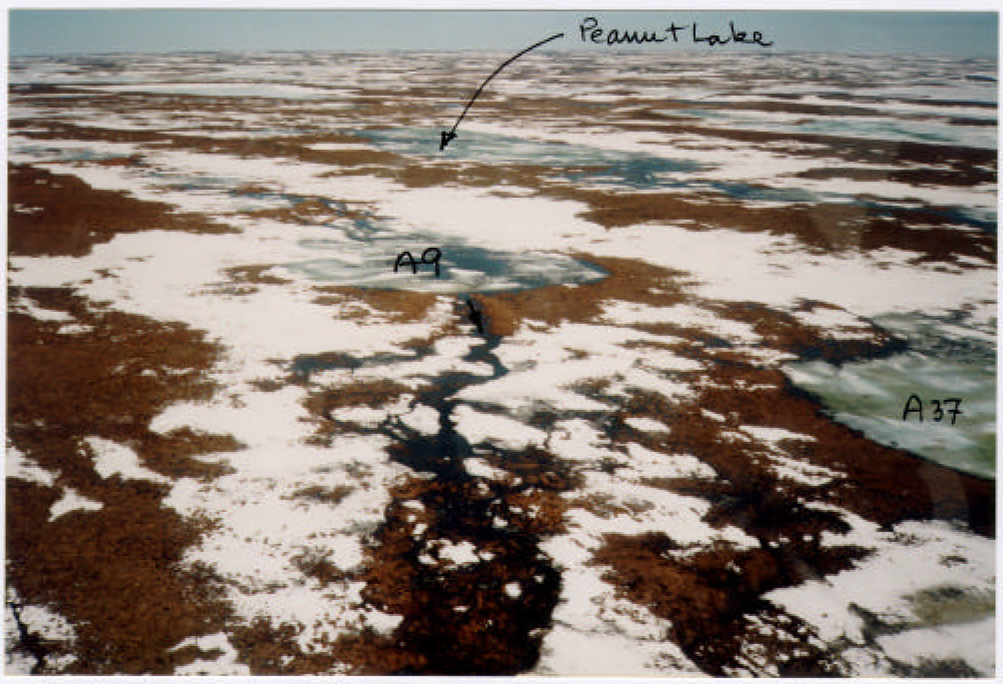


Photo 18 June 15, 2000. Lake A9 and Peanut Lake, looking north.

Photo 19 June 15, 2000. Lake A35 outlet, looking west. Note multiple shallow outflow paths making measurement difficult.

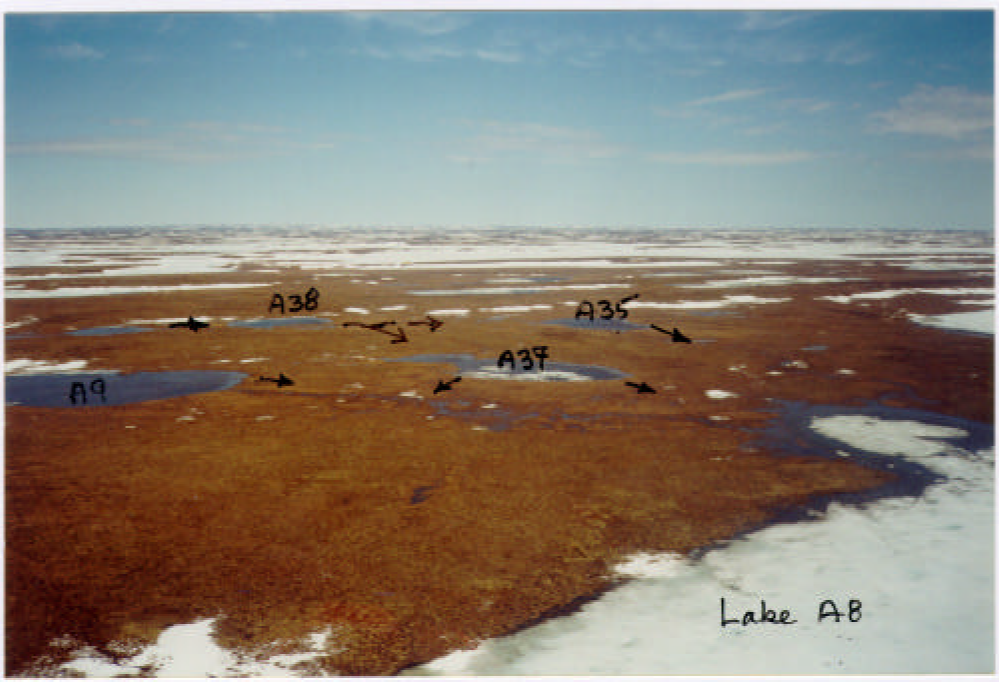


Photo 20 June 20, 2000. Lake A9, A37 and A35 outflow pattern.

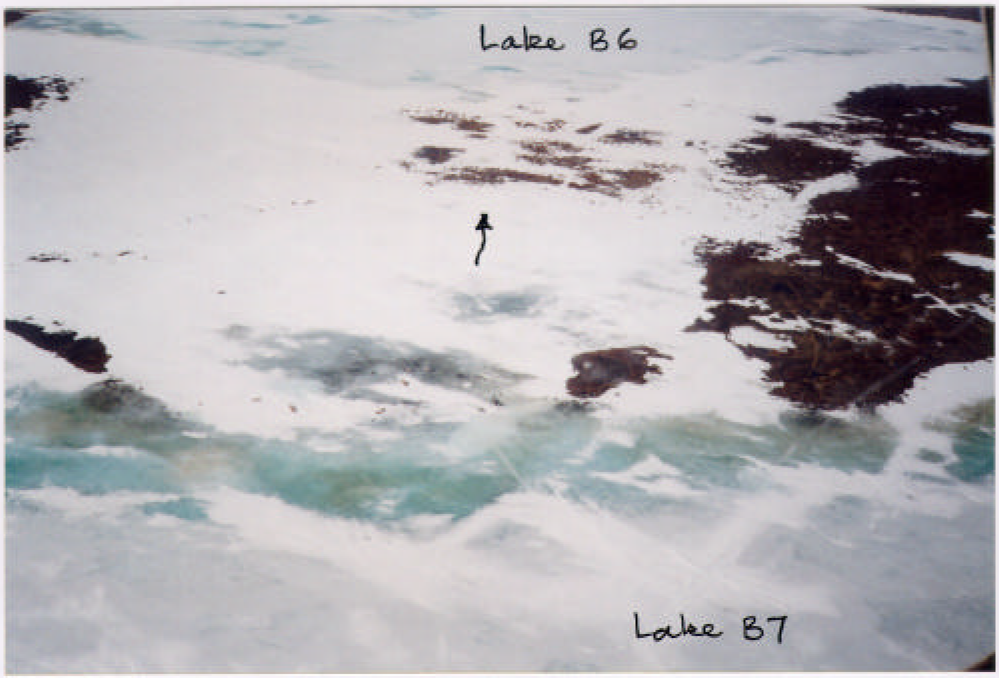


Photo 21 June 13, 2000. Lake B7 looking southwest at outlet. Some ponded water but no outflow.

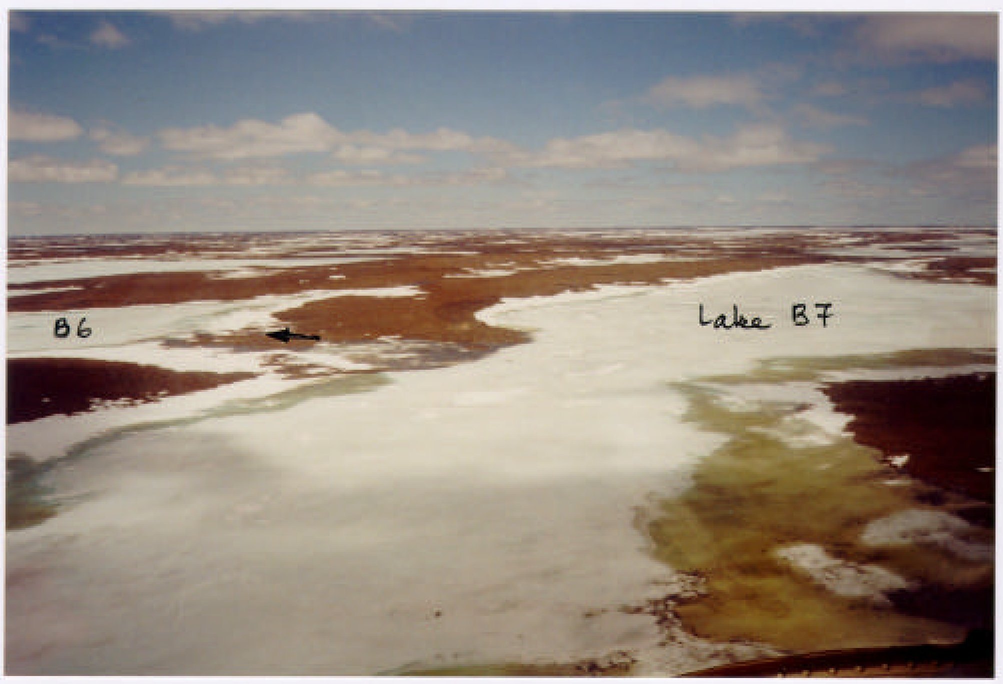


Photo 22 June 16, 2000. Lake B7 looking west, second day of outflow. Note extensive ice cover on lake with ponded water along edges.

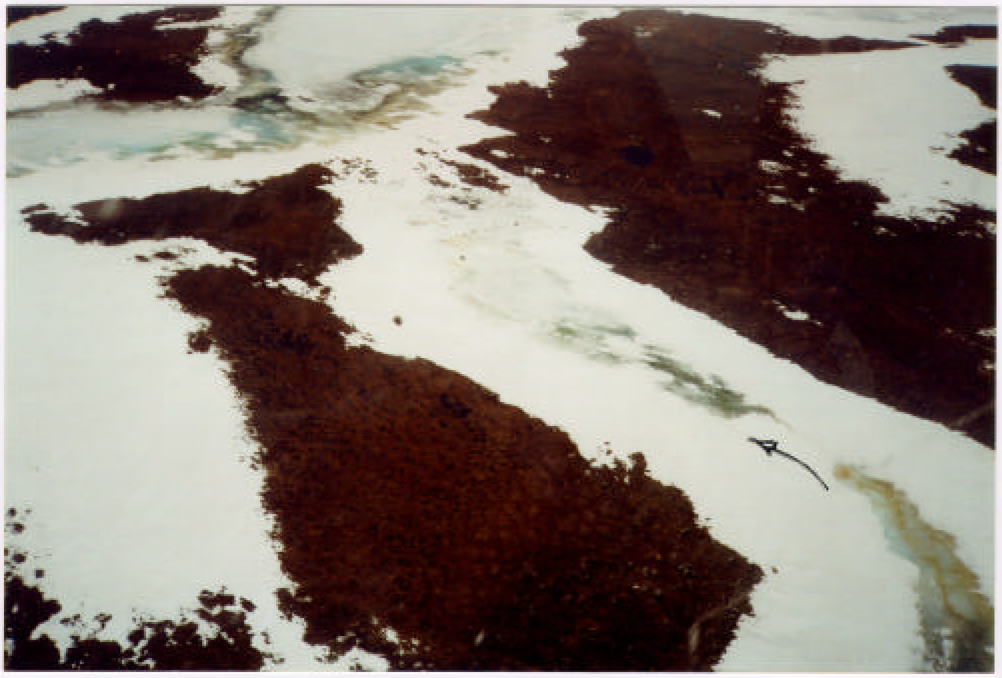


Photo 23 June 13, 2000. Meliadine Lake West Outlet, looking downstream. Some water ponding on the ice, but no outflow.

Photo 24 June 19, 2000. Meliadine Lake West Outlet, looking northwest.

APPENDIX A

CHECKLIST FOR EVAPORATION PAN OPERATION

EVAPORATION PAN OPERATION

Pan Set Up

1. Examine the pan and all accessories which consist of: (1) stilling well with triangular base and internal point gauge, (2) graduated cylinder, (3) max-min thermometer (with attached string to remove from the pan for reading and a magnet to reset the maximum and minimum markers) and (4) manual rain gauge (internal gauge fitted with a funnel inside an external overflow). Obtain replacement accessories if required.

2. Clean the pan and accessories as required.

3. Choose a location with a clear and stable surface, in the general vicinity of the 1999 location.

4. Place a strong wooden pallet to serve as the platform for the pan, and level it using a carpenter's level. Make sure the pallet is well supported and stable.

5. Place the pan into position, being careful not to buckle the pan sides or bottom.

6. Locate the stilling well with the internal point gauge at the marked location on the bottom of the pan (make a new mark if the old one has faded). The stilling well must always remain at this same location in the pan.

7. Fill the pan with water to the top of the point gauge.

8. Place the fencing around the pan to prevent disturbance by small animals.

9. Reset the max and min markers in the thermometer by using the magnet to pull the markers down to the mercury. Place the thermometer in the pan. Lay it on the bottom with the string hanging over the pan edge.

10. Fix the rain gauge in a vertical position adjacent to the pan at a convenient spot. The rain gauge sits inside the larger, overflow cylinder. The funnel is fitted inside the larger cylinder to direct rainfall into the gauge, while allowing the gauge, when filled, to overflow into the outer cylinder.

General Procedures

1. Do not move or lift the pan with water in it, to avoid damage. First remove the water using a scoop or syphon.

2. When filling the graduated cylinder, do so downwind of the pan to avoid unmeasured water from blowing into the pan.

3. When adding water to the pan from the graduated cylinder to restore the pan water level, do so on the upwind side to ensure all measured water enters the pan.

4. If in spite of these precautions some unmeasured water does enter or leave the pan, make a note of this on the data sheet.

5. Check that the point gauge, rain gauge and pan itself have not shifted and/or gone off level.

.6 At the end of each month, fax the data sheet for the month to Neil van der Gugten at AMEC in Calgary - (403) 248-1590 and file the original in the Evaporation Data folder in the camp file drawer.

Daily Procedure

1. Make the observations at the same time each day, preferably in the late evening.

2. Retrieve the thermometer using the string. Avoid immersing your hand as that will cause a loss of water. Read the maximum and minimum markers on the thermometer (read the bottom ends of the markers nearest the mercury), record the values, check readings, and reset the markers down to the mercury by using the magnet. Be careful not to lose water from the pan.

3. Using the graduated cylinder, add to, or remove water from the pan in order to return the pan water level to the point gauge level.

   a. If water needs to be added, start with the cylinder filled to the 0.0 mm mark, then add water to the pan as required to restore the pan level to the point gauge level, then using the (+) scale read the amount added to the nearest 0.1 mm. Record the amount added.

   b. If water needs to be removed, start with the cylinder empty, then remove water using the cylinder, until the pan level equals the point gauge level, then using the (-) scale (which has the 0.0 mm mark at the bottom) read the amount of water in the cylinder to the nearest 0.1 mm. Record the amount removed.

4. Read the rain gauge to the nearest 0.2 mm. The rain gauge is marked in intervals of 2 mm and each small graduation mark represents 0.2 mm. Record the amount, check the reading once again, and then empty the gauge (onto the ground). If overflow has occurred into the outer cylinder, measure the overflow amount by carefully pouring into the smaller cylinder and totaling all readings (note this in the “comments” column). Record “0" if no rain (do not leave blank).

5. Leave the “Net Water Loss” column on the data sheet blank.

6. Record any comments, such as general weather conditions, especially high rainfalls, winds, etc. Also identify days for which no observations were made, and confirm if a subsequent reading represents the accumulated total for preceding days (state number of days).

7. Read the manual rain gauge at the weather station. Record this amount in the last column on the data sheet.

Refreshing Procedure

1. Periodically examine the water in the pan to see if any dirt, oil, slime, algae or other foreign substance is fouling the pan. If such has occurred, the pan water must be refreshed.
2. To refresh the pan water, first take the readings for the day. Also note the condition of the pan water on the data sheet. Then empty out the water in the pan. Rinse or wipe out any dirt, algae or slime etc.

3. Refill the pan to the correct level, using clean lake water. Check that the pan is level and the point gauge in the pan is in the proper position.

4. Check that the rain gauge is level and properly mounted.

Communications

Communicate with Neil van der Gugten at AMEC in Calgary if you are unsure about any of the procedures or if there are any questions:

Email: neil.vandergugten@amec.com
Phone: 403-235-8117
Fax: 403-248-1590

APPENDIX B

CLIMATE DATA

B.1 Rankin Inlet Historical Precipitation
B.2 Rankin Inlet 1999 - 2000 Daily Rainfall, Snowfall and Total Precipitation
B.3 2000 Rainfall Data Comparison
B.4 Meliadine Camp 2000 Evaporation Pan Data
B.5 2000 Lake Evaporation Calculation

APPENDIX B.1

Rankin Inlet Historical Precipitation

Table B.1.1

Rankin Inlet 1981-2000

Monthly and Annual Rainfall in mm

Calendar Year Basis

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Total/Avg.
1981	0.0	0.0	0.0	0.0	16.2	31.0	57.8	31.0	40.4	22.6	0.0	0.0	199.0	1.08
1982	0.0	0.0	0.0	0.0	4.9	10.7	65.7	30.7	17.9	41.1	0.0	0.0	171.0	0.93
1983	0.0	0.0	0.0	0.0	0.0	100.9	33.1	39.0	41.5	19.2	0.2	0.0	233.9	1.27
1984	0.0	0.0	0.0	3.6	0.2	35.7	12.0	95.9	24.7	2.8	0.0	0.0	174.9	0.95
1985	0.0	0.0	0.0	0.0	0.0	13.1	30.8	123.3	71.3	17.2	0.0	0.0	255.7	1.39
1986	0.0	0.0	0.0	0.2	19.3	23.6	10.4	85.1	30.0	0.2	0.0	0.0	168.8	0.92
1987	0.0	0.0	0.0	3.9	1.2	30.1	27.8	74.2	24.0	0.2	0.0	0.0	161.4	0.88
1988	0.0	0.0	0.0	0.0	0.0	14.6	22.6	32.2	29.6	10.7	0.6	0.0	110.3	0.60
1989	0.0	0.0	0.0	0.0	0.0	14.0	48.6	23.1	39.3	8.4	0.0	0.0	133.4	0.72
1990	0.0	0.0	0.0	0.0	7.9	29.7	118.6	62.9	32.7	1.6	0.0	0.0	253.4	1.38
1991	0.0	0.0	0.0	0.0	13.0	8.5	47.9	36.4	102.0	20.6	0.0	0.2	228.6	1.24
1992	0.0	0.0	0.0	0.0	4.0	11.4	3.6	75.8	45.0	0.0	0.0	0.0	139.8	0.76
1993	0.0	0.0	0.0	0.0	13.4	1.4	87.8	68.4	20.4	0.0	0.0	0.0	191.4	1.04
1994	0.0	0.0	0.0	0.0	0.0	20.8	4.0	39.0	50.8	5.4	0.0	0.0	120.0	0.65
1995	0.0	0.0	0.0	0.2	0.0	10.2	69.8	75.2	17.0	25.4	0.0	0.0	197.8	1.07
1996	0.0	0.0	0.0	0.0	0.0	37.6	10.4	50.2	60.0	1.0	0.0	0.0	159.2	0.86
1997	0.0	0.0	0.0	0.6	4.0	47.6	17.8	11.8	13.0	45.1	0.2	0.0	140.1	0.76
1998	0.0	1.0	0.0	0.2	32.4	9.2	49.8	49.4	43.4	3.2	1.2	0.0	189.8	1.03
1999	0.0	0.0	0.0	3.4	29.2	50.4	41.6	69.8	60.8	13.6	0.0	0.0	268.8	1.46
2000	0.4	0.0	0.0	7.2	2.7	0.2	29.4	73.2	20.6					
Average	0.0	0.1	0.0	1.0	7.4	25.0	39.5	57.3	39.2	12.5	0.1	0.0	184.1	

Table B.1.2

Rankin Inlet 1981-2000

Monthly and Annual Rainfall in mm

Hydrologic Year Basis

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Total/Avg.
81 - 82	22.6	0.0	0.0	0.0	0.0	0.0	0.0	4.9	10.7	65.7	30.7	17.9	152.5	0.84
82 - 83	41.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.9	33.1	39.0	41.5	255.6	1.41
83 - 84	19.2	0.2	0.0	0.0	0.0	0.0	3.6	0.2	35.7	12.0	95.9	24.7	191.5	1.05
84 - 85	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.1	30.8	123.3	71.3	241.3	1.33
85 - 86	17.2	0.0	0.0	0.0	0.0	0.0	0.2	19.3	23.6	10.4	85.1	30.0	185.8	1.02
86 - 87	0.2	0.0	0.0	0.0	0.0	0.0	3.9	1.2	30.1	27.8	74.2	24.0	161.4	0.89
87 - 88	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	14.6	22.6	32.2	29.6	99.2	0.55
88 - 89	10.7	0.6	0.0	0.0	0.0	0.0	0.0	0.0	14.0	48.6	23.1	39.3	136.3	0.75
89 - 90	8.4	0.0	0.0	0.0	0.0	0.0	0.0	7.9	29.7	118.6	62.9	32.7	260.2	1.43
90 - 91	1.6	0.0	0.0	0.0	0.0	0.0	0.0	13.0	8.5	47.9	36.4	102.0	209.4	1.15
91 - 92	20.6	0.0	0.2	0.0	0.0	0.0	0.0	4.0	11.4	3.6	75.8	45.0	160.6	0.88
92 - 93	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.4	1.4	87.8	68.4	20.4	191.4	1.05
93 - 94	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.8	4.0	39.0	50.8	114.6	0.63
94 - 95	5.4	0.0	0.0	0.0	0.0	0.0	0.2	0.0	10.2	69.8	75.2	17.0	177.8	0.98
95 - 96	25.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	37.6	10.4	50.2	60.0	183.6	1.01
96 - 97	1.0	0.0	0.0	0.0	0.0	0.0	0.6	4.0	47.6	17.8	11.8	13.0	95.8	0.53
97 - 98	45.1	0.2	0.0	0.0	1.0	0.0	0.2	32.4	9.2	49.8	49.4	43.4	230.7	1.27
98 - 99	3.2	1.2	0.0	0.0	0.0	0.0	3.4	29.2	50.4	41.6	69.8	60.8	259.6	1.43
99 - 00	13.6	0.0	0.0	0.4	0.0	0.0	7.2	2.7	0.2	29.4	73.2	20.6	147.3	0.81
Average	12.5	0.1	0.0	0.0	0.1	0.0	1.0	7.0	24.7	38.5	58.7	39.2	181.8	

Table B.1.3

Rankin Inlet 1981-2000

Monthly and Annual Snowfall in cm

Calendar Year Basis

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Total/Avg.
1981	7.3	21.1	10.5	12.1	8.7	1.6	0.0	0.0	0.0	18.4	26.1	2.6	108.4	0.90
1982	0.7	3.2	12.2	17.5	17.6	5.0	0.2	0.2	15.5	22.4	7.6	6.6	108.7	0.90
1983	9.8	3.1	18.9	3.1	28.5	0.4	0.0	0.0	1.6	20.4	5.2	6.2	97.2	0.81
1984	7.5	19.6	7.1	17.2	0.6	1.6	0.0	0.0	1.5	22.0	19.8	5.6	102.5	0.85
1985	4.2	10.4	17.7	24.8	6.8	1.4	0.0	4.8	10.2	52.0	71.2	6.0	209.5	1.74
1986	12.0	0.2	11.6	3.3	5.8	15.2	0.0	0.0	8.8	28.6	7.6	10.4	103.5	0.86
1987	9.8	5.4	30.2	38.1	5.2	34.4	0.0	0.0	3.6	13.1	31.6	18.0	189.4	1.57
1988	1.2	1.0	11.0	9.2	27.7	4.0	0.0	0.0	0.2	22.2	23.0	17.9	117.4	0.98
1989	6.5	1.6	4.6	3.4	24.0	0.0	0.0	0.0	11.2	10.4	4.8	2.0	68.5	0.57
1990	6.8	15.1	21.7	10.3	1.8	23.5	0.0	0.0	3.2	22.7	47.5	10.0	162.6	1.35
1991	4.5	2.8	25.0	34.6	18.8	0.0	0.0	0.0	12.0	37.7	16.2	14.2	165.8	1.38
1992	14.8	7.0	2.6	9.8	13.0	2.8	0.0	0.0	9.8	16.6	26.2	11.1	113.7	0.94
1993	15.0	7.4	5.2	11.0	20.2	5.4	0.0	0.0	6.6	18.8	12.8	19.4	121.8	1.01
1994	1.6	0.4	6.8	26.0	6.0	0.8	0.0	0.0	0.0	18.6	30.4	20.5	111.1	0.92
1995	6.2	1.8	2.8	15.0	10.4	0.0	0.0	0.0	2.4	12.4	13.6	9.0	73.6	0.61
1996	6.2	42.4	10.0	1.8	0.8	1.0	0.0	0.0	1.0	22.2	10.8	12.6	108.8	0.90
1997	3.4	8.0	4.6	10.6	4.0	0.0	0.0	0.0	0.0	41.0	7.6	21.7	100.9	0.84
1998	4.8	12.8	5.8	9.4	5.2	0.0	0.0	0.0	1.2	25.0	24.8	14.4	103.4	0.86
1999	10.2	10.6	15.6	7.2	18.8	0.4	0.0	0.0	0.8	13.6	23.2	19.8	120.2	1.00
2000	2.6	12.6	34.8	7.2	5.2	1.2	0.0	0.0	1.6					
Average	6.8	9.3	12.9	13.6	11.5	4.9	0.0	0.3	4.6	23.1	21.6	12.0	120.4	

Table B.1.4

Rankin Inlet 1981-2000

Monthly and Annual Snowfall in cm

Hydrologic Year Basis

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Total/Avg.
81 - 82	18.4	26.1	2.6	0.7	3.2	12.2	17.5	17.6	5.0	0.2	0.2	15.5	119.2	0.99
82 - 83	22.4	7.6	6.6	9.8	3.1	18.9	3.1	28.5	0.4	0.0	0.0	1.6	102.0	0.85
83 - 84	20.4	5.2	6.2	7.5	19.6	7.1	17.2	0.6	1.6	0.0	0.0	1.5	86.9	0.72
84 - 85	22.0	19.8	5.6	4.2	10.4	17.7	24.8	6.8	1.4	0.0	4.8	10.2	127.7	1.06
85 - 86	52.0	71.2	6.0	12.0	0.2	11.6	3.3	5.8	15.2	0.0	0.0	8.8	186.1	1.54
86 - 87	28.6	7.6	10.4	9.8	5.4	30.2	38.1	5.2	34.4	0.0	0.0	3.6	173.3	1.44
87 - 88	13.1	31.6	18.0	1.2	1.0	11.0	9.2	27.7	4.0	0.0	0.0	0.2	117.0	0.97
88 - 89	22.2	23.0	17.9	6.5	1.6	4.6	3.4	24.0	0.0	0.0	0.0	11.2	114.4	0.95
89 - 90	10.4	4.8	2.0	6.8	15.1	21.7	10.3	1.8	23.5	0.0	0.0	3.2	99.6	0.83
90 - 91	22.7	47.5	10.0	4.5	2.8	25.0	34.6	18.8	0.0	0.0	0.0	12.0	177.9	1.48
91 - 92	37.7	16.2	14.2	14.8	7.0	2.6	9.8	13.0	2.8	0.0	0.0	9.8	127.9	1.06
92 - 93	16.6	26.2	11.1	15.0	7.4	5.2	11.0	20.2	5.4	0.0	0.0	6.6	124.7	1.03
93 - 94	18.8	12.8	19.4	1.6	0.4	6.8	26.0	6.0	0.8	0.0	0.0	0.0	92.6	0.77
94 - 95	18.6	30.4	20.5	6.2	1.8	2.8	15.0	10.4	0.0	0.0	0.0	2.4	108.1	0.90
95 - 96	12.4	13.6	9.0	6.2	42.4	10.0	1.8	0.8	1.0	0.0	0.0	1.0	98.2	0.81
96 - 97	22.2	10.8	12.6	3.4	8.0	4.6	10.6	4.0	0.0	0.0	0.0	0.0	76.2	0.63
97 - 98	41.0	7.6	21.7	4.8	12.8	5.8	9.4	5.2	0.0	0.0	0.0	1.2	109.5	0.91
98 - 99	25.0	24.8	14.4	10.2	10.6	15.6	7.2	18.8	0.4	0.0	0.0	0.8	127.8	1.06
99 - 00	13.6	23.2	19.8	2.6	12.6	34.8	7.2	5.2	1.2	0.0	0.0	1.6	121.8	1.01
Average	23.1	21.6	12.0	6.7	8.7	13.1	13.7	11.6	5.1	0.0	0.3	4.8	120.6	

Table B.1.5
Rankin Inlet 1981-2000
Monthly and Annual Total Precipitation in mm
Calendar Year Basis

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Total/Avg.
1981	7.3	21.1	10.5	12.1	24.9	32.6	57.8	31.0	40.4	41.0	26.1	2.6	307.4	1.01
1982	0.7	3.2	12.2	17.5	22.5	15.7	65.9	30.9	33.4	63.5	7.6	6.6	279.7	0.92
1983	9.8	3.1	18.9	3.1	28.5	101.3	33.1	39.0	43.1	39.6	5.4	6.2	331.1	1.09
1984	7.5	19.6	7.1	20.8	0.8	37.3	12.0	95.9	26.2	24.8	19.8	5.6	277.4	0.91
1985	4.2	10.4	17.7	24.8	6.8	14.5	30.8	128.1	81.5	69.2	71.2	6.0	465.2	1.53
1986	12.0	0.2	11.6	3.5	25.1	38.8	10.4	85.1	38.8	28.8	7.6	10.4	272.3	0.89
1987	9.8	5.4	30.2	42.0	6.4	64.5	27.8	74.2	27.6	13.3	31.6	18.0	350.8	1.15
1988	1.2	1.0	11.0	9.2	27.7	18.6	22.6	32.2	29.8	32.9	23.6	17.9	227.7	0.75
1989	6.5	1.6	4.6	3.4	24.0	14.0	48.6	23.1	50.5	18.8	4.8	2.0	201.9	0.66
1990	6.8	15.1	21.7	10.3	9.7	53.2	118.6	62.9	35.9	24.3	47.5	10.0	416.0	1.37
1991	4.5	2.8	25.0	34.6	31.8	8.5	47.9	36.4	114.0	58.3	16.2	14.4	394.4	1.30
1992	14.8	7.0	2.6	9.8	17.0	14.2	3.6	75.8	54.8	16.6	26.2	11.1	253.5	0.83
1993	15.0	7.4	5.2	11.0	33.6	6.8	87.8	68.4	27.0	18.8	12.8	19.4	313.2	1.03
1994	1.6	0.4	6.8	26.0	6.0	21.6	4.0	39.0	50.8	24.0	30.4	20.5	231.1	0.76
1995	6.2	1.8	2.8	15.2	10.4	10.2	69.8	75.2	19.4	37.8	13.6	9.0	271.4	0.89
1996	6.2	42.4	10.0	1.8	0.8	38.6	10.4	50.2	61.0	23.2	10.8	12.6	268.0	0.88
1997	3.4	8.0	4.6	11.2	8.0	47.6	17.8	11.8	13.0	86.1	7.8	21.7	241.0	0.79
1998	4.6	13.8	4.6	9.6	37.6	9.2	49.8	49.4	44.6	28.2	25.6	12.8	289.8	0.95
1999	10.2	10.6	15.6	10.6	48.0	50.8	41.6	69.8	61.6	27.2	23.2	19.8	389.0	1.28
2000	3.0	12.6	34.8	14.4	7.9	1.4	29.4	73.2	22.2					
Average	6.8	9.4	12.9	14.5	18.9	30.0	39.5	57.6	43.8	35.6	21.7	11.9	304.3	

Table B.1.6
Rankin Inlet 1981-2000
Monthly and Annual Total Precipitation in mm
Hydrologic Year Basis

Year	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Total	Total/Avg.
81 - 82	41.0	26.1	2.6	0.7	3.2	12.2	17.5	22.5	15.7	65.9	30.9	33.4	271.7	0.90
82 - 83	63.5	7.6	6.6	9.8	3.1	18.9	3.1	28.5	101.3	33.1	39.0	43.1	357.6	1.18
83 - 84	39.6	5.4	6.2	7.5	19.6	7.1	20.8	0.8	37.3	12.0	95.9	26.2	278.4	0.92
84 - 85	24.8	19.8	5.6	4.2	10.4	17.7	24.8	6.8	14.5	30.8	128.1	81.5	369.0	1.22
85 - 86	69.2	71.2	6.0	12.0	0.2	11.6	3.5	25.1	38.8	10.4	85.1	38.8	371.9	1.23
86 - 87	28.8	7.6	10.4	9.8	5.4	30.2	42.0	6.4	64.5	27.8	74.2	27.6	334.7	1.11
87 - 88	13.3	31.6	18.0	1.2	1.0	11.0	9.2	27.7	18.6	22.6	32.2	29.8	216.2	0.72
88 - 89	32.9	23.6	17.9	6.5	1.6	4.6	3.4	24.0	14.0	48.6	23.1	50.5	250.7	0.83
89 - 90	18.8	4.8	2.0	6.8	15.1	21.7	10.3	9.7	53.2	118.6	62.9	35.9	359.8	1.19
90 - 91	24.3	47.5	10.0	4.5	2.8	25.0	34.6	31.8	8.5	47.9	36.4	114.0	387.3	1.28
91 - 92	58.3	16.2	14.4	14.8	7.0	2.6	9.8	17.0	14.2	3.6	75.8	54.8	288.5	0.95
92 - 93	16.6	26.2	11.1	15.0	7.4	5.2	11.0	33.6	6.8	87.8	68.4	27.0	316.1	1.05
93 - 94	18.8	12.8	19.4	1.6	0.4	6.8	26.0	6.0	21.6	4.0	39.0	50.8	207.2	0.69
94 - 95	24.0	30.4	20.5	6.2	1.8	2.8	15.2	10.4	10.2	69.8	75.2	19.4	285.9	0.95
95 - 96	37.8	13.6	9.0	6.2	42.4	10.0	1.8	0.8	38.6	10.4	50.2	61.0	281.8	0.93
96 - 97	23.2	10.8	12.6	3.4	8.0	4.6	11.2	8.0	47.6	17.8	11.8	13.0	172.0	0.57
97 - 98	86.1	7.8	21.7	4.6	13.8	4.6	9.6	37.6	9.2	49.8	49.4	44.6	338.8	1.12
98 - 99	28.2	25.6	12.8	10.2	10.6	15.6	10.6	48.0	50.8	41.6	69.8	61.6	385.4	1.28
99 - 00	27.2	23.2	19.8	3.0	12.6	34.8	14.4	7.9	1.4	29.4	73.2	22.2	269.1	0.89
Average	35.6	21.7	11.9	6.7	8.8	13.0	14.7	18.6	29.8	38.5	59.0	44.0	302.2	

APPENDIX B.2

Rankin Inlet
1999 – 2000 Daily Rainfall, Snowfall and Total Precipitation

Table B.2.1
Rankin Inlet
1999 - 2000 Daily Rainfall in mm

Day	1999			2000								
	October	November	December	January	February	March	April	May	June	July	August	September
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0 T
2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0 T	0.0	0.0
3	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T
6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0 T
7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0
8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0	1.4
10	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	6.8
11	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.2	0.0
12	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8
14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.6
15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	2.8
16	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	8.0	0.0 T
17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.8	0.0
18	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
19	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
20	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.4	0.0
22	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.8	0.0
23	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.6	2.0
24	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0	0.0 T	0.0	13.2	0.0
25	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	12.0	0.0
26	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0 T	0.0
27	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.2
28	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.0	5.0	0.0
29	0.0	0.0	0.0	0.0	0.0	0.0 T	0.0	0.2	0.0	8.4	5.2	0.0
30	0.2	0.0	0.0	0.0		0.0	0.0	1.1	0.0 T	12.2	0.0	0.0
31	0.0		0.0	0.0		0.0		0.2		0.0	0.0	
Total	**13.6**	**0.0**	**0.0**	**0.4**	**0.0**	**0.0**	**7.2**	**2.7**	**0.2**	**29.4**	**73.2**	**20.6**

Table B.2.2
Rankin Inlet
1999 - 2000 Daily Snowfall in cm

Day	1999			2000								
	October	November	December	January	February	March	April	May	June	July	August	September
1	0.0 T	1.4	8.6	0.0	0.0	2.4	0.0	0.0	1.0	0.0	0.0	0.0
2	0.8	0.0 T	0.2	0.0	0.0 T	0.0 T	0.2	3.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0 T	0.2	0.2	5.8	0.2	1.2	0.0	0.0	0.0	0.0
4	0.2	0.0 T	0.0	0.0 T	0.4	2.4	0.0	0.2	0.2	0.0	0.0	0.0
5	0.2	2.0	0.2	0.0 T	0.0	0.0 T	3.2	0.0	0.0 T	0.0	0.0	0.0
6	0.0 T	0.4	6.8	0.0 T	0.0	0.0 T	0.4	0.0 T	0.0 T	0.0	0.0	0.0
7	0.0 T	1.0	1.0	0.0 T	0.8	0.6	0.0 T	0.0 T	0.0	0.0	0.0	0.0
8	0.0 T	6.4	0.0 T	0.0 T	0.2	0.0 T	0.0 T	0.0	0.0 T	0.0	0.0	0.0
9	0.2	0.0 T	0.0	0.0 T	0.0	0.0	0.0 T	0.0	0.0	0.0	0.0	0.0
10	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0
11	1.6	2.4	1.0	0.0 T	0.2	0.0 T	0.0 T	0.4	0.0	0.0	0.0	0.0
12	1.0	0.2	0.2	0.0 T	0.0	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0
13	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0	0.0
14	1.4	0.0 T	0.0	0.0 T	1.8	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0
15	0.0 T	1.4	0.0	0.0 T	0.0	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0
16	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0
17	2.0	0.0 T	0.0 T	0.2	0.0	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0
18	0.4	0.0 T	0.0 T	1.4	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0
19	1.4	0.4	0.0 T	0.0 T	0.0	0.0 T	0.0	0.0 T	0.0	0.0	0.0	0.0
20	0.8	0.0 T	0.0 T	0.2	0.0	4.4	0.0 T	0.0 T	0.0	0.0	0.0	0.0
21	0.4	0.0	0.0	0.0 T	4.2	1.4	0.0 T	0.4	0.0	0.0	0.0	0.0
22	0.0 T	0.0 T	0.0	0.0 T	1.2	1.8	0.0 T	0.0 T	0.0	0.0	0.0	0.0 T
23	1.8	0.6	0.0 T	0.2	0.0	0.8	3.2	0.0 T	0.0	0.0	0.0	0.0 T
24	0.0 T	1.0	1.0	0.0 T	2.0	2.0	0.0 T	0.0	0.0	0.0	0.0	0.6
25	0.0	1.6	0.6	0.0 T	0.8	6.2	0.0 T	0.0	0.0	0.0	0.0	0.8
26	0.0 T	1.0	0.2	0.2	0.8	4.2	0.0 T	0.0	0.0	0.0	0.0	0.0 T
27	0.8	0.0 T	0.0 T	0.0	0.0 T	0.2	0.0 T	0.0	0.0	0.0	0.0	0.0 T
28	0.2	0.6	0.0	0.0	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0 T
29	0.0 T	0.6	0.0	0.0 T	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0 T
30	0.2	2.2	0.0	0.2		2.0	0.0	0.0	0.0	0.0	0.0	0.2
31	0.2		0.0	0.0		0.6		0.0 T		0.0	0.0	
Total	**13.6**	**23.2**	**19.8**	**2.6**	**12.6**	**34.8**	**7.2**	**5.2**	**1.2**	**0.0**	**0.0**	**1.6**

Table B.2.3
Rankin Inlet
1999 - 2000 Daily Total Precipitation in mm

Day	1999			2000									
	October	November	December	January	February	March	April	May	June	July	August	September
1	0.0 T	1.4	8.6	0.0	0.0	2.4	0.0	0.0	1.0	0.0 T	0.0	0.0 T
2	0.8	0.0 T	0.2	0.0	0.0 T	0.0 T	0.2	4.2	0.0	0.0 T	0.0	0.0
3	0.4	0.0	0.0 T	0.2	0.2	5.8	0.2	1.2	0.0	0.0	0.8	0.0
4	0.2	0.0 T	0.0	0.0 T	0.4	2.4	0.0	0.2	0.2	0.0	0.0	0.0
5	0.2	2.0	0.2	0.0 T	0.0	0.0 T	3.2	0.0	0.0 T	0.0	0.0	0.0 T
6	0.0 T	0.4	6.8	0.0 T	0.0	0.0 T	0.4	0.0 T	0.2	0.0	0.0	0.0 T
7	0.0 T	1.0	1.0	0.0 T	0.8	0.6	0.0 T	0.0 T	0.0	0.0	0.0	4.0
8	0.0 T	6.4	0.0 T	0.0 T	0.2	0.0 T	0.0 T	0.0	0.0 T	0.0	0.0	0.0
9	5.0	0.0 T	0.0	0.0 T	0.0	0.0	0.0 T	0.0	0.0 T	0.0	0.0	1.4
10	6.8	0.0 T	0.0 T	0.0 T	0.0	0.0 T	0.0 T	0.0 T	0.0	0.0	1.0	6.8
11	3.0	2.4	1.0	0.0 T	0.2	0.0 T	0.0 T	0.4	0.0	0.0	9.2	0.0
12	1.0	0.2	0.2	0.0 T	0.0	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0
13	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0	0.0	2.8
14	1.4	0.0 T	0.0	0.0 T	1.8	0.0 T	0.0 T	0.0	0.0	3.0	0.0	0.6
15	0.0 T	1.4	0.0	0.0 T	0.0	0.0 T	0.0 T	0.0	0.0	5.8	0.0	2.8
16	0.0 T	0.0 T	0.0 T	0.4	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	8.0	0.0 T
17	2.0	0.0 T	0.0 T	0.2	0.0	0.0 T	0.0 T	0.0 T	0.0	0.0	8.8	0.0
18	0.4	0.0 T	0.0 T	1.4	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0	0.0	0.0
19	1.4	0.4	0.0 T	0.0 T	0.0	0.0 T	0.0	0.0 T	0.0	0.0	0.2	0.0
20	0.8	0.0 T	0.0 T	0.2	0.0	4.4	0.0 T	0.0 T	0.0	0.0	0.0	0.0
21	0.4	0.0	0.0	0.0 T	4.2	1.4	0.0 T	0.4	0.0	0.0	2.4	0.0
22	0.0 T	0.0 T	0.0	0.0 T	1.2	1.8	0.0 T	0.0 T	0.0	0.0	3.8	0.0 T
23	1.8	0.6	0.0 T	0.2	0.0	0.8	3.6	0.0 T	0.0	0.0	0.6	2.0
24	0.0 T	1.0	1.0	0.0 T	2.0	2.0	6.8	0.0	0.0 T	0.0	13.2	0.6
25	0.0	1.6	0.6	0.0 T	0.8	6.2	0.0 T	0.0	0.0 T	0.0	12.0	0.8
26	0.0 T	1.0	0.2	0.2	0.8	4.2	0.0 T	0.0	0.0 T	0.0	0.0 T	0.0 T
27	0.8	0.0 T	0.0 T	0.0	0.0 T	0.2	0.0 T	0.0	0.0	0.0	3.0	0.2
28	0.2	0.6	0.0	0.0	0.0 T	0.0 T	0.0 T	0.0 T	0.0	0.0	5.0	0.0 T
29	0.0 T	0.6	0.0	0.0 T	0.0	0.0 T	0.0	0.2	0.0	8.4	5.2	0.0 T
30	0.4	2.2	0.0	0.2		2.0	0.0	1.1	0.0 T	12.2	0.0	0.2
31	0.2		0.0	0.0		0.6		0.2		0.0	0.0	
Total	**27.2**	**23.2**	**19.8**	**3.0**	**12.6**	**34.8**	**14.4**	**7.9**	**1.4**	**29.4**	**73.2**	**22.2**

APPENDIX B.3

2000 Rainfall Data Comparison

Table B.3.1
2000 Field Season - Observed Rainfall
Rainfall in mm

Day	June Rankin Inlet	June Camp Tipping Bucket	June Evap. Manual Gauge	July Rankin Inlet	July Camp Tipping Bucket	July Evap. Manual Gauge	August Rankin Inlet	August Camp Tipping Bucket	August Evap. Manual Gauge	September Rankin Inlet	September Camp Tipping Bucket	September Evap. Manual Gauge
1	0.0	0.0	m	0.0	0.0	m	0.0	0.0	a	0.0	0.1	0.0
2	0.0	0.0	m	0.0	0.0	m	0.0	0.0	a	0.0	0.0	0.0
3	0.0	0.0	m	0.0	0.0	m	0.8	0.0	a	0.0	0.0	0.1
4	0.0	0.3	m	0.0	0.0	0.0	0.0	0.0	a	0.0	0.0	0.1
5	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	9.0	0.0	1.7	0.0
6	0.2	0.0	m	0.0	0.0	0.0	0.0	0.0	a	0.0	0.0	2.5
7	0.0	0.0	m	0.0	0.0	0.0	0.0	1.3	2.0	4.0	2.8	0.0
8	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
9	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	0.3
10	0.0	0.0	m	0.0	0.0	0.0	1.0	0.3	m	6.8	0.5	0.2
11	0.0	0.0	m	0.0	0.0	0.0	9.2	6.2	m	0.0	0.0	0.0
12	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	m	0.0	0.0	0.2
13	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	m	2.8	3.4	4.0
14	0.0	0.0	m	3.0	0.5	0.6	0.0	0.0	m	0.6	0.5	7.0
15	0.0	0.0	m	5.8	2.7	2.8	0.0	0.0	m	2.8	0.2	1.0
16	0.0	0.0	m	0.0	0.0	0.2	8.0	4.6	m	0.0	0.0	0.0
17	0.0	0.0	m	0.0	0.0	0.0	8.8	7.0	m	0.0	0.0	0.1
18	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	m	0.0	0.0	0.0
19	0.0	0.0	m	0.0	0.0	0.0	0.2	0.2	m	0.0	0.0	0.0
20	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	m	0.0	0.0	m
21	0.0	0.0	m	0.0	0.0	0.0	2.4	2.7	2.0	0.0	0.0	m
22	0.0	0.0	m	0.0	0.0	0.0	3.8	0.4	32.0	0.0	0.0	m
23	0.0	0.0	m	0.0	0.0	0.0	0.6	0.0	0.0	2.0	1.7	m
24	0.0	0.1	m	0.0	0.0	0.0	13.2	9.0	12.0	0.0	0.4	m
25	0.0	0.1	m	0.0	0.0	0.0	12.0	6.5	a	0.0	0.0	m
26	0.0	0.0	m	0.0	0.0	0.0	0.0	0.0	a	0.0	0.0	m
27	0.0	0.0	m	0.0	0.0	0.0	3.0	3.7	a	0.2	0.0	m
28	0.0	0.0	m	0.0	0.0	0.0	5.0	4.1	a	0.0	0.0	m
29	0.0	0.0	m	8.4	0.2	0.0	5.2	6.0	a	0.0	0.0	m
30	0.0	0.1	m	12.2	8.4	a	0.0	0.0	27.8	0.0	0.0	m
31				0.0	0.0	a	0.0	0.0	2.0			
Sub-total	**0.2**	**0.6**	m	**29.4**	**11.8**	3.6	**73.2**	**52.0**	86.8	**20.6**	**11.3**	15.6
									Season Total	**123.4**	**75.7**	106.0

a = Daily value assumed accumulated to next data point.
m = Missing data.
Monthly sub-totals shown as non-bolded are partial sub-totals due to missing data or carry forward of accumulated data

APPENDIX B.4

Meliadine Camp
2000 Evaporation Pan Data

Table B.4.1
Meliadine West Gold Project
2000 Evaporation Pan Data

Date	Water Added mm	Water Removed mm	Water Temperature (C) Max	Water Temperature (C) Min	Rain Gauge Pan mm	Rain Gauge Camp mm	Comments	Net Loss Calculated mm	Net Loss Adjusted mm		Cumulative Adjusted Loss mm
1-Jul-00									5.2	e	5.2
2-Jul-00									5.2	e	10.4
3-Jul-00	Pan setup								5.2	e	15.6
4-Jul-00	5.2				0.0		Sunny	5.2	5.2		20.8
5-Jul-00	5.4				0.0		Sunny	5.4	5.4		26.2
6-Jul-00	4.0				0.0		Foggy AM; sunny	4.0	4.0		30.2
7-Jul-00	3.8				0.0		Ice AM; sunny	3.8	3.8		34.0
8-Jul-00	4.6				0.0		Sunny; light winds	4.6	4.6		38.6
9-Jul-00	5.0				0.0		Sunny; moderate wind	5.0	5.0		43.6
10-Jul-00	7.6				0.0	0.0	Sunny; moderate SE winds	7.6	7.6		51.2
11-Jul-00	7.4				0.0	0.0	Sunny; moderate SE winds	7.4	7.4		58.6
12-Jul-00	7.5				0.0	0.0	Sunny; moderate SE winds	7.5	7.5		66.1
13-Jul-00	5.1				0.0	0.0	Overcast AM; sunny PM	5.1	5.1		71.2
14-Jul-00	1.6				0.6	0.6	Overcast ; showers; wind strong	2.2	2.2		73.4
15-Jul-00	1.2				2.8	2.6	Showers/overcast in AM; clearing in evening	4.0	4.0		77.4
16-Jul-00	5.8				0.2	0.1	Cool; strong NE winds; overcast	6.0	6.0		83.4
17-Jul-00	5.8				0.0	0.0	Clear; calm	5.8	5.8		89.2
18-Jul-00	a				0.0	0.0			5.2	d	94.4
19-Jul-00	a				0.0	0.0			5.1	d	99.5
20-Jul-00	a				0.0	0.0			5.2	d	104.7
21-Jul-00	20.6				0.0	0.0	Sunny; warm; calm	20.6	5.1	d	109.8
22-Jul-00	8.4				0.0	0.0	Hot AM; cooler strong wind PM	8.4	8.4		118.2
23-Jul-00	5.8		25.0	11.0	0.0	0.0	Cool AM; strong wind; warm PM	5.8	5.8		124.0
24-Jul-00	a				0.0	0.0			4.4	d	128.4
25-Jul-00	8.8		25.0	11.0	0.0	0.0	Hot; wind moderate	8.8	4.4	d	132.8
26-Jul-00	a				0.0	0.0			5.5	d	138.3
27-Jul-00	a				0.0	0.0	Hot		5.6	d	143.9
28-Jul-00	16.6		28.0	11.0	0.0	0.0	Cool; overcast; windy	16.6	5.5	d	149.4
29-Jul-00	2.8		24.0	11.0	0.0	0.0	Fog AM; hot afternoon; cooler wet evening	2.8	2.8		152.2
30-Jul-00	a				a	a			4.5	d	156.7
31-Jul-00	a				a	a			4.5	d	161.2
1-Aug-00	a				a	a			4.6	d	165.8
2-Aug-00	a				a	a			4.5	d	170.3
3-Aug-00	a				a	a			4.6	d	174.9
4-Aug-00	a				a	a			4.5	d	179.4
5-Aug-00	22.8				9.0	8.2	Sunny	31.8	4.6	d	184.0
6-Aug-00	a				a	a			4.8	d	188.8
7-Aug-00	7.6		25.0	13.0	2.0	1.6	Cloudy	9.6	4.8	d	193.6
8-Aug-00	5.4				0.0	0.0	Cloudy	5.4	5.4		199.0
9-Aug-00	5.4		24.0	8.0	0.0	0.0	Partly cloudy; windy	5.4	5.4		204.4
10-Aug-00	m	m			m	m			5.4	e	209.8
11-Aug-00	m	m			m	m			5.2	e	215.0
12-Aug-00	m	m			m	m			5.0	e	220.0
13-Aug-00	m	m			m	m			4.8	e	224.8
14-Aug-00	m	m			m	m			4.6	e	229.4
15-Aug-00	m	m			m	m			4.3	e	233.7
16-Aug-00	m	m			m	m			4.0	e	237.7
17-Aug-00	m	m			m	m			3.7	e	241.4
18-Aug-00	m	m			m	m			3.4	e	244.8
19-Aug-00	m	m			m	m			3.2	e	248.0
20-Aug-00	m	m			m	m	Evap pan cleaned out; too windy to re-fill		3.0	e	251.0
21-Aug-00		0.2	14.0	8.0	2.0	2.0	Pan filled at 11:00 AM; cloudy; showers	1.8	1.8		252.8
22-Aug-00		18.0	13.0	10.0	32.0	30.0	Cloudy; cool; windy; heavy rain periods	14.0	2.5	w	255.3
23-Aug-00		0.0	13.0	8.0	0.0	0.0	Cloudy; cool; slight wind	0.0	0.0		255.3
24-Aug-00		9.0	14.0	10.0	12.0	12.0	Rain, foggy, cool; moderate wind	3.0	3.0		258.3
25-Aug-00		a			a	a	Heavy rain; strong winds		3.0	e	261.3
26-Aug-00		a			a	a	Cold; heavy rain; strong winds		3.0	e	264.3
27-Aug-00		a			a	a	Cold; heavy rain; strong winds		3.0	e	267.3
28-Aug-00		a			a	a	Cold; heavy rain; strong winds		3.0	e	270.3
29-Aug-00		a			a	a	Cold; heavy rain; strong winds		3.0	e	273.3
30-Aug-00		10.8	13.0	3.0	27.8	27.2	Cloudy; cool; sunny periods	17.0	4.2	w	277.5
31-Aug-00	2.2		6.0	1.0	2.0	2.0	Cloudy; cool; sunny periods	4.2	4.2		281.7
1-Sep-00	a				0.0				2.3	d	284.0
2-Sep-00	4.6		9.0	0.0	0.0		Sunny; cold windy	4.6	2.3	d	286.3
3-Sep-00	5.5		18.0	4.0	0.1	0.2	Sunny; slight wind	5.6	5.6		291.9
4-Sep-00	1.9		17.0	2.0	0.1	0.0	Cloudy; E wind	2.0	2.0		293.9
5-Sep-00	2.6		12.0	5.0	0.0	0.0	Cloudy; E wind	2.6	2.6		296.5
6-Sep-00	0.0		13.0	2.0	*2.5*	2.5	Windy; NW wind	2.5	2.5		299.0
7-Sep-00	0.0		12.0	2.0	0.0	0.1	Windy; SE wind	0.0	0.0		299.0
8-Sep-00	0.0		13.0	1.0	0.1	0.2	Cloudy windy; SE wind; some fog	0.1	0.1		299.1
9-Sep-00		1.2	10.0	2.0	0.3	0.3	Windy; NE wind, rainy	-0.9	-0.9		298.2
10-Sep-00	0.0		10.0	2.0	0.2	0.2	Windy; NW wind; cloudy	0.2	0.2		298.4
11-Sep-00	3.4		11.0	1.0	0.0	0.1	Windy; NW wind; cloudy	3.4	3.4		301.8
12-Sep-00	0.0		11.0	1.0	0.2	0.2	NW wind; cloudy; some rain	0.2	0.2		302.0
13-Sep-00	0.0		11.0	1.0	4.0	3.1	NW wind; sunny	4.0	4.0		306.0
14-Sep-00		3.2	12.0	3.0	7.0	7.2	All day rain	3.8	3.8		309.8
15-Sep-00		0.8	11.0	5.0	1.0	1.0	NW wind; cloudy	0.2	0.2		310.0
16-Sep-00	3.6		10.0	1.0	0.0	0.1	Sunny; NW wind; partly cloudy	3.6	3.6		313.6
17-Sep-00	2.0		11.0	1.0	0.1	0.1	NW wind; sunny	2.1	2.1		315.7
18-Sep-00	2.8		2.0	0.0	0.0	0.0	Sunny; light winds	2.8	2.8		318.5
19-Sep-00	7.0		2.0	0.0	0.0	0.0	Cloudy; N wind	7.0	7.0		325.5
20-Sep-00	Water in pan frozen; evaporation pan and rain gauges removed for the year.										

blank = Not recorded or invalid.
m = Missing data.
a = Daily value assumed accumulated to next data observation.
e = Missing data estimated from preceding and following days.
w = Data affected by high winds blowing water out of pan; adjusted value estimated from adjacent day data.
d = Accumulated data distributed over accumulation period.
***italics* =Estimated from other rain gauge.**

APPENDIX B.5

2000 Lake Evaporation Calculation

LAKE EVAPORATION CALCULATION

Calculation of lake evaporation from pan evaporation is based on the procedure outlined below. This procedure is the standard one used by the Atmospheric Environment Service.

Daily Lake Evaporation in SI Units

$$E_L = 0.7 [E_P + 0.00642 P \acute{a}_P (.37 + 0.00255 U_P) T]$$

where: E_L = computed daily lake evaporation (mm)

E_P = net daily pan loss (mm)

$E_P = W_a - W_r + R$

W_a = water added (mm)

W_r = water removed (mm)

R = rainfall for past 24 hours (mm)

P = station pressure (kilopascal)

$P = 101.325 (1 - 0.00002257 Z)^{5.25}$

Z = station elevation (m)

$\acute{a}_P$ = fraction of advected energy (Class A Pan) used for evaporation

$\acute{a}_P = 0.35 + 0.01044 T_W + 0.000559 U_P$ if $0 \# U_P < 161$

$\acute{a}_P = 0.35 + 0.01044 T_W + 0.08 + 0.000249 (U_P-161)$ if $161 \# U_P < 322$

$\acute{a}_P = 0.35 + 0.01044 T_W + 0.12 + 0.000124 (U_P-322)$ if $322 \# U_P < 483$

$\acute{a}_P = 0.35 + 0.01044 T_W + 0.14 + 0.000062 (U_P-483)$ if $U_P \$ 483$

U_P = daily wind run across pan (km)

T = mean water and air temperature difference function

$T = (T_W-T_a)^{.88}$ if $T_W>T_a$

$T = -[(T_a-T_w)^{.88}]$ if $T_W<T_a$

$T = 0$ if $T_W = T_a$

TW = mean water temperature

Ta = mean air temperature

Reference: Kohler, M.A., T.J. Nordenson, and W.E. Fox, “Evaporation from Pans and Lakes”, Research Paper No. 38, U.S. Weather Bureau, 1955.

Table B.5.1
WMC Meliadine West Gold Project
2000 Lake Evaporation

Date (2000)	Pan Evap. mm	Water Temperature Tw (^{o}C) Max.	Min.	Average	Mean Air Temp Ta (^{o}C)	Wind Speed km/h	Up km	Alpha	T	Lake Evap. mm	Pan Coefficient
23-Jul	5.8	25.0	11.0	18.0	14.2	15.9	381.6	0.67	3.24	5.4	0.93
25-Jul	4.4	25.0	11.0	18.0	14.5	8.9	213.6	0.63	3.01	3.9	0.88
28-Jul	5.5	28.0	11.0	19.5	12.5	15.9	381.6	0.68	5.54	6.1	1.12
29-Jul	2.8	24.0	11.0	17.5	15.5	12.6	302.4	0.65	1.84	2.6	0.92
7-Aug	4.8	25.0	13.0	19.0	17.7	14.7	352.8	0.67	1.26	3.8	0.80
9-Aug	5.4	24.0	8.0	16.0	14.9	15.5	372.0	0.64	1.09	4.2	0.78
21-Aug	1.8	14.0	8.0	11.0	11.3	10.5	252.0	0.57	-0.35	1.2	0.65
22-Aug	2.5	13.0	10.0	11.5	11.0	18.9	453.6	0.61	0.54	2.0	0.79
23-Aug	0.0	13.0	8.0	10.5	10.3	9.6	230.4	0.56	0.24	0.1	
24-Aug	3.0	14.0	10.0	12.0	10.7	8.3	199.2	0.56	1.26	2.4	0.79
30-Aug	4.2	13.0	3.0	8.0	2.9	34.6	830.4	0.60	4.19	5.7	1.37
31-Aug	4.2	6.0	1.0	3.5	3.8	33.4	801.6	0.55	-0.35	2.7	0.65
2-Sep	2.3	9.0	0.0	4.5	3.7	31.8	762.5	0.55	0.78	2.1	0.90
3-Sep	5.6	18.0	4.0	11.0	8.3	20.9	501.4	0.61	2.43	5.0	0.90
4-Sep	2.0	17.0	2.0	9.5	9.4	15.5	372.0	0.58	0.19	1.5	0.73
5-Sep	2.6	12.0	5.0	8.5	8.6	15.0	359.4	0.56	-0.16	1.8	0.68
6-Sep	2.5	13.0	2.0	7.5	9.3	13.4	321.6	0.55	-1.71	1.2	0.50
7-Sep	0.0	12.0	2.0	7.0	6.1	23.5	563.4	0.57	0.91	0.4	
8-Sep	0.1	13.0	1.0	7.0	4.9	13.8	330.9	0.54	1.93	0.6	6.47
9-Sep	-0.9	10.0	2.0	6.0	6.8	26.9	646.0	0.56	-0.86	-1.1	1.19
10-Sep	0.2	10.0	2.0	6.0	6.9	19.0	455.8	0.55	-0.91	-0.2	-1.03
11-Sep	3.4	11.0	1.0	6.0	8.3	26.3	632.2	0.56	-2.06	1.3	0.39
12-Sep	0.2	11.0	1.0	6.0	8.0	26.8	644.1	0.56	-1.81	-0.8	-3.94
13-Sep	4.0	11.0	1.0	6.0	6.9	18.9	454.8	0.55	-0.93	2.4	0.61
14-Sep	3.8	12.0	3.0	7.5	4.9	21.8	523.6	0.57	2.33	3.7	0.97
15-Sep	0.2	11.0	5.0	8.0	3.4	21.9	525.2	0.58	3.82	1.8	9.21
16-Sep	3.6	10.0	1.0	5.5	6.3	22.9	548.7	0.55	-0.82	2.2	0.60
17-Sep	2.1	11.0	1.0	6.0	3.7	43.3	1040.3	0.59	2.12	3.2	1.51
18-Sep	2.8	2.0	0.0	1.0	2.7	29.1	699.5	0.51	-1.61	1.2	0.41
19-Sep	7.0	2.0	0.0	1.0	1.8	11.0	263.0	0.47	-0.80	4.7	0.67
Sum	**85.9**									**71.1**	**0.83**

Notes: Elake=0.7*(Epan+0.00642*P*Alpha*(0.37+0.00255*Up)*T)
P=station pressure (kilopascal), P=101.325*(1-0.00002257*Z)^5.25, Z=station elevation, Z=58 m here, P=100.6306 kpa
Alpha=fraction of advected energy (Class A Pan) used for evaporation.
Alpha=0.35+0.01044*Tw+0.000559*Up; when 0<=Up<161
Alpha=0.35+0.01044*Tw+0.08+0.000249*(Up-161); when 161<=Up<322.
Alpha=0.35+0.01044*Tw+0.12+0.000124*(Up-322); when 322<=Up<483
Alpha=0.35+0.01044*Tw+0.14+0.000062*(Up-483); when Up>=483
Up=daily wind run across pan (km). Up=average wind speed*24
T=mean water and air temperature difference function.
T=(Tw-Ta)^0.88, when Tw>Ta; T=-[(Ta-Tw)^0.88], when Tw<Ta; T=0, when Tw=Ta
Tw=mean water temperature; Ta=mean air temperature.

APPENDIX C

SNOW SURVEY DATA 2000

APPENDIX C.1

Snow Survey Data

TABLE C.1.1

Meliadine West Gold Project
2000 Snow Survey Data Transect 1
May 13, 2000

TRANSECT 1 790 m SW-NE									
Station	Depth	Slope	GPS Coordinates		Remarks	Station	Depth	Density	Sample
(m)	(cm)	(percent)	East	North		(m)	(cm)	(percent)	Type
0	40		539884	6988217	WP 1-SW	0	40	40	
10	32					30	40	43	
20	26					60	12	31	B
30	40					90	24	31	B
40	22					120	29	31	B
50	32					150	34	41	
60	12					180	49	41	
70	23					210	46	41	
80	30					240	44	36	
90	24					270	65	40	
100	26					300	84	48	
110	29					330	31	35	B
120	29					360	29	35	B
130	41					390	20	35	B
140	62					420	39	33	
150	44					450	24	38	B
160	60					480	32	38	B
170	70					530	32	38	B
180	49					560	20	43	B
190	51					580	40	43	B
200	49					590	40	45	
210	46					620	70	41	
220	40					650	19	42	B
230	49					680	52	42	B
240	49					710	80	38	
250	52		540098	6988335	WP 1-250	740	20	41	B
260	64					770	26	41	B
270	70								
280	69								
290	66								
300	84								
310	56								
320	44								
330	31								
340	29								
350	32								
360	29								
370	56								
380	16								
390	20								
400	21								
410	29								
420	39								
430	52								
440	12								
450	24								
460	26								
470	30								
480	32								

Station	Depth	Slope	GPS Coordinates		Remarks
(m)	(cm)	(percent)	East	North	
490	22				
500	44		540298	6988493	WP 1-500
510	19				
520	18				
530	32				
540	9				
550	12				
560	20				
570	30				
580	29				
590	40				
600	49				
610	56				
620	70				
630	74				
640	49				
650	19				
660	34				
670	52				
680	52				
690	56				
700	56				
710	82				
720	74				
730	54				
740	34				
750	40				
760	3				
770	26				
780	20				
790	20		540522	6988692	WP 1-END

Notes: WP = GPS way point number
B = bulk sample

TABLE C.1.2

Meliadine West Gold Project
2000 Snow Survey Data Transect 2
May 13, 2000

TRANSECT 2 910 m NE-SW									
Station	Depth	Slope	GPS Coordinates		Remarks	Station	Depth	Density	Sample
(m)	(cm)	(percent)	East	North		(m)	(cm)	(percent)	Type
0	24		540306	6989002	WP 2-NE	0	24	43	B
10	44					30	60	43	B
20	44					60	26	34	B
30	60					90	50	34	B
40	54					120	35	49	
50	34					150	22	38	B
60	26					180	44	38	B
70	66					210	54	38	B
80	70					240	55	43	
90	50					270	30	36	B
100	60					300	37	36	B
110	70					330	56	46	
120	40					360	19	41	B
130	30					390	25	41	B
140	40					420	30	41	B
150	22					450	25	32	B
160	30					480	16	32	B
170	46					510	26	32	B
180	44					540	38	32	B
190	50					570	20	41	B
200	60					600	50	41	B
210	54					630	86	44	
220	59					660	60	43	
230	50					690	35	43	
240	60					720	19	33	B
250	54		540075	6988918	WP 2-250	750	30	33	B
260	48					780	14	33	B
270	30					810	31	33	B
280	20					840	20	36	B
290	24					870	15	36	B
300	44					900	29	36	B
310	54					910	105	36	
320	54								
330	56								
340	39								
350	27								
360	19								
370	9								
380	34								
390	25								
400	40								
410	20								
420	30								
430	26								
440	10								
450	30								
460	20								
470	16								
480	16								
490	19								
500	44								
510	32								

Station	Depth	Slope	GPS Coordinates		Remarks
(m)	(cm)	(percent)	East	North	
520	14				
530	26				
540	34				
550	39				
560	44				
570	20				
580	50				
590	72				
600	50				
610	46				
620	85				
630	88				
640	66				
650	54				
660	69				
670	80				
680	62				
690	44				
700	26				
710	24				
720	19				
730	20				
740	21		539633	6988724	WP 2-740
750	30				
760	24				
770	24				
780	14				
790	21				
800	29				
810	31				
820	12				
830	60				
840	20				
850	30				
860	20				
870	21				
880	50				
890	31				
900	29				
910	115		539484	6988644	WP 2-END

TABLE C.1.3

Meliadine West Gold Project
2000 Snow Survey Data Transect 3
May 13, 2000

TRANSECT 3 1080 m SW-NE									
Station (m)	Depth (cm)	Slope (percent)	GPS Coordinates East	GPS Coordinates North	Remarks	Station (m)	Depth (cm)	Density (percent)	Sample Type
0	27				WP 3-SW	0	27	26	B
10	21				(Error in GPS Coords)	30	35	26	B
20	34					60	15	26	B
30	35					90	30	41	B
40	24					120	29	41	B
50	20					150	79	41	B
60	15					180	26	37	B
70	19					210	24	37	B
80	0					240	21	37	B
90	30					270	10	37	B
100	29					300	51	37	B
110	44					330	86	40	
120	29					360	45	44	
130	40					390	35	46	
140	86					420	40	50	
150	82				side of small hill	450	35	40	
160	110				side of small hill	480	35	63	
170	56				side of small hill	510	24	38	B
180	26					540	35	38	B
190	23					570	45	38	B
200	26					600	28	37	B
210	24					630	42	37	B
220	20					660	19	32	B
230	35					690	32	32	B
240	21		539561	6989080	WP 3-240	720	10	32	B
250	20					750	14	32	B
260	26					780	25	40	B
270	19					810	42	40	B
280	22					840	15	40	B
290	14					870	30	41	B
300	51					900	30	41	B
310	29					930	48	41	B
320	79					960	30	46	B
330	84					990	24	46	B
340	84					1020	35	46	B
350	63					1050	75	52	
360	60								
370	51								
380	49								
390	41								
400	39								
410	46								
420	46								
430	41								
440	54								
450	46								
460	46								
470	39								
480	46								
490	34		539738	6989253	WP 3-490				
500	20								
510	29								

Station	Depth	Slope	GPS Coordinates		Remarks
(m)	(cm)	(percent)	East	North	
520	42				
530	52				
540	56				
550	50				
560	62				
570	50				
580	26				
590	46				
600	28				
610	34				
620	52				
630	42				
640	25				
650	30				
660	19				
670	20				
680	14				
690	32				
700	0				
710	20				
720	10				
730	6				
740	16		539911	6989422	WP 3-740
750	30				
760	62				
770	36				
780	30				
790	50				
800	52				
810	44				
820	39				
830	30				
840	29				
850	39				
860	39				
870	34				
880	28				
890	40				
900	31				
910	42				
920	40				
930	56				
940	40				
950	46				
960	30				
970	30				
980	19				
990	24		540098	6989607	WP 3-990
1000	29				
1010	36				
1020	46				
1030	86				
1040	150				
1050	100				
1060	12				
1070	22				
1080	0		540165	6989653	WP 3-

TABLE C.1.4

Meliadine West Gold Project
2000 Snow Survey Data Transect 4
May 13, 2000

TRANSECT 4 810 m NE-SW									
Station	Depth	Slope	GPS Coordinates		Remarks	Station	Depth	Density	Sample
(m)	(cm)	(percent)	East	North		(m)	(cm)	(percent)	Type
0	36		540659	6988521	WP 4-1 (NE)	0	36	11	1 tube
10	42					30	30	43	1 tube
20	20					60	40	30	1 tube
30	30					90	50	8	2 tubes
40	34					120	30	40	
50	40					150	34	32	
60	40					180	0	n/a	
70	50					210	34	38	
80	43					240	60	33	
90	50					270	74	46	
100	74					300	31	43	B
110	40					330	30	43	B
120	30					360	52	46	
130	34					390	38	28	B
140	20					420	16	28	B
150	34					450	31	28	B
160	11					480	58	34	
170	42					510	62	39	
180	0					540	60	40	
190	14					570	46	39	
200	32					600	20	43	
210	34					630	19	43	
220	71					660	36	43	
230	51					690	35	46	
240	60					720	62	39	
250	52					750	49	41	
260	32					780	40	30	B
270	74				on ice	790	40	30	B
280	55								
290	42								
300	31								
310	31								
320	30								
330	30								
340	51								
350	61								
360	52				on ice				
370	53								
380	43								
390	38				on ice				
400	26								
410	21								
420	16								
430	18								
440	0								
450	31								
460	51								
470	46								
480	58				on ice				
490	71								
500	62		540248	6988185	WP 4-1500				
510	62								

Station	Depth	Slope	GPS Coordinates		Remarks
(m)	(cm)	(percent)	East	North	
520	42				
530	62				
540	60				
550	51				
560	48				
570	46				
580	31				
590	32				
600	20				on ice
610	22				
620	18				
630	19				on ice
640	42				
650	42				
660	36				
670	48				
680	21				
690	35				
700	44				
710	62				
720	62				
730	72				
740	69				
750	49				
760	36				
770	40				
780	40				
790	40				
800	32				
810	19		540022	6988002	WP4-2 (SW)

APPENDIX C.2

GIS Terrain Analysis

GIS TERRAIN ANALYSIS

For the terrain analysis and the calculation of the snow water equivalent, the GIS software ARC/INFO was used. First, a raster digital elevation model (DEM) was created with a horizontal grid size of 10 m by 10 m. In combination with a raster which represented all lakes larger than 1 ha, this DEM was used to carry out the following terrain analysis:

- slope
- aspect
- curvature (degree of convexity or concavity)
- lake surfaces
- lake edges (defined as a 30 m buffer on either side of a lake edge, as long as the slope is less than 3%).

These grids representing the various terrain features were then combined to define the 10 terrain units (Table C.2.1).

TABLE C.2.1
Terrain Units and Their Definition Using GIS Coverages

Terrain Unit		Slope (%)	Aspect	Lake Surface	Lake Edge	Slope
No.	Description					Curvature
1	Lake	-	-	X	-	-
2	Lake Edges	< 3	-	-	X	-
3	Crest	-	-	-	-	> 0.65
4	Low Slopes (<3%)	< 3	-	-	-	-
5	NE Slopes (3-8.5%)	> 3, < 8.5	NE	-	-	-
6	NE Slopes (>8.5%)	> 8.5	NE			
7	SW Slopes (3-8.5%)	> 3, < 8.5	SW			
8	SW Slopes (>8.5%)	> 8.5	SW			
9	NW Slopes (>3%)	> 3	NW			
10	SE Slopes (>3%)	> 3	SE			

After the definition of the terrain units, the associated snow water equivalent values were calculated and summed for each basin.

APPENDIX D

HYDROLOGIC MONITORING DATA

D.1 General Information
D.2 Meliadine Lake Near Rankin Inlet
D.3 Meliadine River at Meliadine Lake Outlet
D.4 West Outlet of Meliadine Lake
D.5 Meliadine River Near the Mouth
D.6 Outlet of Lake A1
D.7 Outlet of Lake B7
D.8 Outlet of Lake B2
D.9 Lake A37 Sub-Basin
D.10 Char River Near the Mouth

APPENDIX D.1

General Information

Hydrometric Monitoring Data 2000
General Information

This appendix contains the following standard information for each station except for the Lake A37 Sub-Basin and the Char River, for which miscellaneous information only was obtained:

- A Site Inspection Summary table listing the site visits made during the year, with water level observations and flow measurements.
- The station rating curve of the relationship between water elevation and discharge (for streamflow stations only).
- A graph showing water levels recorded in 2000.
- A graph showing the hydrograph of the daily discharges for 2000.
- A table of mean daily water levels (for continuous recording stations only).
- A table of mean daily discharges (for continuous streamflow stations only).
- A "Gauge History" page reporting benchmark surveys made at the site.

The stations are listed in the order given in Table D.1.1 below. The table provides station names and numbers under several different numbering systems used during the project.

TABLE D.1.1
Streamflow and Lake Level Monitoring Stations

Appendix	Name	Alternate Name	Type[1]	RL&L[2]	WSC[3]
D.2	Meliadine Lake near Rankin Inlet		CL		06MC002
D.3	Meliadine River at Meliadine Lake Outlet		MS	ML-MR	06MC008
D.4	West Outlet of Meliadine Lake		MS	ML-PL or ML-DR	06MC009
D.5	Meliadine River near the Mouth		CS		06MC001
D.6	Outlet of Lake A1	Peg Creek near the Mouth	CS	A1-ML	06MC003
D.7	Outlet of Lake B7	Outlet of Woody Lake	CS	B7-6	---
D.8	Outlet of Lake B2	Outlet of Woodstock Lake	CS	B2-1	---
D.9	Lake A37 Sub-Basin		Misc.		
D.10	Char Lake near the Mouth		Misc.		

1. Type: C = Continuous (datalogger)
   M = Manual (direct water level survey)
   S = Streamflow
   L = Water Level only
   Misc. = Miscellaneous observations
2. Number system based on RL&L nomenclature.
3. Water Survey of Canada

Abbreviations used in this appendix are as follows:

- DWL Direct water level. A water level obtained by surveying from a benchmark.
- DL Datalogger
- E Estimate
- NR Not recorded in the field notes
- NDLR No datalogger records
- WSC Water Survey of Canada

Some general notes explaining the data in this appendix are defined below.

- Elevations shown in the "DWL" column of the Site Inspection Summary have been adjusted to compensate for movement of the benchmarks during the season.

- Elevations shown in the "Data Logger" column of the Site Inspection Summary are values read from the datalogger's digital display during the field visit.

- The "Difference" adjustment identifies the systematic differences between the surveyed water levels and those recorded by the datalogger, by which the datalogger record is adjusted.

- Depths where noted are measured above the "zero flow elevation", which is the water level below which no streamflow will occur.

- For the calculation of seasonal flow volumes, missing discharges are estimated by linear interpolation between measured discharges.

- Mean daily discharges are obtained by averaging 15-minute interval discharges calculated by using the rating curve and 15-minute interval water level readings recorded by the station datalogger.

APPENDIX D.2

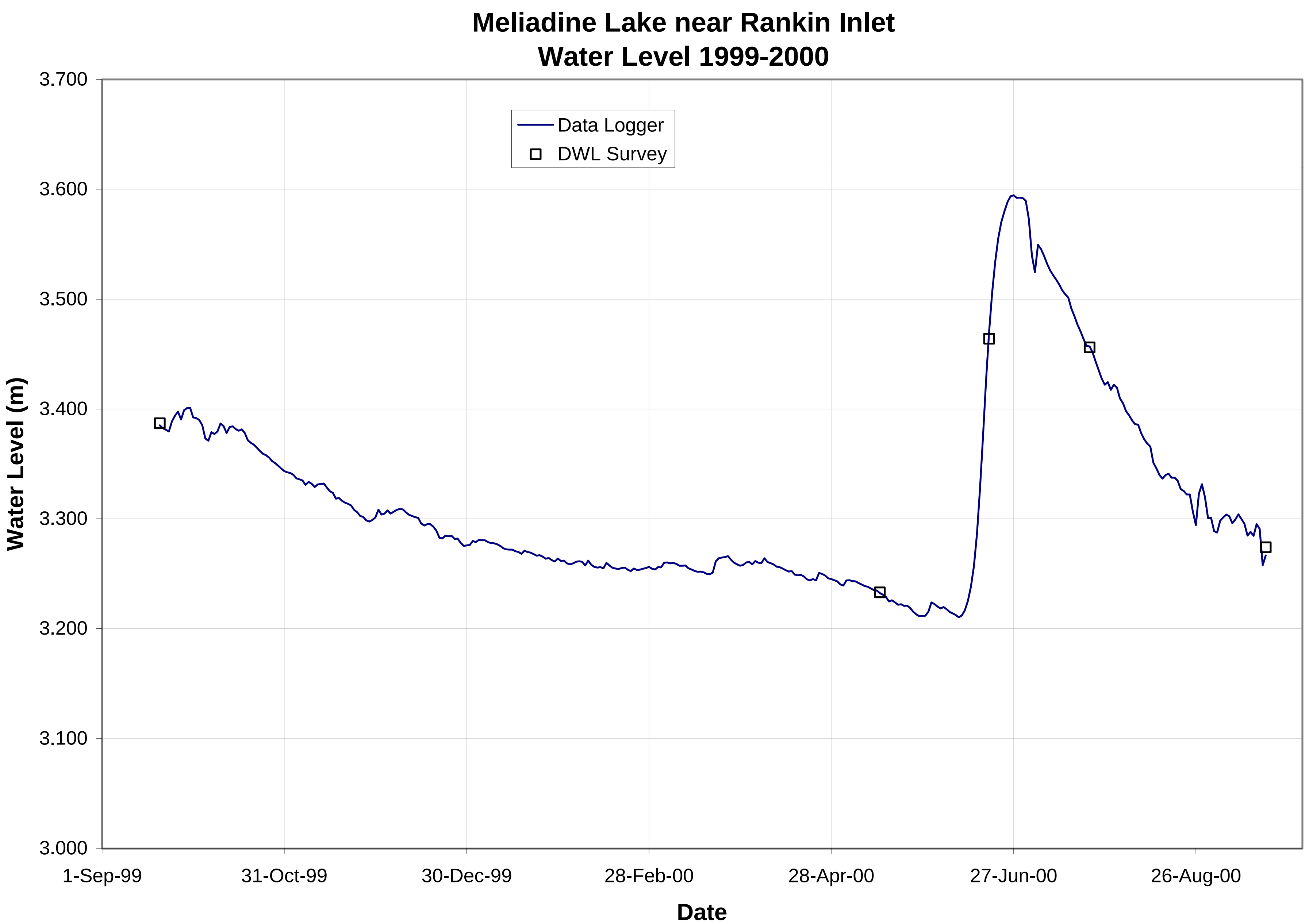
Meliadine Lake Near Rankin Inlet

Site Inspection Summary (2000)
Meliadine Lake Near Rankin Inlet (06MC002)

Date (dd-mm-yy)	DWL (m)	Data Logger (D.L.) (m)	Time (hours)	Difference (DWL-D.L.)
20-Sep-99	3.387	3.423	12.45	-0.036
14-May-00	3.233	3.240	15:00	-0.007
13-Jun-00	3.357 *	3.261	8:30	0.096
19-Jun-00	3.464	3.489	8:00	-0.025
22-Jul-00	3.456	3.466	14:45	-0.010
18-Sep-00	3.274	3.266	17:15	0.008

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
DL = Data logger water level
Difference = Difference between surveyed level (DWL) and Data Logger water level reading
= value by which to adjust the Data Logger reading
N.R. = Not Recorded in Field Notes
N.D.L.R. = No Data Logger Records

* DWL on 13 June 00 represents water pooled on ice and may not represent the true water level



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Meliadine lake.xls [Adj 99-00]
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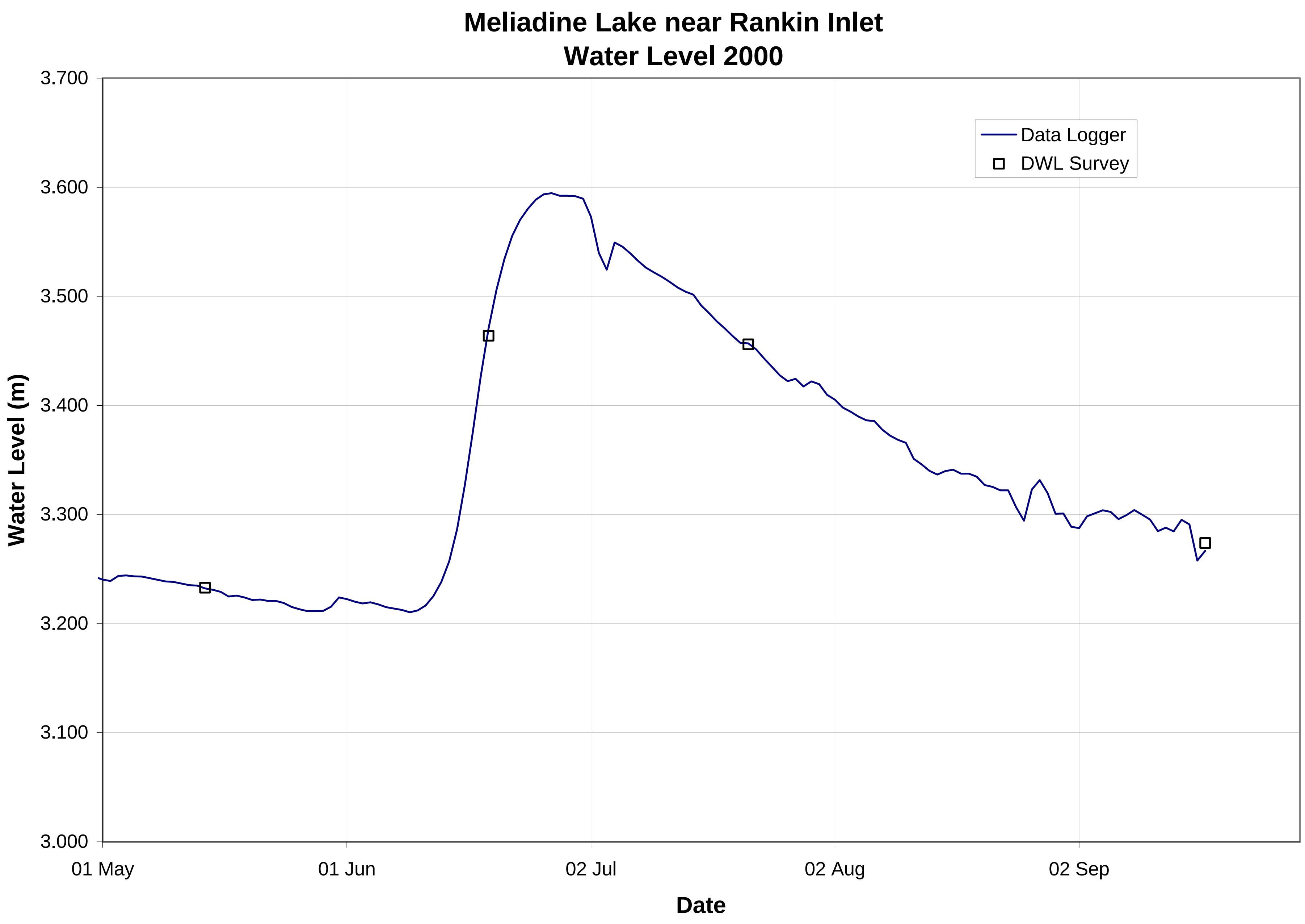
WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.2.1



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Meliadine lake.xls [Adj]
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WMC Meliadine West Gold Project Water Balance Study
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Figure D.2.2

STATION NUMBER: LAKE Meliadine Lake near Rankin Inlet 1999 (06MC002)
DATA LOGGER START UP DATE: 9/20/1999
DATA LOGGER ENDING DATE: 09/18/2000

DAILY MEAN WATER LEVEL IN METERS

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	---	---	---	3.392	3.342	3.308
2	---	---	---	---	---	---	---	---	---	3.392	3.341	3.304
3	---	---	---	---	---	---	---	---	---	3.390	3.340	3.304
4	---	---	---	---	---	---	---	---	---	3.385	3.337	3.307
5	---	---	---	---	---	---	---	---	---	3.373	3.336	3.304
6	---	---	---	---	---	---	---	---	---	3.371	3.335	3.306
7	---	---	---	---	---	---	---	---	---	3.379	3.331	3.308
8	---	---	---	---	---	---	---	---	---	3.377	3.333	3.309
9	---	---	---	---	---	---	---	---	---	3.379	3.332	3.308
10	---	---	---	---	---	---	---	---	---	3.387	3.329	3.305
11	---	---	---	---	---	---	---	---	---	3.384	3.331	3.303
12	---	---	---	---	---	---	---	---	---	3.378	3.332	3.302
13	---	---	---	---	---	---	---	---	---	3.383	3.332	3.301
14	---	---	---	---	---	---	---	---	---	3.384	3.328	3.300
15	---	---	---	---	---	---	---	---	---	3.382	3.325	3.295
16	---	---	---	---	---	---	---	---	---	3.380	3.323	3.293
17	---	---	---	---	---	---	---	---	---	3.381	3.318	3.295
18	---	---	---	---	---	---	---	---	---	3.378	3.319	3.295
19	---	---	---	---	---	---	---	---	---	3.371	3.316	3.292
20	---	---	---	---	---	---	---	---	3.385	3.369	3.314	3.289
21	---	---	---	---	---	---	---	---	3.382	3.367	3.313	3.282
22	---	---	---	---	---	---	---	---	3.381	3.364	3.312	3.282
23	---	---	---	---	---	---	---	---	3.380	3.361	3.308	3.284
24	---	---	---	---	---	---	---	---	3.389	3.359	3.306	3.284
25	---	---	---	---	---	---	---	---	3.394	3.358	3.302	3.284
26	---	---	---	---	---	---	---	---	3.398	3.355	3.301	3.281
27	---	---	---	---	---	---	---	---	3.390	3.352	3.298	3.282
28	---	---	---	---	---	---	---	---	3.399	3.351	3.297	3.278
29	---	---	---	---	---	---	---	---	3.401	3.348	3.299	3.275
30	---	---	---	---	---	---	---	---	3.401	3.346	3.301	3.275
31	---	---	---	---	---	---	---	---	---	3.343	---	3.276
MIN	---	---	---	---	---	---	---	---	3.380	3.343	3.297	3.275
MEAN	---	---	---	---	---	---	---	---	3.391	3.372	3.321	3.294
MAX	---	---	---	---	---	---	---	---	3.401	3.392	3.342	3.309

STATION NUMBER: LAKE   Meliadine Lake near Rankin Inlet 2000 (06MC002)
DATA LOGGER START UP DATE: 9/20/1999
DATA LOGGER ENDING DATE: 09/18/2000

DAILY MEAN WATER LEVEL IN METERS

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	3.279	3.259	3.254	3.261	3.240	3.222	3.589	3.410	3.289	---	---	---
2	3.278	3.258	3.256	3.258	3.239	3.220	3.573	3.405	3.288	---	---	---
3	3.280	3.259	3.255	3.261	3.244	3.218	3.540	3.398	3.298	---	---	---
4	3.280	3.260	3.260	3.260	3.244	3.220	3.525	3.394	3.301	---	---	---
5	3.280	3.261	3.260	3.260	3.243	3.218	3.549	3.390	3.304	---	---	---
6	3.278	3.261	3.259	3.264	3.243	3.215	3.546	3.386	3.302	---	---	---
7	3.277	3.257	3.260	3.261	3.242	3.214	3.539	3.386	3.296	---	---	---
8	3.277	3.261	3.259	3.259	3.240	3.212	3.532	3.378	3.299	---	---	---
9	3.276	3.258	3.257	3.258	3.239	3.210	3.526	3.372	3.304	---	---	---
10	3.275	3.256	3.257	3.256	3.238	3.212	3.522	3.368	3.300	---	---	---
11	3.273	3.255	3.257	3.256	3.237	3.217	3.518	3.366	3.295	---	---	---
12	3.272	3.256	3.255	3.255	3.235	3.225	3.513	3.351	3.285	---	---	---
13	3.271	3.255	3.254	3.253	3.235	3.238	3.508	3.346	3.288	---	---	---
14	3.271	3.260	3.252	3.252	3.232	3.257	3.504	3.340	3.285	---	---	---
15	3.270	3.257	3.251	3.252	3.231	3.286	3.501	3.337	3.295	---	---	---
16	3.269	3.255	3.252	3.249	3.229	3.328	3.491	3.340	3.291	---	---	---
17	3.268	3.254	3.251	3.249	3.225	3.376	3.485	3.341	3.258	---	---	---
18	3.270	3.254	3.250	3.249	3.226	3.427	3.477	3.337	3.267	---	---	---
19	3.269	3.255	3.249	3.247	3.224	3.471	3.471	3.337	---	---	---	---
20	3.269	3.255	3.251	3.245	3.222	3.506	3.464	3.335	---	---	---	---
21	3.267	3.253	3.261	3.244	3.222	3.534	3.457	3.327	---	---	---	---
22	3.266	3.252	3.264	3.245	3.221	3.555	3.457	3.325	---	---	---	---
23	3.266	3.254	3.265	3.244	3.221	3.570	3.451	3.322	---	---	---	---
24	3.265	3.253	3.265	3.251	3.219	3.580	3.443	3.322	---	---	---	---
25	3.263	3.253	3.266	3.250	3.215	3.589	3.435	3.307	---	---	---	---
26	3.264	3.254	3.263	3.248	3.213	3.594	3.428	3.294	---	---	---	---
27	3.262	3.255	3.260	3.246	3.211	3.595	3.422	3.323	---	---	---	---
28	3.261	3.256	3.258	3.245	3.212	3.592	3.424	3.331	---	---	---	---
29	3.263	3.254	3.257	3.244	3.212	3.592	3.417	3.320	---	---	---	---
30	3.261	---	3.258	3.243	3.215	3.592	3.422	3.301	---	---	---	---
31	3.262	---	3.260	---	3.224	---	3.419	3.301	---	---	---	---
MIN	3.261	3.252	3.249	3.243	3.211	3.210	3.417	3.294	3.258	---	---	---
MEAN	3.270	3.256	3.257	3.252	3.229	3.376	3.489	3.348	3.291	---	---	---
MAX	3.280	3.261	3.266	3.264	3.244	3.595	3.589	3.410	3.304	---	---	---

GAUGE HISTORY

STATION NAME: Meliadine Lake near Rankin Inlet
STATION NUMBER: **06MC002** **ELEVATION OF GAUGE DATUM:** **ASSUMED DATUM**
0.000 m.
LATITUDE: **63° 05' 14" gps** **LONGITUDE:** **92° 23' 15" gps**

BENCH MARKS:

B.M. #1	**Red paint mark on top of bedrock outcrop 31.4 meters south of shelter.**	**Elev. 10.000 m. (assumed)**
B.M. #2	**Red paint mark on bedrock outcrop 20.0 meters west of shelter.**	**Elev. 6.980 m.**
B.M. #3	**Red paint mark on bedrock outcrop 16.2 meters NW of shelter.**	**Elev. 5.980 m.**
B.M. #1 is control bench mark.		

HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT

DATE	GAUGE CORRECTIONS (BENCH MARK USED TO OBTAIN WATER LEVELS: BOLD TYPE AND UNDERLINED)					NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.
	B.M. #1	B.M. #2	B.M. #3			
1997						
Jun. 12	10.000	6.980	5.980			Established bench marks
			5.980			Used for the year
1998						
May 7	10.000	6.969	5.965			Level circuit
Jun 6	10.000	6.977	5.976			Level circuit
Sept 22	10.000	6.977	5.972			Level circuit
	10.000		**5.980**			Used for the year
1999						
Jun. 16	10.000	6.975	5.971			Level circuit
Jul. 13	10.000	6.977	5.974			Level circuit
	10.000	**6.980**	**5.980**			Used for the year
2000						
May 14	10.000	6.971	Not found			Level circuit
Jun. 13	10.000	6.975	5.969			Level circuit
Jul. 22	10.000	6.972	5.964			Level circuit
			5.980			Used for the year

APPENDIX D.3

Meliadine River at Meliadine Lake Outlet

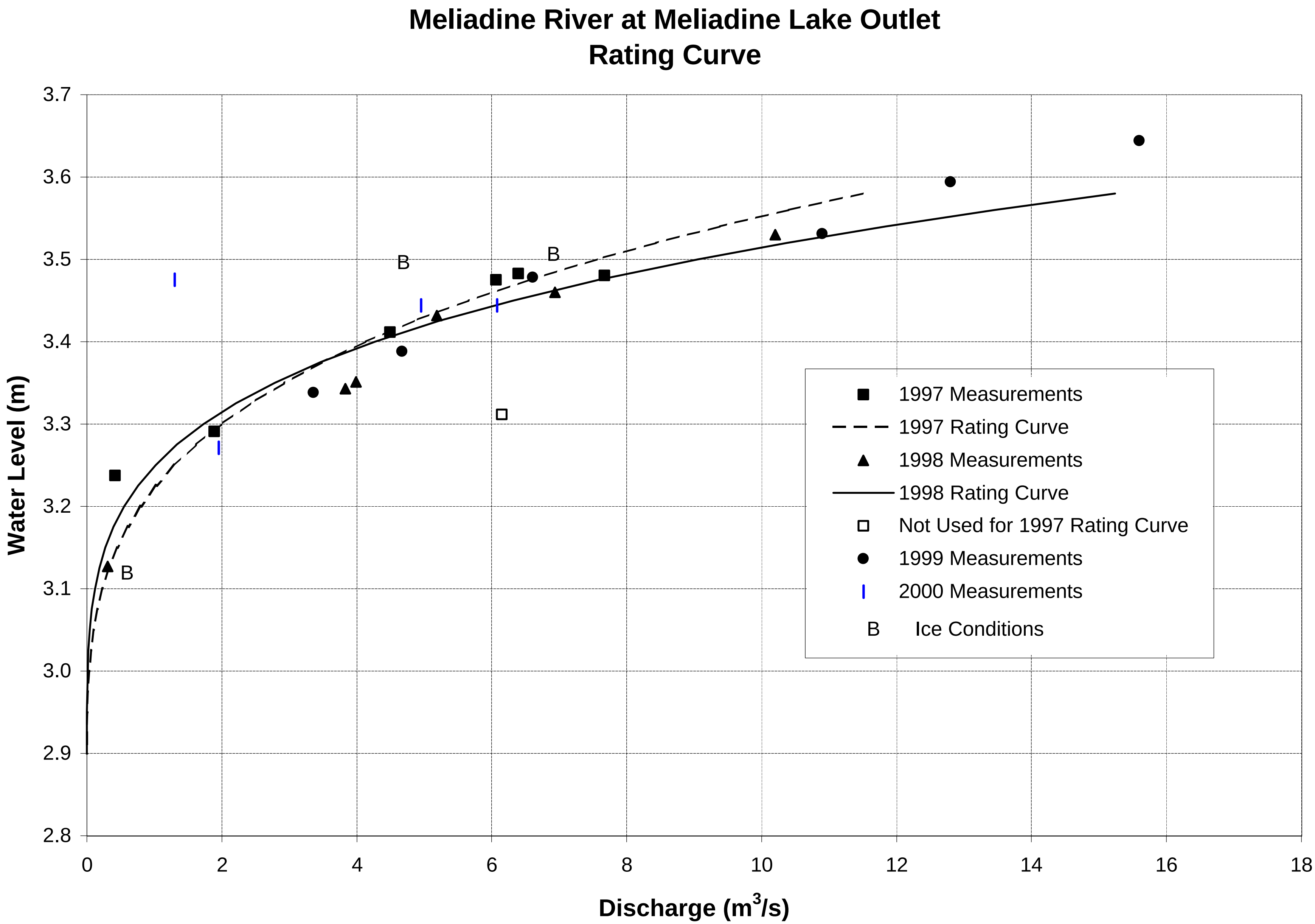
Site Inspection Summary (2000)

Meliadine River at Meliadine Lake Outlet (ML-MR, 06MC008)

Zero Flow Elevation: 2.791 m

Date (dd-mm-yy)	Discharge (m3/s)		Actual DWL (m)	Adjustment to ML Elev.	Adjusted DWL (m)	Depth Above Zero Flow (m)	Time (MST)
13-Jun-00	1.300	B	8.422	-4.947	3.475	0.684	12:45
19-Jun-00	6.080		8.391	-4.947	3.444	0.653	9:45
22-Jul-99	4.948		8.391	-4.947	3.444	0.653	12:00
18-Sep-99	1.950		8.218	-4.947	3.271	0.480	14:30

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
Final Depth = Adjusted depth of flow above the zero flow elevation
N.R. = Not Recorded in Field Notes
B = Ice Conditions
Adjustment to ML Elev. = Constant added to DWL and staff gauge observations to adjust datum relative to Meliadine Lake near Rankin Inlet data logger levels



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Summary2000.xls [06MC008RC2]
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WMC Meliadine West Water Balance Study
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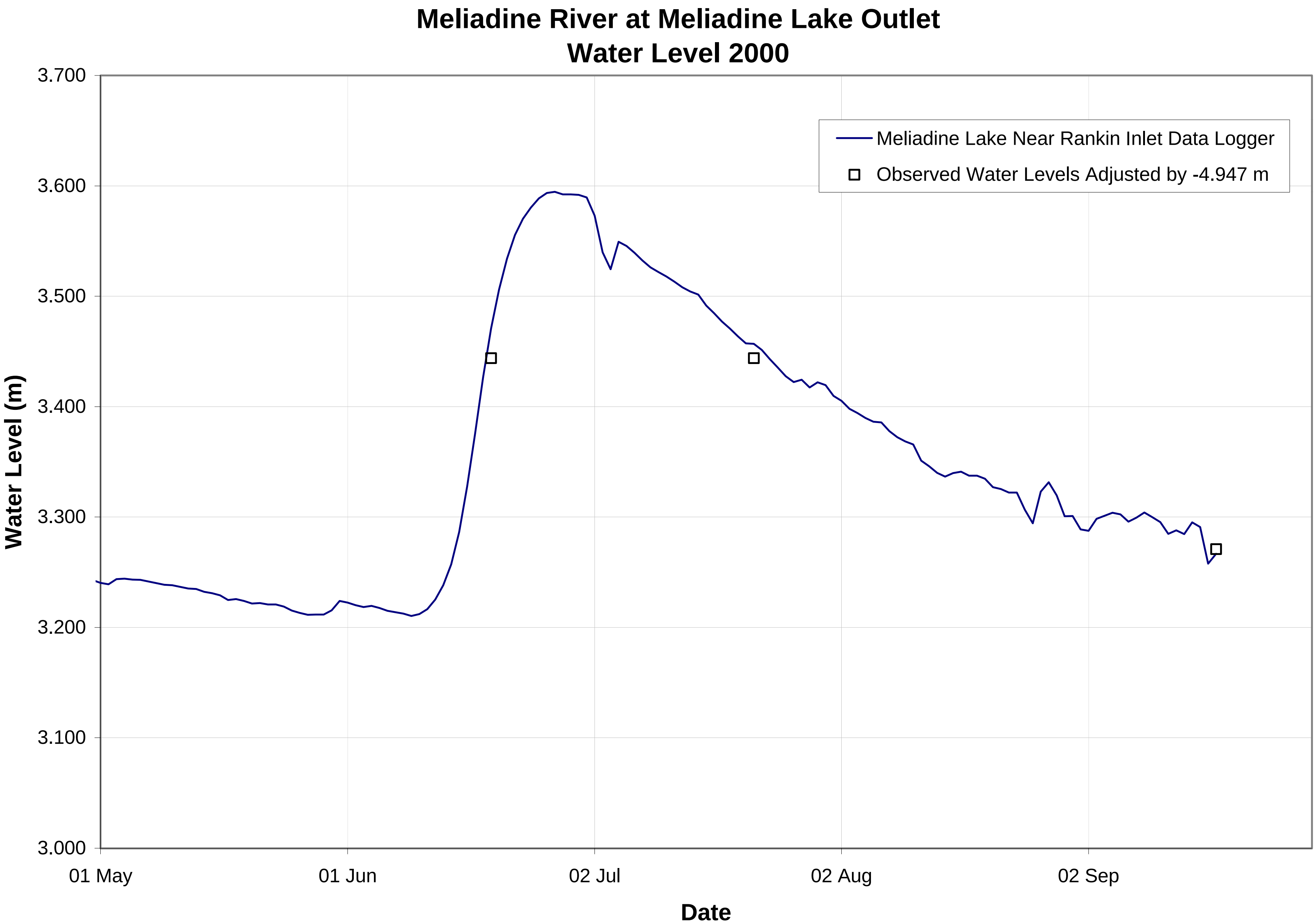
Figure D.3.1



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Meliadine lake.xls [MainL]
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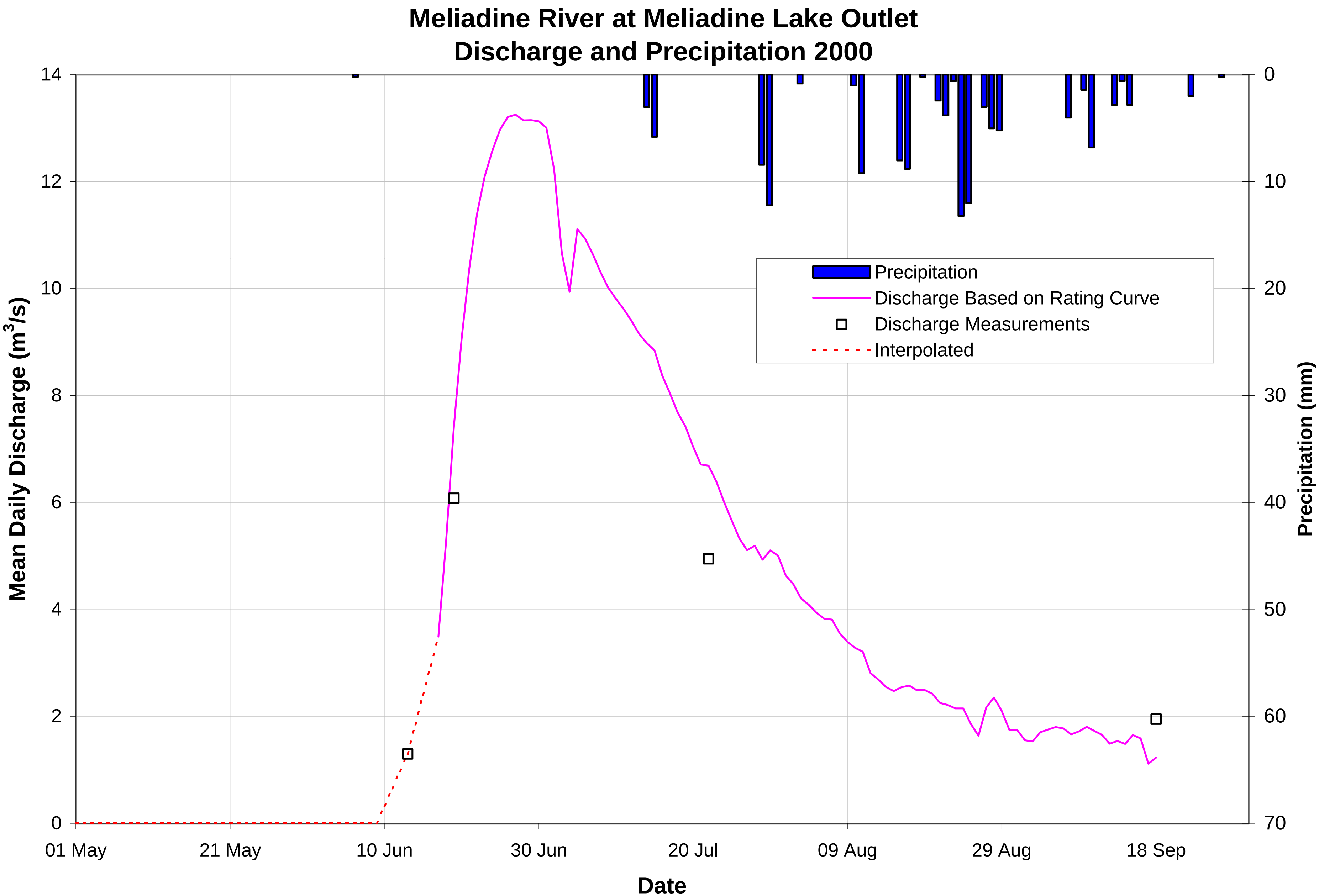
WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.3.2



WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.3.3

STATION NUMBER: LAKE Meliadine Lake near Rankin Inlet 2000 (06MC002)
DATA LOGGER START UP DATE: 9/20/1999
DATA LOGGER ENDING DATE: 09/18/2000

DAILY MEAN DISCHARGE IN CUBIC METERS PER SECOND

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
1	---	---	---	---	---	---	13.009	4.636	1.554	---	---	---	---
2	---	---	---	---	---	---	12.228	4.474	1.534	---	---	---	---
3	---	---	---	---	---	---	10.660	4.207	1.704	---	---	---	---
4	---	---	---	---	---	---	9.936	4.086	1.753	---	---	---	---
5	---	---	---	---	---	---	11.113	3.937	1.802	---	---	---	---
6	---	---	---	---	---	---	10.935	3.828	1.776	---	---	---	---
7	---	---	---	---	---	---	10.640	3.811	1.665	---	---	---	---
8	---	---	---	---	---	---	10.304	3.557	1.721	---	---	---	---
9	---	---	---	---	---	*0.000*	10.017	3.393	1.806	---	---	---	---
10	---	---	---	---	---	*0.325*	9.811	3.285	1.728	---	---	---	---
11	---	---	---	---	---	*0.650*	9.617	3.209	1.658	---	---	---	---
12	---	---	---	---	---	*0.975*	9.400	2.810	1.489	---	---	---	---
13	---	---	---	---	---	*1.300*	9.155	2.689	1.541	---	---	---	---
14	---	---	---	---	---	*1.848*	8.982	2.552	1.487	---	---	---	---
15	---	---	---	---	---	*2.396*	8.844	2.473	1.653	---	---	---	---
16	---	---	---	---	---	*2.943*	8.369	2.547	1.586	---	---	---	---
17	---	---	---	---	---	3.491	8.048	2.576	1.116	---	---	---	---
18	---	---	---	---	---	5.286	7.686	2.492	1.229	---	---	---	---
19	---	---	---	---	---	7.417	7.424	2.494	---	---	---	---	---
20	---	---	---	---	---	9.059	7.048	2.429	---	---	---	---	---
21	---	---	---	---	---	10.385	6.712	2.254	---	---	---	---	---
22	---	---	---	---	---	11.401	6.689	2.213	---	---	---	---	---
23	---	---	---	---	---	12.093	6.396	2.152	---	---	---	---	---
24	---	---	---	---	---	12.578	6.013	2.152	---	---	---	---	---
25	---	---	---	---	---	12.973	5.672	1.857	---	---	---	---	---
26	---	---	---	---	---	13.207	5.332	1.641	---	---	---	---	---
27	---	---	---	---	---	13.252	5.111	2.168	---	---	---	---	---
28	---	---	---	---	---	13.146	5.192	2.355	---	---	---	---	---
29	---	---	---	---	---	13.148	4.933	2.104	---	---	---	---	---
30	---	---	---	---	---	13.127	5.104	1.744	---	---	---	---	---
31	---	---	---	---	---	---	5.009	1.745	---	---	---	---	---
MIN	---	---	---	---	---	3.491	4.933	1.641	1.116	---	---	---	
MEAN	---	---	---	---	---	10.755	8.238	2.834	1.600	---	---	---	
MAX	---	---	---	---	---	13.252	13.009	4.636	1.806	---	---	---	

Discharge in cubic meters per second
Mean 5.560
Maximum Daily 13.252 on June 27
Maximum instantaneous 14.458 at 10:45 on June 26

Total Volume
46056.470 Cubic Decameters

Note: *italics* indicates discharge measurement or estimate
All MIN, MEAN, and MAX values are computed for data from June 17 to September 18 only

GAUGE HISTORY

STATION NAME: Meliadine River at outlet Meliadine Lake
STATION NUMBER: **06MC008** **ELEVATION OF GAUGE DATUM:** **ASSUMED DATUM**
0.000 m.
LATITUDE: **63° 02' 04" gps** **LONGITUDE:** **92° 23' 35" gps**

BENCH MARKS:

B.M. #1	**Red paint mark on large boulder on left bank about 200 meters upstream of rapids.**	**Elev. 10.000 m. (assumed)**
B.M. #2	**Red paint mark on boulder 30 meters south of B.M. #1.**	**Elev. 11.035 m.**
B.M. #3	**Red paint mark on boulder 32 meters downstream of B.M. #1.**	**Elev. 9.192 m.**
B.M. #1 is control bench mark.		

HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT

DATE	GAUGE CORRECTIONS					NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.
	B.M. #1	**B.M. #2**	**B.M. #3**	**Top of Staff**	**Correction to Staff**	
1997						
Jun. 22	10.000	11.035	9.192	8.657	0.000	Established bench marks. "Top of Staff" is the top of a 1.0 meter gauge plate.
Sep. 26	10.000	11.025	9.174	8.682	+ 0.025	Circuit levels
1998						
May 7	10.000		9.179			Level circuit
Jun. 8	10.000	11.031	9.188	8.625		Level circuit
Jul. 7	10.000			8.617	-0.008	Level circuit
Sept. 22	10.000	11.018	9.178	8.577	-0.048	Level circuit
	10.000	**11.031**				Used for the year
1999						
Jun. 6	10.000	11.026	9.178	8.612		Level circuit
Jul. 13	10.000	11.028	9.185			Level circuit
Sep. 22	10.000	11.013	9.168			Level circuit
	10.000					Used for the year
2000						
Jun. 13	10.000	11.021	9.178			Level circuit
Jul. 22	10.000	11.018	9.180			Level circuit
Sep. 18	10.000	11.015	9.173			Level circuit
	10.000					Used for the year

APPENDIX D.4

West Outlet of Meliadine Lake

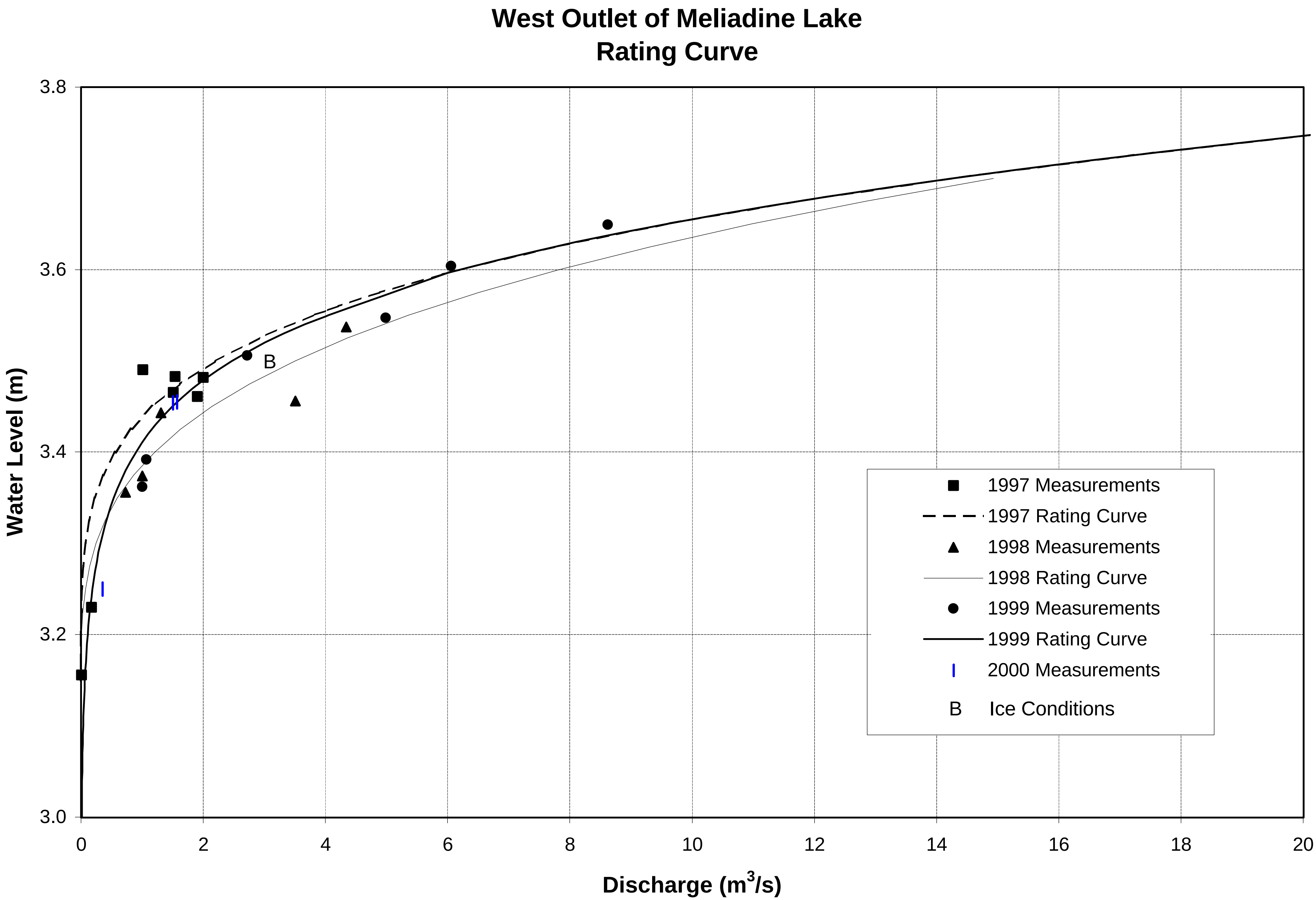
Site Inspection Summary (2000)
West Outlet of Meliadine Lake (ML-DR, 06MC009)
Zero Flow Elevation: 3.116 m

Date (dd-mm-yy)	Discharge (m^3/s)		Actual DWL (m)	Adjustment to ML Elev.	Adjusted DWL (m)	Depth Above Zero Flow (m)	Time MTS
13-Jun-00	0.000	B	7.219 *	-3.743	3.476 *	0.360	10:10
15-Jun-00	0.000	B	N.R.	-3.743			
19-Jun-00	1.567		7.198	-3.743	3.455	0.339	8:30
22-Jul-00	1.503		7.197	-3.743	3.454	0.338	6:30
18-Sep-00	0.348		6.993	-3.743	3.250	0.134	15:45

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
N.R. = Not Recorded in Field Notes

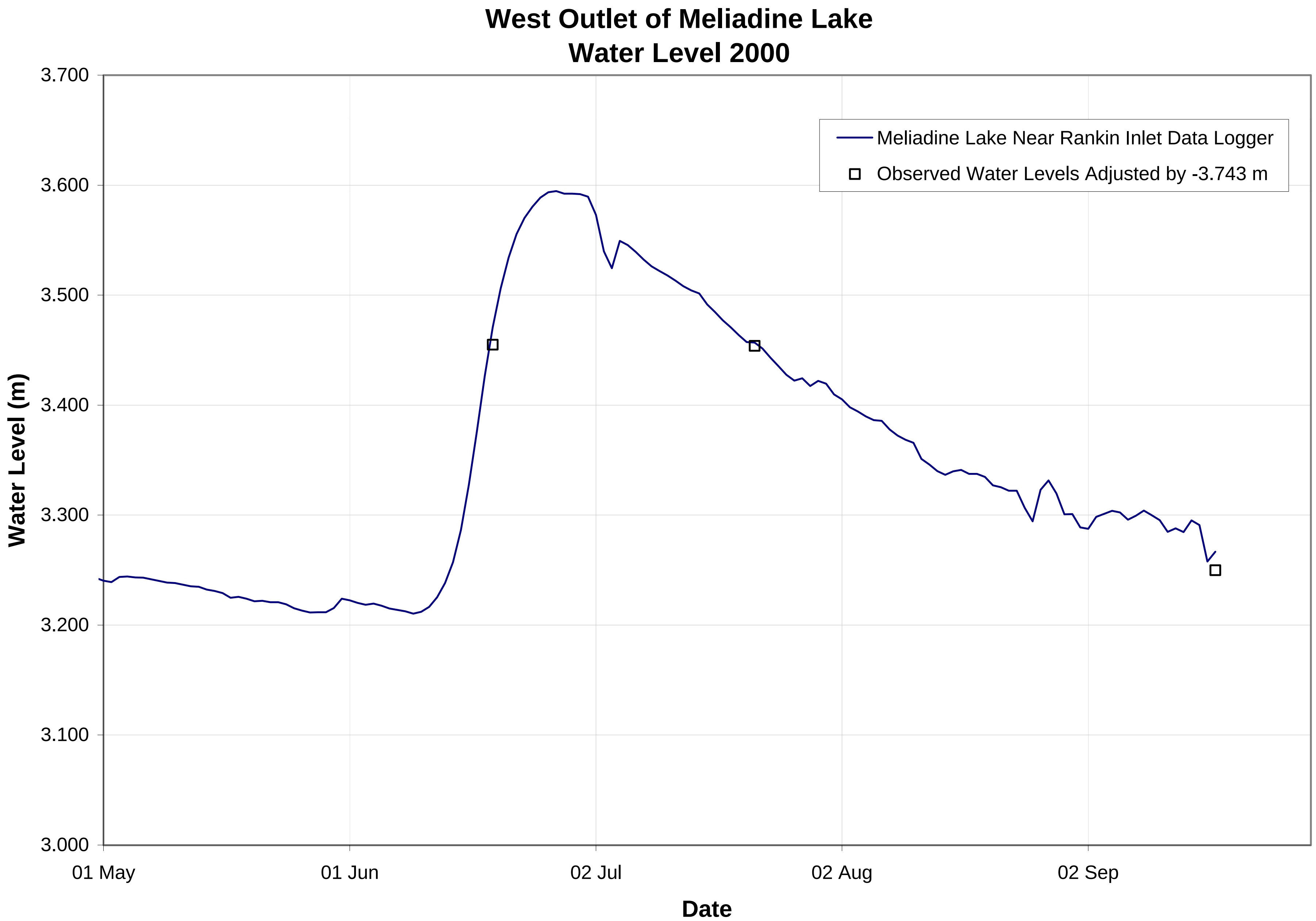
B = Ice Conditions
Adjustment to ML Elev. = Constant added to DWL to adjust datum relative to Meliadine Lake near Rankin Inlet data logger levels

***** DWL on 13 June 00 represents water pooled on ice and may not represent the true water level



P:\PROJECT\CW\1525.2\FLOWS AND LEVELS\GAUGE HISTORY\
Summary2000.xls [06MC009RC2 (2)]
1/25/01 2:54 PM

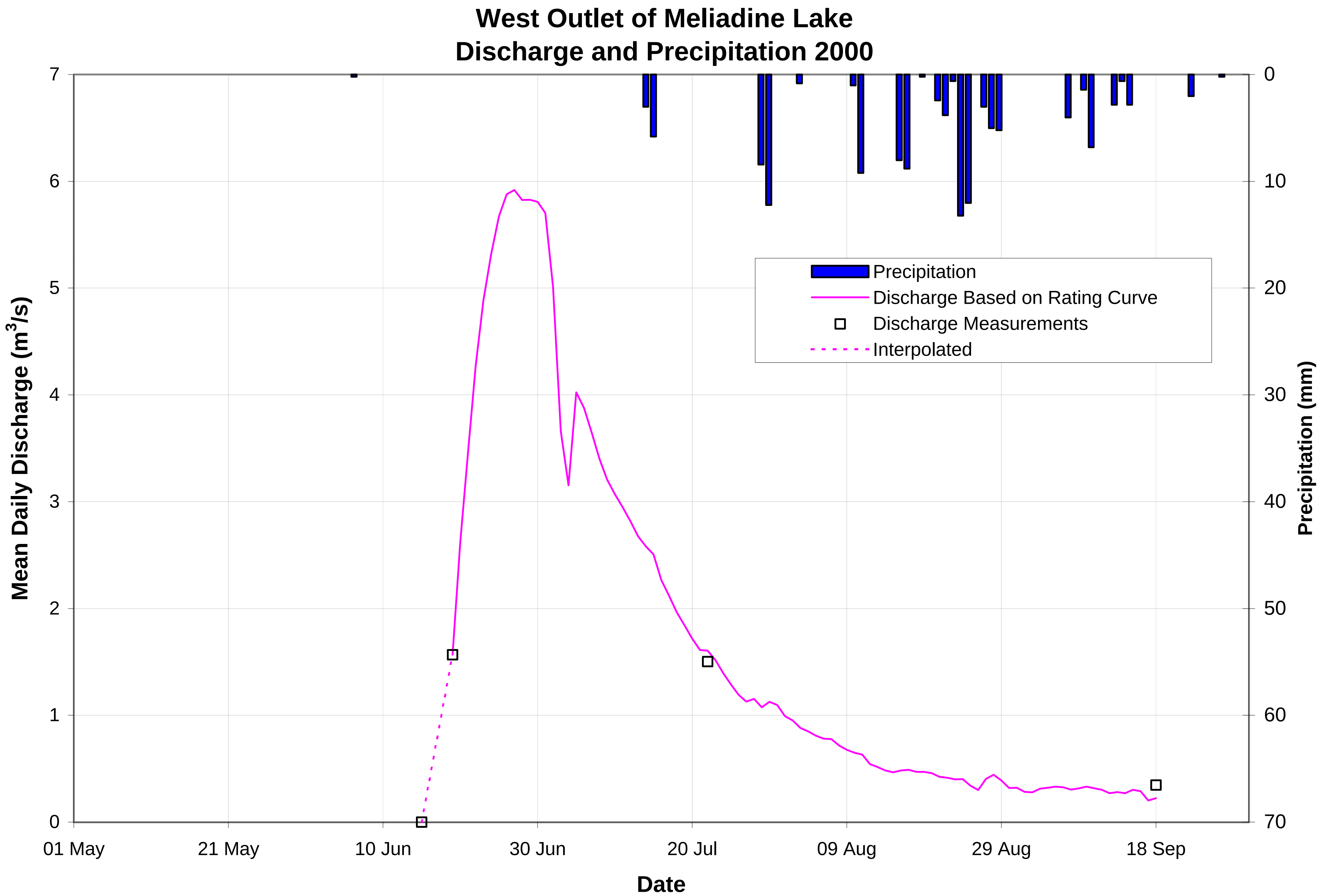
Figure D.4.1



P:\PROEJCT\CW\1525.2\FLOWS AND LEVELS\DATA LOGGER\
Meliadine lake.xls [WestL]
1/25/01 2:56 PM

WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.4.2



P:\PROEJCT\CW\1525.2\FLOWS AND LEVELS\DATA LOGGER\
Meliadine lake.xls [WestQ]
1/25/01 3:07 PM

WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.4.3

STATION NUMBER: LAKE West Outlet of Meliadine Lake (ML-DR, 06MC009)
DATA LOGGER START UP DATE: 9/20/1999
DATA LOGGER ENDING DATE: 09/18/2000

DAILY MEAN DISCHARGE IN CUBIC METERS PER SECOND

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	5.702	0.992	0.282	---	---	---
2	---	---	---	---	---	---	5.010	0.950	0.278	---	---	---
3	---	---	---	---	---	---	3.661	0.881	0.312	---	---	---
4	---	---	---	---	---	---	3.152	0.848	0.321	---	---	---
5	---	---	---	---	---	---	4.023	0.808	0.331	---	---	---
6	---	---	---	---	---	---	3.878	0.781	0.326	---	---	---
7	---	---	---	---	---	---	3.646	0.777	0.304	---	---	---
8	---	---	---	---	---	---	3.402	0.716	0.315	---	---	---
9	---	---	---	---	---	---	3.205	0.677	0.331	---	---	---
10	---	---	---	---	---	---	3.069	0.649	0.317	---	---	---
11	---	---	---	---	---	---	2.947	0.631	0.303	---	---	---
12	---	---	---	---	---	---	2.817	0.542	0.270	---	---	---
13	---	---	---	---	---	---	2.675	0.515	0.280	---	---	---
14	---	---	---	---	---	---	2.581	0.483	0.270	---	---	---
15	---	---	---	---	---	*0.000*	2.506	0.467	0.302	---	---	---
16	---	---	---	---	---	---	2.268	0.482	0.288	---	---	---
17	---	---	---	---	---	---	2.121	0.489	0.203	---	---	---
18	---	---	---	---	---	---	1.964	0.470	0.223	---	---	---
19	---	---	---	---	---	*1.567*	1.843	0.471	---	---	---	---
20	---	---	---	---	---	2.623	1.718	0.457	---	---	---	---
21	---	---	---	---	---	3.461	1.612	0.422	---	---	---	---
22	---	---	---	---	---	4.278	1.605	0.414	---	---	---	---
23	---	---	---	---	---	4.891	1.518	0.401	---	---	---	---
24	---	---	---	---	---	5.321	1.395	0.401	---	---	---	---
25	---	---	---	---	---	5.670	1.290	0.341	---	---	---	---
26	---	---	---	---	---	5.877	1.192	0.299	---	---	---	---
27	---	---	---	---	---	5.917	1.128	0.404	---	---	---	---
28	---	---	---	---	---	5.824	1.153	0.442	---	---	---	---
29	---	---	---	---	---	5.826	1.075	0.390	---	---	---	---
30	---	---	---	---	---	5.807	1.126	0.320	---	---	---	---
31	---	---	---	---	---	---	1.097	0.320	---	---	---	---
MIN	---	---	---	---	---	2.623	1.076	0.300	0.203	---	---	---
MEAN	---	---	---	---	---	5.045	2.464	0.557	0.292	---	---	---
MAX	---	---	---	---	---	5.917	5.702	0.992	0.332	---	---	---

Discharge in cubic meters per second
Mean 1.697
Maximum Daily 5.917 on June 27
Maximum instantaneous 7.421 at 10:45 on June 26

Total Volume
13679.800 Cubic Decameters

Note: *italics* indicates discharge measurement or estimate
All MIN, MEAN, and MAX values are computed for data from June 19 to September 18 only

GAUGE HISTORY

STATION NAME: West Outlet Meliadine Lake
STATION NUMBER: **06MC009** **ELEVATION OF GAUGE DATUM:** **ASSUMED DATUM**
0.000 m.
LATITUDE: **63° 08' 12" gps** **LONGITUDE:** **92° 31' 42" gps**

BENCH MARKS:

B.M. #1	**Red paint mark on large boulder on left bank 16.5 meters east of huge boulder.**	**Elev. 10.000 m. (assumed)**
B.M. #2	**Red paint mark on large boulder 15.5 meters north of huge boulder.**	**Elev. 8.388 m.**
B.M. #3	**Red paint mark on large boulder 35 meters NE of huge boulder.**	**Elev. 9.691 m.**
B.M. #1 is the control bench mark.		

HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT						
DATE	**GAUGE CORRECTIONS (BENCH MARK USED TO OBTAIN WATER LEVELS: BOLD TYPE AND UNDERLINED)**					**NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.**
	B.M. #1	**B.M. #2**	**B.M. #3**	**Top of staff**	**Correction to Staff**	
1997						
Jun. 22	10.000	8.388	9.691	7.641	0.000	Established bench marks & staff gauge. "Top of Staff" is the top of a 1.0 meter gauge plate.
Sep. 26	10.000	8.373	9.688	7.576	- 0.065	Circuit levels
1998						
Jun. 8	10.000	8.375	9.690			Level circuit
Sept. 22	10.000	8.371	9.686	7.754	0.000	Level circuit
	<u>10.000</u>	**<u>8.388</u>**				Used for the year
1999						
Jun. 6	10.000		9.689			Level circuit
Jun. 16	10.000	8.371	9.687			Level circuit
Jul. 13	10.000	8.374	9.684			Level circuit
Sep. 22	10.000	8.364	9.678			Level circuit
	<u>10.000</u>	**<u>8.388</u>**	**<u>9.691</u>**			Used for the year
2000						
Jun. 19	10.000	8.374	9.692			Level circuit
Jul. 22	10.000	8.371	9.688			Level circuit
Sep. 22	10.000	8.363	9.685			Level circuit
	<u>10.000</u>					Used for the year

APPENDIX D.5

Meliadine River Near the Mouth

Site Inspection Summary (2000)

Meliadine River Near the Mouth (06MC001)

Zero flow elevation: 6.506 m

Date (dd-mm-yy)	Discharge (m^3/s)		DWL (m)	Depth Above Zero Flow (m)	Data Logger (D.L.) (m)	Time MST	Difference (DWL-D.L.)
12-Jun-00	5.267	B	7.728		N.D.L.R.		
14-Jun-00	18.110	B	8.006	1.500	8.011	13:15	-0.005
16-Jun-00	35.000	B, E	8.401	1.895	8.440	11:15	-0.039
19-Jun-00	N.R.	B	7.769	1.263	7.773	11:30	-0.004
21-Jun-00	27.890		7.707	1.201	7.661	8:00	0.046
23-Jul-00	N.R.		7.251	0.745	7.113	14:45	0.138
19-Sep-00	2.912		7.083	0.577	6.951	9:30	0.132

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
DL = Data logger water level
Difference = Difference between surveyed level (DWL) and Data Logger water level reading
= value by which to adjust the Data Logger reading
N.R. = Not Recorded in Field Notes
N.D.L.R. = No Data Logger Records
B = Ice conditions
E = Estimated

Meliadine River near the Mouth
Rating Curve

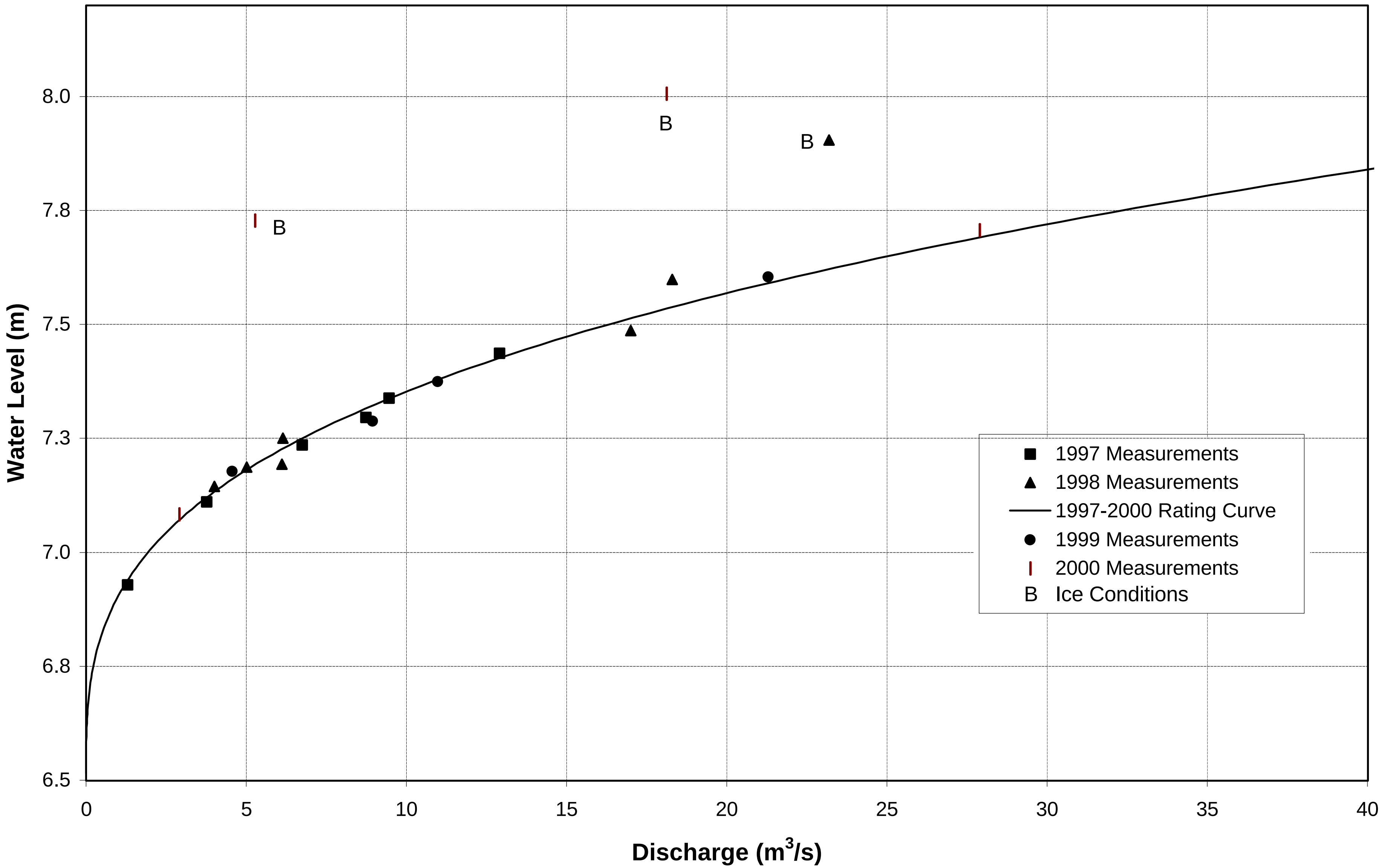


Figure D.5.1

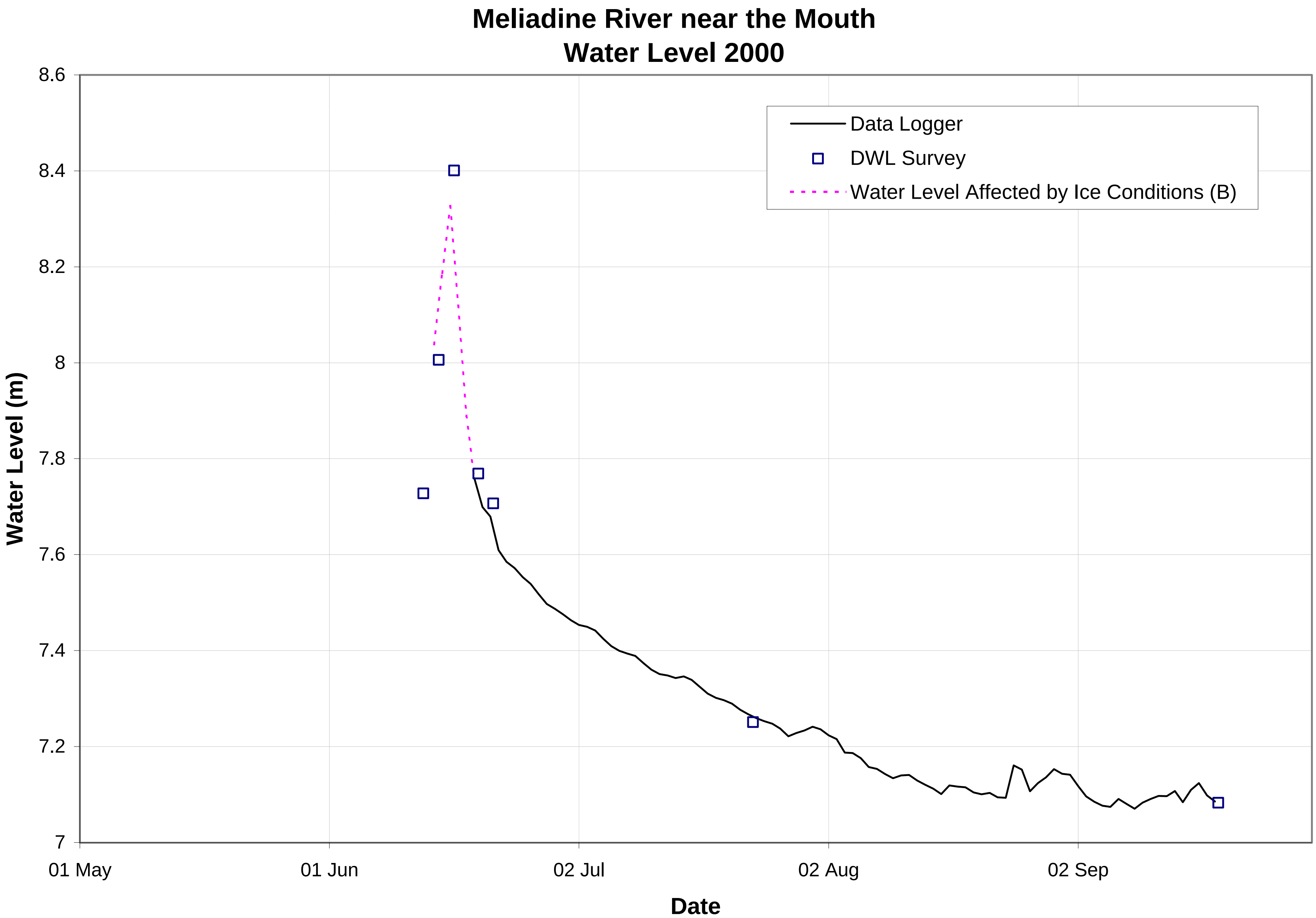
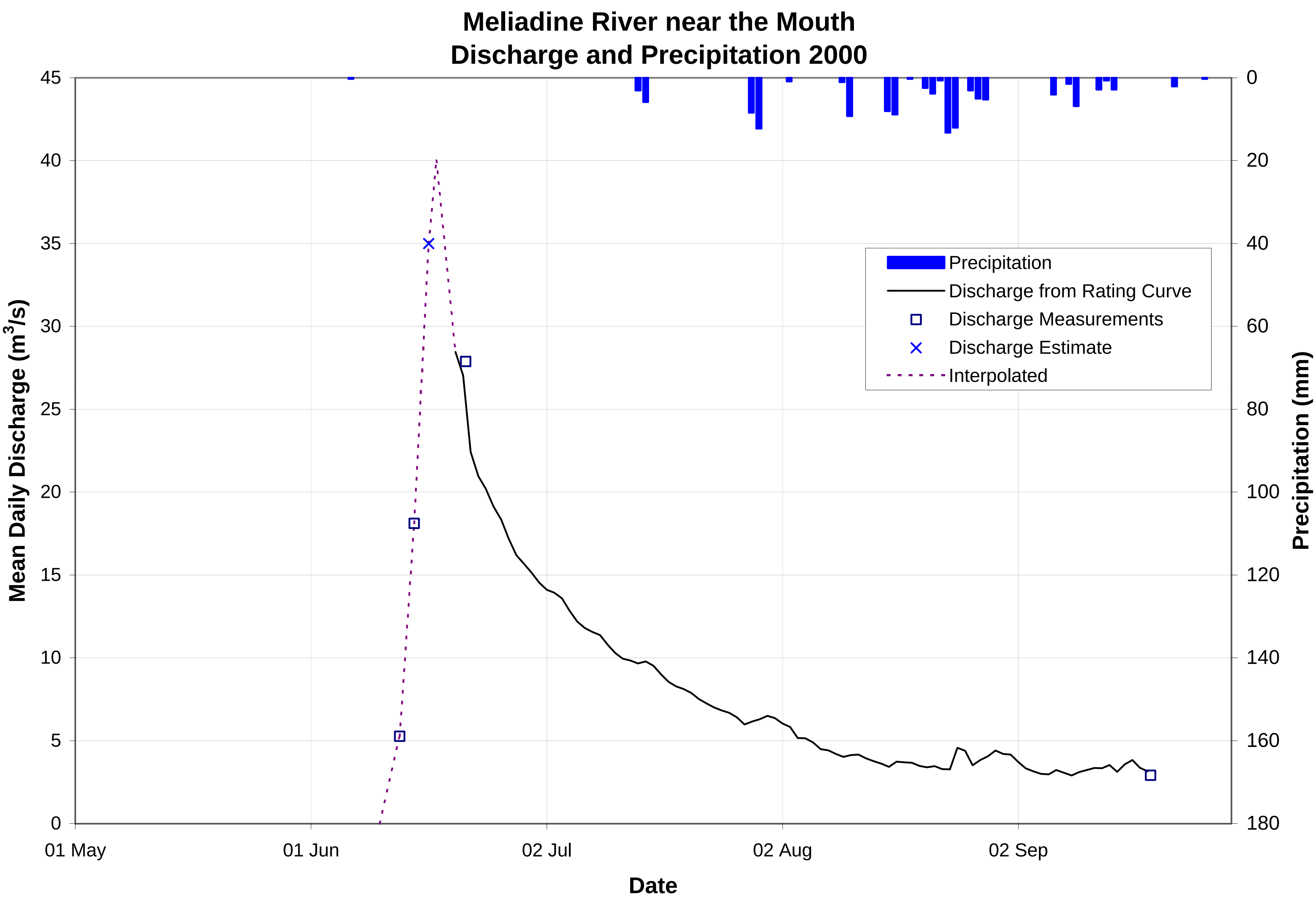

Meliadine River near the Mouth
Water Level 2000
Water Level (m)
8.6
8.4
8.2
8
7.8
7.6
7.4
7.2
7
01 May
01 Jun
02 Jul
02 Aug
02 Sep
Date
Data Logger
DWL Survey
Water Level Affected by Ice Conditions (B)

Figure D.5.2



P:\PROEJCT\CW\1525.2\FLOWS AND LEVELS\Data Logger\
Meliadine River.xls [Discharge]
1/25/01 3:12 PM

WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.5.3

STATION NUMBER: RIVR   Meliadine River near the Mouth (06MC001)
DATA LOGGER START UP DATE: 6/19/2000
DATA LOGGER ENDING DATE: 09/19/2000

DAILY MEAN WATER LEVEL IN METERS

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	7.463	7.236	7.141	---	---	---
2	---	---	---	---	---	---	7.454	7.223	7.117	---	---	---
3	---	---	---	---	---	---	7.450	7.215	7.096	---	---	---
4	---	---	---	---	---	---	7.442	7.188	7.085	---	---	---
5	---	---	---	---	---	---	7.425	7.187	7.077	---	---	---
6	---	---	---	---	---	---	7.410	7.176	7.074	---	---	---
7	---	---	---	---	---	---	7.400	7.157	7.091	---	---	---
8	---	---	---	---	---	---	7.394	7.154	7.081	---	---	---
9	---	---	---	---	---	---	7.389	7.143	7.071	---	---	---
10	---	---	---	---	---	---	7.374	7.134	7.083	---	---	---
11	---	---	---	---	---	---	7.361	7.140	7.091	---	---	---
12	---	---	---	---	---	---	7.351	7.141	7.097	---	---	---
13	---	---	---	---	---	---	7.348	7.129	7.097	---	---	---
14	---	---	---	---	---	8.038 B	7.343	7.120	7.107	---	---	---
15	---	---	---	---	---	8.187 B	7.346	7.112	7.084	---	---	---
16	---	---	---	---	---	8.326 B	7.339	7.101	7.110	---	---	---
17	---	---	---	---	---	8.119 B	7.324	7.119	7.124	---	---	---
18	---	---	---	---	---	7.889 B	7.310	7.117	7.098	---	---	---
19	---	---	---	---	---	7.760 B	7.302	7.115	7.085	---	---	---
20	---	---	---	---	---	7.699	7.297	7.105	---	---	---	---
21	---	---	---	---	---	7.679	7.289	7.100	---	---	---	---
22	---	---	---	---	---	7.609	7.277	7.104	---	---	---	---
23	---	---	---	---	---	7.585	7.268	7.094	---	---	---	---
24	---	---	---	---	---	7.572	7.259	7.093	---	---	---	---
25	---	---	---	---	---	7.553	7.253	7.161	---	---	---	---
26	---	---	---	---	---	7.539	7.248	7.152	---	---	---	---
27	---	---	---	---	---	7.517	7.238	7.107	---	---	---	---
28	---	---	---	---	---	7.497	7.221	7.124	---	---	---	---
29	---	---	---	---	---	7.487	7.228	7.136	---	---	---	---
30	---	---	---	---	---	7.476	7.234	7.153	---	---	---	---
31	---	---	---	---	---	---	7.241	7.143	---	---	---	---
MIN	---	---	---	---	---	7.476	7.221	7.093	7.071	---	---	---
MEAN	---	---	---	---	---	7.565	7.331	7.141	7.095	---	---	---
MAX	---	---	---	---	---	7.699	7.463	7.236	7.141	---	---	---

Note: B indicates water level affected by ice conditions
All MIN, MEAN, and MAX values are computed for data from June 20 to September 19 only

STATION NUMBER: RIVR Meliadine River near the Mouth (06MC001)
DATA LOGGER START UP DATE: 6/19/2000
DATA LOGGER ENDING DATE: 09/19/2000

DAILY MEAN DISCHARGE IN CUBIC METERS PER SECOND

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	14.5	6.37	4.16	---	---	---
2	---	---	---	---	---	---	14.1	6.03	3.71	---	---	---
3	---	---	---	---	---	---	13.9	5.84	3.33	---	---	---
4	---	---	---	---	---	---	13.6	5.16	3.14	---	---	---
5	---	---	---	---	---	---	12.8	5.14	3.00	---	---	---
6	---	---	---	---	---	---	12.2	4.90	2.96	---	---	---
7	---	---	---	---	---	---	11.8	4.50	3.24	---	---	---
8	---	---	---	---	---	---	11.6	4.42	3.07	---	---	---
9	---	---	---	---	---	---	11.4	4.20	2.91	---	---	---
10	---	---	---	---	---	*0.0*	10.8	4.02	3.11	---	---	---
11	---	---	---	---	---	---	10.3	4.13	3.23	---	---	---
12	---	---	---	---	---	*5.27*	9.95	4.16	3.35	---	---	---
13	---	---	---	---	---	---	9.84	3.93	3.34	---	---	---
14	---	---	---	---	---	*18.11*	9.66	3.76	3.53	---	---	---
15	---	---	---	---	---	---	9.78	3.61	3.13	---	---	---
16	---	---	---	---	---	*35.0*	9.52	3.41	3.57	---	---	---
17	---	---	---	---	---	*40.0*	9.02	3.73	3.83	---	---	---
18	---	---	---	---	---	---	8.55	3.69	3.37	---	---	---
19	---	---	---	---	---	---	8.27	3.66	3.14	---	---	---
20	---	---	---	---	---	28.5	8.12	3.47	---	---	---	---
21	---	---	---	---	---	27.2	7.89	3.40	---	---	---	---
22	---	---	---	---	---	22.4	7.52	3.46	---	---	---	---
23	---	---	---	---	---	21.0	7.24	3.29	---	---	---	---
24	---	---	---	---	---	20.2	7.01	3.28	---	---	---	---
25	---	---	---	---	---	19.1	6.83	4.58	---	---	---	---
26	---	---	---	---	---	18.3	6.68	4.40	---	---	---	---
27	---	---	---	---	---	17.2	6.41	3.52	---	---	---	---
28	---	---	---	---	---	16.2	5.99	3.83	---	---	---	---
29	---	---	---	---	---	15.7	6.16	4.06	---	---	---	---
30	---	---	---	---	---	15.1	6.30	4.40	---	---	---	---
31	---	---	---	---	---	---	6.50	4.20	---	---	---	---
MIN	---	---	---	---	---	15.1	5.99	3.28	2.91	---	---	---
MEAN	---	---	---	---	---	20.1	9.49	4.21	3.32	---	---	---
MAX	---	---	---	---	---	28.5	14.5	6.37	4.16	---	---	---

Discharge in cubic meters per second
Mean 7.731
Maximum Daily 28.486 on June 20
Maximum instantaneous 33.875 at 10:15 on June 21

Total Volume
80161.060 Cubic Decameters

Note: *italics* indicates discharge measurement or estimate
All MIN, MEAN, and MAX values are computed for data from June 20 to September 19 only

GAUGE HISTORY

STATION NAME: Meliadine River near the Mouth
STATION NUMBER: **06MC001** **ELEVATION OF GAUGE DATUM:** **ASSUMED DATUM 0.000 m.**
LATITUDE: **62° 52'25" gps** **LONGITUDE:** **92° 07' 14" gps**

BENCH MARKS:

B.M. #1	**Red paint mark on bedrock outcrop 80 meters east of shelter.**	**Elev. 10.000 m. (assumed)**
B.M. #2	**Red paint mark on large boulder 11 meters east of shelter.**	**Elev. 10.455 m.**
B.M. #3	**Red paint mark on boulder (shoreward) 5.4 meters south of shelter.**	**Elev. 8.779 m.**
B.M. #1 is control bench mark.		

HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT

DATE	GAUGE CORRECTIONS (BENCH MARK USED TO OBTAIN WATER LEVELS: BOLD TYPE AND UNDERLINED)					NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.
	B.M. #1	**B.M. #2**	**B.M. #3**			
1997						
Jun. 13	10.000	10.455	8.779			Established Bench Marks
Sep. 25	10.000	10.450	8.763			Circuit levels
			<u>8.779</u>			Used for the year
1998						
Jun. 4	10.000	10.455	8.769			Level circuit
Jul 8	10.000	10.449	8.767			Level circuit
Sep. 23	10.000	10.438	8.748			Level circuit
			<u>8.779</u>			Used for the year
1999						
Jun. 15	10.000	10.449	8.771			Level circuit
Jul. 14	10.000	10.453	8.774			Level circuit
Sep. 22	10.000	10.460	8.776			Level circuit
			<u>8.779</u>			Used for the year
2000						
Jun. 19	10.000	10.450	8.771			Level circuit
Jul. 23	10.000	10.450	8.769			Level circuit
Sep. 19	10.000	10.433	8.747			Level circuit
		<u>10.455</u>				Used for June 12, 14, 16
			<u>8.779</u>			Used for June 19, 21 & Sept. 19

APPENDIX D.6

Outlet of Lake A1

Site Inspection Summary (2000)

Outlet of Lake A1 (A1-ML, 06MC003)

Zero Flow elevation: 9.282 m

Date (dd-mm-yy)	Discharge (m^3/s)		DWL (m)	Depth Above Zero Flow (m)	Data Logger (D.L.) (m)	Time MST	Difference (DWL-D.L.)
14-May-00	0.000	B	9.070				
12-Jun-00	0.000	B					
13-Jun-00	0.869	B	9.930	0.725	9.948	10:45	-0.018
15-Jun-00	1.010	B	9.758	0.553	9.779	7:00	-0.021
17-Jun-00	1.316		9.667	0.462	9.691	8:30	-0.024
20-Jun-00	0.913		9.603	0.398	9.630	7:15	-0.027
23-Jul-00	0.009		9.299	0.094	9.341	10:00	-0.042
19-Sep-00	0.011		9.305	0.100	9.373	8:00	-0.068

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
DL = Data logger water level
Difference = Difference between surveyed level (DWL) and Data Logger water level reading
= value by which to adjust the Data Logger reading
N.R. = Not Recorded in Field Notes
N.D.L.R. = No Data Logger Records
B = Ice conditions

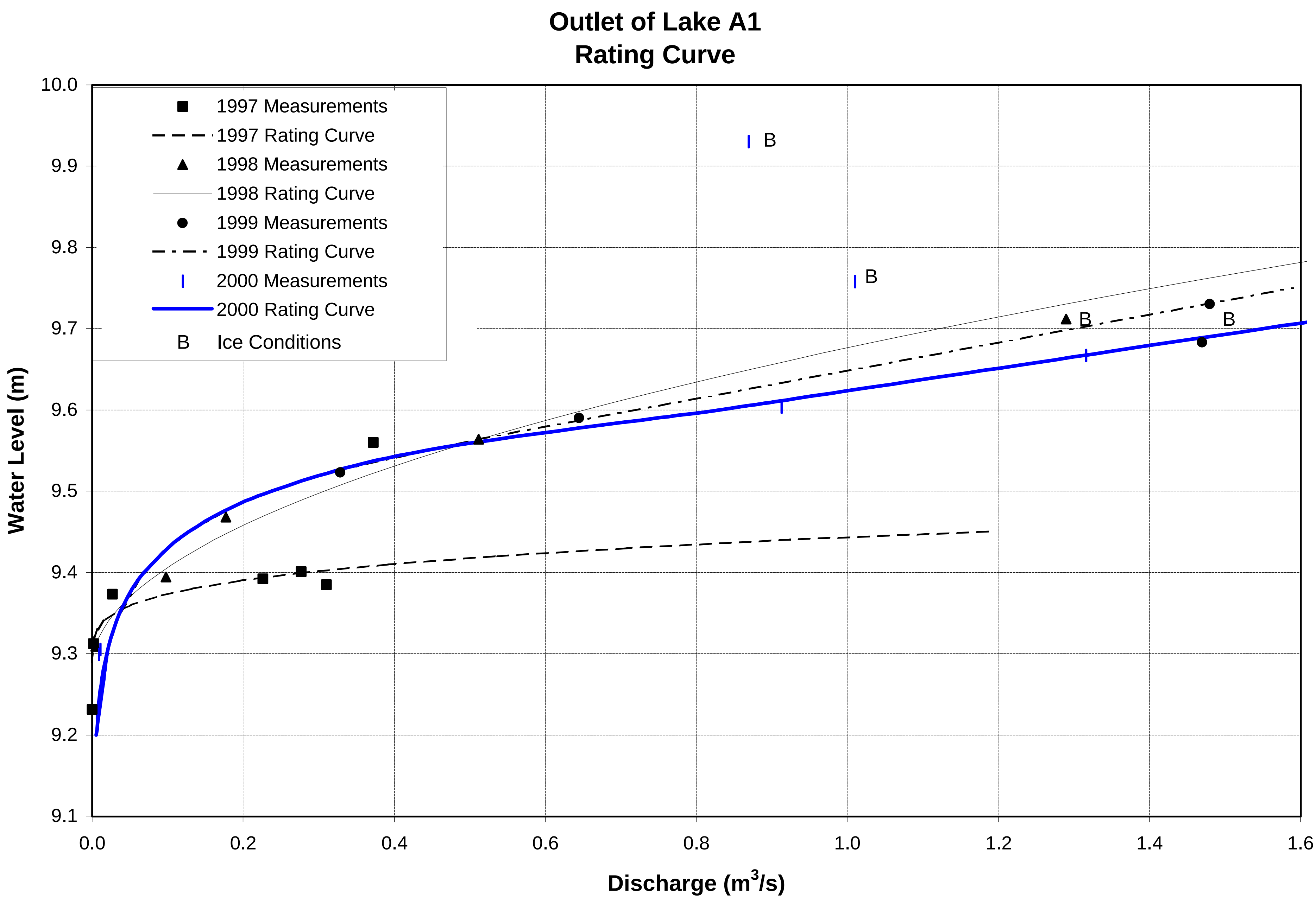
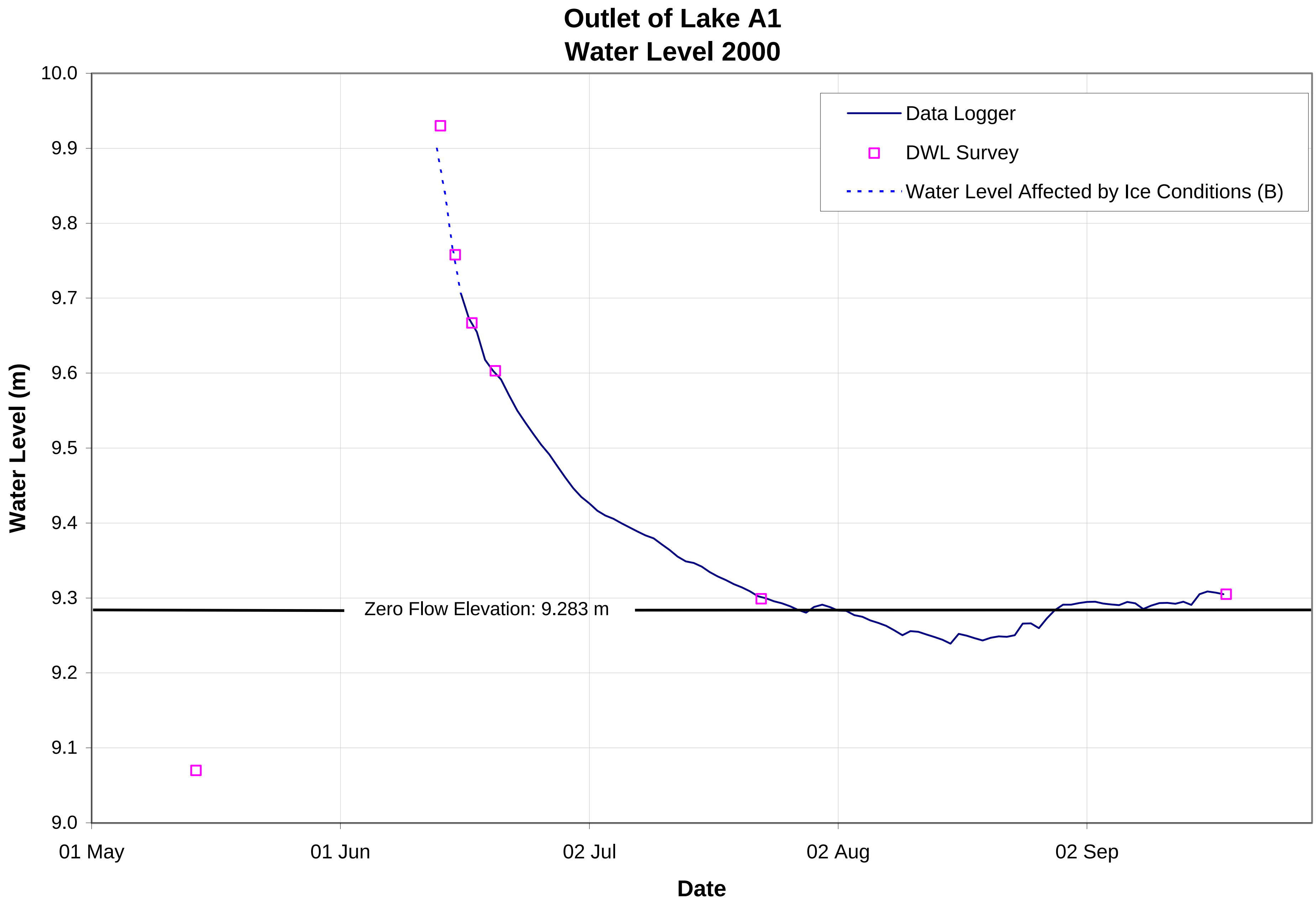

Outlet of Lake A1
Rating Curve
1997 Measurements
1997 Rating Curve
1998 Measurements
1998 Rating Curve
1999 Measurements
1999 Rating Curve
2000 Measurements
2000 Rating Curve
B Ice Conditions
B
B
B
B
Water Level (m)
10.0
9.9
9.8
9.7
9.6
9.5
9.4
9.3
9.2
9.1
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
Discharge (m3/s)

Figure D.6.1



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A1.xls [HG Plot Adj]
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WMC Meliadine West Gold Project Water Balance Study
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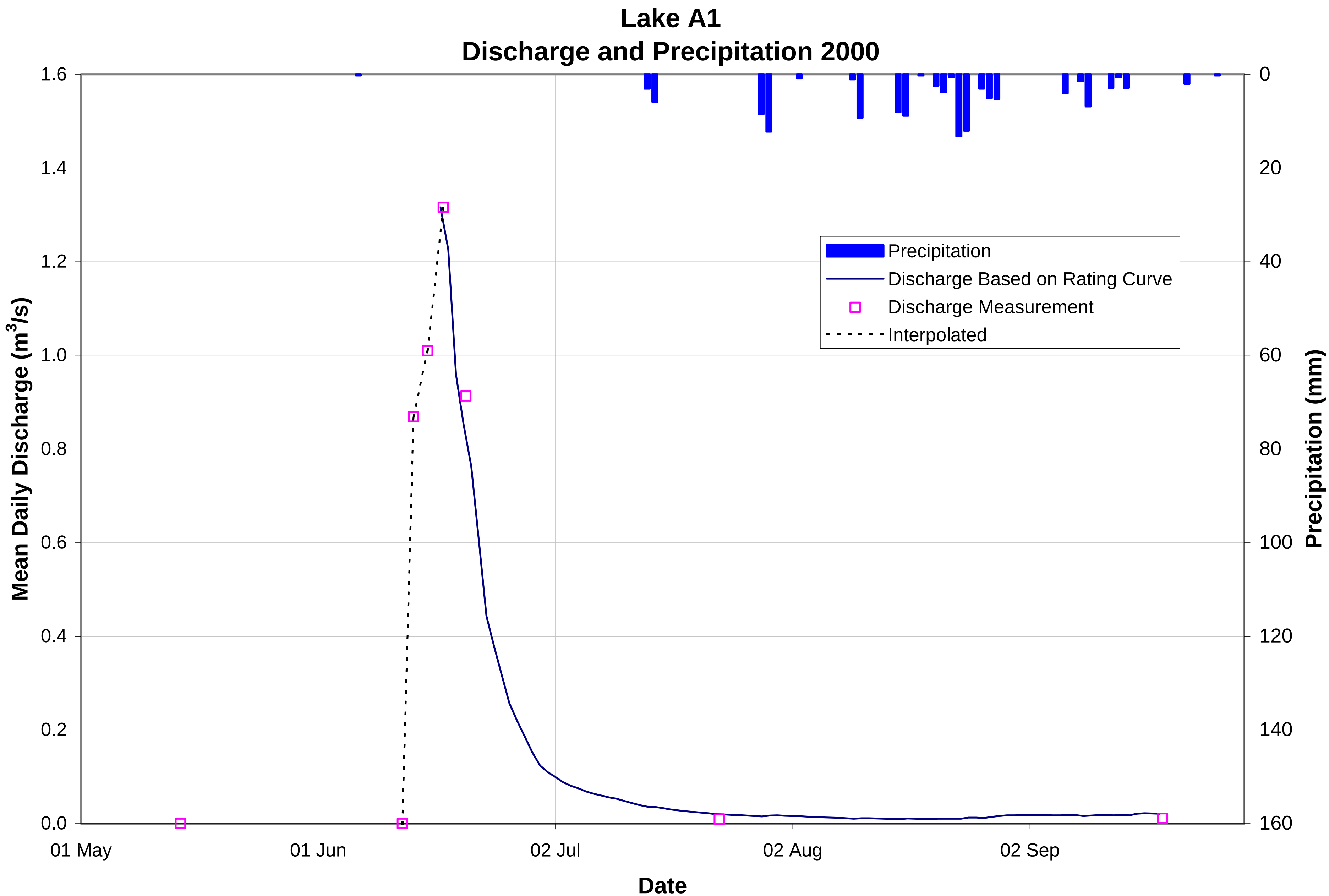
Figure D.6.2



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A1.xls [Discharge]
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WMC Meliadine West Gold Project Water Balance Study
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Figure D.6.3

STATION NUMBER: A1 DA Lake A1 (Peg Lake) (06MC003)
DATA LOGGER START UP DATE: 6/17/2000
DATA LOGGER ENDING DATE: 09/19/2000

DAILY MEAN WATER LEVEL IN METERS

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	9.435	9.288	9.293	---	---	---
2	---	---	---	---	---	---	9.426	9.283	9.295	---	---	---
3	---	---	---	---	---	---	9.417	9.283	9.295	---	---	---
4	---	---	---	---	---	---	9.410	9.277	9.293	---	---	---
5	---	---	---	---	---	---	9.406	9.275	9.291	---	---	---
6	---	---	---	---	---	---	9.400	9.270	9.290	---	---	---
7	---	---	---	---	---	---	9.394	9.267	9.295	---	---	---
8	---	---	---	---	---	---	9.389	9.263	9.293	---	---	---
9	---	---	---	---	---	---	9.383	9.257	9.285	---	---	---
10	---	---	---	---	---	---	9.380	9.250	9.290	---	---	---
11	---	---	---	---	---	---	9.372	9.256	9.293	---	---	---
12	---	---	---	---	---	---	9.364	9.255	9.293	---	---	---
13	---	---	---	---	---	9.899 B	9.355	9.251	9.292	---	---	---
14	---	---	---	---	---	9.842 B	9.349	9.248	9.295	---	---	---
15	---	---	---	---	---	9.763 B	9.347	9.244	9.291	---	---	---
16	---	---	---	---	---	9.706 B	9.342	9.239	9.305	---	---	---
17	---	---	---	---	---	9.673	9.334	9.252	9.309	---	---	---
18	---	---	---	---	---	9.655	9.329	9.250	9.307	---	---	---
19	---	---	---	---	---	9.618	9.324	9.246	9.305	---	---	---
20	---	---	---	---	---	9.603	9.318	9.243	---	---	---	---
21	---	---	---	---	---	9.591	9.314	9.247	---	---	---	---
22	---	---	---	---	---	9.571	9.309	9.249	---	---	---	---
23	---	---	---	---	---	9.550	9.302	9.248	---	---	---	---
24	---	---	---	---	---	9.534	9.300	9.250	---	---	---	---
25	---	---	---	---	---	9.519	9.296	9.266	---	---	---	---
26	---	---	---	---	---	9.505	9.293	9.266	---	---	---	---
27	---	---	---	---	---	9.491	9.289	9.260	---	---	---	---
28	---	---	---	---	---	9.476	9.284	9.273	---	---	---	---
29	---	---	---	---	---	9.461	9.280	9.284	---	---	---	---
30	---	---	---	---	---	9.446	9.288	9.291	---	---	---	---
31	---	---	---	---	---	---	9.291	9.291	---	---	---	---
MIN	---	---	---	---	---	9.446	9.280	9.239	9.285	---	---	---
MEAN	---	---	---	---	---	9.550	9.346	9.262	9.295	---	---	---
MAX	---	---	---	---	---	9.673	9.435	9.291	9.309	---	---	---

Note: B indicates water level affected by ice conditions
All MIN, MEAN, and MAX values are computed for data from June 18 to September 19 only

STATION NUMBER: A1 DA Lake A1 (Peg Lake) (06MC003)
DATA LOGGER START UP DATE: 6/17/2000
DATA LOGGER ENDING DATE: 09/19/2000

DAILY MEAN DISCHARGE IN CUBIC METERS PER SECOND

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	0.110	0.017	0.018	---	---	---
2	---	---	---	---	---	---	0.100	0.016	0.018	---	---	---
3	---	---	---	---	---	---	0.088	0.016	0.018	---	---	---
4	---	---	---	---	---	---	0.080	0.015	0.018	---	---	---
5	---	---	---	---	---	---	0.075	0.014	0.017	---	---	---
6	---	---	---	---	---	---	0.068	0.013	0.017	---	---	---
7	---	---	---	---	---	---	0.064	0.013	0.018	---	---	---
8	---	---	---	---	---	---	0.060	0.012	0.018	---	---	---
9	---	---	---	---	---	---	0.056	0.011	0.016	---	---	---
10	---	---	---	---	---	---	0.053	0.010	0.017	---	---	---
11	---	---	---	---	---	---	0.048	0.011	0.018	---	---	---
12	---	---	---	---	---	*0.000*	0.044	0.011	0.018	---	---	---
13	---	---	---	---	---	*0.869*	0.039	0.011	0.018	---	---	---
14	---	---	---	---	---	---	0.036	0.010	0.018	---	---	---
15	---	---	---	---	---	*1.010*	0.035	0.010	0.017	---	---	---
16	---	---	---	---	---	---	0.033	0.009	0.021	---	---	---
17	---	---	---	---	---	*1.316*	0.030	0.011	0.022	---	---	---
18	---	---	---	---	---	1.226	0.028	0.010	0.021	---	---	---
19	---	---	---	---	---	0.959	0.026	0.010	0.021	---	---	---
20	---	---	---	---	---	0.853	0.025	0.009	---	---	---	---
21	---	---	---	---	---	0.763	0.023	0.010	---	---	---	---
22	---	---	---	---	---	0.602	0.022	0.010	---	---	---	---
23	---	---	---	---	---	0.443	0.020	0.010	---	---	---	---
24	---	---	---	---	---	0.378	0.019	0.010	---	---	---	---
25	---	---	---	---	---	0.316	0.018	0.013	---	---	---	---
26	---	---	---	---	---	0.257	0.018	0.013	---	---	---	---
27	---	---	---	---	---	0.219	0.017	0.012	---	---	---	---
28	---	---	---	---	---	0.185	0.016	0.014	---	---	---	---
29	---	---	---	---	---	0.152	0.015	0.016	---	---	---	---
30	---	---	---	---	---	0.124	0.017	0.017	---	---	---	---
31	---	---	---	---	---	---	0.020	0.020	---	---	---	---
MIN	---	---	---	---	---	0.124	0.015	0.009	0.016	---	---	---
MEAN	---	---	---	---	---	0.557	0.040	0.012	0.018	---	---	---
MAX	---	---	---	---	---	1.316	0.088	0.017	0.022	---	---	---

Discharge in cubic meters per second
Mean 0.103
Maximum Daily 1.316 on June 17
Maximum instantaneous 1.747 at 00:00 on June 17

Total Volume
1193.050 Cubic Decameters

Note: *italics* indicates discharge measurement or estimate
All MIN, MEAN, and MAX values are computed for data from June 18 to September 19 only

<u>GAUGE HISTORY</u>

STATION NAME: Outlet of Lake A1

STATION NUMBER: **<u>06MC003</u>** **ELEVATION OF GAUGE DATUM:** **<u>ASSUMED DATUM</u>**
0.000 m.

LATITUDE: **<u>63° 00' 03" gps</u>** **LONGITUDE:** **<u>92° 07' 26" gps</u>**

BENCH MARKS:

B.M. #1	**Red paint mark on large rock 9.2 meters NW of shelter.**	**Elev. 10.000 m. (assumed)**
B.M. #2	**Red paint mark on rock 5.1 meters west of shelter.**	**Elev. 10.146 m.**
B.M. #3	**Red paint mark on rock 3.8 meters SE of shelter.**	**Elev. 9.978 m.**
B.M. #1 is control bench mark.		

HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT

DATE	**GAUGE CORRECTIONS (BENCH MARK USED TO OBTAIN WATER LEVELS: BOLD TYPE AND UNDERLINED)**					**NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.**
	B.M. #1	**B.M. #2**	**B.M. #3**			
1997						
Jun. 11	**<u>10.000</u>**	10.146	9.978			Established Bench Marks
Sep. 25	10.000	10.135	9.937			
			<u>9.978</u>			Used for the year
1998						
May 8	10.000	10.133	9.966			Level circuit
Jun 5	10.000	10.133	9.966			Level circuit
Sept 23	10.000	10.126	9.932			Level circuit
	<u>10.000</u>		**<u>9.978</u>**			Used for the year
1999						
Jun 4	10.000	10.128	9.966			Level circuit
Jul. 12	10.000	10.129	9.946			Level circuit
Sep. 20	10.000	10.128	9.933			Level circuit
			<u>9.978</u>			Used for the year
2000						
May 14	10.000	10.128	9.959			Level Circuit
Jun. 13	10.000	10.129	9.978			Level Circuit
Jul. 23	10.000	10.130	9.942			Level Circuit
Sept. 19	10.000	10.127	9.930			Level Circuit from B.M. #3
			<u>9.978</u>			Used for the year

APPENDIX D.7

Outlet of Lake B7

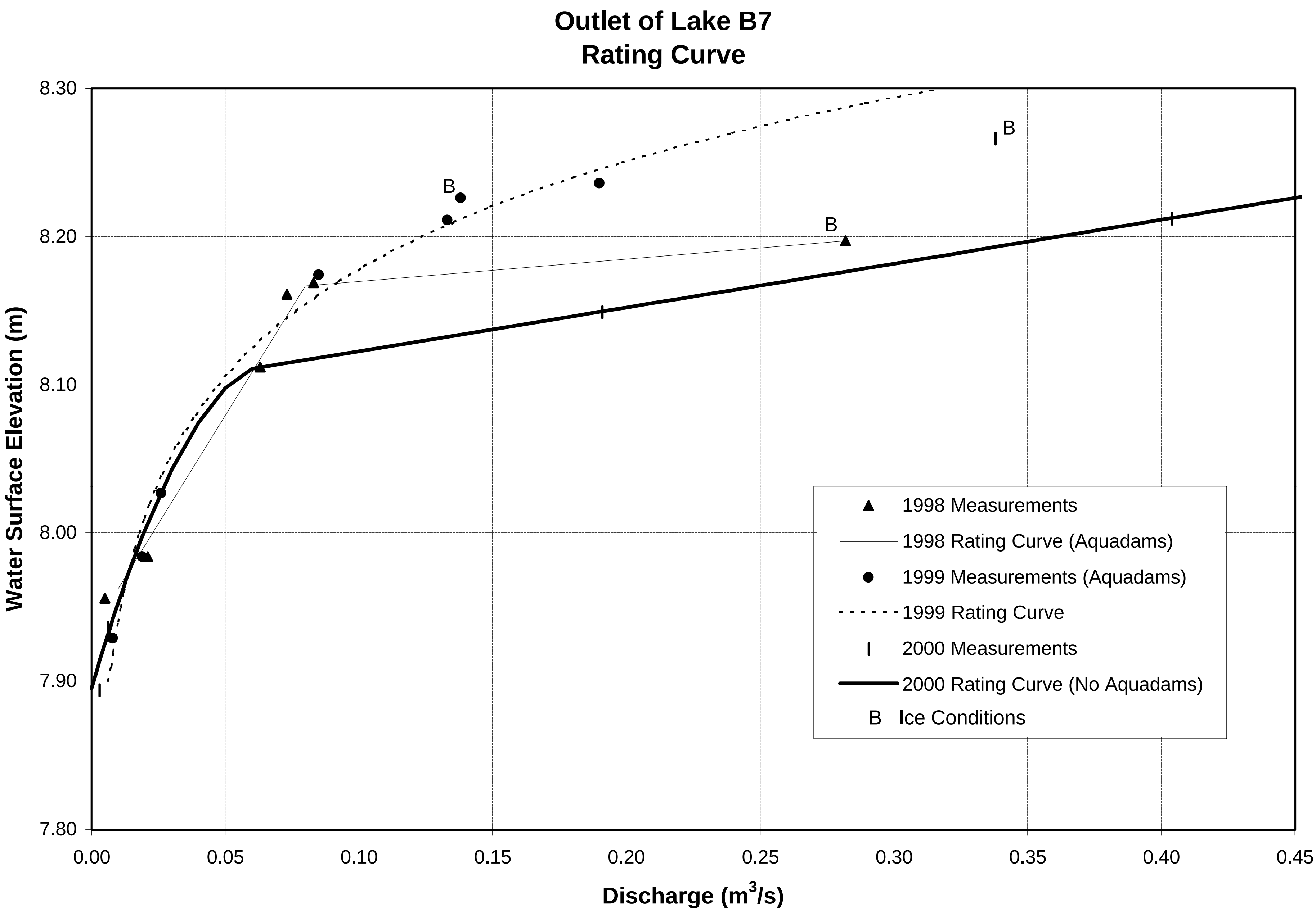
Site Inspection Summary (2000)

Outlet of Lake B7 (B7-6)

Zero flow elevation: 7.920 m

Date (dd-mm-yy)	Discharge (m3/s)		DWL (m)	Depth Above Zero Flow (m)	Data Logger (D.L.) (m)	Time (MST)	Difference (DWL-D.L.)
14-May-00	0.000	B	7.911		N.R.D.L.		
13-Jun-00	0.000	B	8.148	0.228	8.150	7:45	-0.002
14-Jun-00	0.000	B					
16-Jun-00	0.338	B	8.266	0.346	8.328	6:45	-0.062
17-Jun-00	0.404		8.212	0.292	8.188	11:30	0.024
20-Jun-00	0.191		8.149	0.229	8.156	9:00	-0.007
23-Jul-00	0.006		7.936	0.016	7.969	12:45	-0.033
18-Sep-00	0.003		7.894	-0.026	7.900	16:00	-0.006

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
DL = Data logger water level
Difference = Difference between surveyed water level (DWL) and Data Logger water level reading
= Value by which to adjust the Data Logger reading
N.R. = Not Recorded in Field Notes
N.D.L.R. = No Data Logger Records
B = Ice conditions



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Summary2000.xls [WoodyRC2]
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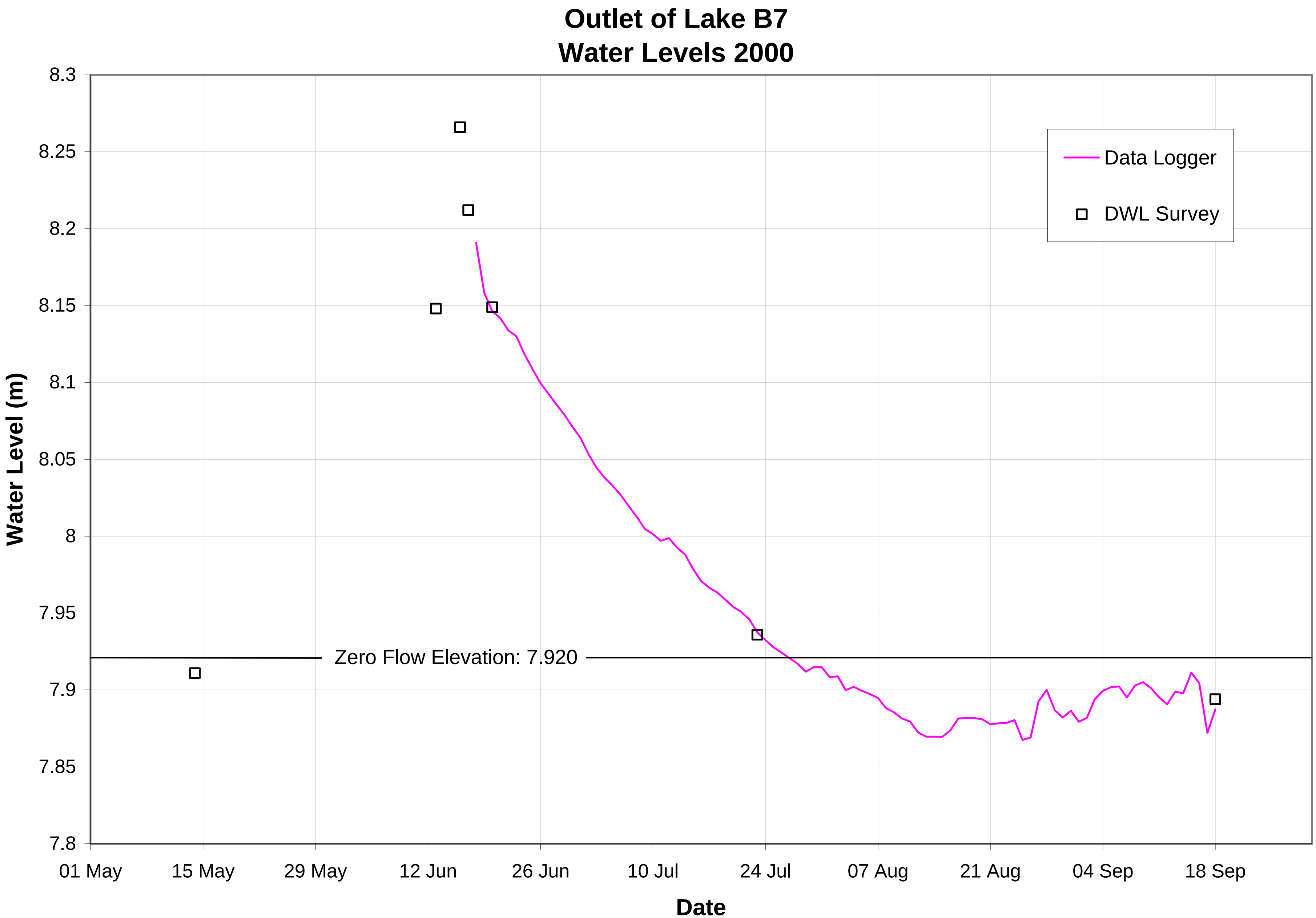
WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.7.1



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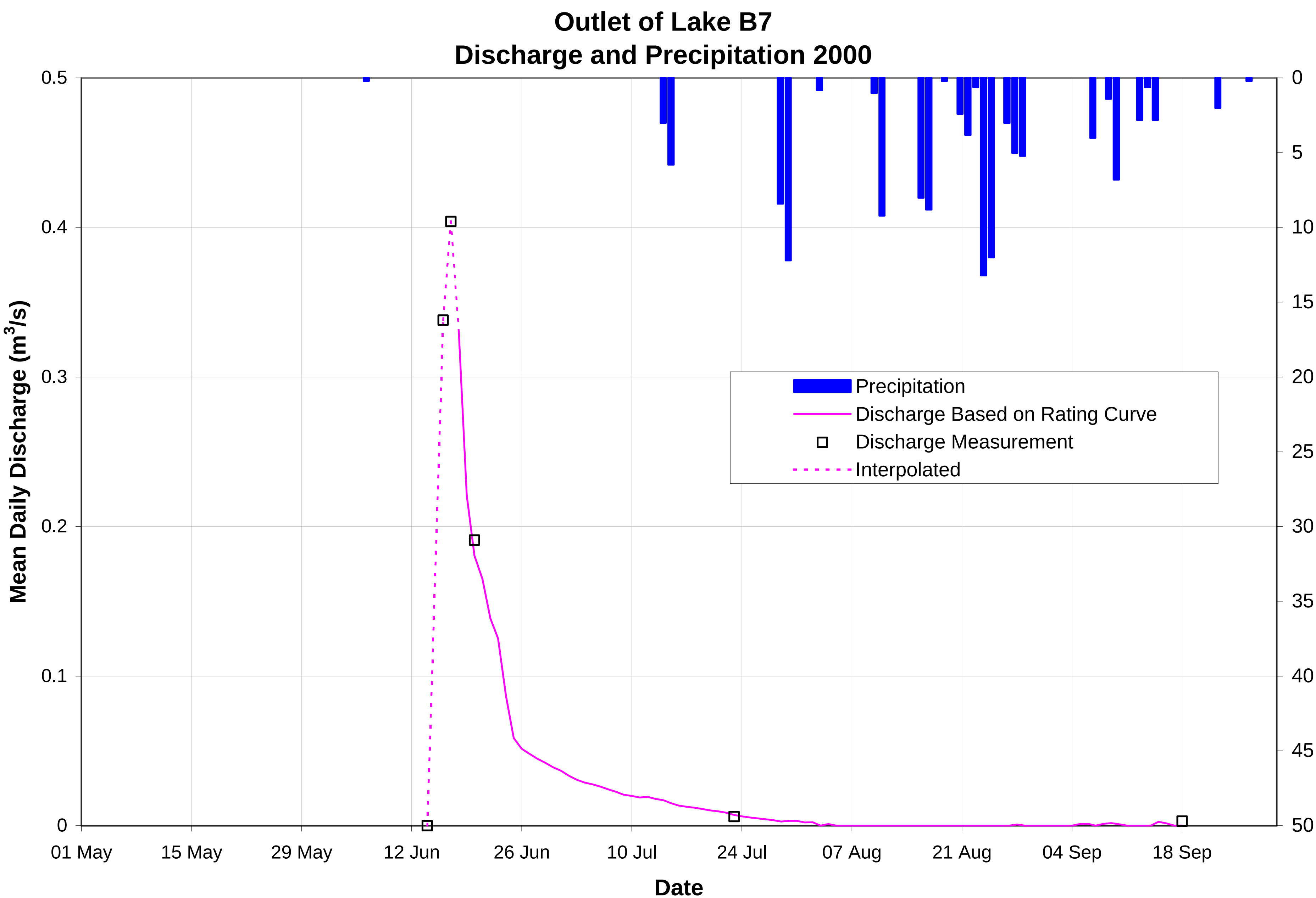
WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.7.2



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WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.7.3

STATION NUMBER: B7   DA   Lake B7 (Woody Lake)
DATA LOGGER START UP DATE: 6/13/2000
DATA LOGGER ENDING DATE: 09/18/2000

DAILY MEAN WATER LEVEL IN METERS

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	8.064	7.908	7.879	---	---	---
2	---	---	---	---	---	---	8.053	7.909	7.882	---	---	---
3	---	---	---	---	---	---	8.045	7.900	7.894	---	---	---
4	---	---	---	---	---	---	8.038	7.902	7.899	---	---	---
5	---	---	---	---	---	---	8.033	7.899	7.902	---	---	---
6	---	---	---	---	---	---	8.027	7.897	7.902	---	---	---
7	---	---	---	---	---	---	8.019	7.895	7.895	---	---	---
8	---	---	---	---	---	---	8.013	7.888	7.903	---	---	---
9	---	---	---	---	---	---	8.005	7.885	7.905	---	---	---
10	---	---	---	---	---	---	8.001	7.881	7.901	---	---	---
11	---	---	---	---	---	---	7.997	7.879	7.895	---	---	---
12	---	---	---	---	---	---	7.999	7.872	7.891	---	---	---
13	---	---	---	---	---	---	7.992	7.870	7.899	---	---	---
14	---	---	---	---	---	---	7.988	7.870	7.898	---	---	---
15	---	---	---	---	---	---	7.979	7.869	7.911	---	---	---
16	---	---	---	---	---	---	7.971	7.873	7.904	---	---	---
17	---	---	---	---	---	---	7.967	7.881	7.872	---	---	---
18	---	---	---	---	---	8.191	7.963	7.882	7.887	---	---	---
19	---	---	---	---	---	8.158	7.959	7.882	---	---	---	---
20	---	---	---	---	---	8.146	7.954	7.881	---	---	---	---
21	---	---	---	---	---	8.142	7.951	7.878	---	---	---	---
22	---	---	---	---	---	8.134	7.946	7.878	---	---	---	---
23	---	---	---	---	---	8.130	7.937	7.879	---	---	---	---
24	---	---	---	---	---	8.119	7.932	7.880	---	---	---	---
25	---	---	---	---	---	8.109	7.928	7.867	---	---	---	---
26	---	---	---	---	---	8.099	7.924	7.869	---	---	---	---
27	---	---	---	---	---	8.093	7.921	7.893	---	---	---	---
28	---	---	---	---	---	8.085	7.917	7.900	---	---	---	---
29	---	---	---	---	---	8.079	7.912	7.887	---	---	---	---
30	---	---	---	---	---	8.071	7.915	7.882	---	---	---	---
31	---	---	---	---	---	---	7.915	7.887	---	---	---	---
MIN	---	---	---	---	---	8.071	7.912	7.867	7.872	---	---	---
MEAN	---	---	---	---	---	8.120	7.976	7.885	7.896	---	---	---
MAX	---	---	---	---	---	8.266	8.064	7.909	7.911	---	---	---

Note: B indicates water level affected by ice conditions
All MIN, MEAN, and MAX values are computed for data from June 18 to September 18 only

STATION NUMBER: B7 DA Lake B7 (Woody Lake)
DATA LOGGER START UP DATE: 6/13/2000
DATA LOGGER ENDING DATE: 09/18/2000

DAILY MEAN DISCHARGE IN CUBIC METERS PER SECOND

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	0.037	0.002	0.000	---	---	---
2	---	---	---	---	---	---	0.033	0.002	0.000	---	---	---
3	---	---	---	---	---	---	0.031	0.000	0.000	---	---	---
4	---	---	---	---	---	---	0.029	0.001	0.000	---	---	---
5	---	---	---	---	---	---	0.028	0.000	0.001	---	---	---
6	---	---	---	---	---	---	0.026	0.000	0.001	---	---	---
7	---	---	---	---	---	---	0.024	0.000	0.000	---	---	---
8	---	---	---	---	---	---	0.023	0.000	0.001	---	---	---
9	---	---	---	---	---	---	0.021	0.000	0.002	---	---	---
10	---	---	---	---	---	---	0.020	0.000	0.001	---	---	---
11	---	---	---	---	---	---	0.019	0.000	0.000	---	---	---
12	---	---	---	---	---	---	0.019	0.000	0.000	---	---	---
13	---	---	---	---	---	---	0.018	0.000	0.000	---	---	---
14	---	---	---	---	---	*0.000*	0.017	0.000	0.000	---	---	---
15	---	---	---	---	---	---	0.015	0.000	0.003	---	---	---
16	---	---	---	---	---	*0.338*	0.013	0.000	0.001	---	---	---
17	---	---	---	---	---	*0.404*	0.013	0.000	0.000	---	---	---
18	---	---	---	---	---	0.330	0.012	0.000	0.000	---	---	---
19	---	---	---	---	---	0.221	0.011	0.000	---	---	---	---
20	---	---	---	---	---	0.181	0.010	0.000	---	---	---	---
21	---	---	---	---	---	0.165	0.010	0.000	---	---	---	---
22	---	---	---	---	---	0.139	0.009	0.000	---	---	---	---
23	---	---	---	---	---	0.125	0.007	0.000	---	---	---	---
24	---	---	---	---	---	0.087	0.006	0.000	---	---	---	---
25	---	---	---	---	---	0.059	0.005	0.000	---	---	---	---
26	---	---	---	---	---	0.051	0.005	0.000	---	---	---	---
27	---	---	---	---	---	0.048	0.004	0.000	---	---	---	---
28	---	---	---	---	---	0.045	0.004	0.000	---	---	---	---
29	---	---	---	---	---	0.042	0.003	0.000	---	---	---	---
30	---	---	---	---	---	0.039	0.003	0.000	---	---	---	---
31	---	---	---	---	---	---	0.003	0.000	---	---	---	---
MIN	---	---	---	---	---	0.039	0.003	0.000	0.000	---	---	---
MEAN	---	---	---	---	---	0.118	0.016	0.000	0.001	---	---	---
MAX	---	---	---	---	---	0.330	0.037	0.002	0.003	---	---	---

Discharge in cubic meters per second
Mean 0.022
Maximum Daily 0.330 on June 18
Maximum instantaneous 0.365 at 00:00 on June 18

Total Volume
238.923 Cubic Decameters

Note: *italics* indicates discharge measurement or estimate
All MIN, MEAN, and MAX values are computed for data from June 18 to September 18 only

GAUGE HISTORY

STATION NAME: Outlet of Lake B7
STATION NUMBER: **ELEVATION OF GAUGE DATUM:** **ASSUMED DATUM**
0.000 m.
LATITUDE: **63° 01' 59" gps** **LONGITUDE:** **92° 15' 06" gps**

BENCH MARKS:

T.B.M. #1 Established at UTM 537860, 6989447. Ppaint on boulder approx. 10 m from lake shore & 100 m N.W. of Creek. Assumed Elevation 10.000 m (Adopted as B.M. #1 on June 7, 1998; Elev. 10.000 m)	
B.M. #1 Paint mark on small rock	**Elev. 10.000 m.**
B.M. #2	**Elev. 9.577 m.**
B.M. #3	**Elev. 10.213 m**
B.M. #1 is control bench mark.	

HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT

DATE	GAUGE CORRECTIONS					NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.
	B.M. #1	**B.M. #2**	**B.M. #3**			
1998						
Jun. 7	10.000	9.577	10.213			Established bench marks, BM # 1 used as control bench mark
Jul. 9	10.000	9.575	10.214			Level circuit
Sept. 24	10.000	9.576	10.215			Level circuit
	10.000					Used for the year
1999						
Jun. 14	10.000	9.579	10.217			Level circuit
Jul. 12	10.000	9.577	10.214			Level circuit
Sep. 20	10.000	9.578	10.211			Level circuit
	10.000					Used for the year
2000						
May 14	10.000	9.577	10.215			Level circuit
Jun. 13	10.000	9.581	10.217			Level circuit
Jul. 23	10.000	9.575	10.214			Level circuit
Sep. 18	10.000	9.576	10.215			Level circuit
	10.000					Used for the year

APPENDIX D.8

Outlet of Lake B2

Site Inspection Summary (2000)

Outlet of Lake B2 (B2-ML)

Zero flow elevation: 7.347 m

Date (dd-mm-yy)	Discharge (m^3/s)		DWL (m)		Depth Above Zero Flow (m)	Data Logger (D.L.) (m)	Time MST	Difference (DWL-D.L.)
14-May-00	0.000	B	7.355		0.008	N.D.L.R		
13-Jun-00	0.000	B	7.582	*	0.235	N.D.L.R		
15-Jun-00	0.243	B	7.642		0.295	7.699	8:30	-0.057
17-Jun-00	3.330		7.852		0.505	7.840	10:15	0.012
20-Jun-00	1.968		7.811		0.464	7.791	10:15	0.020
23-Jul-00	0.060		7.496		0.149	7.576	6:45	-0.080
19-Sep-00	0.013		7.436		0.089	7.558	6:45	-0.122

DWL = Direct water level surveyed from bench mark (adjusted for BM movement)
DL = Data logger water level
Difference = Difference between surveyed water level (DWL) and Data Logger water level reading
= Value by which to adjust the Data Logger reading
N.R. = Not Recorded in Field Notes
N.D.L.R. = No Data Logger Records
B = Ice conditions
***** = DWL represents water ponded on ice and may not represent true water level

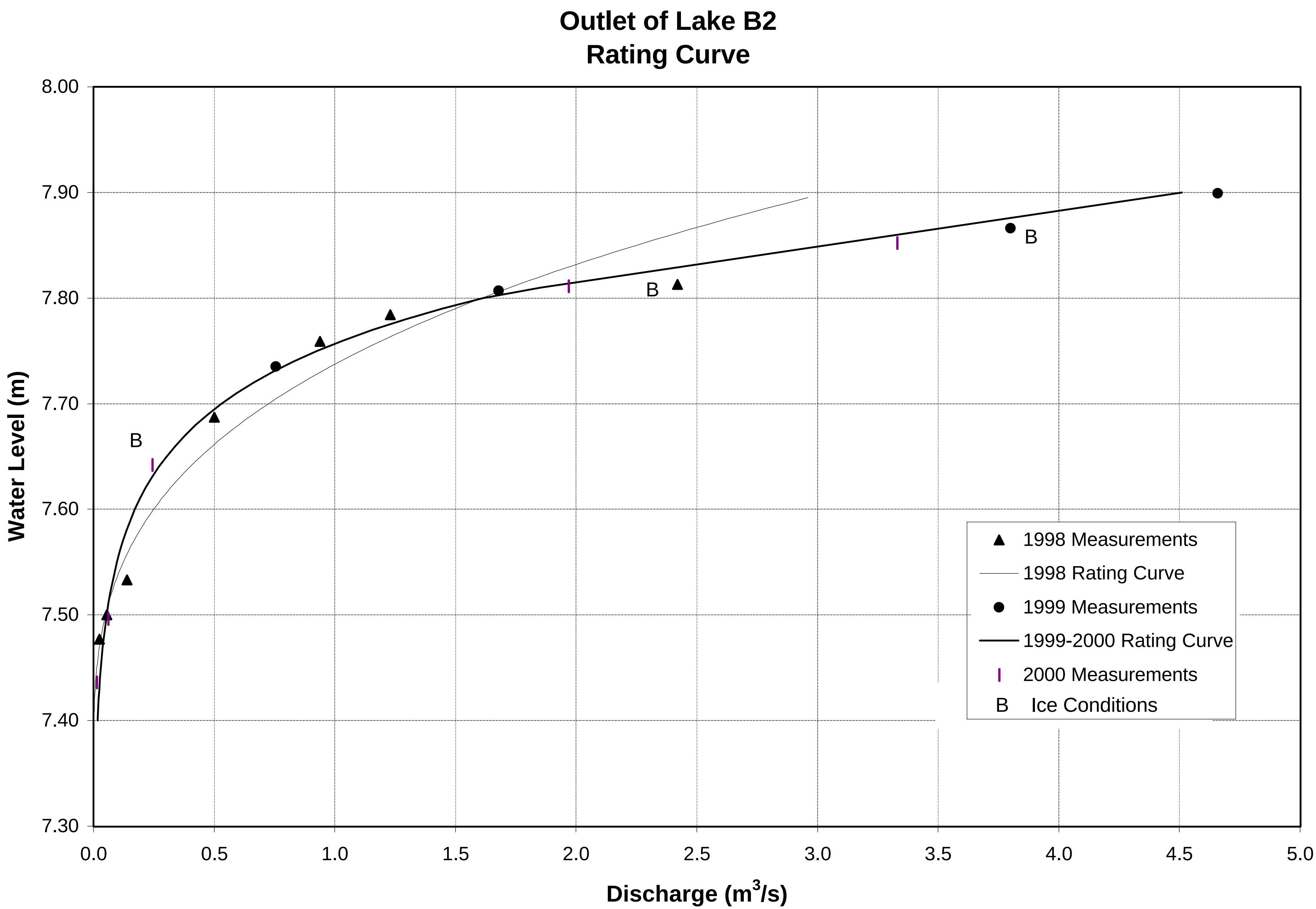
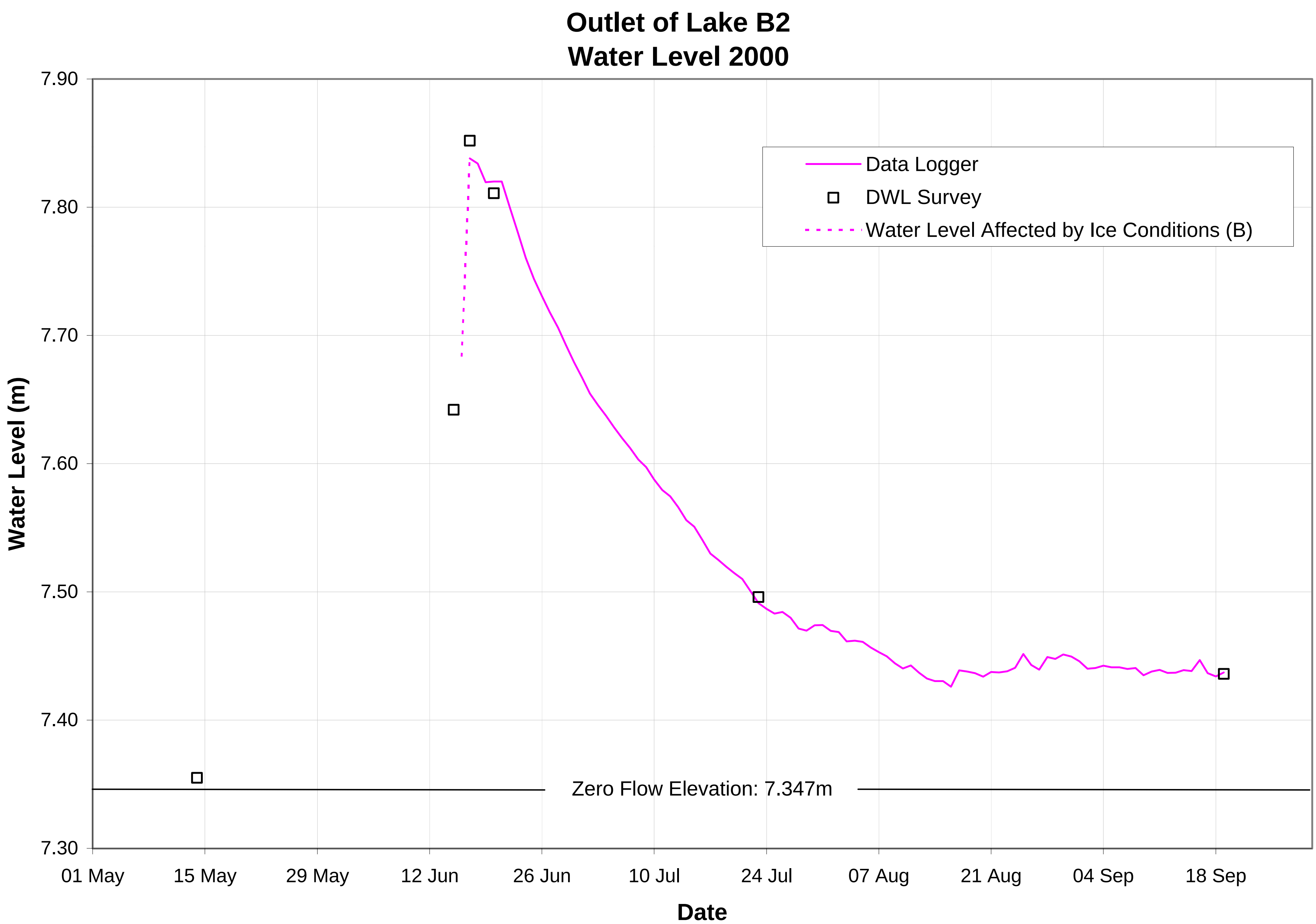

Outlet of Lake B2
Rating Curve
8.00
7.90
7.80
7.70
7.60
7.50
7.40
7.30
Water Level (m)
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
Discharge (m3/s)
B
B
B
1998 Measurements
1998 Rating Curve
1999 Measurements
1999-2000 Rating Curve
2000 Measurements
B Ice Conditions

Figure D.8.1



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B2.xls [Adj Drift]
1/25/01 3:58 PM

WMC Meliadine West Gold Project Water Balance Study
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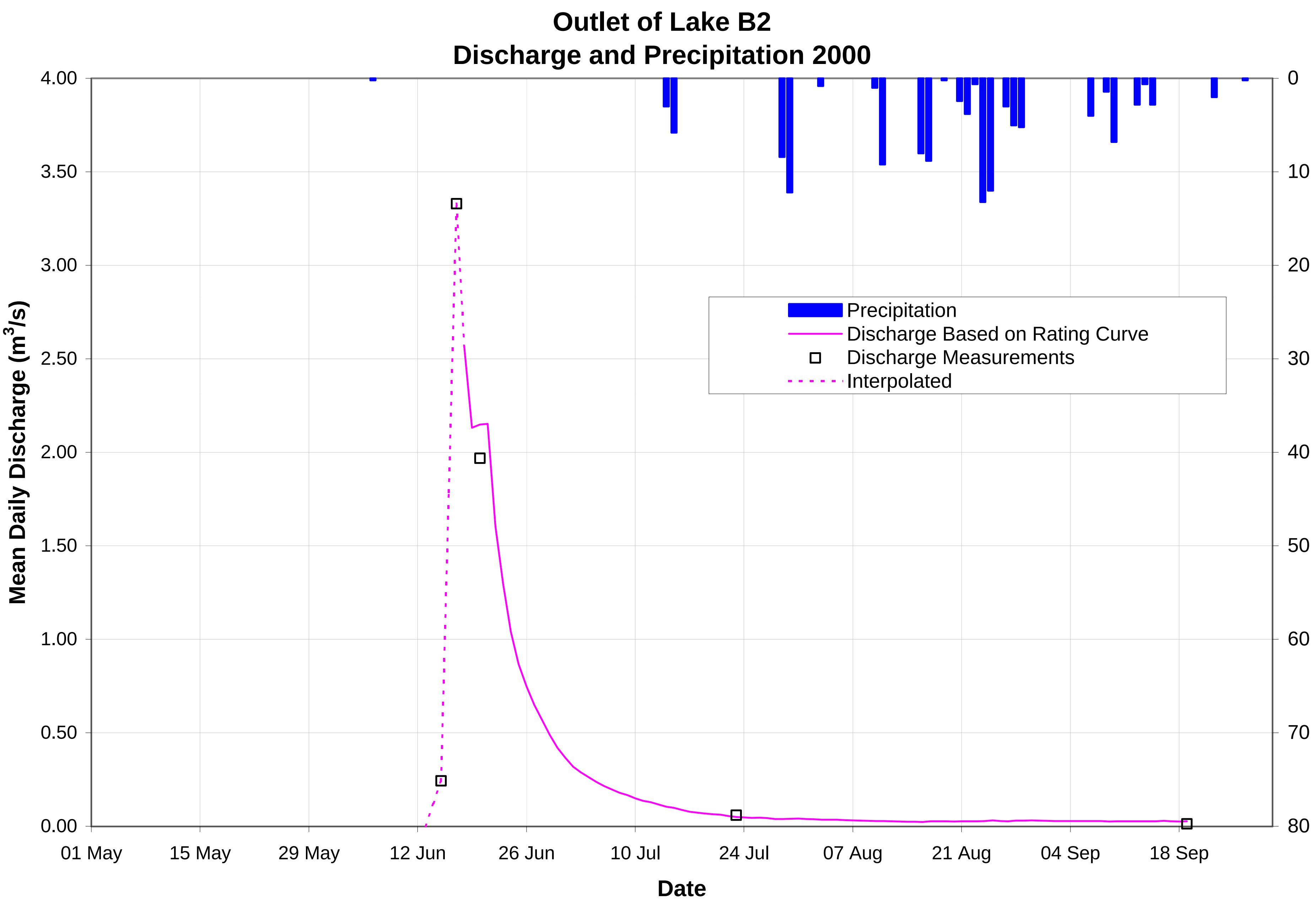
Figure D.8.2



P:\PROEJCT\CW\1525.2\FLOWS AND LEVELS\Data Logger\
B2.xls [QAdj]
1/25/01 3:58 PM

WMC Meliadine West Gold Project Water Balance Study
AMEC Earth & Environmental Limited

Figure D.8.3

STATION NUMBER: B2 DA Lake B2 (Woodstock Lake)
DATA LOGGER START UP DATE: 6/13/2000
DATA LOGGER ENDING DATE: 09/19/2000

DAILY MEAN WATER LEVEL IN METERS

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	7.667	7.470	7.446	---	---	---
2	---	---	---	---	---	---	7.655	7.469	7.440	---	---	---
3	---	---	---	---	---	---	7.646	7.461	7.441	---	---	---
4	---	---	---	---	---	---	7.637	7.462	7.442	---	---	---
5	---	---	---	---	---	---	7.629	7.461	7.441	---	---	---
6	---	---	---	---	---	---	7.620	7.457	7.441	---	---	---
7	---	---	---	---	---	---	7.612	7.453	7.440	---	---	---
8	---	---	---	---	---	---	7.603	7.450	7.441	---	---	---
9	---	---	---	---	---	---	7.597	7.444	7.435	---	---	---
10	---	---	---	---	---	---	7.588	7.440	7.438	---	---	---
11	---	---	---	---	---	---	7.579	7.443	7.439	---	---	---
12	---	---	---	---	---	---	7.575	7.437	7.437	---	---	---
13	---	---	---	---	---	---	7.566	7.433	7.437	---	---	---
14	---	---	---	---	---	---	7.556	7.430	7.439	---	---	---
15	---	---	---	---	---	---	7.551	7.430	7.438	---	---	---
16	---	---	---	---	---	7.684 B	7.540	7.426	7.447	---	---	---
17	---	---	---	---	---	7.838	7.530	7.439	7.437	---	---	---
18	---	---	---	---	---	7.834	7.525	7.438	7.434	---	---	---
19	---	---	---	---	---	7.819	7.519	7.437	7.437	---	---	---
20	---	---	---	---	---	7.820	7.515	7.434	---	---	---	---
21	---	---	---	---	---	7.820	7.510	7.438	---	---	---	---
22	---	---	---	---	---	7.800	7.500	7.437	---	---	---	---
23	---	---	---	---	---	7.780	7.491	7.438	---	---	---	---
24	---	---	---	---	---	7.760	7.487	7.441	---	---	---	---
25	---	---	---	---	---	7.744	7.483	7.452	---	---	---	---
26	---	---	---	---	---	7.731	7.484	7.443	---	---	---	---
27	---	---	---	---	---	7.718	7.480	7.439	---	---	---	---
28	---	---	---	---	---	7.706	7.471	7.449	---	---	---	---
29	---	---	---	---	---	7.693	7.470	7.448	---	---	---	---
30	---	---	---	---	---	7.679	7.474	7.451	---	---	---	---
31	---	---	---	---	---	---	7.474	7.450	---	---	---	---
MIN	---	---	---	---	---	7.679	7.470	7.426	7.434	---	---	---
MEAN	---	---	---	---	---	7.767	7.550	7.445	7.439	---	---	---
MAX	---	---	---	---	---	7.838	7.667	7.470	7.447	---	---	---

Note: B indicates water level affected by ice conditions
All MIN, MEAN, and MAX values are computed for data from June 17 to September 19 only

STATION NUMBER: B2   DA   Lake B2 (Woodstock Lake)
DATA LOGGER START UP DATE: 6/13/2000
DATA LOGGER ENDING DATE: 09/19/2000

DAILY MEAN DISCHARGE IN CUBIC METERS PER SECOND

Date	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	---	---	---	---	---	---	0.368	0.039	0.029	---	---	---
2	---	---	---	---	---	---	0.319	0.038	0.027	---	---	---
3	---	---	---	---	---	---	0.288	0.035	0.028	---	---	---
4	---	---	---	---	---	---	0.263	0.035	0.028	---	---	---
5	---	---	---	---	---	---	0.237	0.035	0.028	---	---	---
6	---	---	---	---	---	---	0.215	0.033	0.028	---	---	---
7	---	---	---	---	---	---	0.197	0.032	0.027	---	---	---
8	---	---	---	---	---	---	0.178	0.031	0.028	---	---	---
9	---	---	---	---	---	---	0.167	0.029	0.026	---	---	---
10	---	---	---	---	---	---	0.149	0.028	0.027	---	---	---
11	---	---	---	---	---	---	0.136	0.028	0.027	---	---	---
12	---	---	---	---	---	---	0.129	0.027	0.026	---	---	---
13	---	---	---	---	---	*0.000*	0.117	0.025	0.027	---	---	---
14	---	---	---	---	---	---	0.104	0.025	0.027	---	---	---
15	---	---	---	---	---	*0.243*	0.098	0.025	0.027	---	---	---
16	---	---	---	---	---	---	0.087	0.023	0.030	---	---	---
17	---	---	---	---	---	*3.330*	0.077	0.027	0.026	---	---	---
18	---	---	---	---	---	2.565	0.073	0.027	0.026	---	---	---
19	---	---	---	---	---	2.131	0.069	0.026	0.027	---	---	---
20	---	---	---	---	---	2.149	0.065	0.026	---	---	---	---
21	---	---	---	---	---	2.152	0.062	0.027	---	---	---	---
22	---	---	---	---	---	1.606	0.055	0.027	---	---	---	---
23	---	---	---	---	---	1.297	0.050	0.027	---	---	---	---
24	---	---	---	---	---	1.040	0.047	0.028	---	---	---	---
25	---	---	---	---	---	0.868	0.045	0.031	---	---	---	---
26	---	---	---	---	---	0.748	0.046	0.028	---	---	---	---
27	---	---	---	---	---	0.650	0.043	0.027	---	---	---	---
28	---	---	---	---	---	0.569	0.039	0.031	---	---	---	---
29	---	---	---	---	---	0.489	0.039	0.030	---	---	---	---
30	---	---	---	---	---	0.419	0.041	0.031	---	---	---	---
31	---	---	---	---	---	---	0.041	0.031	---	---	---	---
MIN	---	---	---	---	---	0.419	0.039	0.023	0.026	---	---	---
MEAN	---	---	---	---	---	1.283	0.124	0.029	0.027	---	---	---
MAX	---	---	---	---	---	2.565	0.369	0.039	0.030	---	---	---

Discharge in cubic meters per second
Mean 0.266
Maximum Daily 3.330 on July 17
Maximum instantaneous 3.035 at 02:30 on July 17

Total Volume
2370.633 Cubic Decameters

Note: *italics* indicates discharge measurement or estimate
All MIN, MEAN, and MAX values are computed for data from June 18 to September 19 only

GAUGE HISTORY

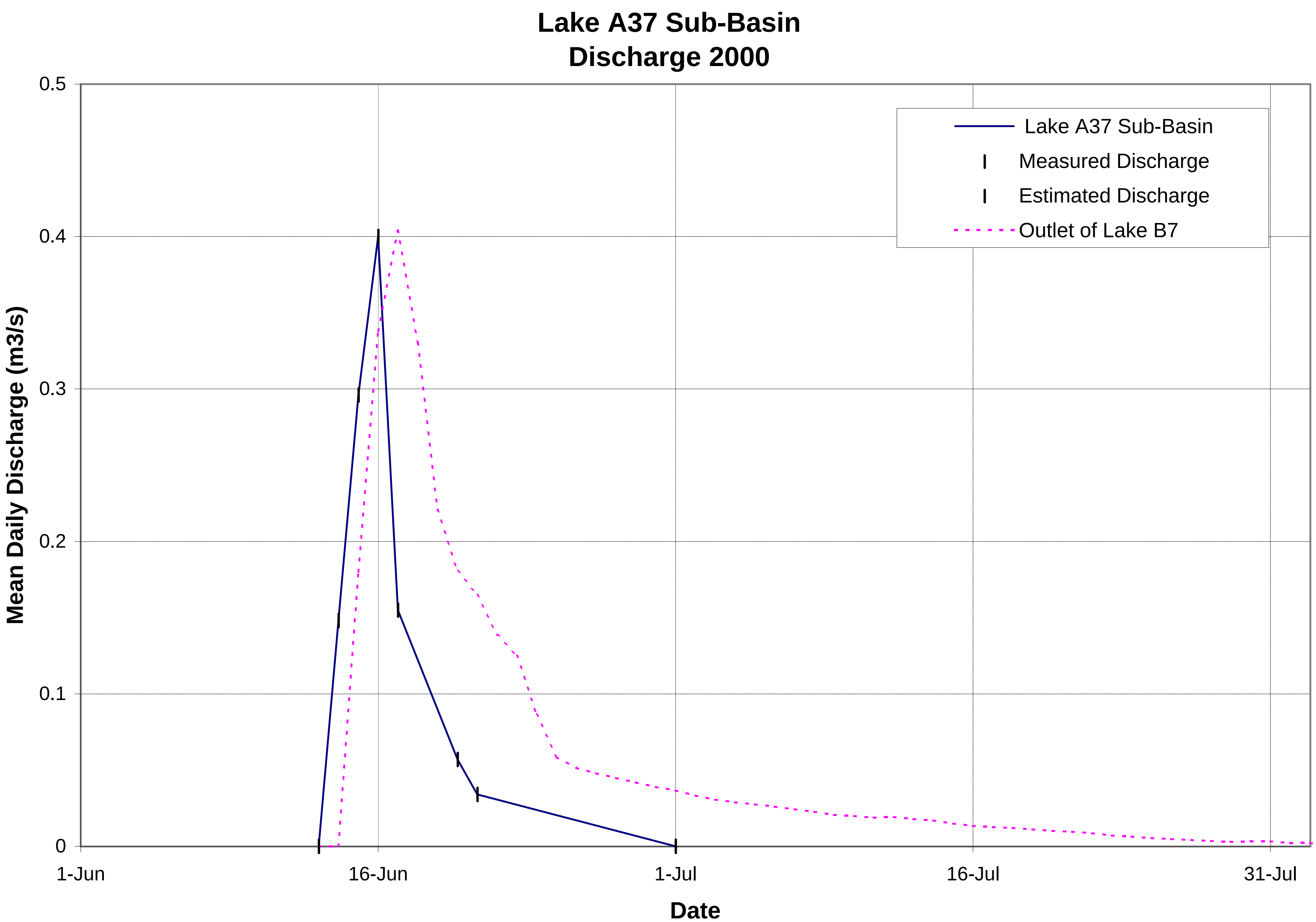
STATION NAME: Outlet of Lake B2
STATION NUMBER: **ELEVATION OF GAUGE DATUM:** **ASSUMED DATUM**
0.000 m.
LATITUDE: **63° 00' 17" gps** **LONGITUDE:** **92° 15' 43" gps**

BENCH MARKS:

T.B.M. #1 Established at UTM 537337, 6986319. Orange paint on small rock approx. 15 m from lake shore. Assumed Elevation 10.000 m (Adopted as B.M. #1 on June 7, 1998; Elev. 10.000 m)						
B.M. #1 Paint mark on small rock Elev. 10.000 m.						
B.M. #2 Elev. 10.862 m.						
B.M. #3 Elev. 9.633 m						
B.M. #1 is control bench mark.						
HISTORY OF GAUGE CORRECTIONS, BENCH MARKS, AND OTHER EQUIPMENT						
DATE	**GAUGE CORRECTIONS**					**NOTES ON INSTALLATION OR REMOVAL OF BENCH MARKS, ETC.**
	B.M. #1	**B.M. #2**	**B.M. #3**			
1998						
Jun. 8	10.000	10.862	9.633			Established bench marks, BM # 1 used as control bench mark
Jul. 8	10.000	10.863	9.643			Level circuit
Sept. 24	10.000	10.864	9.934			Level circuit
	10.000					Used for the year
1999						
Jun. 6	10.000	10.867	9.637			Level circuit
Jul. 12	10.000	10.863	9.630			Level circuit
Sep. 20	10.000	10.868	9.614			Level circuit
	10.000					Used for the year
2000						
May 14	10.000	10.864	9.626			Level circuit
Jun. 13	10.000	10.869	9.632			Level circuit
Jul. 23	10.000	10.865	9.633			Level circuit
Sep. 19	10.000	10.865	9.627			Level circuit
	10.000					Used for the year

APPENDIX D.9

Lake A37 Sub-Basin



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A37_volume_new.xls[D.9.1]
1/25/01

WMC Meliadine West Gold Project Water Balance Study
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Figure D.9.1

APPENDIX D.10

Char River Near the Mouth

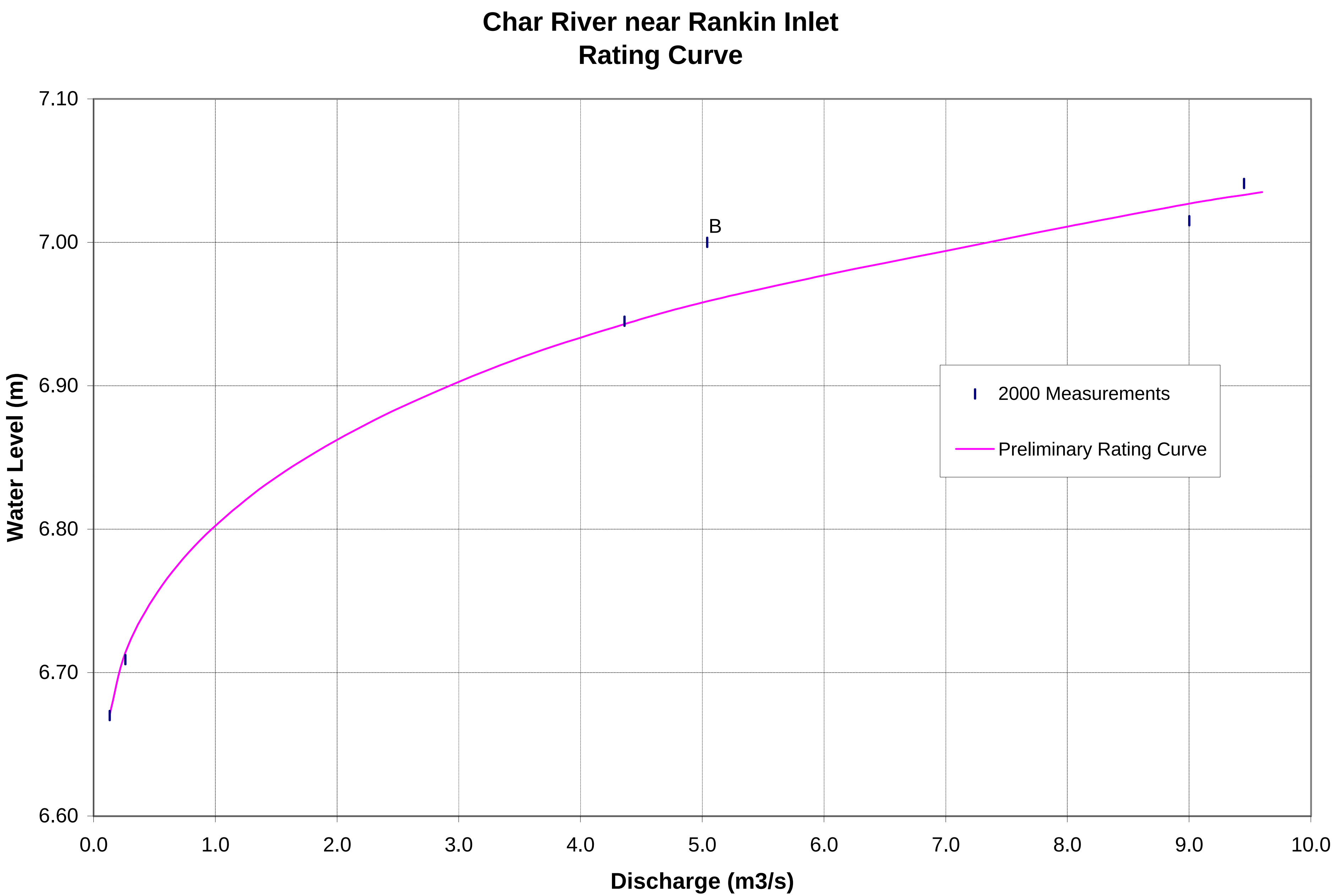
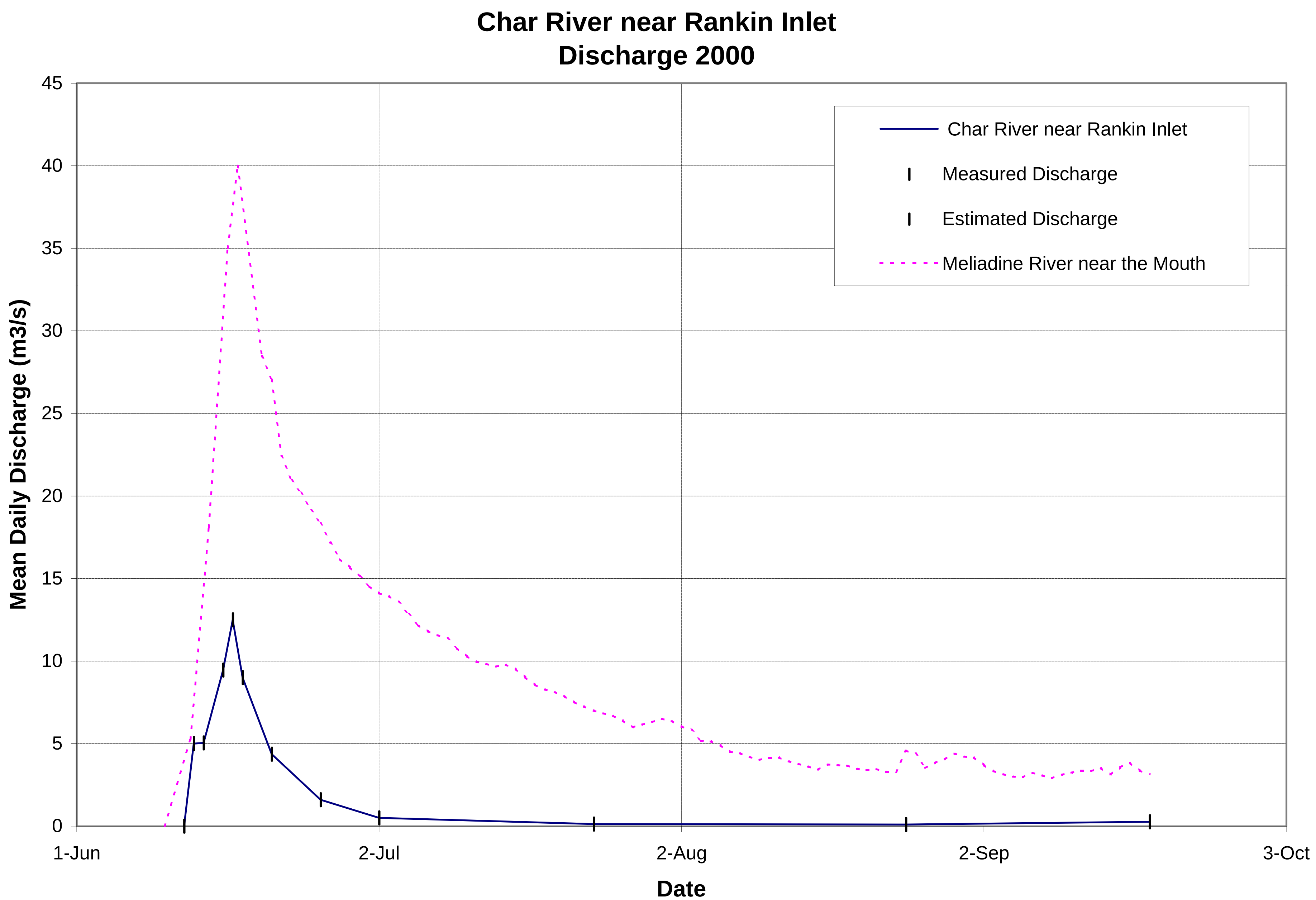

Char River near Rankin Inlet
Rating Curve
7.10
7.00
6.90
6.80
6.70
6.60
Water Level (m)
0.0
1.0
2.0
3.0
4.0
5.0
6.0
7.0
8.0
9.0
10.0
Discharge (m3/s)
B
2000 Measurements
Preliminary Rating Curve

Figure D.10.1



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1/25/01

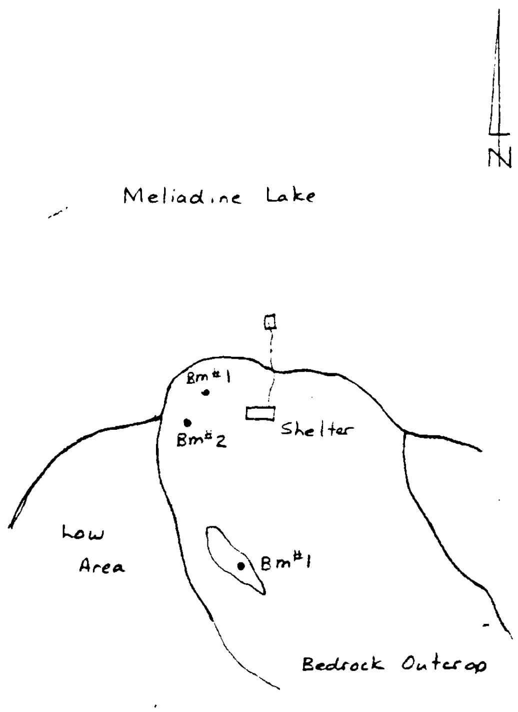
Figure D.10.2

APPENDIX E

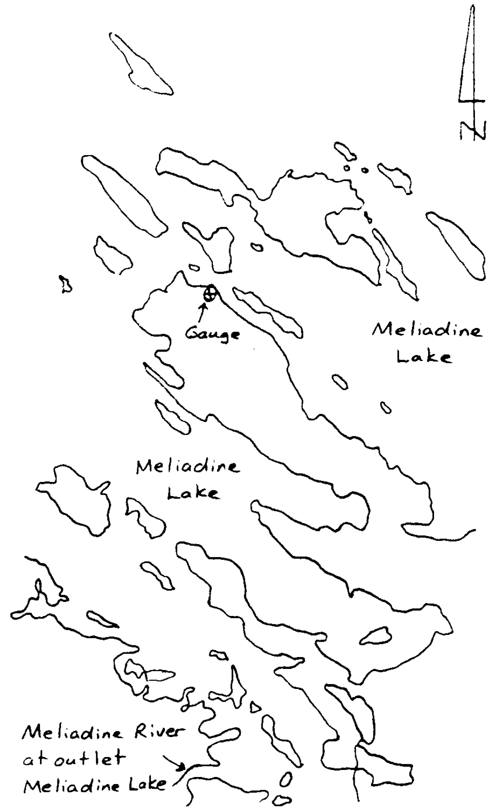
HYDROMETRIC STATION DESCRIPTIONS

- Meliadine Lake near Rankin Inlet
- Meliadine River at Outlet Meliadine Lake
- West Outlet Meliadine Lake
- Meliadine River near the Mouth
- Outlet of Lake A1 (Peg Creek)
- Outlet of Lake B7 (Woody Lake)
- Outlet of Lake B2 (Woodstock Lake)

AND GAUGING EQUIPMENT.
INDICATE DOCKING AND LANDING AREAS.



SCALE 1:50,000 **MAP** 55 N/1



ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. 06MC002 **Drainage Area** ______

Station Name Meliadine Lake near Rankin Inlet **District** NWT

Latitude 63° 05' 14" **Longitude** 92° 23' 15" GPS

Established June 20, 1997 **By** R.N. Pilling, M.K. Jones

Description of Gauging Equipment and Location

Shelter contains Sutron 8210 logger and Tavis pressure transducer.

Station is located 33.6 km northwest of Rankin Inlet airport, 6 km north of outlet. Station is on the north tip of a peninsula near the middle of the lake.

Description of Control & Measuring Sections

Stage only.

Discharge measurements are made at the West outlet of Meliadine Lake and at the Meliadine River at outlet of Meliadine Lake.

Prepared by M.K. Jones **Date** Jun 23, 1997

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 **m. assumed**

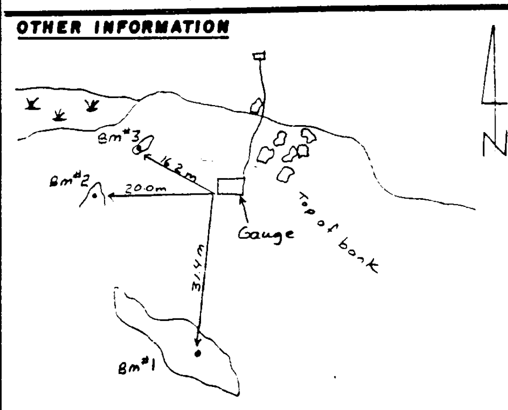
Conversion Equation ______ **to convert to** ______

Bm#1 - Red paint mark on top of bedrock outcrop 31.4 m. south of shelter. Elev. 10.000 m

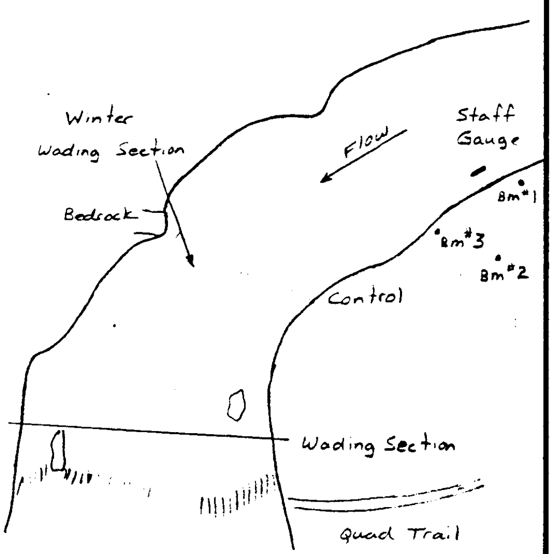
B.m#2 - Red paint mark on bedrock outcrop 20.0 m. west of shelter. Elev. 6.980 m

B.m#3 - Red paint mark on bedrock outcrop 16.2 m NW of shelter. Elev. 5.980 m

OTHER INFORMATION



AND GAUGING EQUIPMENT.
INDICATE DOCKING AND LANDING AREAS.



SCALE 1:50,000 **MAP** 55N/1

ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. 06MC008 **Drainage Area** ____________

Station Name Meliadine River at outlet Meliadine Lake **District** NWT

Latitude 63°02'04" **Longitude** 92°23'35" GPS

Established ____________ **By** ____________

Description of Gauging Equipment and Location

Staff gauge set in stream bed on left bank about 200 meters above first set of rapids.

Gauge is on left bank at outlet of Meliadine Lake 28.6 km NW of Rankin Inlet airport, 11.4 km west of WMC camp and 5.9 km south of Meliadine Lake gauge.

Description of Control & Measuring Sections

Natural rock and boulder control.

Wading measurements are made just above last set of rapids. River bed at meas. section consists of small and medium sized boulders.

Prepared by M.K. Jones **Date** Jun. 24, 1997

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 **m, assumed**

Conversion Equation ____________ **to convert to**

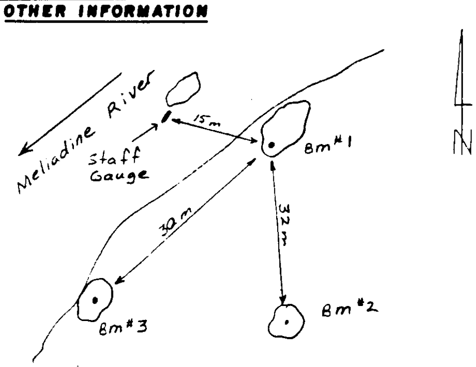
Top of staff 0.657 m

B.m#1 - Red paint on large boulder on left bank about 200 meters upstream of rapids. Elev. 10.000m.

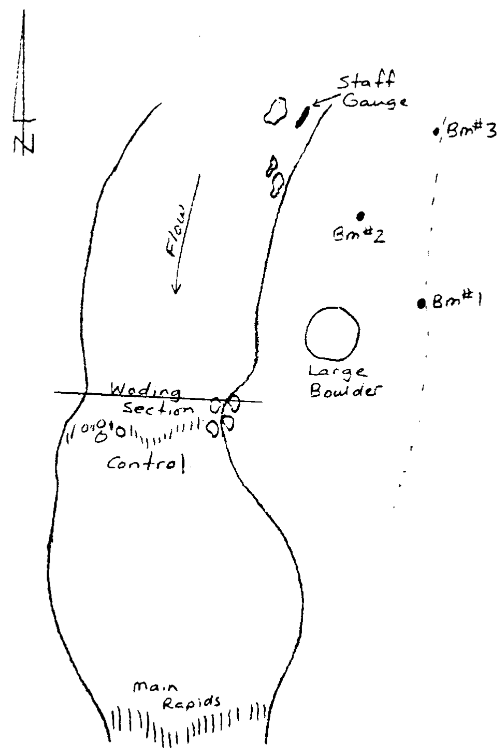
B.m#2 - Red paint mark on boulder 30 m. south of Bm#1. Elev. 11.035m.

Bm#3 - Red paint mark on boulder 32 m. downstream of B.m.#1. Elev. 9.192m.

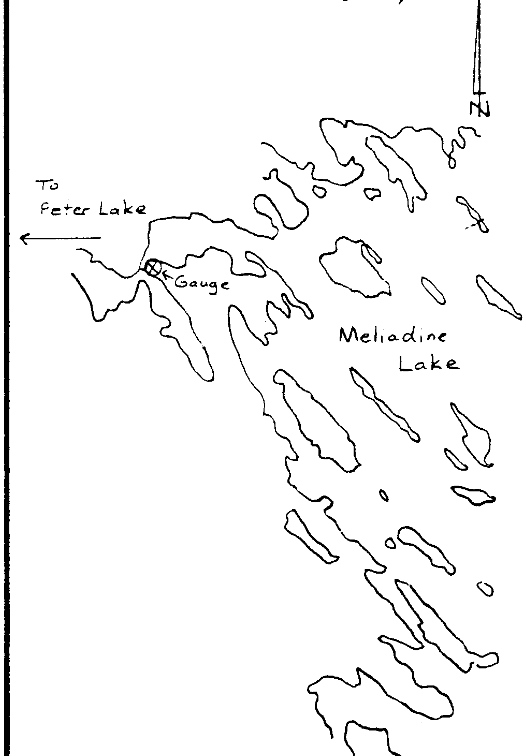
OTHER INFORMATION



AND GAUGING EQUIPMENT.
INDICATE DOCKING AND LANDING AREAS.



SCALE 1:50,000 **MAP** 55 N/1
55 N/2



ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. ______ **Drainage Area.** ______

Station Name West Outlet Meliadine Lake

District NWT

Latitude 63°08'12" **Longitude** 92°31'42" GPS

Established June 22, 1997 **By** R.N. Pilling
M.K. Jones

Description of Gauging Equipment and Location

Staff gauge set in stream bed on left bank about 60 meters above first set of rapids

Gauge is set on left bank at the west outlet of Meliadine Lake 41.8 km NW of Rankin Inlet airport and 22 km NW of WMC camp.

Description of Control & Measuring Sections

Natural rock and boulder control.

Wading measurements are made just above first set of rapids. River bed at meast. section consists of small and medium sized boulders.

Prepared by M.K. Jones **Date** Jun 24, 1997

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 **m. assumed**

Conversion Equation **to convert to**

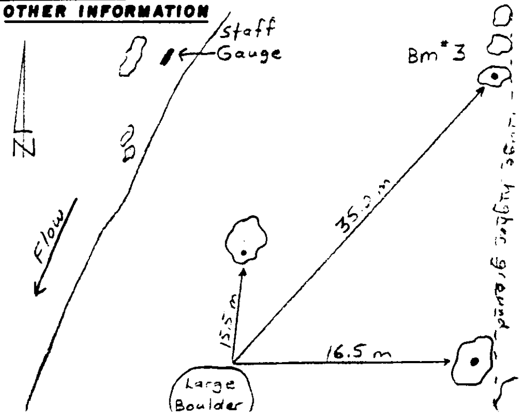
Top of staff 7.641 m

Bm#1 - Red paint on large boulder on left bank 16.5 meters east of huge boulder. Elev 10.000 m

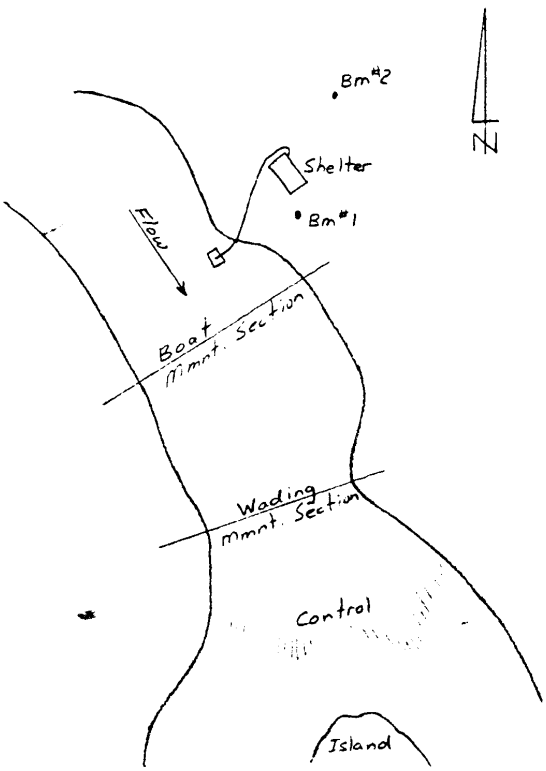
Bm#2 - Red paint on large boulder 15.5 meters north of huge boulder Elev. 8.388 m

Bm.#3 - Red paint on large boulder 35 meters NE of huge boulder Elev. 9.691 m.

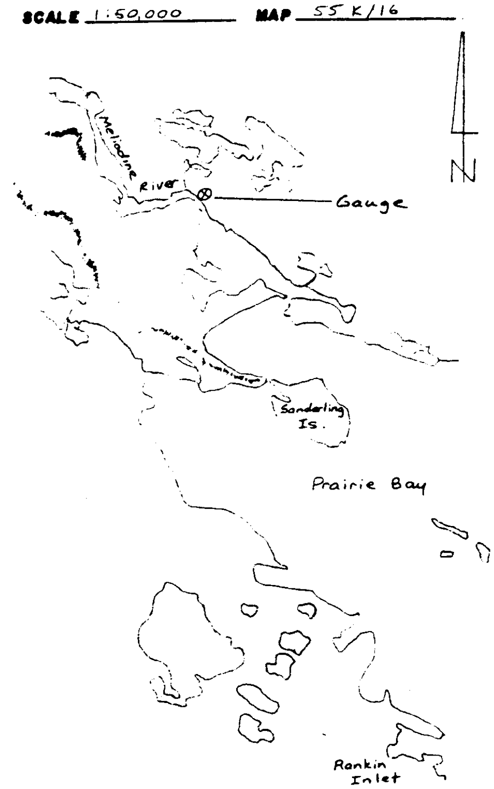
OTHER INFORMATION



AND GAUGING EQUIPMENT.
INDICATE DOCKING AND LANDING AREAS.



SCALE 1:50,000 **MAP** 55 K/16



ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. 06MC001 **Drainage Area.**

Station Name Meliadine River near the Mouth **District** NWT

Latitude 62°52'25" **Longitude** 92°07'14" GPS

Established June 20, 1997 **By** R.N. Pilling, M.K. Jones

Description of Gauging Equipment and Location

Shelter contains Sutron 8210 logger and Tavis pressure transducer.

Boat measurement equipment is stored in the Diana River shelter.

Station is located on the left bank 7.2 km north of Rankin Inlet airport, 1.8 km upstream of the mouth.

Description of Control & Measuring Sections

Channel control with small to medium sized boulders

Boat measurement section at gauge. Wading section about 10 m. below gauge. 7.5 meters is about maxium wading water level.

Prepared by M.K. Jones **Date** Jun. 23, 1997

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 **m, assumed**

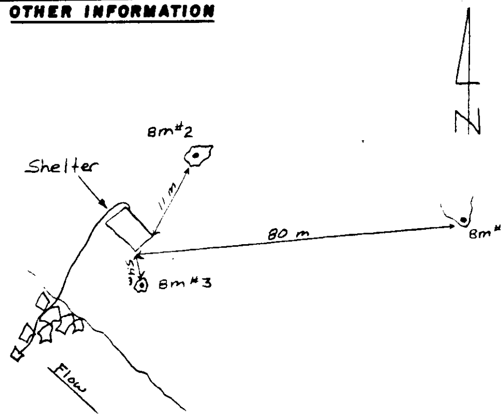
Conversion Equation **to convert to**

B.m#1 - Red paint mark on bedrock outcrop 80 m. east of shelter. Elev. 10.000 m

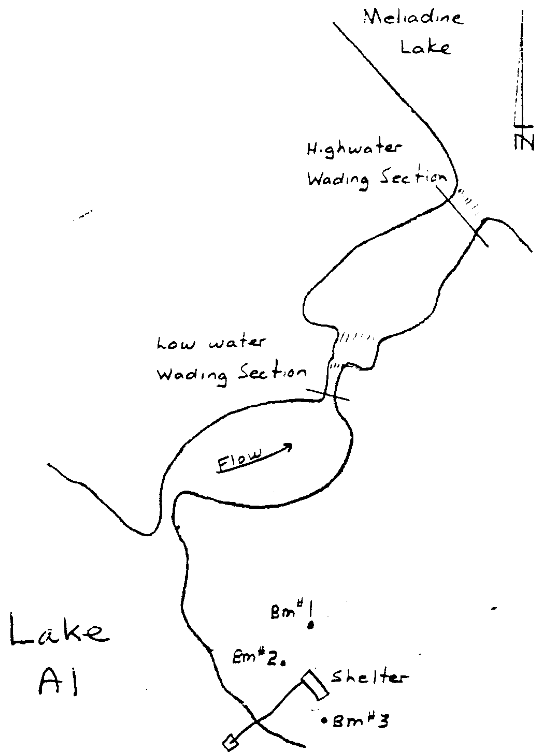
B.m#2 - Red paint mark on large boulder 11 m. NE of shelter Elev. 10.455 m

B.m#3 - Red paint mark on boulder (shoreward 5.4 m. S of shelter. Elev. 8.779 m

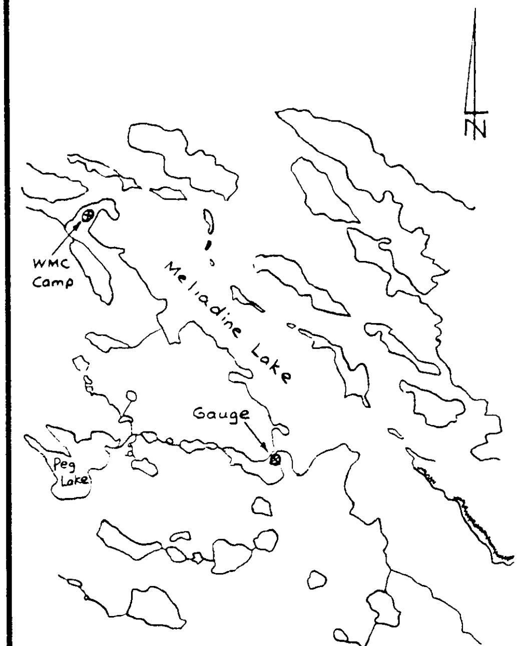
OTHER INFORMATION



AND GAUGING EQUIPMENT·
INDICATE DOCKING AND LANDING AREAS·



SCALE 1:50,000 **MAP** 55 N/1 55 K/16



ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. 06MC003 **Drainage Area**

Station Name A2 Peg Creek near the Mouth

District NWT

Latitude 63° 00' 03" **Longitude** 92° 07' 26" GPS

Established June 20, 1997 **By** R. N. Pilling, M. K. Jones

Description of Gauging Equipment and Location

Shelter contains a Sutron 8210 logger and Tavis pressure transducer.

Station is located on the right bank at the outlet of a small lake 21.2 km north of Rankin Inlet airport, 3.8 km SE of WMC Camp. Meliadine Lake is about 150 meters north of gauge.

Description of Control & Measuring Sections

Channel control consists of till and marsh / moss vegetation with rock stream bed. At low stages flow is contained to one channel. Low stage wading mmnts made at control 55 meters below gauge; medium to high stage wading mmnts. made downstream at the mouth.

Prepared by M. K. Jones **Date** Jun. 24 1997

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 **m, assumed**

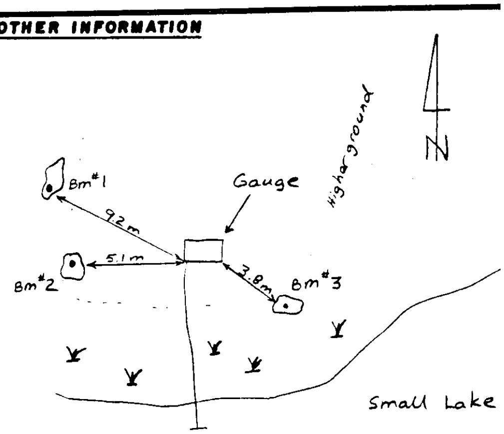
Conversion Equation **to convert to**

Bm#1 - Paint mark on large rock 9.2 meters NW of shelter. Elev. 10.000 m

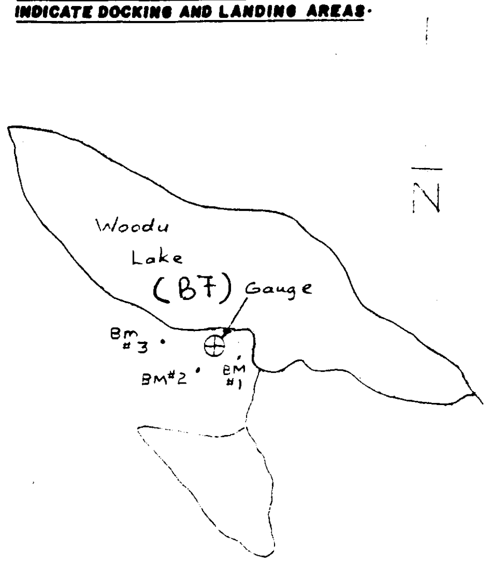
Bm#2 - Paint mark on rock 5.1 meters west of shelter. Elev. 10.146 m

Bm#3 - Paint mark on rock 3.8 meters SE of shelter. Elev. 9.978 m

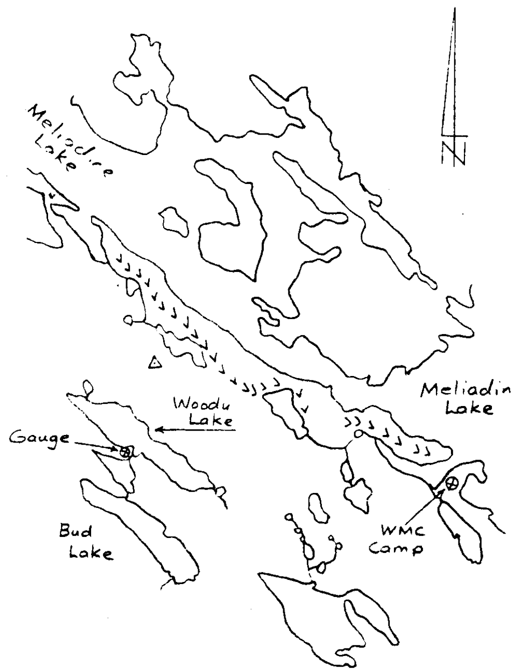
OTHER INFORMATION



SKETCH SHOWING LOCATION OF BENCH MARKS AND GAUGING EQUIPMENT.
INDICATE DOCKING AND LANDING AREAS.



SKETCH OF STATION LOCATION
SCALE 1:50,000 **MAP** 55 N/1



ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. ________ Drainage Area ________

Station Name Outlet of Woody Lake

District NWT

Latitude 63°01'59" Longitude 92°15'06" GPS

Established Jun 7, 1998 By Wade Hanna, D. Fredlund

Description of Gauging Equipment and Location

Shelter contains Sutron 8210 logger and Tavis pressure transducer.

Station is located 29 km northwest of Rankin Inlet airport, 2.4 km west of WMC camp. Gauge is on the south west shore of Woody Lake west of the outlet

Description of Control & Measuring Sections

Channel control consists of till and marsh / moss vegetation with rock streambed.
Wading measurements are made below outlet. Braided channel at high stage

Prepared by M. K. Jones Date Oct 20, 1998

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 m, assumed

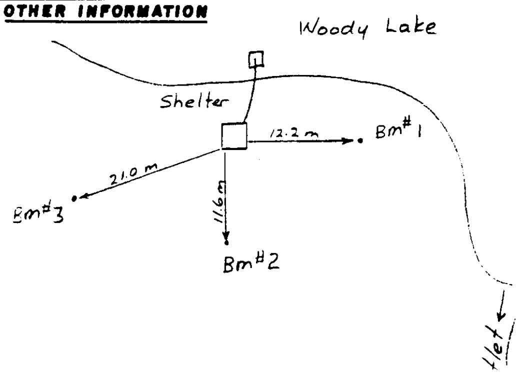
Conversion Equation ________ to convert to ________

B.m.#1 - Red paint on large boulder 12.2 m east of shelter. Elev. 10.000 m

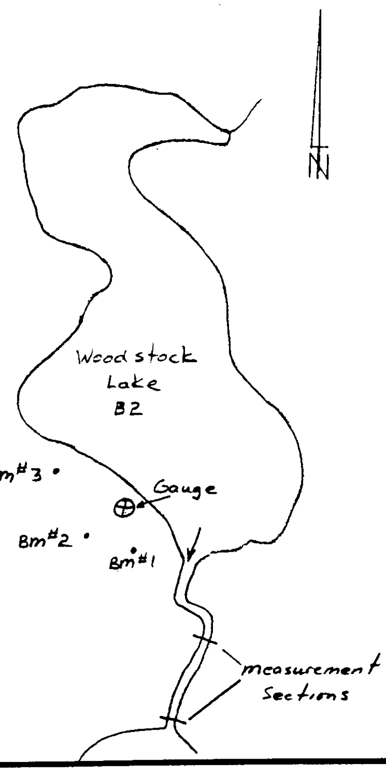
B.m.#2 - Red paint on boulder 11.6 m south of shelter. Elev. 9.577 m

Bm.#3 - Red paint on boulder 21.0 m southwest of shelter. Elev. 10.214 m.

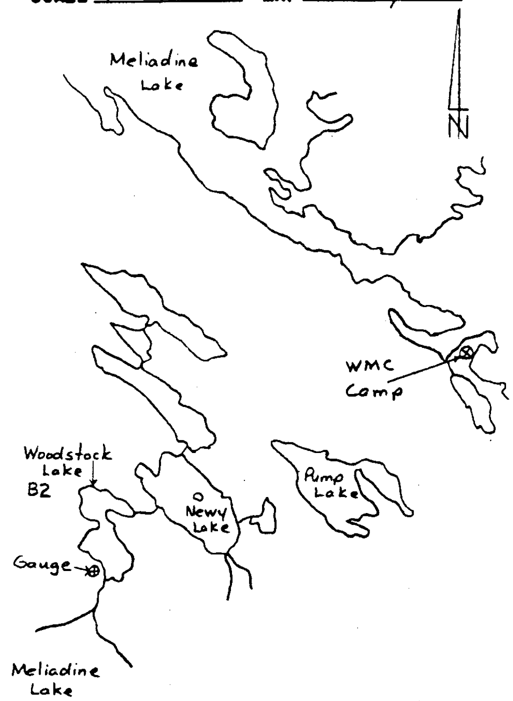
OTHER INFORMATION



SKETCH SHOWING LOCATION OF BENCH MARKS AND GAUGING EQUIPMENT. INDICATE DOCKING AND LANDING AREAS.



SKETCH OF STATION LOCATION
SCALE 1:50,000 **MAP** 55 N/1



ENVIRONMENT CANADA
WATER SURVEY OF CANADA

DESCRIPTION OF STATION

Station No. ______ Drainage Area ______

Station Name Outlet of Lake B2 (Woodstock Lake) District NWT

Latitude 63°00'17" Longitude 92°15'43" GPS

Established Jun. 8, 1998 By Wade Hanna, D. Fredlund

Description of Gauging Equipment and Location

Shelter contains a Sutron 8210 logger and Tavis transducer.

Station is located 23 km northeast of Rankin Inlet airport and 5.6 km southwest of WMC camp. Gauge is on southwest shore and northwest of outlet of Lake B2.

Description of Control & Measuring Sections

Control consists of till and marsh/moss vegetation. At low stages the flow at outlet is contained to one channel. At medium to high stages the low marsh area becomes flooded and multiple flow channels exist.

Prepared by M.K. Jones Date Oct. 20, 1998

ELEVATION OF GAUGE DATUM AND DESCRIPTION OF BENCH MARKS

Elevation of Gauge Datum 0.000 m. assumed

Conversion Equation ______ to convert to ______

BM#1 - Point mark on boulder 22.5 m. south of shelter. Elev. 10.000 m

BM#2 - Paint mark on boulder 24.1 m south-west of shelter. Elev. 10.862 m.

BM#3 - Point mark on boulder 62 m. west of shelter. Elev. 9.634 m.

OTHER INFORMATION