Tyhee NWT Corp

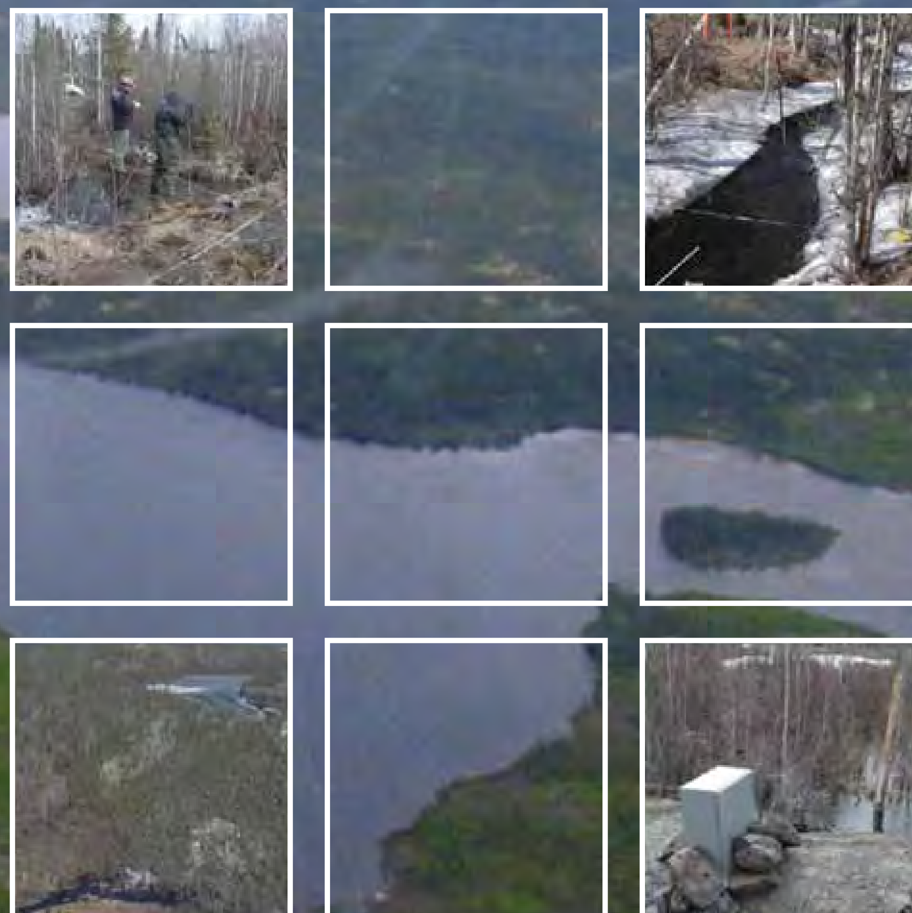
APPENDIX B

APPENDIX B AIR, CLIMATE, HYDROLOGY, NOISE

YELLOWKNIFE GOLD PROJECT

APPENDIX B

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT - FIELD REPORT



February, 2005

Tyhee NWT Corp

Tyhee NWT Corp

APPENDIX B

INITIAL HYDROLOGICAL SURVEY

FOR THE

YELLOWKNIFE GOLD PROJECT – FIELD REPORT

Prepared for:

TYHEE NWT CORP

Prepared by:

HAY & COMPANY CONSULTANTS LTD.
Vancouver, British Columbia

FEBRUARY 2005

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF CONTENTS continued

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

Tyhee NWT Corp is conducting background studies on their Yellowknife Gold Project (YGP) site to assist in developing a mine. The overall project was awarded to EBA Engineering Consultants Limited. Hay and Company Consultants Inc. was subcontracted by EBA to conduct a hydrology study.

Phase 1 of the study consisted of a visit to the YGP site during the spring freshet. The objective was to familiarize Hay and Co personnel with the area, install staff gauges where appropriate and collect stage discharge information on selected creeks during peak freshet flows. Also, strategies to install automated recorders for creek flows were to be determined. Phase 2 consisted of the stage discharge collection at low flows.

The initial field survey occurred from May 19 to through June 2, 2004. An additional field survey was completed on September 30 to October 1, 2004. Six sites were identified for site-specific observations on drainage patterns to gain an overall appreciation of the hydrology of the YGP site. Three sites were chosen for the collection of stage discharge data, due to their hydrological characteristics. A site for the proposed installation of a meteorological station was determined during the initial site visit. This report summarizes the measurements and observations collected in 2004. The level of accuracy of the discharge readings from the measurements taken is ± 10%.

The six hydrometric sites of interest and the hydrological survey objectives are summarized in Section 2.0. The exact locations of the six hydrometric sites of interest are shown on the Figure 1.0. Table 1.1 identifies the survey sites' objectives. Table 1.2 lists the GPS positions for each hydrometric site. Additional site description data are referenced in Appendix A.

Table 1.1
Hydrology Survey Objectives

Survey Sites	Survey Objectives
Site #1	Southwest Narrow Lake, collect flow data, stage-discharge data.
Site #2	Northwest Brien Lake, collect flow data, stage-discharge data.
Site #3	Northeast Narrow Lake, determine if flows exist and in which direction.
Site #4	Between Winter and Round Lake, determine if flows exist and in which direction.
Site #5	Northeast Brien Lake, determine if flows exist and in which direction.
Site #6	Nicholas Lake, collect flow data, stage-discharge data.
Site #7	Meteorological station, record various weather parameters.

Table 1.2
Hydrometric Station Geographic Coordinates

Site #	Site name	Longitude			Latitude		
		o	‘	“	o	‘	“
Site #1	Southwest Narrow Lake	63	9	15.0	113	57	18.4
Site #2	Northwest Brien Lake	63	10	52.3	113	57	54.0
Site #3	Northeast Narrow Lake	63	10	3.8	113	55	51.2
Site #4	Between Winter and Narrow Lake	63	10	22.4	113	54	49.7
Site #5	Northeast Brien Lake	63	11	7.0	113	55	7.1
Site #6	Nicholas Lake	63	15	20.2	113	46	6.7

2.0 HYDROMETRIC SITE DESCRIPTIONS

2.1 Site #1 – Southwest Narrow Lake

The hydrometric station is located on the lake outlet, southwest end of Narrow Lake. Two small creeks exit the lake and both creeks flow into a small pond about 100 m southwest of the lake near the winter road. There is a relatively well-defined channel, approximately 100 m downstream of the pond. The hydrometric station is located about 10 m downstream of the pond **(**Figure 2.1). Downstream of this point there is no well-defined channel and the flow meanders through muskeg and stunted growths of birch and spruce trees. There is no flow during the winter months from October to May, due to the climatic conditions of the YGP area. This region is characterized with long, cold winters and short, cool summers. The freshet typically begins in late May.

2.1.1 Stage Measurements

During the 2004 field program, a staff gauge was installed on May 28, and readings manually recorded four times a day, and/or in conjunction with each discharge measurement made during the survey.

2.1.2 Discharge Measurements

The site survey was completed May 19 to October 1, 2004. A total of 23 discharge measurements were collected from May 28 to October 1, 2004. In the spring collection, a reliable stage discharge curve could not be developed because of the instability of the river channel and the cross sectional area increasing daily, due to ice in the channel melting. The net result was a decreased stage with increased discharge. This is the reverse of a typical stage-discharge relationship. However, the measured discharge readings are accurate and provide data to produce a time history of discharges out of Narrow Lake. Appendix B illustrates the constantly increasing cross sectional area for the creek channel via a series of photos of the creek channel taken over the course of the spring survey.

The creek discharge recorded on May 19, 2004, was observed to be 0 L/s. At this time the creek channel was filled with snow and ice. The first recorded creek flow measurement was completed on May 28, 2004, with a flow of 10 L/s. This flow increased over the next few days to a peak flow on the afternoon of June 2, 2004. From this point on, the flow appears to be slowly reducing; and by June 2, the majority of the snow pack had disappeared, with an estimated < 1% left in the drainage basin.

In the fall collection, September 30 to October 1, 2005, a reliable stage discharge could not be developed, due to low flows and the instability of the cross sectional area, caused by the mud clay bed undercutting the creek banks. This time history is presented in Figure 2.2. Table 2.1 summarizes the measured discharges, times and river stages for this site.

2.2 Site #2 – Northwest Brien Lake

An outlet creek near the northwest end of Brien Lake flows into Shona Lake. The poorly defined creek channel, meanders through a 10 to 100 m wide valley, which is fully vegetated. In much of the wetted area small willows and long grass dominate. Along the entire stretch of the one km creek valley**,** only one possible site was located that would be suitable for a hydrometric station. The approximate location of this site is shown in the site map (Figure 1.0). All of the flows from the upstream valley flow through a 10 m wide bedrock saddle. This was the only section of the creek with a well-defined bed that was clear of vegetation that would enable measurements of velocities. Just upstream was a slight depression in the creek bed, which allowed the water to pool. This provided a good site for locating the staff gauge. Figure 3.1 Photo A shows the discharge measurement site from the air. Figure 3.1 Photo B shows the location of the newly installed staff gauge and stage data logger in the vegetated pond area located approximately 15 m upstream from the discharge measurement station. There was no snow or ice observed in the creek bed, which would cause errors in the stage-discharge relationship.

2.2.1 Stage Measurements

A staff gauge was installed on May 29, 2004, about 15 m upstream from the discharge measurement site. The creek flowed through a stand of birch and long grass but the water surface was quiescent and provided accurate and easily read staff gauge readings measurements. Staff gauge readings were recorded with each discharge measurement.

2.2.2 Discharge Measurements

The field survey was completed May 19 to September 30, 2004. A total of 17 discharge measurements were completed from May 19 to June 2, 2004. Figure 3.2 shows the technicians measuring creek velocities at Site #2 for the discharge computations using area–velocity calculations.

A creek bed composed of bedrock provided a very constant cross section and the lack of ice in the area allowed data to be collected, which was used to generate a stage-discharge curve. The graph and stage-discharge relationships are shown in Figure 3.3. The relationships will not be complete until a full range of stage discharge and flow measurements are obtained.

The measured discharge data collected daily at Site #3 was used to produce Figure 3.4, which is the time history of flow for the outlet creek from Brien Lake over the 2004 field program. It is clear from the graph that flows were decreasing on a daily basis. An estimated 99% of the snow pack had melted, indicating that creek discharges are likely near peak freshet flows for the year.

An inspection was completed at Site #3 on September 30, 2004. It was noted the creek bed was not flowing, and as a result no further measurements were taken at this site. The time, date, recorded stage and discharge for each discharge measurement are summarized in Table 3.1.

2.2.3 Creek Stage Data Logging

A pressure transducer and data logger were installed at Site #2 on May 29, 2004, in proximity to the staff gauge. The system records water pressure over the transducer, which is a measure of the creek stage. Creek water temperatures were also recorded along with a date and time stamp. The system records data every 15 minutes. This is a temporary installation only and will eventually be replaced with a more accurate and permanent system. The data was downloaded on the afternoon of June 2, 2004, near the conclusion of the site survey. The data was processed to produce water levels above the transducer and river water temperature in degrees Celsius. This data is presented in Figure 3.5.

No attempt has been made to convert the creek stages to discharge using a stage-discharge relationship, as this relationship has not yet been fully developed. The creek temperatures are observed to have a diurnal cyclic nature. The water temperature warms up to about 3 degrees Celsius during the day and then cools to less than 1 degree during the evening. The degree of heating or cooling of the creek water is dependent on both the incident solar radiation and the air temperature.

2.3 Site #3 – Between Winter and Narrow Lakes

The purpose of this station was to determine if there was flow and if so, in which direction. By visual inspection it was determined that Winter Lake is about 1 to 2 m higher than Narrow Lake. There is a small creek flowing between the two lakes. The creek channel was approximately 30 cm wide by 15 to 20 cm deep, near the exit of Winter Lake. In most areas the creek bed was still filled with snow and ice, but some small pools of water were observed. Figure 4.1 is an aerial view of the creek. The headwaters of this creek exit Winter Lake about 10 m to the south of the winter road. The creek meanders through a vegetated creek bed until about midway between the two lakes beyond, where it follows the winter road to Narrow Lake along a poorly defined route. The flow from Winter Lake to Narrow Lake was estimated at less than 5 L/s.

2.4 Site #4 – Between Winter and Round Lakes

The purpose of this station was to determine if there was flow, and if so, in which direction. By observation, it was determined that Round Lake was at a higher elevation than Winter Lake. There is flow into Winter Lake along a very diffuse flow path on the north side of the winter road, identified in Figure 5.1. The headwaters of this flow were determined to be a swampy area just to the north of Round Lake. Surface flows were observed draining into this swampy area from the higher ground to the north, but there was no observed surface flow out of Round Lake to the swamp or the creek. There may be subsurface flows out of Round Lake into the swamp and from Round Lake to Winter Lake, but this could not be verified during this survey. Any discharges out of Round Lake would flow down the valley and into Winter Lake.

2.5 Site #5 – Northeast Brien Lake

The purpose of this station was to determine if there was flow between northeast Brien Lake and the small unnamed lake to the northeast, and if so, in which direction. There was no surface flow or defined channel between the two lakes as shown in Figure 6.1. At the southwest end of the unnamed lake there is a 2 to 3 m rise in topography along the shore closest to Brien Lake. This topography makes it impossible for surface flows to leave the small lake and flow into Brien Lake.

2.6 Site #6 – Nicholas Lake

This site is located at the creek exiting the northwest arm of Nicholas Lake. At this point a creek discharges out of Nicholas Lake (Figure 7.1) and flows for about 700 m into a small lake and eventually into Eclipse Lake.

The outflow of Nicholas Lake is a clearly defined channel, approximately 30 cm deep by 1.5 m wide. Large boulders litter the entire valley and upon exiting the lake, the creek bed is filled with large rocks and boulders. Surface flow in the creek disappears under boulders downstream of the gauging site (Figure 7.2 Photo A).

The location for the hydrometric station was found near the outlet of Nicholas Lake.

2.6.1 Stage Measurements

A staff gauge was installed in the centre of the creek on May 31, 2004, and readings were recorded whenever personnel were on site. Figure 7.2 Photo B represents a view of the staff gauge location and the stream discharge gauging location.

2.6.2 Discharge Measurements

The site survey was undertaken from May 19 to September 30, 2004. A total of ten discharge measurements were collected May 29 to June 2, 2004.

A time history of the flows exited Nicholas Lake was generated and is shown on Figure 7.4. At the May spring survey, typical peak flows are in the order of 30 L/s and were assumed to be the peak freshet flows for the year, as there was almost no snowpack left in the area, at the conclusion of the spring survey.

Table 7.1 summarizes the data collected over the period. The data was used to generate a stage-discharge relationship for the site. The data and numerical relationship are presented in Figure 7.3. The relationship is not yet complete, as more data on the middle flow rates is to be collected.

This report has been prepared by:

HAY & COMPANY CONSULTANTS INC.

R E Draho

R.E. Draho, B Sc
Instrumentation Specialist

Reviewed by:

A.G. Chantler

Dr. A.G. Chantler
President

TABLES

Table 2.1

Summary of Discharge Measurements Collected
Site #1 - Southwest Narrow Lake

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Velocity Instrumentation used	Tech[1]	Comments
May 19/04 12:00	Not installed	0.0	inspection	red	iced channel
May 28/04 15:13	0.194	10.2	Swoffer Meter	red	iced channel
May 28/04 15:35	0.200	11.8	Swoffer Meter	red	iced channel
May 28/04 16:15	0.212	16.2	Swoffer Meter	red	iced channel
May 28/04 17:12	0.226	20.4	Swoffer Meter	red	iced channel
May 28/04 18:10	0.238	24.5	Swoffer Meter	red	iced channel
May 29/04 15:52	0.255	70.3	Swoffer Meter	red	iced channel
May 29/04 16:37	0.254	69.5	Swoffer Meter	red	iced channel
May 30/04 16:04	0.138	101.1	Swoffer Meter	red	iced channel
May 30/04 16:50	0.136	99.6	Swoffer Meter	red	iced channel
May 31/04 11:42	0.094	91.1	Swoffer Meter	red	iced channel
May 31/04 11:58	0.094	96.4	Swoffer Meter	red	iced channel
Jun 01/04 10:06	0.076	107.6	Swoffer Meter	red	iced channel
Jun 01/04 10:38	0.075	102.5	Swoffer Meter	red	iced channel
Jun 01/04 17:12	0.073	100.7	Swoffer Meter	red	iced channel
Jun 01/04 17:41	0.073	102.4	Swoffer Meter	red	iced channel
Jun 02/04 11:05	0.066	99.5	Swoffer Meter	red	iced channel
Jun 02/04 11:48	0.066	98.2	Swoffer Meter	red	iced channel
Jun 02/04 14:40	0.068	94.5	Swoffer Meter	be	iced channel
Jun 02/04 15:05	0.068	99.2	Swoffer Meter	red	iced channel
Sep 30/04 15:51	0.147	1.5	Swoffer Meter	red	
Sep 30/04 16:06	0.147	1.6	Swoffer Meter	red	
Oct 01/04 08:05	0.148	1.4	Swoffer Meter	red	
Oct 01/04 08:14	0.148	1.6	Swoffer Meter	red	

1) Technician Initials red - Robert E. Draho (Hay & Company Consultants Inc)
be - Bill Excell (EBA Engineering Consultants Ltd)

Table 3.1

Summary of Discharge Measurements Collected
Site #2 - Northwest Brien Lake

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Velocity Instrumentation used	Tech[1]	Comments
May 19/04 14:00	not installed	0.0	inspection	red	Snow covered creek bed
May 29/04 13:54	0.458	159.9	Swoffer meter	red	Two Bedrock Channels
May 29/04 14:35	0.459	165.3	Swoffer meter	red	Two Bedrock Channels
May 29/04 17:20	0.457	151.9	Swoffer meter	red	Two Bedrock Channels
May 30/04 10:30	0.456	169.6	Swoffer meter	be	Two Bedrock Channels
May 30/04 11:26	0.457	166.1	Swoffer meter	be	Two Bedrock Channels
May 30/04 17:38	0.455	140.5	Swoffer meter	red	Two Bedrock Channels
May 30/04 18:18	0.454	154.4	Swoffer meter	red	Two Bedrock Channels
May 31/04 10:21	0.447	133.6	Swoffer meter	red	Two Bedrock Channels
May 31/04 10:56	0.447	144.8	Swoffer meter	red	Two Bedrock Channels
Jun 01/04 11:24	0.444	132.2	Swoffer meter	red	Two Bedrock Channels
Jun 01/04 12:08	0.444	128.5	Swoffer meter	red	Two Bedrock Channels
Jun 01/04 15:11	0.444	116.7	Swoffer meter	be	Two Bedrock Channels
Jun 01/04 15:50	0.444	117.7	Swoffer meter	red	Two Bedrock Channels
Jun 02/04 09:37	0.436	105.9	Swoffer meter	red	Two Bedrock Channels
Jun 02/04 10:17	0.436	114.8	Swoffer meter	be	Two Bedrock Channels
Jun 02/04 15:53	0.435	99.5	Swoffer meter	red	Two Bedrock Channels
Jun 02/04 16:40	0.435	103.6	Swoffer meter	be	Two Bedrock Channels
Sep 30/04 09:00	n/a	0.0	inspection	red	Two Bedrock Channels

1) Technician Initials red - Robert E. Draho (Hay & Company Consultants Inc)
be - Bill Excell (EBA Engineering Consultants Ltd)

Table 7.1

Summary of Discharge Measurements Collected
Site #6 - Nicholas Lake

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Velocity Instrumentation used	Tech[1]	Comments
19/05/2004 14:00:0(	Not installed	0.0	inspection	be	Ice filled creek bed
May 31/04 15:53	0.470	22.4	Swoffer Meter	be	no ice in creek bed
May 31/04 16:39	0.470	21.0	Swoffer Meter	be	no ice in creek bed
Jun 01/04 14:04	0.478	26.4	Swoffer Meter	be	no ice in creek bed
Jun 01/04 14:26	0.478	22.0	Swoffer Meter	be	no ice in creek bed
Jun 02/04 13:34	0.487	25.5	Swoffer Meter	red	no ice in creek bed
Jun 02/04 13:57	0.487	30.3	Swoffer Meter	be	no ice in creek bed
Sep 30/04 14:26	0.229	10.5	Swoffer Meter	red	no ice in creek bed
Sep 30/04 14:52	0.228	10.4	Swoffer Meter	red	no ice in creek bed
Oct 01/04 08:52	0.231	11.3	Swoffer Meter	red	no ice in creek bed
Oct 01/04 09:02	0.231	11.2	Swoffer Meter	red	no ice in creek bed

1) Technician Initials red - Robert E. Draho (Hay & Company Consultants Inc)
be - Bill Excell (EBA Engineering Consultants Ltd)

FIGURES

HAY & COMPANY CONSULTANTS INC.

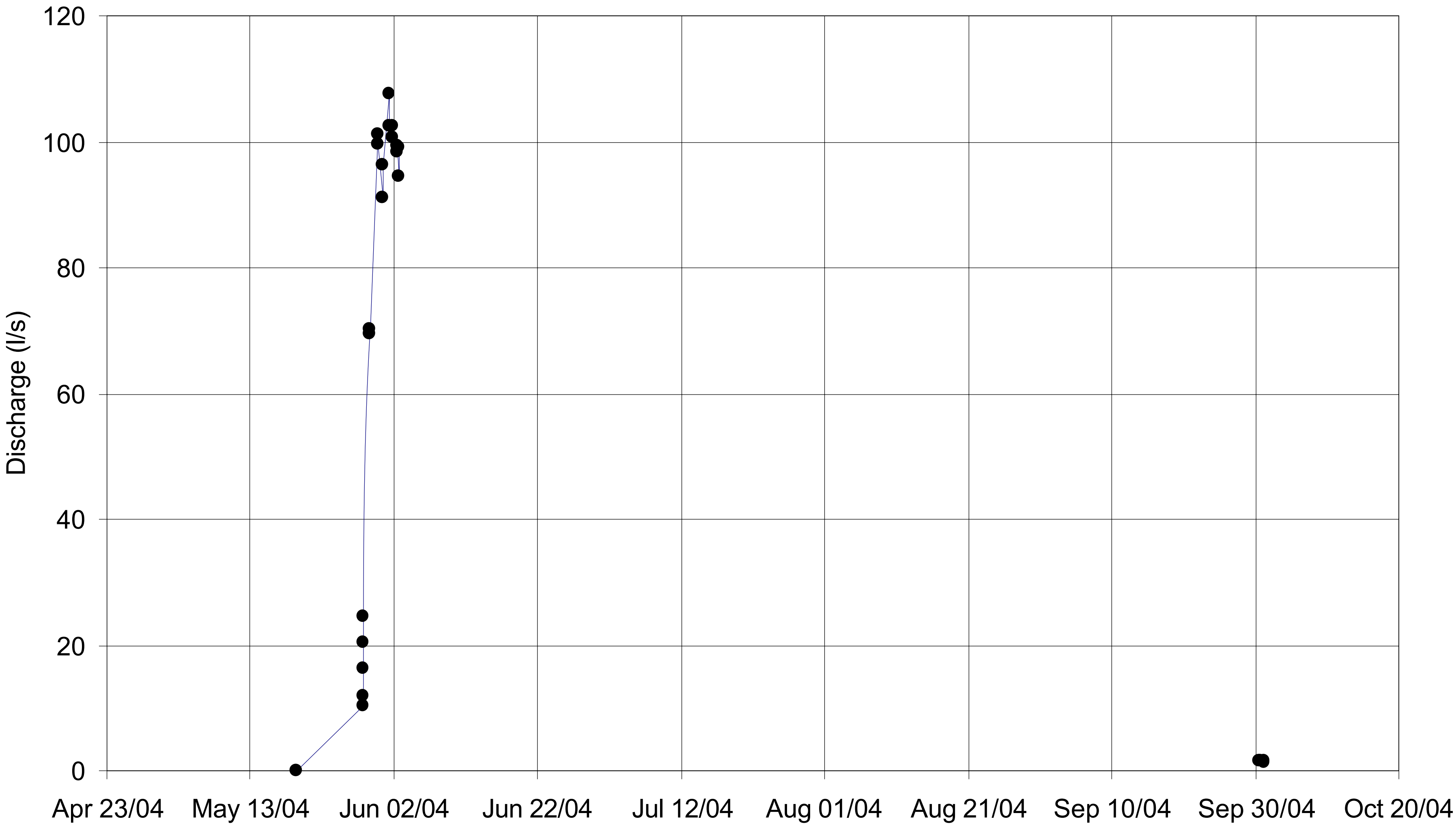
TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #1 - SOUTHWEST NARROW LAKE

FIG 2.1

FILE: I:\Eba-024\Reports\horizontal_figures.ppt



HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROMETRIC SURVEY FOR
THE YELLOWKNIFE GOLD PROJECT

TIME HISTORY OF DISCHARGE
SITE 1 - SOUTHWEST NARROW LAKE

FIG.
2.2

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls

Photo A – Site #2: Reach of creek used for discharge measurements

Photo B – Site #2: Staff gauge and creek stage data logger

HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #2 – NORTHWEST BRIEN LAKE HYDROMETRIC STATION

FIG. 3.1

FILE: I:\Fba.024\Reports\vertical_figures.ppt

HAY & COMPANY CONSULTANTS INC.

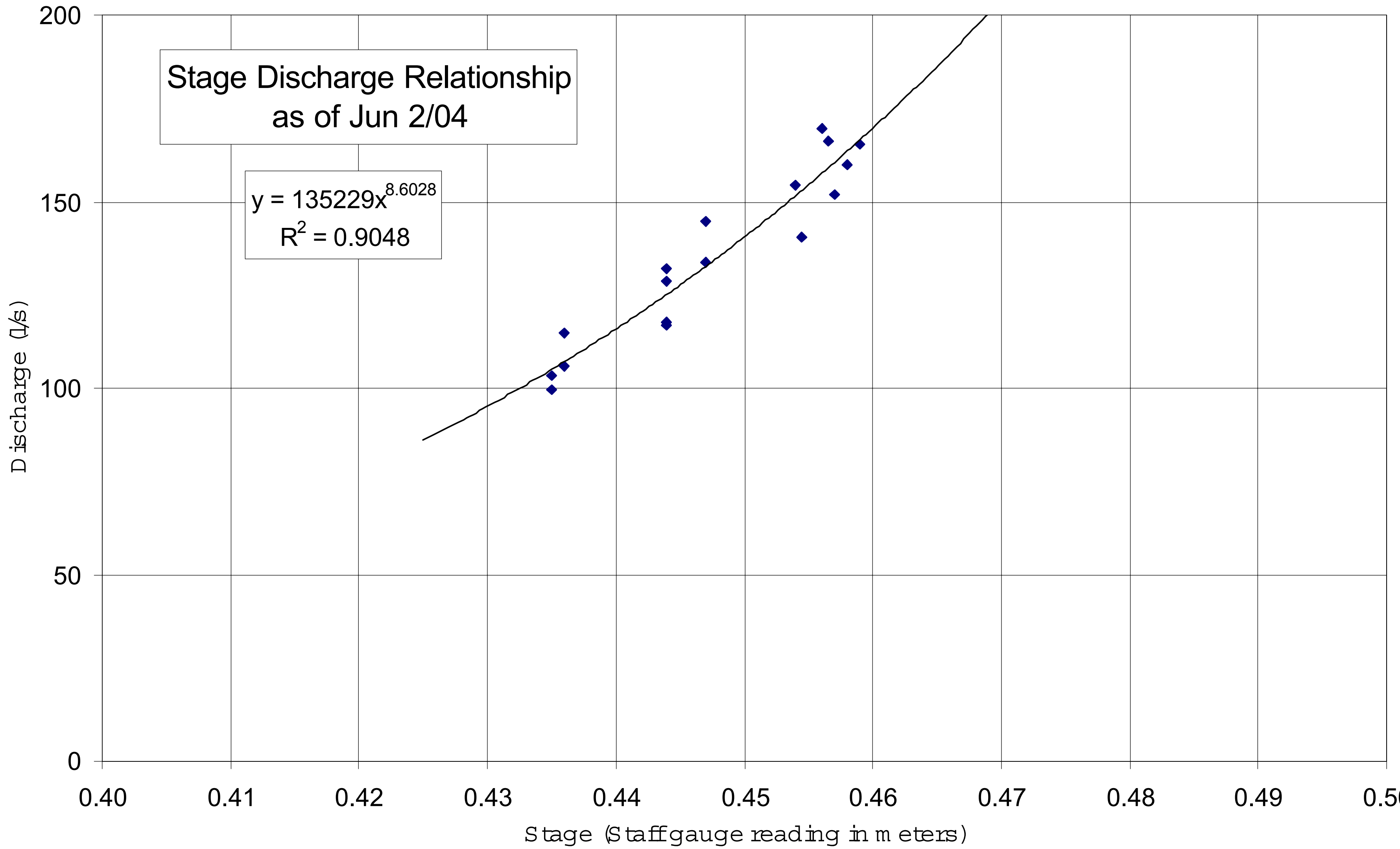
TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

MEASUREMENT OF CREEK DISCHARGE SITE #2 – NORTHWEST BRIEN LAKE

FIG 3.2

FILE: I:\Eba-024\Reports\horizontal_figures.ppt



HAY & COMPANY CONSULTANTS INC.

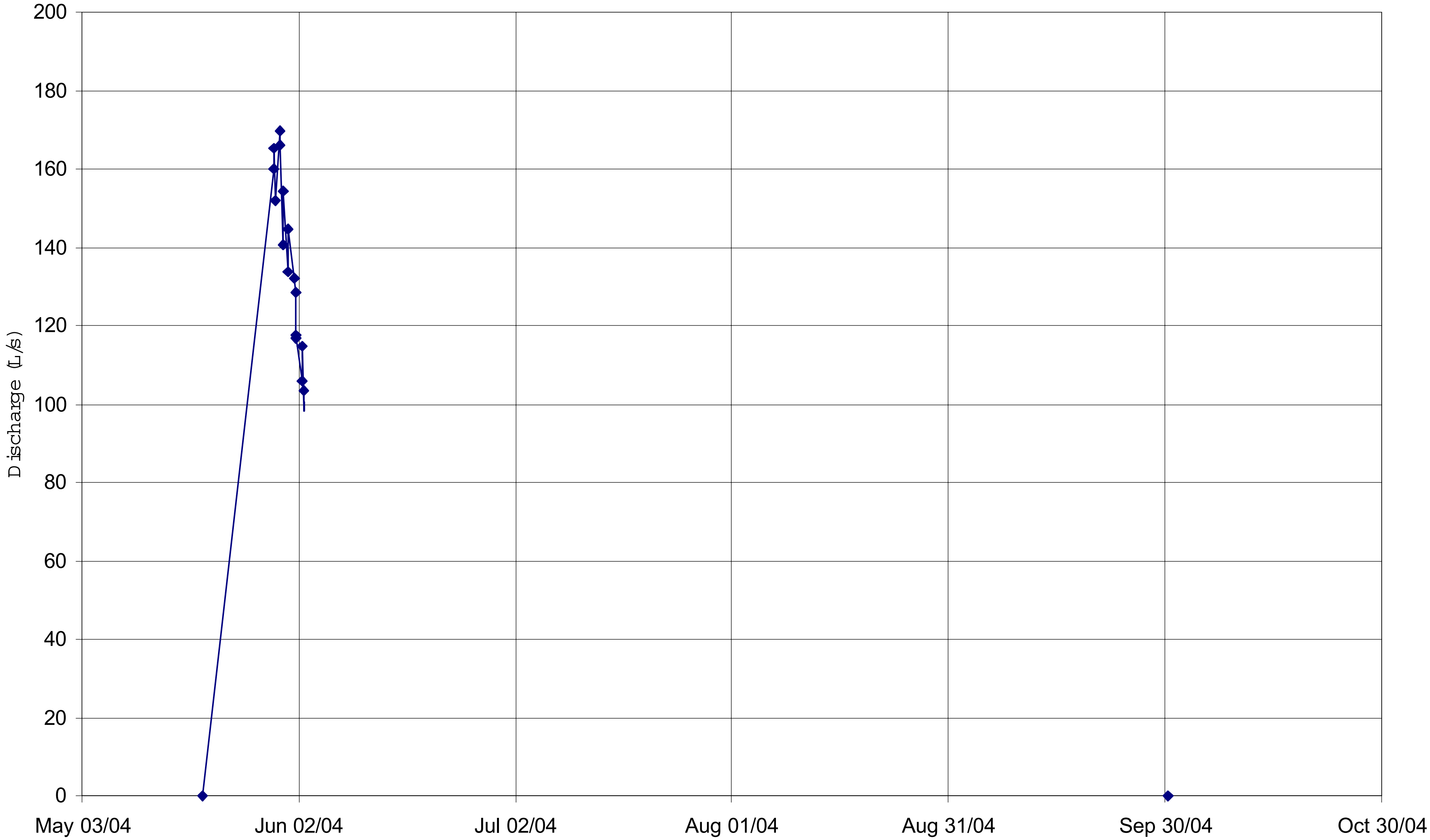
TYHEE NWT CORP

INITIAL HYDROMETRIC SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

STAGE-DISCHARGE RELATIONSHIP FOR SITE 2 - NORTHWEST BRIEN LAKE

FIG. 3.3

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS INC.

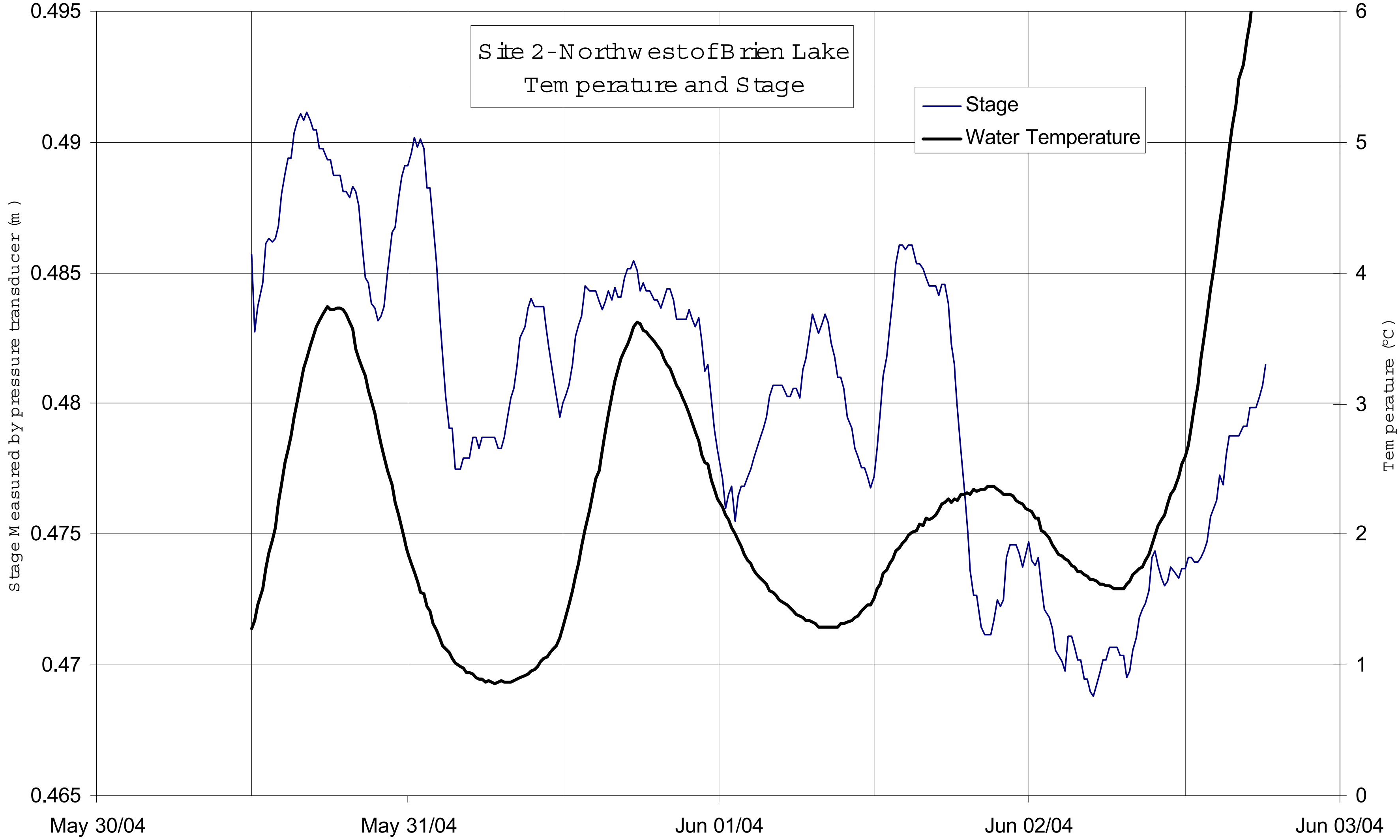
TYHEE NWT CORP

INITIAL HYDROMETRIC SURVEY FOR
THE YELLOWKNIFE GOLD PROJECT

TIME HISTORY OF DISCHARGE
SITE 2 - NORTHWEST BRIEN LAKE

FIG. 3.4

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS INC.

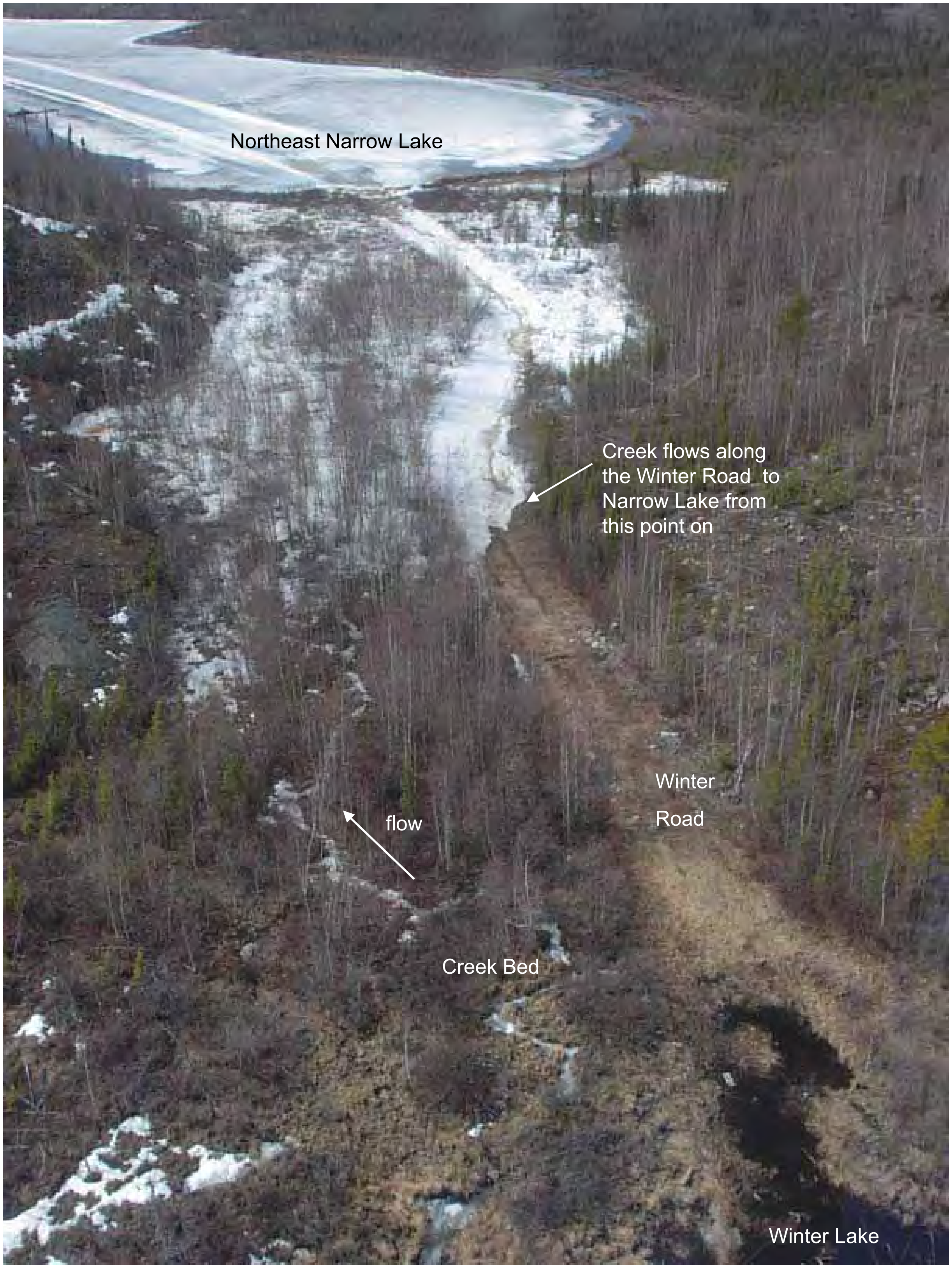
TYHEE NWT CORP

INITIAL HYDROMETRIC SURVEY FOR
THE YELLOWKNIFE GOLD PROJECT

CREEK TEMPERATURE AND
STAGE RECORDED AT SITE 2

FIG.
3.5

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #3 - NORTHEAST NARROW LAKE

FIG. 4.1

HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #4 – BETWEEN WINTER AND ROUND LAKES

FIG 5.1

FILE: I:\Eba-024\Reports\horizontal_figures.ppt

HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #5 - NORTHEAST BRIEN LAKE

FIG 6.1

FILE: I:\Eba-024\Reports\horizontal_figures.ppt

HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #6 - NICHOLAS LAKE

FIG 7.1

FILE: I:\Eba-024\Reports\horizontal_figures.ppt

Photo A – Creek flows from open channel to flow under the rock filled bed

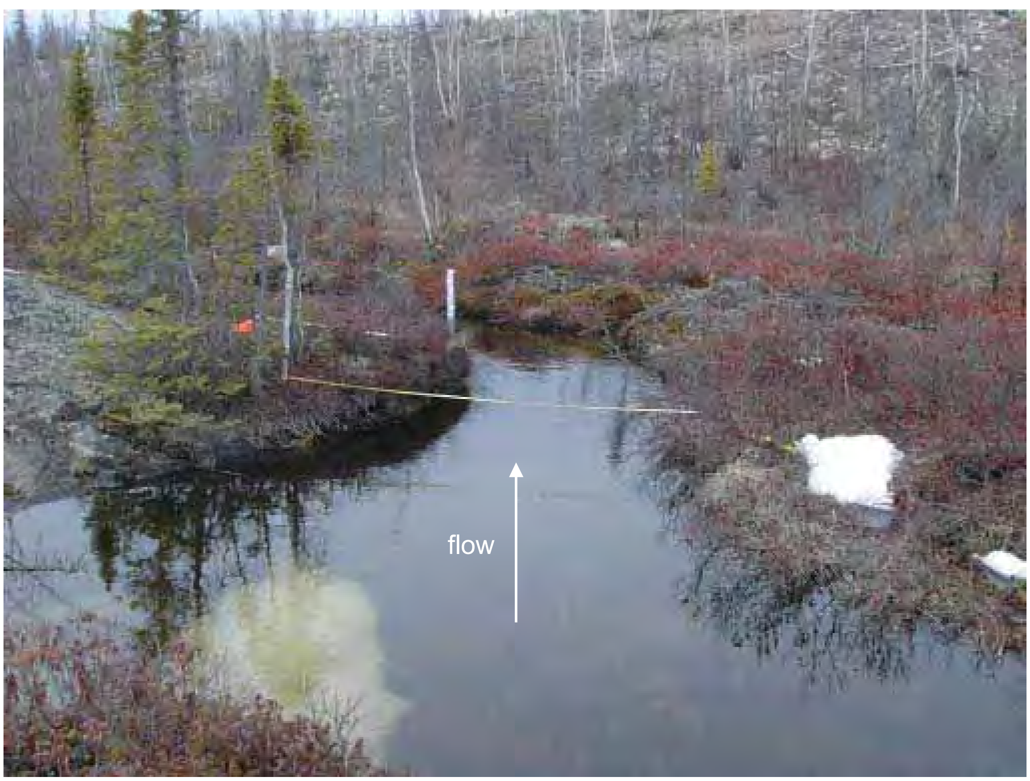


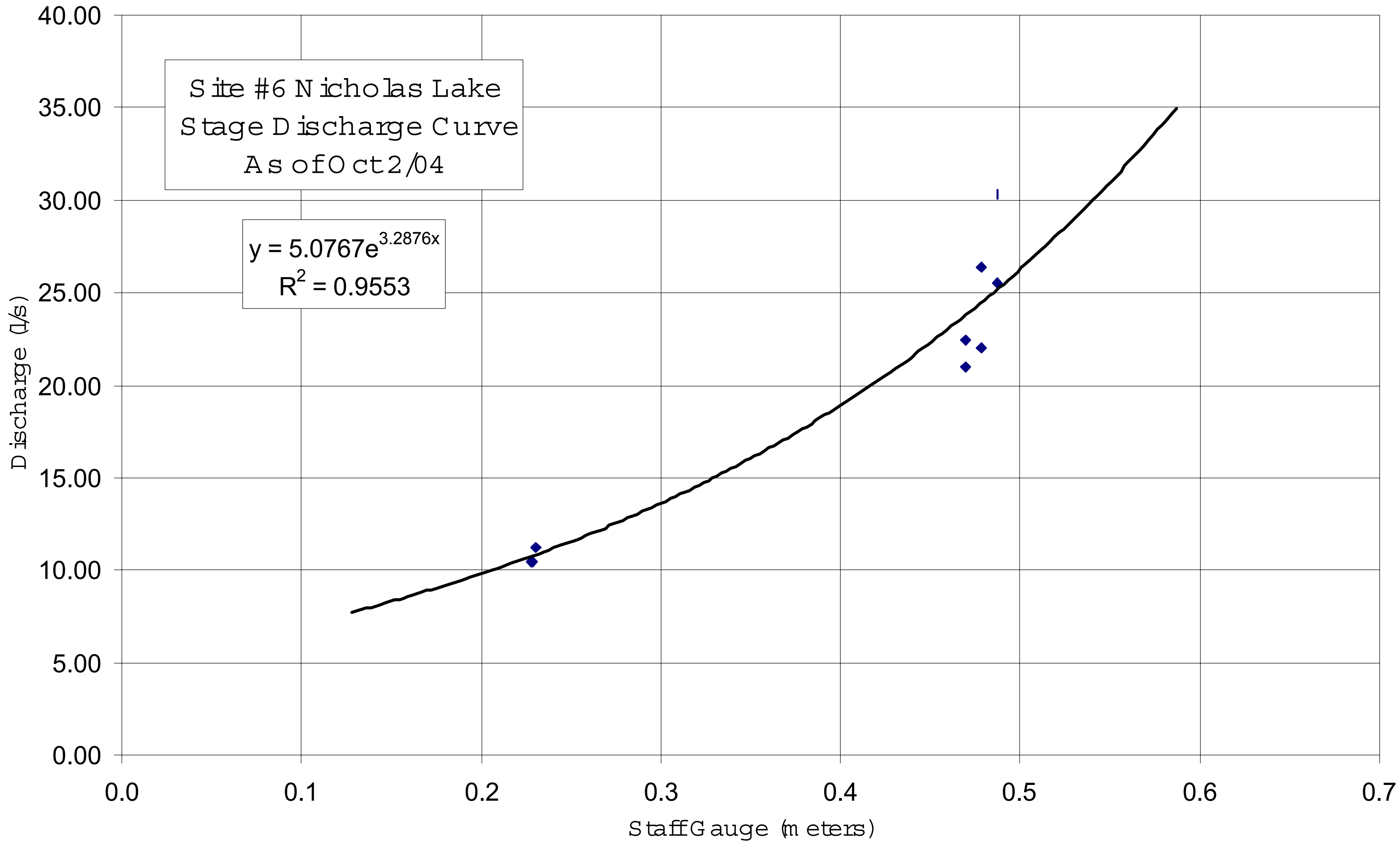
Photo B – Section of creek selected for hydrometric station

HAYCO HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP
INITIAL HYDROLOGICAL SURVEY FOR THE YELLOWKNIFE GOLD PROJECT

SITE #6 – NICHOLAS LAKE DISCHARGE GAUGING STATION

FIG. 7.2



HAY & COMPANY CONSULTANTS INC.

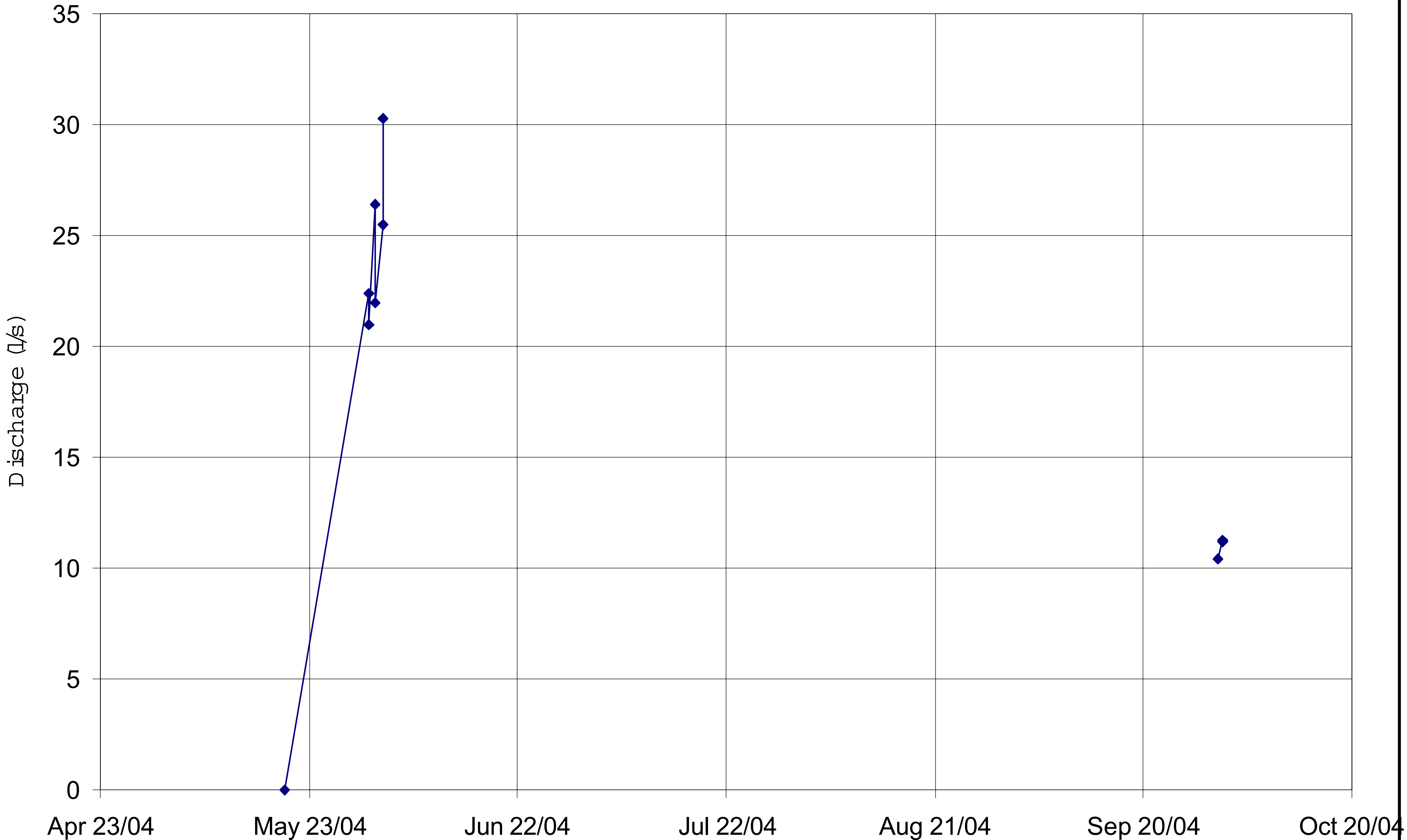
TYHEE NWT CORP

INITIAL HYDROMETRIC SURVEY FOR
THE YELLOWKNIFE GOLD PROJECT

STAGE DISCHARGE RELATIONSHIP FOR
SITE 6 - NICHOLAS LAKE

FIG.
7.3

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS INC.

TYHEE NWT CORP

INITIAL HYDROMETRIC SURVEY FOR
THE YELLOWKNIFE GOLD PROJECT

TIME HISTORY OF DISCHARGE
SITE 6 - NICHOLAS LAKE

FIG.
7.4

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls

APPENDIX A

SITE DESCRIPTIONS

Site Identification: Site: #1 Name: Southwest Narrow Lake

Site GPS Coordinates: 113° 57′ 18.4″ West Longitude 63° 9′ 15.0″ North Latitude

Site Location:

The station is located on the southwest end of Narrow Lake. It is about 10 m north of the winter road at the junction of the creek with the road. There are two small creeks, which flow out of Narrow Lake. Both creeks enter a small pond. A single creek flows out of this pond and for the first 50 m the flow is along a well-defined channel. Hydrometric Site #1 is located in this channel about 10 m downstream of the pond.

Description:

Two creeks flow southwest from Narrow Lake and merge again into a small pond. The creek flows out of the southwest side of the pond. The creek bed is about 0.5 m below the typical bank elevation and is typically about 1 to 3 m in width. After approximately 100 m of defined creek channel, the channel disappears. The creek flow is diffuse in nature and in general meanders through stunted growth of birch, pine trees, willow shrubs and long grass.

Instrumentation:

A hydrometric station is to be installed at this site. The station will include a continuous recording river stage logger and water level and temperature sensor. A staff gauge and creek flow gauging station has been located near the proposed logger site.

Specifics on Measurements:

_______ m sea level, benchmark elevation at the site (assumed)

_______ m sea level, elevation of zero reading on staff gauge (assumed)

_______ m difference in elevation from BM to staff gauge zero reading

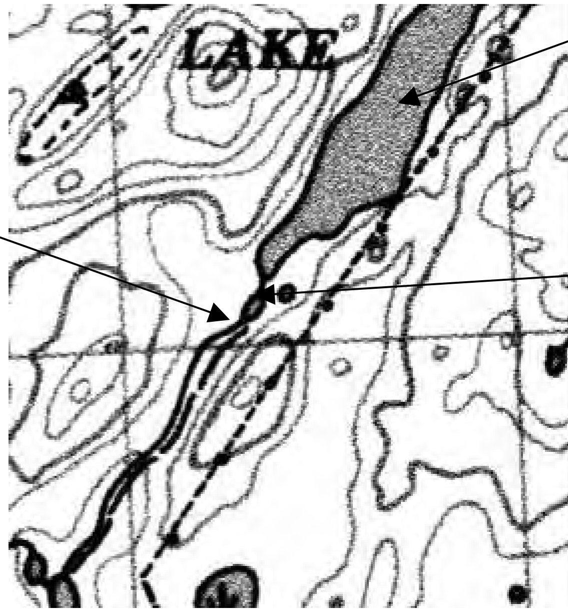
_______ m difference in elevation from BM to the pressure transducer

_______ m/mV calibration slope for transducer serial number_________

_______ m offset on transducer calibration to record the same as the staff gauge

_______ m transducer elevation relative to zero on the staff gauge

Map of Site #1:



Photograph of the site: View upstream to the northeast to Narrow Lake

Site Identification: Site: #2 Name: Northwest of Brien Lake

Site GPS Coordinates: 113° 57' 54.0" West Longitude 63° 10' 52.3" North Latitude

Site Location:

The site is located along the creek connecting Brien Lake to Shona Lake about 1 km downstream of the creek headwaters at Brien Lake. This was the only location along the entire valley where the creek was observed to flow in a confined channel.

Description:

The creek meanders through a 30 to 100 m wide fully vegetated valley. A small lake is located about 200 m along the valley from Brien Lake to Shona Lake. The hydrometric station is located a further 300 m downstream from this small lake. A bedrock saddle confines the typically diffuse creek flow through a narrow well-defined section. This section is the site of the hydrometric station.

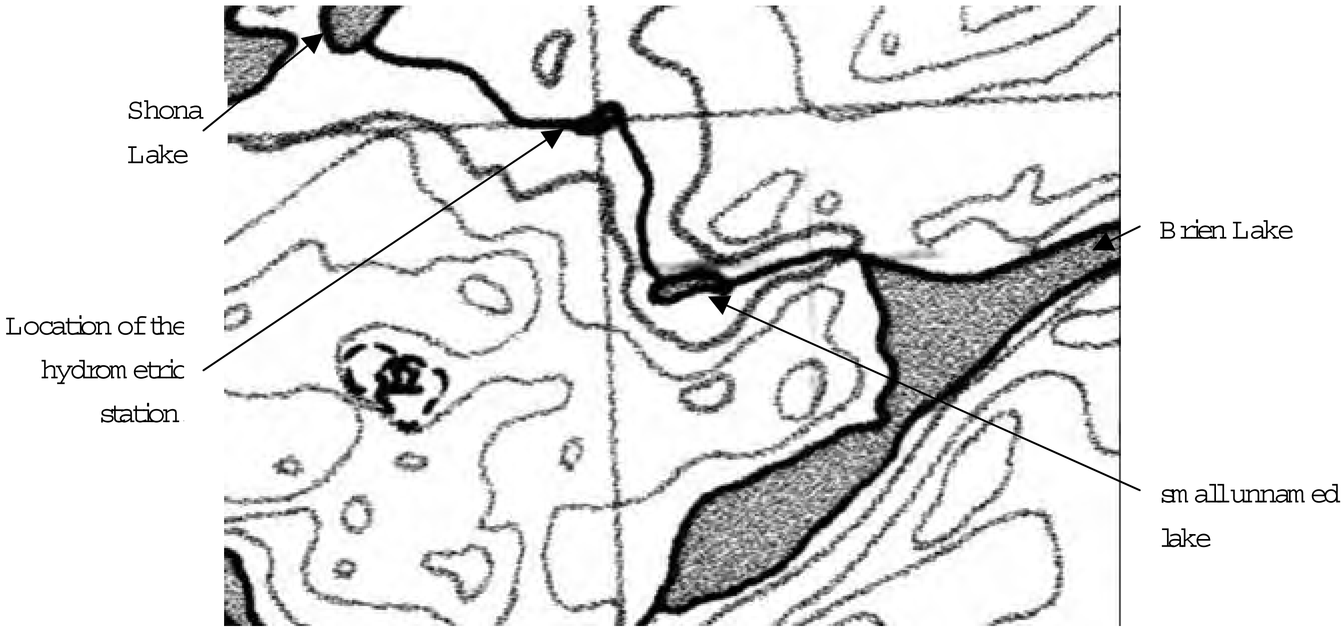
Instrumentation:

A hydrometric station is to be installed at this site. The station will include a continuous recording river stage logger and water level and temperature sensor. A staff gauge and creek flow gauging station are located near the logger.

Specifics on Measurements:

________ m sea level, benchmark elevation at the site (assumed)
________ m sea level, elevation of zero reading on staff gauge (assumed)
________ m difference in elevation from BM to staff gauge zero reading
________ m difference in elevation from BM to the pressure transducer
________ m/mV calibration slope for transducer serial number ________
________ m offset on transducer calibration to record the same as the staff gauge
________ m transducer elevation relative to zero on the staff gauge

Map of Site #2



Photograph of Site #2: View looking southeast along creek from Brien Lake to Shona Lake.

Site Identification: Site: #3 Name: Northeast Narrow Lake

Site GPS Coordinates: 113° 55' 51.2" West Longitude 63° 10' 3.6" North Latitude

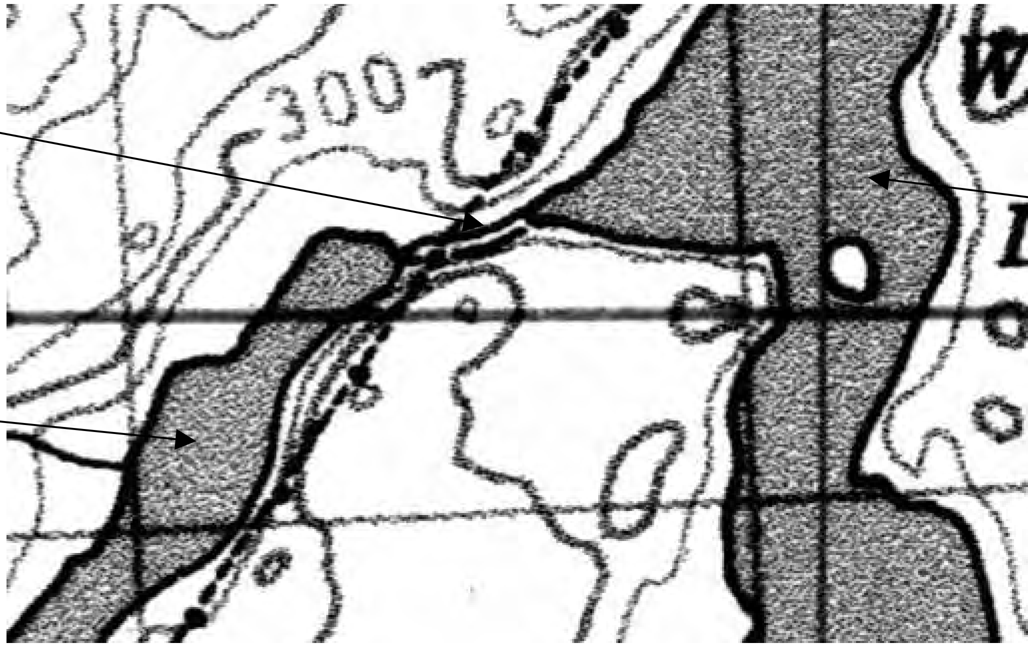
Site Location:
The site is located between Narrow Lake to the southwest and Winter Lake to the northeast.

Description:
The two lakes are separated by approximately 300 m of dry land. During the winter months, an ice road passes over this section of land from Winter Lake to Narrow Lake. There is an obvious stream bed visible with the headwaters at Winter Lake. The creek flows along the south side of the winter road for about half the distance between the two lakes. The rest of the way the creek flows diffusely down the winter road and discharges to Narrow Lake.

Instrumentation:
No instrumentation is required for this site. It was required only to determine that there is flow from Winter Lake to Narrow Lake.

Specifics on Measurements:
No hydrometric station is to be installed at this site

Map of Site #3:



Photograph of Site #3: View from Winter Lake looking southwest across site to Narrow Lake

Site Identification: Site: #4 Name: Between Winter and Round Lakes

Site GPS Coordinates: 113° 54' 49.7" West Longitude 63° 10' 22.4" North Latitude

Site Location:

The site is located between Winter Lake to the southwest and Round Lake to the east.

Description:

The two lakes are separated by approximately 300 m of dry land. During the winter months, the ice road passes over this section of land from Winter Lake to Round Lake. There was no evidence of surface flows out of Round Lake. However drainage in the area flowed southwest towards Winter Lake.

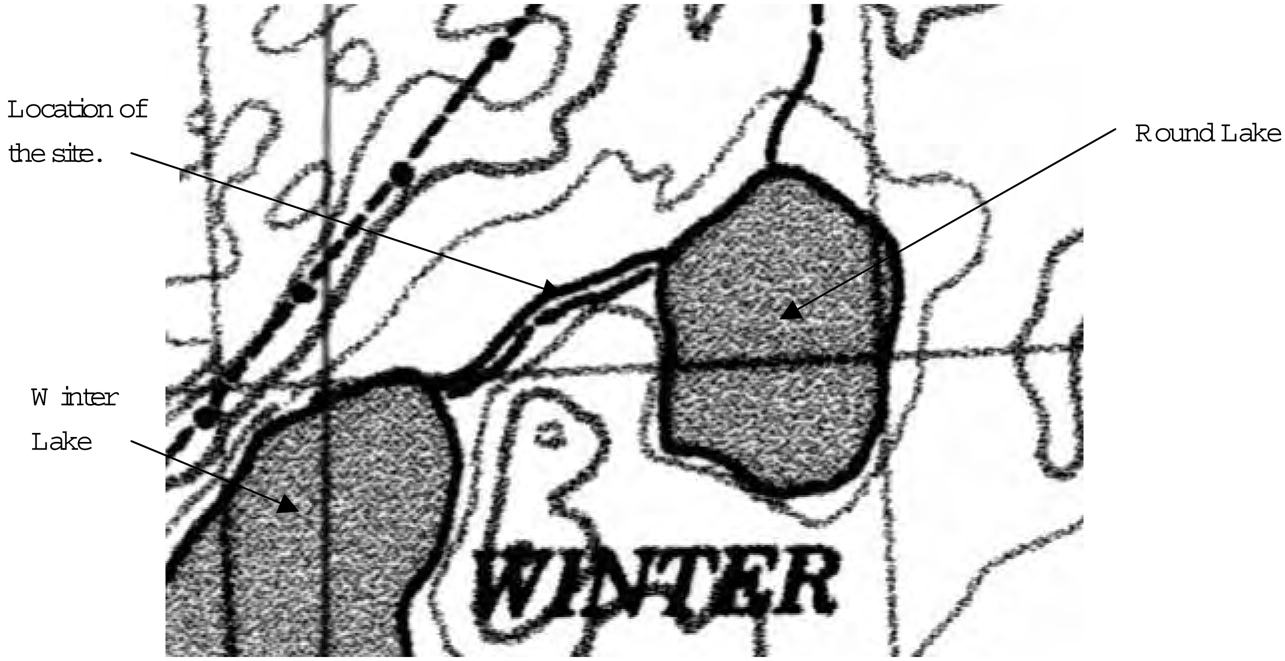
Instrumentation:

No instrumentation is required for this site. It was required only to determine if there was flow from Round Lake to Winter Lake.

Specifics on Measurements:

No hydrometric station is to be installed at this site

Map of Site #4:



Photograph of Site #4: View from Round Lake southwest across site to Winter Lake

Site Identification: Site: #5 Name: Northeast Brien Lake

Site GPS Coordinates: 113° 55' 7.1" West Longitude 63° 11' 7" North Latitude

Site Location:

The site is located between Brien Lake to the southwest and a small unnamed lake to the northeast in the vicinity of the mine waste area.

Description:

The two lakes are separated by approximately 300 m of dry land. There is no obvious surface flow path between the two lakes.

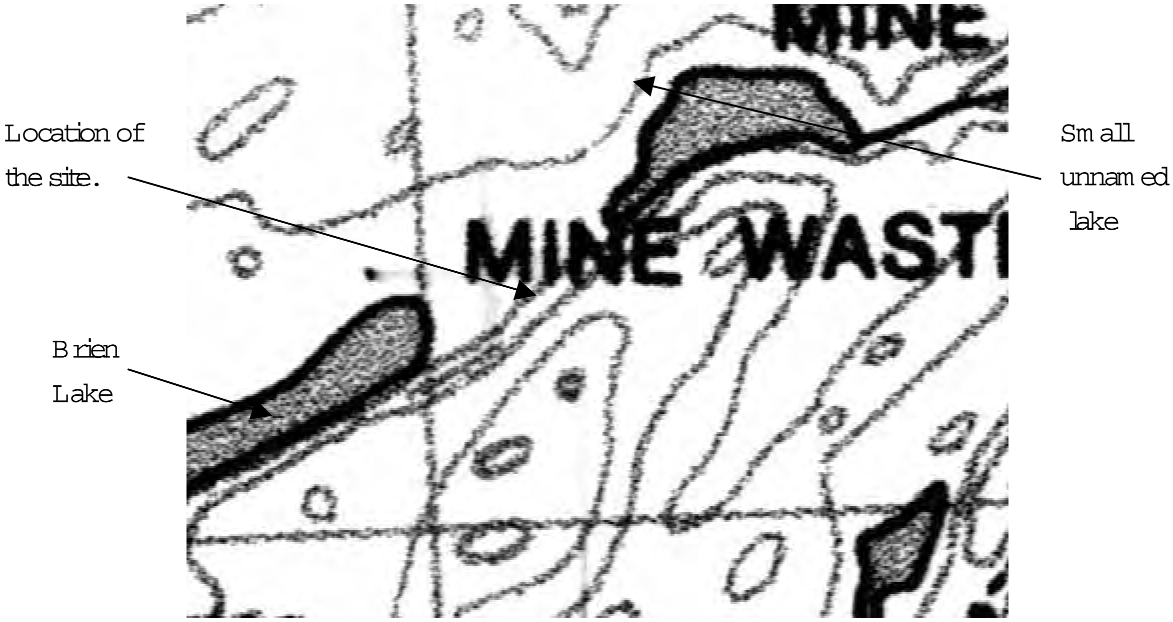
Instrumentation:

No instrumentation is required for this site. It was required only to determine if there is water flow between the two lakes and, if so, in which direction. There is an estimated 2 m shoreline rise at the southwest end of the unnamed lake that would prevent any surface flow from travelling down to Brien Lake. If flow exists between the two lakes, it must be subsurface.

Specifics on Measurements:

No hydrometric station is to be installed at this site.

Map of Site #5:



Photograph of Site #5: View northeast from Brien Lake looking over the site.

Site Identification: Site: #6 Name: Nicholas Lake

Site GPS Coordinates: 113° 46' 6.7" West Longitude 63° 15' 20.2" North Latitude

Site Location:
The site is located at the western end of the Northwest arm of Nicholas Lake about 10 m downstream from the creek headwaters at Nicholas Lake.

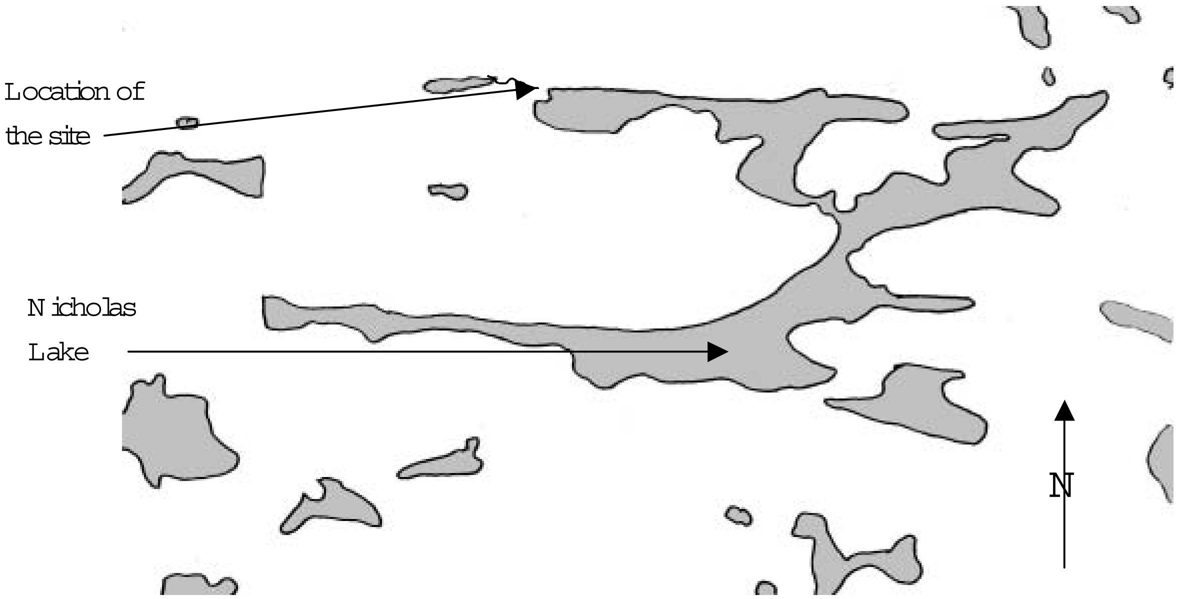
Description:
The creek exits Nicholas Lake in a well-defined bedrock channel. Within 20 m of the lake large boulders begin to occupy the stream bed. Within 100 m of the creek headwaters boulders almost completely fill the creek channel restricting the area for flow, which is around and under the numerous boulders. There are only small areas where the flow is visible under the rock-filled channel. This rock-filled channel extends the rest of the length of the creek. The discharge gauging station and staff gauge are located about 10 m downstream of the creek headwaters at Nicholas Lake, in the open and well-defined channel.

Instrumentation:
A hydrometric station is to be installed at this site. The station will include a continuous recording river stage logger, with water level and temperature sensors. A staff gauge and creek discharge gauging station have been located near the proposed logger site.

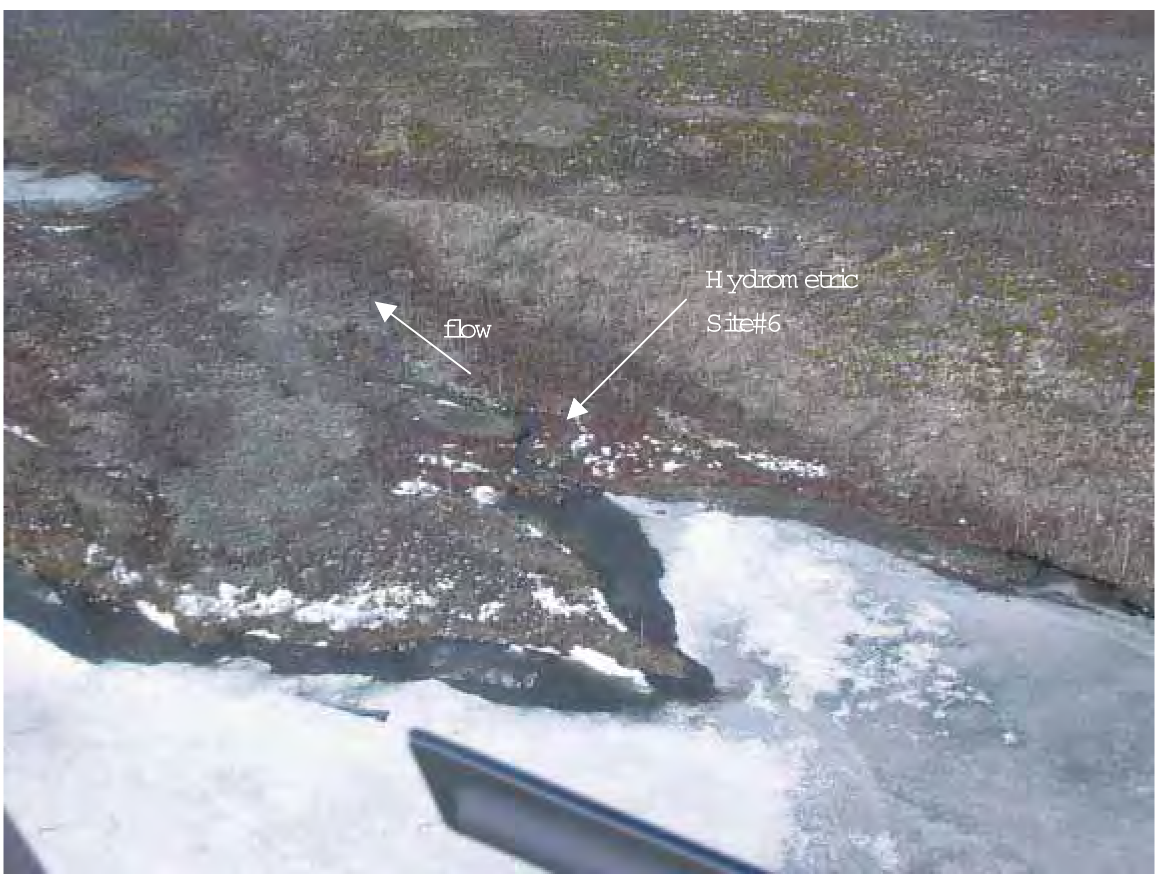
Specifics on Measurements:

_______ m sea level, benchmark elevation at the site (assumed)
_______ m sea level, elevation of zero reading on staff gauge (assumed)
_______ m difference in elevation from BM to staff gauge zero reading
_______ m difference in elevation from BM to the pressure transducer
_______ m/mV calibration slope for transducer serial number_________
_______ m offset on transducer calibration to record the same as the staff gauge
_______ m transducer elevation relative to zero on the staff gauge

Map of Site #6:



Photograph of Site #6: View from Nicholas Lake northwest across site.



APPENDIX B

EVOLUTION OF AN ICED CREEK BED DURING FRESHET
SITE #1 – SOUTHWEST NARROW LAKE

Evolution of an Iced Creek Bed at Site #1 During Freshet

PART 1/2

May 28/04 – Right Photo

Narrow rectangular flow channel cut through ice. 30 cm wide by 20 cm deep.

May 19/04 - Photo above

Snow covered creek channel Observed some 6 cm slush under 20 cm of snow cover.

May 29/04 – Photo to Left

Channel has widened but channel is still bordered by ice. Some undercutting of ice banks by flow.

May 30/04 – Right Photo

Channel has widened with further undercutting of ice bank. Flow still surrounded by ice.

May 31/04 – Photo Below

Channel has widened with further undercutting of ice/permafrost banks. Channel now has a gravel bed.

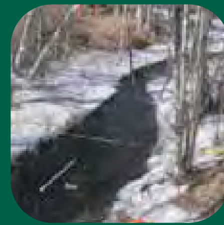
June 1/04 – Photo Below

Channel has widened furthermore undercutting of ice/permafrost bank. Creek bed is gravel with no ice.

Evolution of an Iced Creek Bed at Site #1 During Freshet

PART 2/2

Tyhee NWT Corp

YELLOWKNIFE GOLD PROJECT

2005 HYDROLOGY AND METEOROLOGY REPORT

May 2006

CREATING AND DELIVERING BETTER SOLUTIONS

HAYCO

eba

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT

2005 Hydrology and Meteorology Report

May 2006

HAY & COMPANY CONSULTANTS
Suite 900, 1066 W Hastings St.
Vancouver, BC V6E 3X2
www.hayco.com

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

1 INTRODUCTION

Tyhee NWT Corp. (Tyhee) is conducting baseline environmental studies on its Yellowknife Gold Project site to assist in developing a new mine in the area. In 2004, EBA Engineering Consultants Ltd. (EBA) was retained by Tyhee to undertake the necessary baseline environmental study program. Hay and Company Consultants, a division of EBA, conducted the hydrology and meteorology components of the overall study program for the Yellowknife Gold Project.

Phase 1 of this study, conducted during the summer of 2004, consisted of a visit to the Yellowknife Gold Project site and was timed for the start of the spring freshet. The objectives were to become familiar with the area, install staff gauges where appropriate, and collect stage discharge information on selected creeks during peak freshet flows. In addition, methods to automate the collection of creek flows were determined.

The initial field survey was conducted between May 28, 2004 and June 2, 2004. Over this period, stage discharge data were collected at three of the six sites of interest. The remaining sites were observed with respect to drainage patterns, to gain an overall appreciation of the hydrology of the area. A site for the proposed installation of a meteorological station was determined during this preliminary site visit.

The six hydrometric sites and the meteorological station site are summarized below, as well as the main objective for each station. Figure 1.0 is a site location map and shows a portion of a 1:50,000 scale topographic map of the area on which the sites are indicated. Table 1.1 lists the global positioning system (GPS) positions for each hydrometric site and the meteorological station.

- Site #1 – Narrow Lake Outlet, collect flow data, stage-discharge data.
- Site #2 – Brien Lake Outlet, collect flow data, stage-discharge data.
- Site #3 – Winter Lake Outlet, collect flow data, stage-discharge data.
- Site #4 – Round Lake Outlet, collect flow data, stage-discharge data.
- Site #5 – Northeast Brien Lake, determine if flows exist and in which direction
- Site #6 – Nicholas Lake Outlet, collect flow data, stage-discharge data.
- Site #7 – Meteorological station, record pertinent weather parameters.

Further detailed information on these seven sites is provided in the site description documents included in Appendix A. Section 2 of this report presents the hydrological component of the baseline study program while Section 3 discusses the meteorological component of the study program.

2 HYDROLOGY

2.1 Methodology

To gain an understanding of the hydrological conditions present in the Yellowknife Gold Project study area, hydrometric stations were installed at the six specific sites identified above. For each hydrometric station, a standard methodology was employed to determine time history of discharge. First an appropriate hydrometric site was chosen, which represented all of the flow out of the specific drainage basin. A staff gauge was installed to enable the manual recording of water surface elevations. The pressure transducer, data logger instrumentation and protective housing were installed in the creek. Each time hydrological personnel were at site, creek velocity data were recorded to enable the development of a stage discharge relationship.

To develop a stage-discharge rating curve, the most common and precise practice is to measure stream flow and stage simultaneously. The data points are plotted on a graph relating stream stage to discharge. The stage-discharge function is developed as the best-fit curve through the observed stage-discharge measurements. The stages recorded by the data logger are used in the stage-discharge relationship to determine creek discharge.

A second method used to record creek time histories of discharge, was achieved through the installation of a Parshall flume. This structure is installed in the creek so that all flow passes through it. The flume has a unique design that enables the determination of creek discharge by measuring the depth of flowing water in the upstream part of the flume by using the factory calibration relationship.

2.2 Outlet of Narrow Lake (Site #1)

Narrow Lake basin is approximately 3.9 km by 1.5 km and has a catchment area of 3.8 km^2. The elevation of Narrow Lake is approximately 282 m above mean sea level (asl) and the maximum elevation in the basin is approximately 350 m asl. Inflows to Narrow Lake consist of the Narrow Lake basin runoff as well as the outflows from Winter Lake.

The outlet of Narrow Lake is located at the southwest end of the lake and consists of two creeks that enter a small pond about 100 m southwest of the lake, near the existing winter road. A single creek flows out of this pond. The hydrometric station is located on this single creek, in a well-defined channel, about 10 m downstream of the pond. Downstream of the station, there is no well-defined channel and the flow meanders southwesterly through muskeg and stunted growth of birch and conifer. Discharge from the Narrow Lake basin flows southwest to Morris Lake (el. 278 m), and to the Yellowknife River.

Figure 2.0 shows the location of the Narrow Lake outlet flow monitoring station prior to installation of the Parshall flume on this creek.

2.2.1 Station History

The Narrow Lake outlet flow monitoring station was established shortly after spring thaw in 2004. During the summer of 2004, a staff gauge was installed at the site and spot measurements of flow and stage were manually recorded.

On May 22, 2005, an automated stage and temperature recorder was installed at this station. A survey monument was also installed on site, to provide a known reference point, for elevation surveys of the site instrumentation. This station was removed from service on July 15, 2005 to accommodate the installation of the Parshall flume.

On July 17, 2005, the hydrometric station was upgraded with the installation of a Parshall flume. The pressure transducer was removed on September 12, 2005, to prevent damage to the pressure transducer due to freezing.

2.2.2 Stage Measurements

During 2004, site staff gauge readings were recorded manually, typically four times a day, during the two periods that the hydrological survey team was on site. These periods were between May 19, 2004 and June 2, 2004 and September 30, 2004 and October 1, 2004. There was no flow between October and May due to freezing weather.

The 2005 freshet began in May, just prior to installation of the automatic stage recorder. Creek stage data were recorded every 15 minutes until July 15, 2005, when the station was removed. Stage measurements resumed on July 17 2005, using the Parshall flume and the same stage data logger instrumentation as in 2004. The time history of creek stages measured during the 2005 flow period is presented in Figure 2.1. The increase of stage, approximately 0.15 m, following installation of the flume, is due to the backwater effect caused by the head loss through the flume.

2.2.3 Point Discharge Measurements

During the period of the site survey between May 2004 and July 2005, a total of 35 discharge points were collected, including 21 readings in 2004 and the remaining 14 during the summer of 2005 prior to installation of the Parshall flume.

The discharge point recorded on May 19, 2004, was determined by inspection. At this time, the creek channel was filled with snow and ice and no flow was observed.

The data collected between May 28, 2004 and June 2, 2004 could not be used for the determination of the stage discharge curve due to the constantly changing nature of the stream bed geometry, as the creek was flowing over and melting the ice (for more information on these ice bed flows see Appendix B, Evolution of an Iced Creek Bed during Freshet, in the report titled "Initial Hydrological Survey for the Yellowknife Gold Project" by Hay and Company Consultants, June 2004.)

Point discharge data collected between September 2004 and July 15, 2005 were used to develop the stage discharge curve.

2.2.4 Stage Discharge Curve

The line shown in Figure 2.2 was fitted by linear regression and has a regression coefficient (R^2) of 0.9053.

To calculate the discharge at any point in time from the stage records, the following equation was used:

$$y = 907.44x - 543.13$$

Where y = creek discharge (L/s)

x = recorded water depth over transducer (m)

Following installation of the Parshall flume, the stage discharge method for determining creek flows was replaced by the flume algorithm, which converts depth of water in the flume to discharge.

2.2.5 Time History of Discharge

The time history of discharges, for Narrow Lake Outlet for 2004 is shown in Figure 2.3. The measured point discharge readings were the primary source of discharge data. Table 2.0 summarizes the measured discharges, times and staff gauge readings for this site.

Between May 19, 2005 and July 17, 2005, the stage discharge technique was used for flow determination and the data are summarized in Figure 2.4. The difficulty with employing this method were noted as illustrated in Figure 2.2 by the spread of stage data points for similar discharges in the upper right of the graph. This error was primarily due to the changing cross-sectional area of the creek channel caused by a mobile bed and vegetative growth.

To correct the difficulty associated with the unstable creek bed, it was decided that a Parshall flume should be installed at this site. A Parshall flume does not require a stage discharge curve to determine flow as it has its own relationship between water depth and discharge. It also maintains a constant flow geometry and roughness, which improves accuracy.

The flume selected for the Narrow Lake site had a throat width of 30.5 cm (12 inches) and a flow measurement range from 3.5 L/s to 454.0 L/s.

The Narrow Lake Parshall flume calibration formula is:

$$Q = 4.0 \times H^{1.522}$$ where Q = flow in cubic ft per second
H = depth of water in flume (ft)

To convert Q from ft^3/s to m^3/s:

$$Q\ (m^3/s) = Q\ (ft^3/s)/35.3146$$

The discharges determined by the flume are shown on the right side of Figure 2.4 for the period July 17, 2005 to September 12, 2005. Figure 2.5 shows a photograph of the Parshall flume shortly following installation.

The maximum measured flow for 2004, of 108 L/s, occurred on June 1, 2004, shortly after spring thaw. The minimum measured flow of 1.5 L/s occurred on October 1, 2004 just prior to winter freeze-up. The creek did not flow during the winter months.

The maximum measured flow for 2005, of 221 L/s, occurred on May 31, 2005, shortly after spring thaw. The minimum measured flow of 17 L/s occurred on August 28, 2005.

Based on the time history of the Narrow Lake outlet creek discharge for the two years of collected data, the following general observations were made:

1) the creek started to flow in the latter half of May;
2) peak discharges of up to 220 L/s occurred near the first of June, attributed to melt water;
3) these peak discharges lasted about two weeks, to mid June;
4) from mid June to mid August, the flows gradually reduced to about 20 L/s;
5) from mid August until mid September flows remained about 20 L/s; and
6) in mid September, the creek froze up and remained in that state until the following May.

2.2.6 Time History of Creek Water Temperatures

During the period of flow measurement, between May 19, 2005 and July 17, 2005, creek water temperatures were recorded using the temperature instrumentation contained within the pressure transducer. Because the pressure/temperature transducers were physically located in the active flow area of the site, accurate temperatures were recorded. The creek temperature data are presented as a red line in Figure 2.4.

Following installation of the Parshall flume, the pressure/temperature transducer was moved to a stilling well, which was not located directly in the creek flow. The water in the stilling well was more influenced by air temperature than by the creek water. This was evident by elevated temperatures with large diurnal fluctuations. This temperature data has not been presented.

2.3 Brien Lake Outlet (Site #2)

Brien Lake basin is about 1.3 km by 3.5 km with a drainage area of 3.2 km^2. The estimated elevation of Brien Lake is 300 m asl and basin elevations extends up to approximately 340 m asl. Brien Lake is the only major lake in this drainage basin. The outlet is situated in a bay on the northwest side of the lake. Outflows enter Shona Lake (el. 291 m asl) and then generally flow southwest through a series of small, unnamed lakes eventually reaching Barker Lake (el. 243 m asl), Johnstone Lake (el. 232 m asl), Clan Lake (el. 216 m asl), and then the Yellowknife River.

The hydrometric station at Brien Lake outlet was established shortly after the 2004 spring thaw and corresponds to Site #2 on Figure 1.0. It is located about 0.8 km downstream of the lake outlet. The creek channel is poorly defined in most areas, and meanders through a 10 m to 100 m wide valley, which is vegetated with birch and conifers. Small willows and long grass dominate much of the wetted area. Along the entire stretch of the creek valley only one site was located that was suitable for a hydrometric station. All of the flow funnels through a 10 m wide bedrock saddle. This is the only section of the creek with a well-defined bed that was clear of vegetation, factors necessary for accurate flow measurement. Just upstream of this point, there is a slight depression in the creek bed, which allows the water to pool prior to flowing over the saddle. These conditions provided a good site for installing the staff gauge and stage measurement instrumentation.

Figure 2.6 (Photo A) shows the discharge measurement site from the air. Figure 2.6 (Photo B) shows technicians measuring creek velocities at Site #2. Over the winter of 2005, the measurement of stage discharge data at this station ceased as Brien Lake was no longer considered to be potentially affected by the proposed development of the Yellowknife Gold Project. The data presented in this report are Brien Lake discharges and stages collected over the summer of 2004.

2.3.1 Stage Measurements

A staff gauge was installed on May 29, 2004, about 15 m upstream of the discharge measurement site. The creek flows through a stand of birch and long grass, but the water surface was quiescent and provided accurate and easy staff gauge readings. Staff gauge readings were recorded with each discharge measurement.

2.3.2 Discharge Measurements

Over the duration of the field survey for 2004, a total of 19 discharge measurements were recorded. The time, date, stage and discharge for each discharge measurement are summarized in Table 2.1.

The creek bed at Site #2 is composed of bedrock and provides a very stable creek cross-section. The discharge data collected at Site #2 during 2004 were assembled to produce Figure 2.7, a time history of outflows from Brien Lake. As indicated in Figure 2.7, flows were reducing on a daily basis. An estimated 99% of the snow pack had melted, indicating that creek discharges on May 26, 2004 were representative of peak flows for the year. By September 30, 2004, the creek bed was dry.

2.4 Winter Lake Outlet (Site #3)

Winter Lake basin is approximately 4.3 km by 1.4 km and has a drainage area of 4.3 km^2. The elevation of Winter Lake is approximately 285 m above mean sea level (asl) and the maximum elevation in the basin is approximately 330 m asl. Inflows to Winter Lake consist of the Winter Lake basin runoff as well as the outflows from Round Lake.

The outlet creek flows from the northwest portion of Winter Lake at a location about 10 m to the south of the existing winter road towards Narrow Lake. The creek channel is typically 30 cm to 60 cm wide by 15 cm to 20 cm deep as it exits Winter Lake. Figure 2.8 provides an aerial view of the creek bed and the location of the hydrometric station. The creek meanders southwest through a vegetated creek bed until about midway between Winter and Narrow lakes, where it aligns with the existing winter road route to Narrow Lake along a poorly-defined diffuse route.

2.4.1 Stage Measurements

The Winter Lake outlet hydrometric station was instrumented with the installation of a Parshall flume on July 16, 2005. Following installation of the flume, creek stages were recorded every 15 minutes until removal of the pressure transducer on September 12, 2005. The stages presented in Figure 2.9

approximate the maximum creek depth directly upstream of the Parshall flume, which, over the period of record, has averaged about 0.3 m.

2.4.2 Discharge Measurements

Winter Lake outflows were first measured using area-velocity techniques on May 20, 2005 just after the creek had started flowing. Table 2.2 summarizes the measured creek discharge data collected over the summer of 2005.

To address issues related to the unstable creek bed at the gauging site, a Parshall flume was installed that had a throat width of 22.9 cm (9 inches) and a flow measurement range of between 2.8 L/s and 251.0 L/s.

The Winter Lake Parshall flume calibration formula is:

$$Q = 3.07 \times H^{1.53} \quad \text{where} \quad Q = \text{flow in cubic ft per second}, \quad H = \text{depth of water in flume (ft)}$$

2.4.3 Time History of Discharge

The record for the time history of discharge for the Winter Lake Outlet began after the Parshall flume was installed on July 16, 2005. Figure 2.10 shows the flume shortly after installation. The time history of Winter Lake outlet discharges is presented in Figure 2.11. The blue line is the discharge measured by the Parshall flume. The yellow triangles are discharges determined by the velocity-area method, based on data collected during the site visits. The four yellow triangles, almost co-incident with the discharges determined by flume, serve as a check on the accuracy of the flume.

2.5 Round Lake Outlet (Site #4)

Round Lake basin is about 0.8 km by 1.8 km with a drainage area of 1.2 km^2. The estimated elevation of Round Lake is 288 m asl and basin elevations extend up to about 330 m asl. The flow outlet from Round Lake to Winter Lake is situated on the northwest side of Round Lake. There is no distinct flow channel out of Round Lake but rather a diffuse flow through the muskeg into a small marsh approximately 5 m downstream of the lake, see Figure 2.12 (Photo A). The outlet flows southwest into Winter Lake, typically as a subsurface flow, through the muskeg and willow shrubs. At one point, about 25 m southwest of the Round Lake outlet the flow is contained in a single channel, see Figure 2.13 (Photo B). This was the selected site for the hydrometric station.

2.5.1 Stage Measurements

The staff gauge was installed at Site #4 on May 24, 2005. Stages were recorded using the staff gauge before and after each discharge measurement. When the Parshall flume was installed on July 18, 2005, the creek stages were logged every 15 minutes and the staff gauge was read each time the discharge was checked by the velocity-area method. Figure 2.13 summarizes the creek stages recorded in 2005. It is estimated that the installation of the Parshall flume caused the stage to rise 0.15 m to 0.2 m from the previous levels. The creek depth prior to the flume installation was typically 0.2 m, whereas following installation of the flume the stages increased to 0.37 m because of the backwater effect.

2.5.2 Discharge Measurements

Round Lake outlet discharges were first measured using area-velocity techniques on May 21, 2005, just after the creek had started flowing. Table 2.3 summarizes the measured creek discharge data collected over the summer of 2005. A Parshall flume was selected for the measurement of discharge over the stage-discharge technique for the same reasons as discussed in Section 2.2.5 of this report.

The Parshall flume selected has a throat width of 15.2 cm (6 inches) and a flow measurement range between 1.6 L/s and 110.0 L/s. It was installed on July 18, 2005 and instrumented with a pressure transducer and data logger to collect flume water depths every 15 minutes. Figure 2.14 shows Site #4 with the Parshall flume installed.

The 6 inch flume calibration formula is:

$$Q = 2.06 \times H^{1.58} \qquad \text{where } Q = \text{flow in cubic ft per second}$$

$$H = \text{depth of water in flume (ft)}$$

2.5.3 Time History of Discharge

By using the logged water depths and the flume calibration formula, a time history of creek discharges was determined. This history is presented in Figure 2.15. The single point discharges, indicated on the graph as triangles, are discharges measured by velocity-area techniques. The solid line represents discharges as determined by the Parshall flume every 15 minutes.

2.6 Northeast Brien Lake (Site #5)

The purpose of this station was to determine if there was flow between Northeast Brien Lake and the small unnamed lake located to the northeast of Brien Lake, and if so, in which direction.

There was no surface flow or observable creek bed between the two lakes. At the southwest end of the unnamed lake, there is a 2 m to 3 m rise in topography along the shore closest to Brien Lake. This topography makes it impossible for surface flows to leave the small lake and flow into Brien Lake. There may be subsurface flows connecting the two lakes, but this could not be determined during this field survey.

2.7 Outlet of Nicholas Lake (Site #6)

The Nicholas Lake Gold Deposit is located within the Nicholas Lake drainage basin, which is approximately 6 km by 2 km, with a total discharge area of 6.28 km^2. Nicholas Lake is at an elevation of 325 m asl and elevations in the basin range up to about 370 m asl.

The Nicholas Lake outlet is located at the western end of the northwest arm of Nicholas Lake and conveys all flow leaving the Nicholas Lake drainage basin. Figure 2.16 shows an aerial view of the Nicholas Lake outlet. Where the flow leaves the lake, there is a clearly defined channel about 30 cm deep by 1.5 m wide, see Figure 2.17 (Photo A). Within 30 m of the lake outlet, the creek bed is filled with large boulders and there is little evidence of surface flow, Figure 2.17 (Photo B). The flow travels through boulders for about 700 m prior to discharging into a small lake, and then flows west to Eclipse Lake (el. 311 m) followed by numerous small lakes, ponds and bogs before reaching the Yellowknife River.

The hydrometric station was installed in the creek approximately 10 m downstream from the Nicholas Lake outlet. The station location is indicated as Site #6 on Figure 1. Stage discharge flow gauging techniques were utilized for this hydrometric station.

2.7.1 Stage Measurements

A staff gauge was installed on the Nicholas Lake outlet on May 31, 2004, and readings were recorded whenever personnel were on site. Figure 2.17 (Photo A) shows the staff gauge and the stream velocity gauging location. There was no logger installed in 2004, therefore, only staff gauge readings were recorded; these have been summarized in Table 2.4. Figure 2.18 summarize the creek stages recorded by the pressure transducer and logger for 2005.

2.7.2 Discharge Measurements

Nicholas Lake outlet stage-discharge data were recorded during open water periods between May 31, 2004 and August 6, 2005. Table 2.4 summarizes these flow data. The point discharges are presented on Figure 2.19.

On May 19, 2004, there was no flow at the outlet. Two weeks later, on June 2, 2004, the maximum discharge for 2004 (30.3 L/s) was measured. A flow of 10.4 L/s was recorded on September 30, 2004, just before winter freeze-up.

During 2005 only three stage discharge measurements were recorded. The first, on May 23 2005, was zero flow and the outlet was still frozen. The other two measurements were recorded on August 6, 2005 and are on Table 2.4.

2.7.3 Stage Discharge Curve

A stage-discharge relationship for the site was developed using the stage data in conjunction with the measured discharge data for the outlet. This relationship is presented in Figure 2.20. The relationship is not considered complete, as more data must be collected at the medium and low flow rates. This is demonstrated by the scatter in stage discharge points, in particular the readings near 25 L/s.

The exponential relationship that best fits the data set as of August 6, 2005 is

$$Q = 4.0472\, e^{3.2407x}$$

Where Q = Nicholas Lake Outlet Discharge (L/s)
x = Depth of water over the pressure transducer (m)

2.7.4 Time History of Discharge

On July 13, 2005, the pressure transducer and data logger were installed at the Nicholas Lake outlet. The subsequently recorded stages were used in conjunction with the stage discharge relationship to produce a time history of discharge for 2005. This time history of the outflows from Nicholas Lake is presented in Figure 2.21. The maximum peak flows measured are in the order of 22 L/s; however, the initial melt flows during the month of June would likely exceed these discharges. The observed flows would have peaked in early June and then slowly decreased over the summer.

Norecol (1990) reported the results of some limited flow measurements and lake levels for Nicholas Lake between May 29, 1989 and October 4 1989. These are presented in Table 2.5. The time history of Nicholas Lake outlet discharges for 1989 are plotted in Figure 2.22. The flow out of Nicholas Lake varied from 37.8 L/s on June 3, 1989 to 2.57 L/s on October 4, 1989. Comparing Figure 2.21 and Figure 2.22, the measured discharges in 2004 and 2005 are similar to those reported by Norecol for 1989.

2.7.5 Time History of Creek Water Temperatures

During the period of instrumented flow measurements between July 13, 2005 and September 13, 2005, water temperatures were also logged. Because the pressure/temperature transducers were physically located in the active flow area of the site, accurate temperatures were recorded. The creek temperature data are presented as a red line in Figure 2.21.

3 METEOROLOGY

On September 28 2004, a meteorological station was installed at the Yellowknife Gold Project site at a location approximately 50 m to the east of the north end of the airstrip. The NAD 27 GPS coordinates for the station are provided in Table 1.0.

The station records wind speed and direction, air temperature, barometric pressure, relative humidity, incident solar radiation, precipitation and during the summer period, evaporation. All the data, with the exception of the evaporation data, are saved to a logger at 15-minute intervals and the logger produces a 24-hour daily summary. The data are retrieved by downloading, at convenient times, using a laptop computer.

3.1 Meteorological Station Instrumentation

The weather station consists of a standard 10 m meteorological tower with instrumentation to measure all the above parameters except evaporation. The meteorological station is powered by a 12-V DC battery and 20-watt solar panel. Data are recorded to a Campbell Scientific CR10X data logger.

Specifications of the instruments installed on the weather station, a photograph of the station, and a map showing the station location are contained in the site description for the meteorological station included in Appendix A. Brief descriptions of these instruments, based on material provided by the manufacturers, are provided below.

3.1.1 Wind Speed and Direction Monitor

Model 05103-10-L Wind Speed and Direction Monitor is manufactured by R.M. Young. It is composed of a four-blade propeller mounted on a torpedo-shaped wind vane. Rotation of the propeller produces an alternating current with a frequency that is directly proportional to the wind speed. Wind direction is sensed by a potentiometer that is excited by an applied voltage. The potentiometer outputs a voltage that is directly proportional to the azimuth angle. Wind data are collected every five seconds and the mean wind vector magnitude and direction are calculated and stored at 15 minute intervals.

The standard deviation of wind direction is also computed and indicates the variability of wind direction over the archiving period.

3.1.2 Temperature and Relative Humidity Probe

The HMP25C212-L relative humidity and air temperature probe contains a Vaisala capacitive relative humidity sensor and a YSI 44212 thermistor. Both sensors are enclosed in a 10-plate gill radiation shield designed to shield the sensors from rainfall and solar radiation.

3.1.3 Barometric Pressure Sensor

A 61205V barometric pressure sensor is enclosed inside the data logger housing. Atmospheric pressure is maintained inside the sealed logger housing with a hydrophobic filter and entry seal which prevent moisture and insects from entering the housing, while allowing the inside of the housing to maintain atmospheric pressure.

3.1.4 Pyranometer

A pyranometer is a device used to measure incident solar radiation. The CM3 Kipp & Zonen pyranometer consists of a thermopile sensor coated with a black absorbent coating, which converts the incident solar radiation to heat. The resultant temperature difference is converted to a voltage by a copper-constant in thermocouple. The thermopile is encapsulated inside the pyranometer’s glass dome such that it has a field of view of 180 degrees. It has a flat spectral sensitivity between 300 mn and 3,000 nm.

3.1.5 All Weather Precipitation Gauge

The all weather precipitation gauge consists of three devices. They are: a tipping bucket for the measurement of water equivalent precipitation, a precipitation adaptor to convert snowfall to water, and a device that ensures catchment of all snow and rainfall.

The TE525WS is an adaptation of the standard US Weather Bureau tipping bucket rain gauge. The output is a switch closure for each bucket tip. Each tip represents 0.254 mm of water equivalent precipitation.

To enable the TE525WS gauge to measure snowfall a CS705 precipitation adaptor is mounted on top of the tipping bucket rain gauge. The CS705 consists of a catch tube, antifreeze reservoir and overflow tube. Snow is captured in the catch tube and melts into the antifreeze solution contained in the antifreeze reservoir. As the snow melts the level in the reservoir rises causing the water antifreeze mix to flow through the overflow tube onto the tipping bucket, thereby measuring the quantity of precipitation.

The Alter windscreen is to prevent snow and rain from blowing past the rain gauge catch tube during periods of high wind velocities. The Alter windscreen prevents strong updrafts and induces turbulence around the rain gauge catch tube. This aids in reducing airflow streams over the rain gauge resulting in better collection of precipitation during windy periods and, therefore, increasing the accuracy of the precipitation measurements.

3.1.6 Data Storage

Data are recorded on a Campbell Scientific CR10X-2M logger. The archiving interval for all parameters, except evaporation, is 15 minutes but this can be adjusted to suit specific data collection requirements. At a 15-minute sample frequency, the station will log up to one year of data before filling the memory. Meteorological data on all instruments are collected at 5-second intervals, then averaged over the archiving period and saved to the logger memory.

At the conclusion of each 24-hour period, a daily summary of the meteorological data collected for the day is saved to the logger memory. Other variables, which are indicative of the status of the meteorological station, such as battery power, internal temperatures and low voltage counts are also saved. Refer to the site description document in Appendix A for further information on the daily summary.

3.1.7 Station Power

The meteorological station is powered by a 12-V DC battery, a 20-watt solar panel and a charge regulator, all of which are attached to the 10-m tower. With this power configuration the station can run unattended for more than a year.

3.2 Winds

Wind data for the Yellowknife Gold Project site have been collected continuously since the installation of the meteorological station on September 28, 2004. The data have been summarized and presented in three different forms, as described below.

3.2.1 Maximum Wind Speed

The maximum gust wind speed for the day is recorded by the meteorological station at midnight. These data, collected over the period between September 28, 2004 and March 2, 2006 are displayed in Figure 3.1.

The maximum wind gust of 18 m/s was recorded on October 26, 2005. The average maximum gust on a daily basis is approximately 8 m/s. On a calm day maximum wind gusts are in the order of 2 m/s to 3 m/s, whereas on a windy day maximum gusts are in the order of 12 m/s.

3.2.2 Wind Speed and Direction Stick Plots

Figure 3.2 is a sample of the wind direction figures presented in Appendix B. Each figure consists of three panels.
The upper panel is a stick plot that displays the hourly wind vector; direction is indicated by the angle of each hourly stick; true north is towards the top of the page. The wind speed is indicated by the length of the stick using the scale in m/s given at the left and right of the plot. For example, in Figure 3.2 on October 1, 2004, winds were blowing from the northwest at a speed of 5 m/s. The next day the wind changed to a south wind, at about 5 m/s, tapering off near the end of the day.

The central panel indicates the hourly wind speed in m/s. This panel is useful as an indicator of windstorms or periods of calm.

The lower panel in Figure 3.2 shows the hourly wind direction.

Appendix B contains 17 monthly wind summary graphs representing the winds on a monthly basis from October 2004 to February 2006.

3.2.3 Wind Roses

A wind rose is a useful tool that can display an entire period of recorded wind data on a single graph. The total duration of wind occurring within a specified speed range and compass direction is determined as a percentage of the total period of record. Figure 3.3 is an example of a wind rose calculated using the entire period of record between September 28, 2004 and March 2, 2006. Wind speeds are grouped into ranges from 0 m/s to 1 m/s (calm), 1 m/s to 3 m/s, 3 m/s to 6 m/s etc., in 3 m/s ranges, to 18 m/s. The wind direction is also grouped into 16 compass direction ranges of 22.5 degrees starting at north. These data are summarized in the wind speed and direction frequency distribution table, which is located in the lower right of Figure 3.3. The wind rose displays graphically the data contained within the table.

The line types used to display winds in each compass direction are indicative of the wind speed. For example, in Figure 3.3, viewing the data in the east compass direction three line types are displayed. The single thin line closest to the centre of the rose indicates that 5.67% of the time the winds are blowing from the east at between 1 m/s and 3 m/s. The next line type is a double line, which indicate that 5.63% of the time winds are blowing from the east at between 3 m/s and 6 m/s. The thick blue line at the end indicates wind speeds between 6 m/s and 9 m/s, blowing from the east for 0.78% of the period of record.

The winds at the Yellowknife Gold Project, recorded over the period of record, are summarized in Figure 3.3. It is evident from this wind rose that during the period of record the wind has been blowing primarily from the northeast quadrant 37.44% of the time. (12.08% E; 9.90% ENE; 8.18% NE and 7.28% NNE). The wind has been calm (less than 1 m/s) for 13.58% of the time. For the remaining 48.98% of the time, the wind has been blowing from the other 12 compass directions at greater than 1 m/s.

It is also possible to determine percentages of times the wind blows at specific speeds by viewing the “total %” row at the bottom of the frequency distribution table. For the Tyhee meteorological station location, over the period between September 28, 2004 and March 2, 2006, the wind speed was less than 1 m/s 13.58% of the time, between 1 m/s and 3 m/s 44.06% of the time, between 3 m/s and 6 m/s for 36.98%, between 6 m/s and 9 m/s for 5.23% of the time and between 9 m/s and 12 m/s for 0.16% of the time. There were no extended periods when the wind speed was greater than 12 m/s.

Appendix C contains 17 wind rose and table figures, one for each month for the period of record. Viewing all of these wind roses indicates that there is little to no seasonal variability in the wind direction. The prevailing winds are from the northeast.

3.3 Other Meteorological Parameters

Figure 3.4 is a sample of the 17 figures contained in Appendix D. These figures show, on a monthly basis, the remaining meteorological parameters of air temperature, solar radiation, relative humidity, barometric pressure, and precipitation measured by the meteorological station between September 28, 2004 and March 2, 2006.

These plots present all the recorded meteorological data for a single month and how each parameter relates to the other parameters at a single point in time. For example, in Figure 3.4 on

October 3, 2004, it was a relatively bright day, incident solar radiation was 400 W/m^2 (Watts per square meter) (second panel from top), air temperature was near –5 ^{o}C (top panel), relative humidity was 65%, which is lower than normal (third panel from the top), even though it rained about 1 mm that day (bottom panel). Barometric pressure (fourth panel from the top) was near 1025 hPa.

3.3.1 Air Temperature

Air temperatures are discussed in terms of daily extreme temperatures and means as well as the hourly data.

3.3.1.1 Daily Extremes for Air Temperature

The maximum, minimum and mean air temperatures for each day are recorded by the meteorological station at midnight. The data summarized in Figure 3.5 were collected between September 28, 2004 and March 2, 2006, and show the mean air temperatures for the day as a thick orange line bounded by the maximum and minimum temperatures for the day indicated by thin red lines. Generally, the daily variance in air temperature is $\pm$12 ^{o}C from the mean daily air temperature.

Viewing Figure 3.5 a sinusoidal pattern to air temperature is evident. The warmest period (summer) is from May to July with a mean daily temperature of 15 ^{o}C. During this period, temperatures could reach as high as 29^{o}C and as low as 5^{o}C. Between August and November, the temperatures start to drop to the winter normals.

The coldest period for the site occurs between the months of November and January. During this period, the mean daily temperature is –28 ^{o}C; however, temperatures can be expected to be as low as -45 ^{o}C or as high as –20 ^{o}C. In February, it starts to warm up, with the summer temperature normals starting in May.

3.3.1.2 Hourly Air Temperatures

Figure 3.4 is used as an example of the 17 monthly weather parameter figures contained in Appendix D. The upper panel in Figure 3.4 and the figures in Appendix D show the temperatures measured by the station for the month of October 2004 for each hour of the day. These figures are useful for viewing temperature trends for a particular day or for a short period of time.

3.3.2 Relative Humidity

Relative humidity is discussed in terms of daily extremes and means as well as data recorded hourly by the meteorological station.

3.3.2.1 Daily Extremes for Relative Humidity

Over the period of record, the relative humidity varies from a low of 17% in mid summer to a high of 100%, which could occur at any time of the year. At the conclusion of each day, the station records the maximum, mean and minimum relative humidity for the day. Figure 3.6 shows the relative humidity data plotted from September 28, 2004 to March 2, 2006. The thick green line in the figure represents the mean relative humidity for the day. The maximum and minimum relative humidity results are indicated by black lines.

There is a slight sinusodial pattern to the mean relative humidity recorded on site. For October to November, the mean relative humidity is near 90%. The relative humidity exhibits a slow decline from this peak over the winter and spring until the minimum mean relative humidity occurs between April and August. From August, the relative humidity increases back to the peak daily means in October.

The variance of relative humidity is indicated by the envelope of maximum and minimum relative humidity. Over the winter period between October and February, the maximum and minimum relative humidity vary only $\pm 15\%$ from the mean. However, for the summer period the daily variation of relative humidity can be as much as $\pm 40\%$.

3.3.2.2 Hourly Relative Humidity

Figure 3.4 is used as an example of the 17 monthly weather parameter figures contained in Appendix D. The third panel from the top shows the relative humidity measured by the station for each hour in the particular month.

3.3.3 Barometric Pressure

Barometric pressures are discussed in terms of daily extreme temperatures and means as well as the hourly data.

The barometric pressures recorded by the meteorological station have been corrected to represent the equivalent air pressures referenced to mean sea level. This is a standard meteorological convention used to enable direct comparison of meteorological station data regardless of the station elevation. To correct the barometric pressures presented in this report to the actual barometric pressures experienced at site, it is necessary to reduce the stated pressure by 35.525 hPa

3.3.3.1 Daily Extremes for Barometric Pressure

At the conclusion of each day, the station records the maximum, mean, and minimum barometric pressure in hPa (put in full with bracketed hPa) for the day. Figure 3.7 show the barometric pressure data plotted between September 28, 2004 and March 2, 2006. The thick light blue line in the figure represents the mean barometric pressure measured for the day. The maximum and minimum barometric pressures are indicated by black lines.

Over the period of record, the barometric pressure varies from a low of 978 hPa to a high of 1043 hPa. There is little seasonal variation to barometric pressure and the yearly mean varies slightly around a value of 1010 hPa. On a day-to-day basis the barometric pressure can change by more than 30 hPa

The variance of relative humidity for a single day is indicated by the maximum and minimum barometric pressure and is shown as black lines. Typically, the variance of pressure is ±10 hPa from the daily mean.

3.3.3.2 Hourly Barometric Pressure

Figure 3.4 is used as an example of the figures contained in Appendix D. The fourth panel from the top shows the barometric pressure measured by the station for each hour in the month.

3.3.4 Solar Incident Radiation

Solar incident radiation is discussed in terms of daily extremes as well as hourly data.

3.3.4.1 Daily Extremes for Incident Solar Radiation

At the conclusion of each day, the station records the maximum incident solar radiation in W/m^2 for the day. The minimum daily incident solar radiation should always be zero as at this latitude it gets dark for at least a short time each day. Figure 3.8 shows the daily maximum recorded incident solar radiation plotted from September 28, 2004 to March 2, 2006.

There is a strong sinusoidal pattern to the data set. Over the winter period from mid October to mid January the sun is lowest in the sky, hence the solar radiation is at a minimum, typically in the order of less than 100 W/m^2. During this winter period, daily variations to the maximum incident solar radiation are typically less than 50 W/m^2.

During the summer period from April to mid July, the solar radiation is at it highest, averaging a peak for the day of about 900 W/m^2. During the summer months there are large changes to the daily maximums due to heavy cloud cover. This cloud cover can reduce the measured maximum daily incident solar radiation from an average of 900 W/m^2 to 300 W/m^2 for any particular day.

3.3.4.2 Hourly Incident Solar Radiation

Figure 3.4 is used as an example of the 17 monthly weather parameter figures contained in Appendix D. The second panel from the top shows the solar incident radiation, measured by the station, for each hour during the month.

The peaks typically occur at midday, when the sun is at its highest. The radiation drops to zero over the night.

The data can be used to determine the number of daylight hours at site for any day of the year, or to determine the incident solar radiation at any point in time.

3.3.5 Precipitation

Precipitation at site can occur as either rain or snow. Generally the precipitation is in the form of rain between June and August, and as snow from October to April. During the months of May and September could be in either form of rain or snow. It is possible to determine if a particular day's precipitation is rain or snow by examining the hourly air temperature for the day. Two forms of precipitation data for site have been collected. The first is the continuous precipitation record measured by the meteorological station, and the second is as snow surveys collected during April of 2004 and 2005.

3.3.5.1 Recorded Precipitation

Precipitation has been recorded by the meteorological station at a frequency of 15 minutes for the period September 28, 2004 to March 2, 2005. Both rain and snow are recorded by this gauge as water equivalent. The instrumentation for the continuous measurement of all forms of precipitation is outlined in Section 3.1.5 "All Weather Precipitation Gauge" of this report.

A summary of daily precipitation is presented in Figure 3.9 as a histogram. The maximum daily precipitation recorded over the period of record was 21 mm of rain on July 16, 2005. Generally; however, the precipitation falling during a typical rainy day is about 2 mm to 3 mm. A heavy precipitation day will typically be over 10 mm/day. These heavy precipitation days usually occur during the summer months, but can also occasionally occur as snowfall, as was the case on January 5, 2005 when 11.2 mm water equivalent precipitation (12.3 cm snowfall) occurred during the day and on February 12, 2006 when 18 mm water equivalent precipitation (19.8 cm snowfall) occurred.

The daily precipitation data collected over the period of record have been summarized, by year, in Tables 3.0 to 3.2. The monthly total water equivalent precipitation is shown at the bottom of each column. Table 3.1 shows the only complete year of precipitation data and indicates that 316 mm of precipitation occurred during 2005.

Figure 3.4 provides an example of the 17 monthly weather parameter figures contained in Appendix D. The bottom panel in this figure shows the daily precipitation measured by the station during the month.

3.3.5.2 Snow Surveys

Snow surveys were conducted at the Yellowknife Gold Project site in April of 2004 and 2005. In 2004, the survey included sites near Maguire Lake, North Giauque Lake, Narrow Lake, Piloski Lake, and Winter Lake. In 2005, a similar data set was collected with an additional site near the meteorological station.

Figure 3.10 is a portion of a NTS 1:50000 scale map, with the snow sampling stations indicated. The yellow labels are for the 2004 survey and the blue labels are for the survey conducted in 2005. There is a 1-km UTM grid overlay on this map.

Table 3.3 summarizes the results of the snow surveys conducted in 2004 and 2005. The table includes the NAD 27 coordinates, actual measured snow depth and water equivalent depth, as well as the snow density for each site. More snow fell in 2005 (average snow depth of 690 mm) than in 2004 (average snow depth of 453 mm). Table 3.3 also summarizes water equivalents. Figure 3.11 is a histogram comparing the water equivalent snowfall for each site, for the years 2004 and 2005.

Table 3.3 includes the calculated snow density for each site. Snow density is expressed as a percentage and calculated by dividing the actual snow depth by the water equivalent depth, then multiplying by 100%. The snow density gives an idea of the type of snow at the site. Snow densities near 10% indicate fresh fallen snow, whereas 60% snow density is indicative of a ripe late season snowpack. Generally the snow density will increase with the advance of winter into spring. In 2004, the average snow density was 18.6% and in 2005 it was 16.2%. These densities are similar and indicate relatively fresh snow conditions. The fact that the 2004 snow survey was conducted later in the month than the 2005 survey may account for the slightly higher snow density.

The new site, located near the meteorological station, was added in 2005, for two reasons. The first was to check the reliability of the two methods of determining water equivalent snowfall, and the second reason was to create a snow survey site that would represent the large area between North Giauque Lake and Narrow Lake, which was not sampled in 2004.

The new snow sampling site enabled a determination of the accuracy of both the snow gauging technique and the all weather precipitation gauge, which, as mentioned earlier, was installed on September 28, 2004. The rightmost pair of bars in Figure 3.11 compares the snow survey water equivalent snow data collected in 2005 to the water equivalent snow fall as measured by the all weather precipitation gauge over the same time period. The snow survey indicated water equivalent snowfall of 119.4 mm where as the meteorological station recorded 126.0 mm. The 5% difference validates the two methods.

3.4 Evaporation

On May 27, 2005, an evaporation pan was installed near the meteorological station, and data were recorded from this date until September 13, 2005 when the pan was decommissioned. The water level in the pan was measured daily at 07:00 hours using a point gauge, accurate to ±0.5 mm. Daily evaporation was calculated by determining the change in the pan water level and removing the increase in the pan depth due to precipitation for the same period. For the days the point gauge was read at times other than at 07:00 hours, a ratio of 24 hours to the time difference between the two consecutive readings was used to correct the evaporation rate to a 24-hour period.

The equivalent daily evaporation rate is shown as a black line in Figure 3.12. On days when the evaporation is less than zero, it is assumed that water was added to the pan by condensation. The pink line in Figure 3.12 is a seven-day running average of the daily evaporation rate.

Table 3.4a summarizes the pan evaporation daily rates and totals for each month over the period the evaporation pan was operational.

The average pan evaporation rate for the summer of 2005 was 3.8 mm/day and the total pan evaporation was 377.5 mm for the same period (May 27, 2005 to September 13, 2005).

Research into evaporation pan rates has shown that lake evaporation rates are lower than pan evaporation rates by a factor of 0.7 to 0.8. A factor of 0.7 was used to convert the pan evaporation data to the lake evaporation rate. These data are summarized in Table 3.4b. The lake evaporation rate for the summer of 2005 was 2.6 mm/day and the total lake evaporation rate was 264.3 mm.

4 CLOSURE

EBA and HAYCO are pleased to present Tyhee NWT Corp. with this 2005 Hydrology and Meteorology Report for the Yellowknife Gold Project. We trust everything is found to be satisfactory. If there are questions or if we can be of further assistance, please do not hesitate to contact us.
Respectfully submitted,

HAY & COMPANY CONSULTANTS

R.E. Draho, B.Sc.
Senior Project Scientist

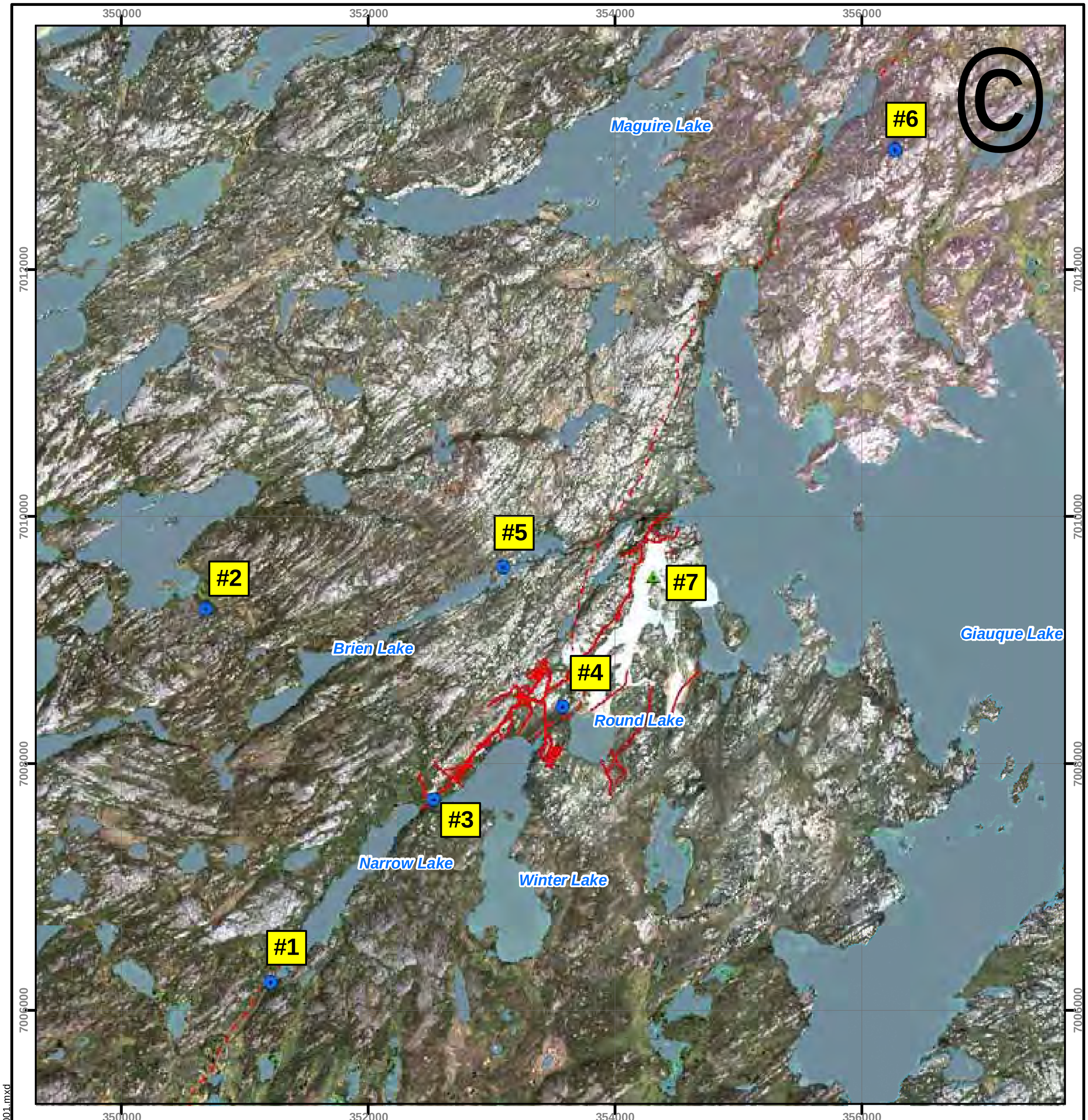
Reviewed by:

Dr. A.G. Chantler, P.Eng.
Principal

And

R.A.W. Hoos, M.Sc. R.P. Bio
Principal Consultant

FIGURES



O:\Vancouver\GIS\0701_YELL\1740180_Tyhee\Maps\002_hydrology\B-Hydro-001.mxd

LEGEND

- Proposed Footprint
- Winter Road
- Hydrometric Site
- Meteorological Station

NOTES
Base data source: IKONOS Imagery
Landsat 7
Road route is approximate

YELLOWKNIFE GOLD PROJECT

Site Location Map

PROJECTION: UTM Zone 12	DATUM: NAD83
Scale: 1:45,000 (0.5 0.25 0 0.5 1 Kilometres)	
FILE No: B-Hydro-001.mxd	DATE: May 11, 2006
JOB NO: 1740180	REVISION NO: 1
OFFICE: EBA-VANC	DRAWN: KMW; CHECK: XX

Tyhee NWT Corp

EBA Engineering Consultants Ltd.

Figure 1.0

HAY & COMPANY CONSULTANTS

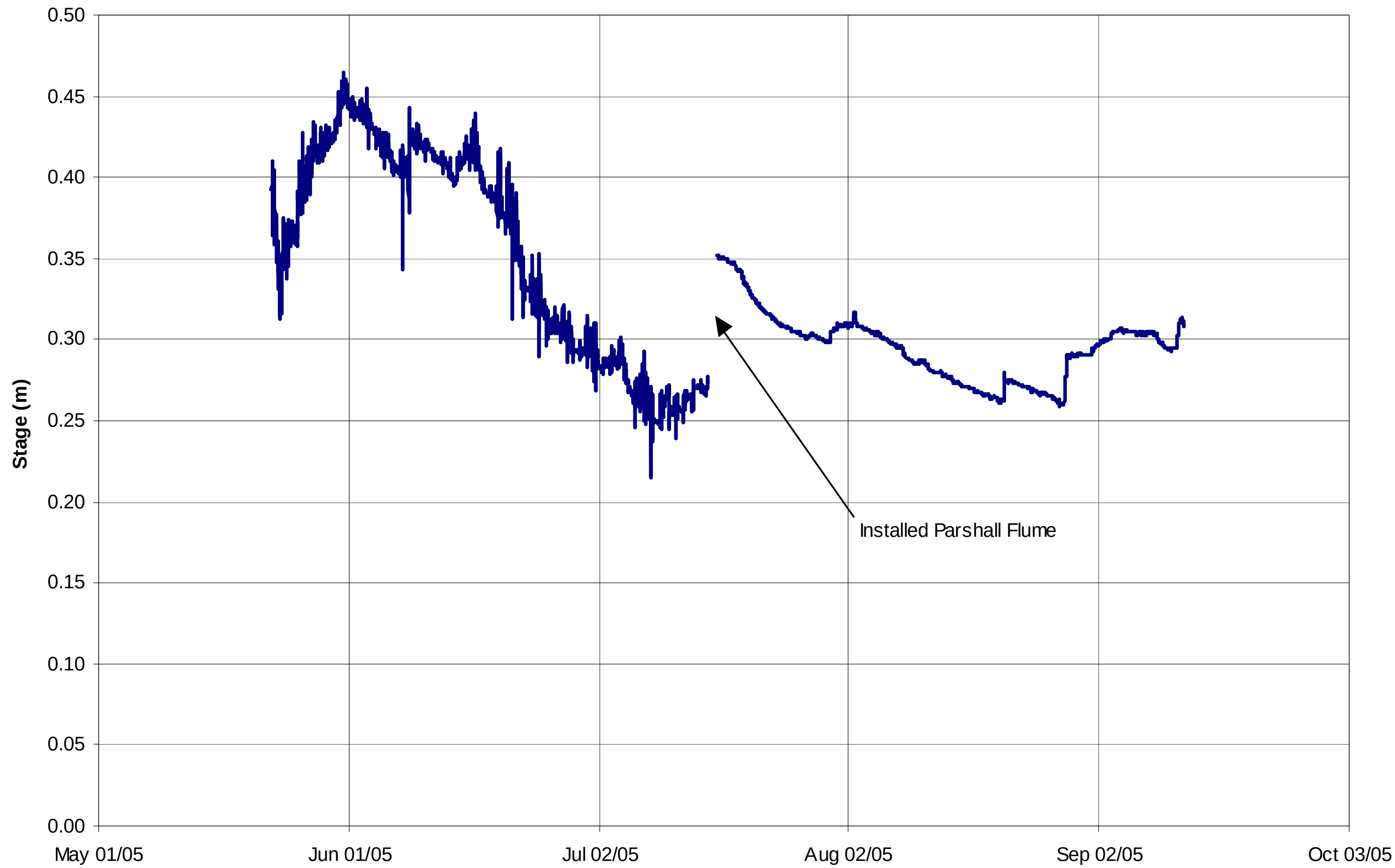
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION - MAY 30, 2004
SITE#1 - NARROW LAKE OUTLET

FIG
2.0

FILE: J:\1740180_Yellowknife_Gold\Reports\April06_status_report\Figures\Fig_2.0.pdf



HAY & COMPANY CONSULTANTS

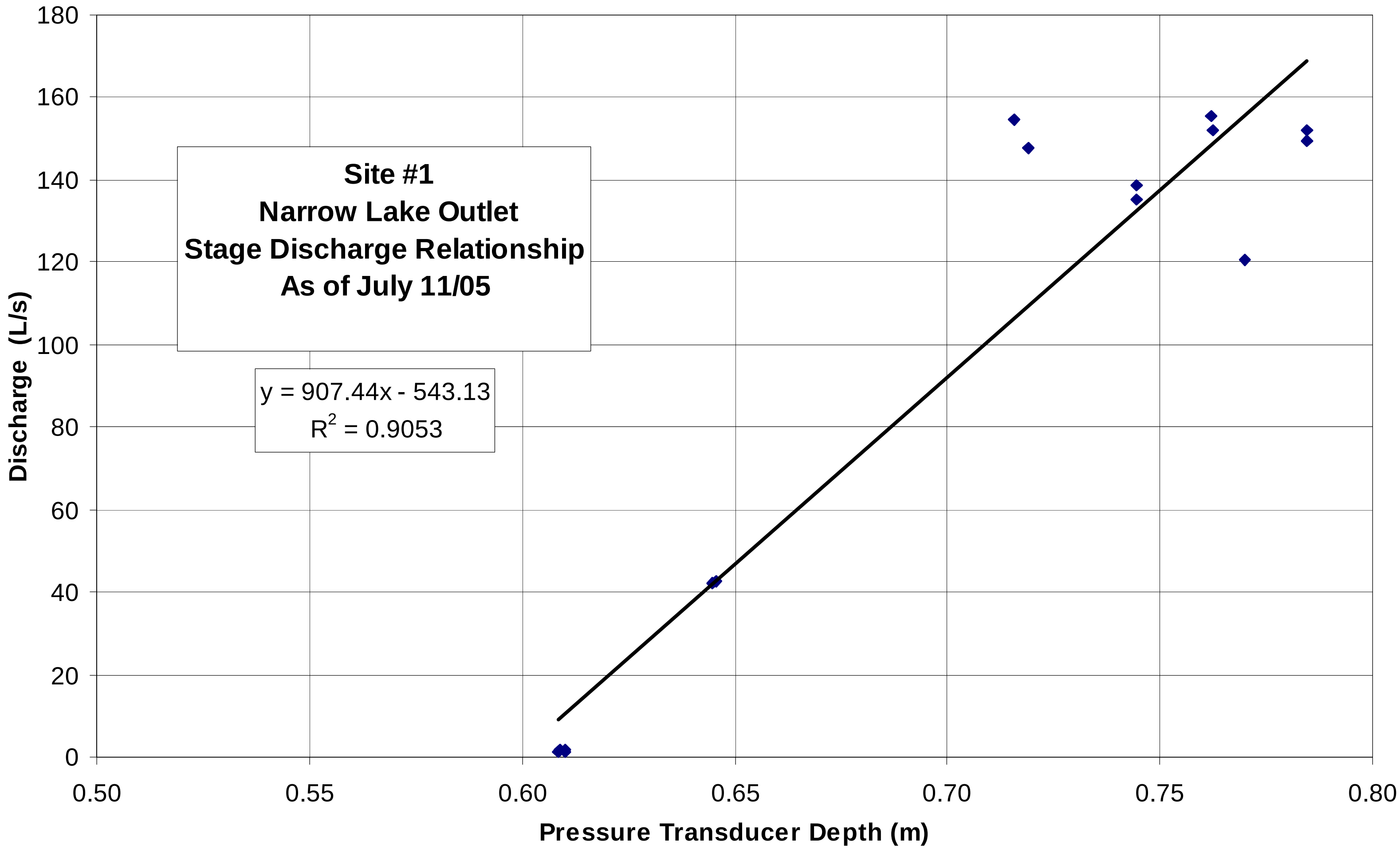
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF STAGE
SITE#1 - NARROW LAKE OUTLET

FIG.
2.1

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_1-Narrow\Narrow_lake Discharge_history.xls



HAY & COMPANY CONSULTANTS

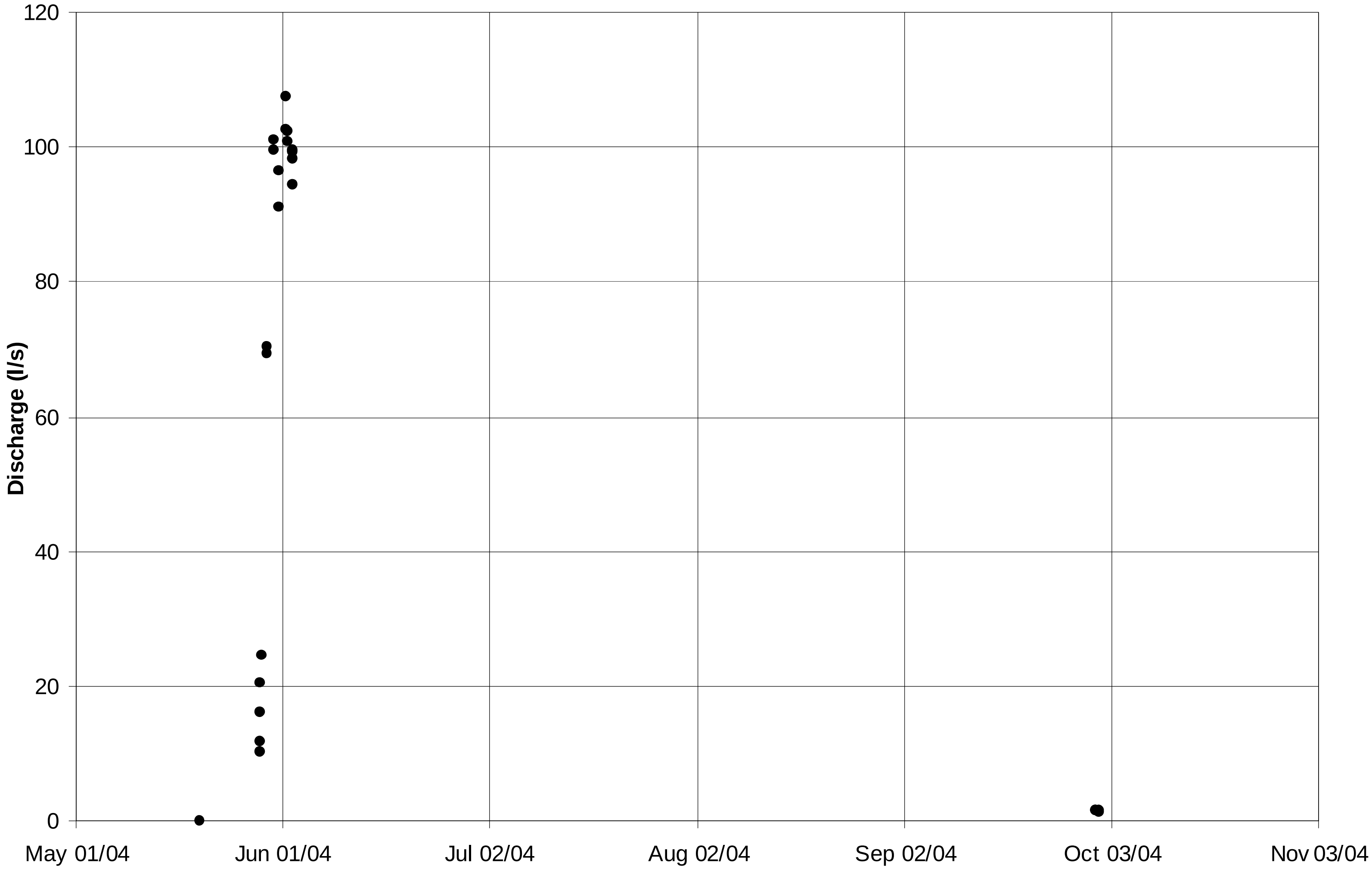
TYHEE NWT CORP

HYDROLOGY AND METEOROLOGY FOR THE YELLOWKNIFE GOLD PROJECT

STAGE-DISCHARGE RELATIONSHIP
SITE#1 - NARROW LAKE OUTLET

FIG. 2.2

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_1-Narrow\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

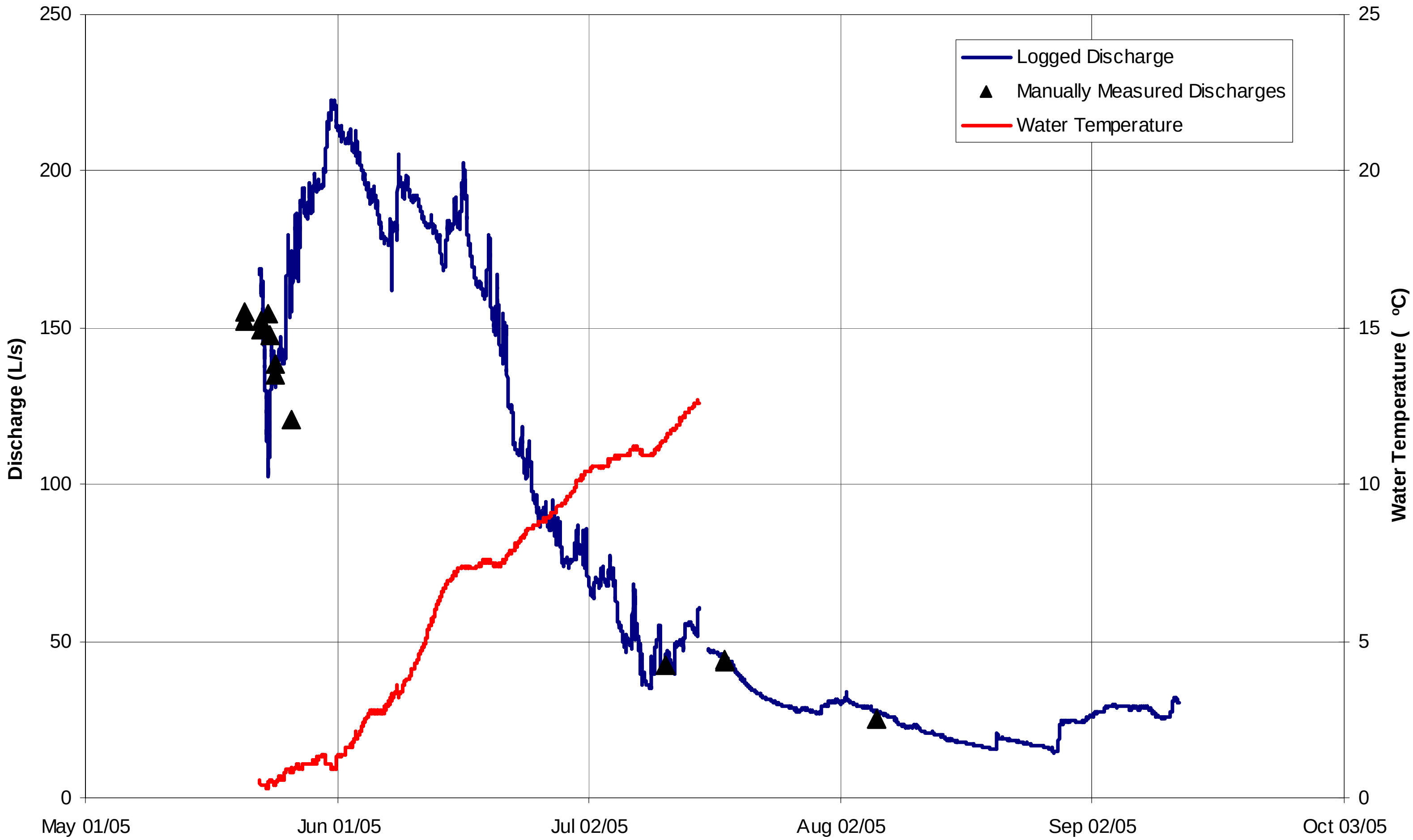
HYDROLOGY AND METEOROLOGY

2004 TIME HISTORY OF DISCHARGE

SITE#1 - NARROW LAKE OUTLET

FIG. 2.3

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_1-Narrow\Narrow_lake Discharge_history.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF DISCHARGE
SITE#1 - NARROW LAKE OUTLET

FIG.
2.4

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

PARSHALL FLUME JULY 18, 2005
SITE#1 - NARROW LAKE OUTLET

FIG
2.5

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt

Photo A – Site#2: Reach of creek used for discharge measurements

Photo B – Site#2: Measurement of creek discharge

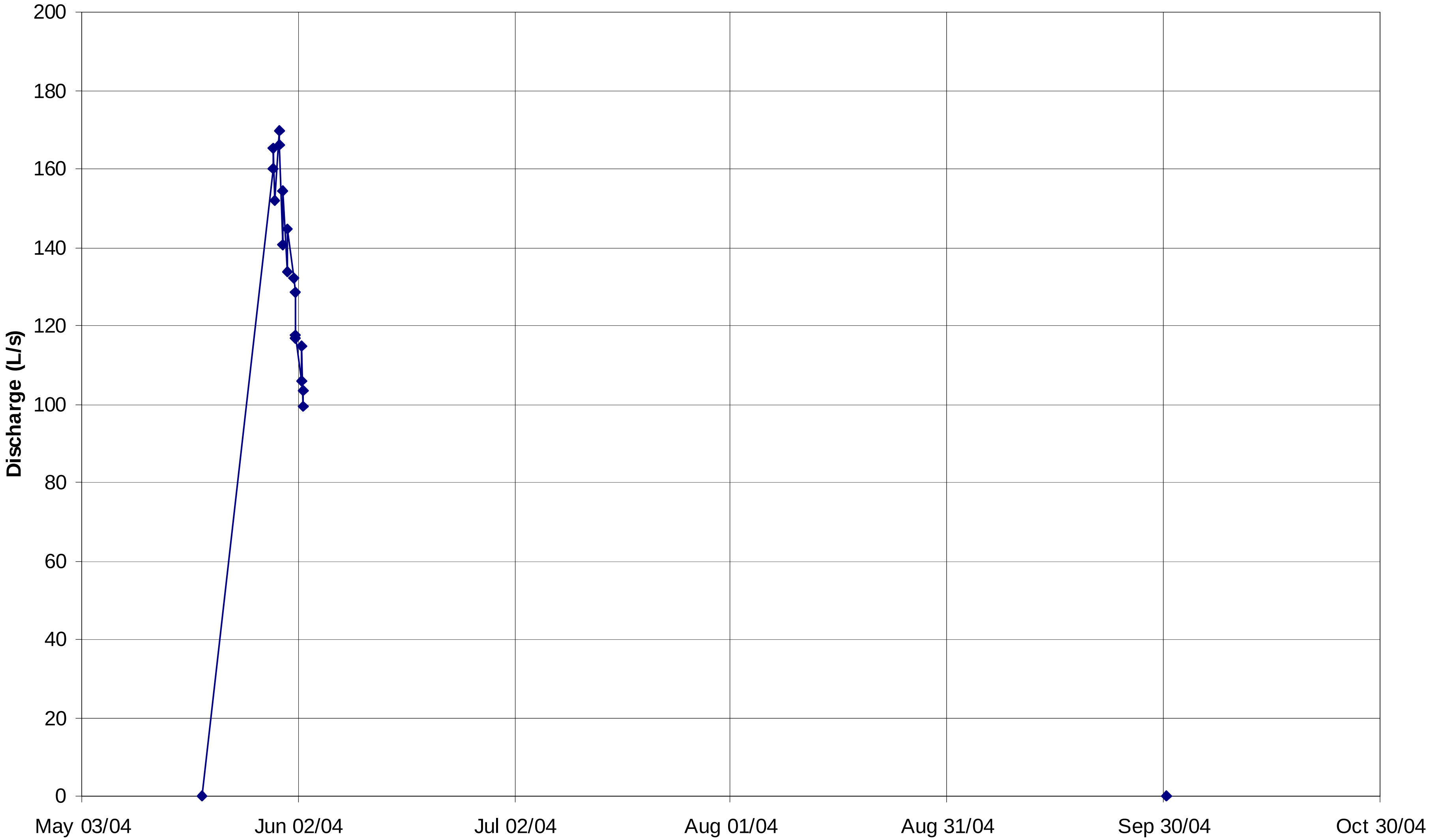
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION
SITE#2 – BRIEN LAKE OUTLET

FIG. 2.6

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_portrait_figures.ppt



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2004 TIME HISTORY OF DISCHARGE
SITE#2 - BRIEN LAKE OUTLET

FIG. 2.7

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_2\Site2_Flowcalc.xls

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AERIAL VIEW
SITE#3 – WINTER LAKE OUTLET

FIG. 2.8

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_portrait_figures.ppt

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF STAGE

SITE#3 - WINTER LAKE OUTLET

FIG.
2.9

EXCEL FILE: I:\Eba-024\Working\RED\Streamflow\Site_1\Site1_Flowcalc.xls

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

PARSHALL FLUME JULY 18, 2005
SITE#3 - WINTER LAKE OUTLET

FIG
2.10

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF DISCHARGE

SITE#3 - WINTER LAKE OUTLET

FIG.
2.11

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_3-Winter\Winter_Lake Discharge_History.xls

Photo A – Site#4: Aerial View of Round Lake Outlet

Photo B – Site#4: View of creek used for hydrometric site

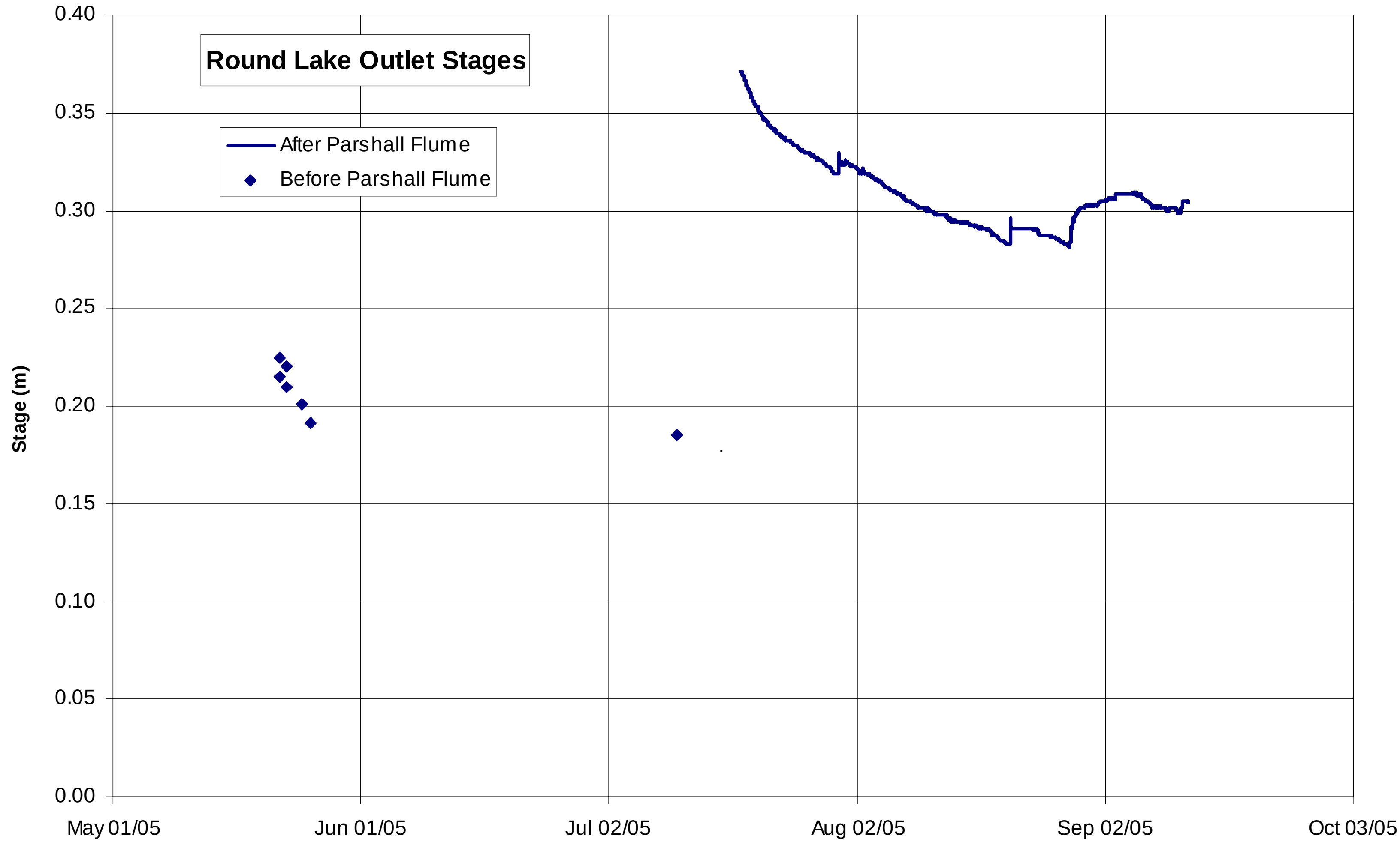
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION
SITE#4 – ROUND LAKE OUTLET

FIG.
2.12

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_portrait_figures.ppt



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF STAGE
SITE#4 - ROUND LAKE OUTLET

FIG. 2.13

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_4-Round\Round_Lake Discharge_History.xls

HAYCO HAY & COMPANY CONSULTANTS

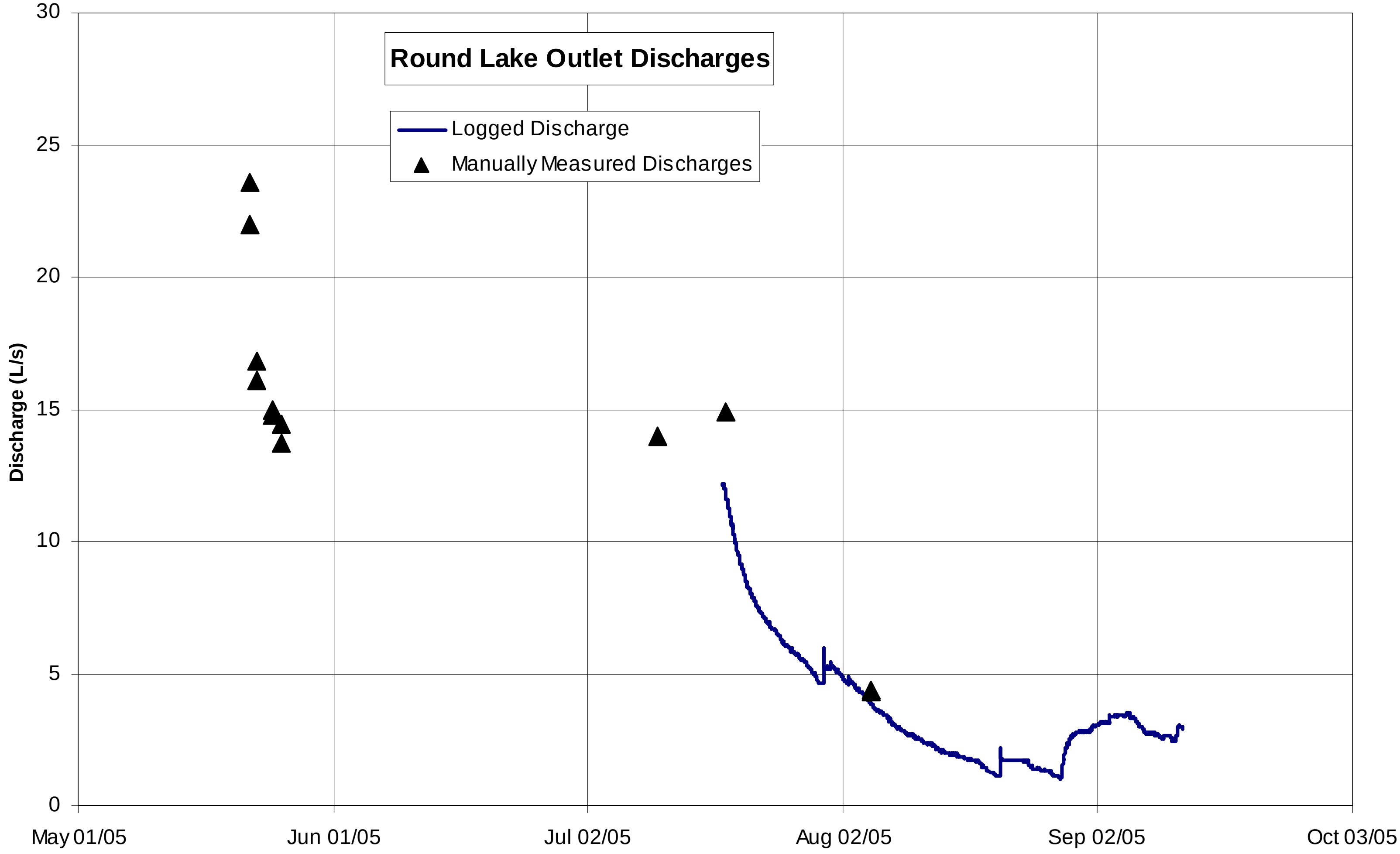
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

PARSHALL FLUME JULY 18, 2005
SITE#4 - ROUND LAKE OUTLET

FIG
2.14

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF DISCHARGE

SITE#4 - ROUND LAKE OUTLET

FIG. 2.15

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_4-Round\Round_Lake Discharge_History.xls

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AERIAL VIEW
SITE#6 - NICHOLAS LAKE OUTLET

FIG
2.16

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt

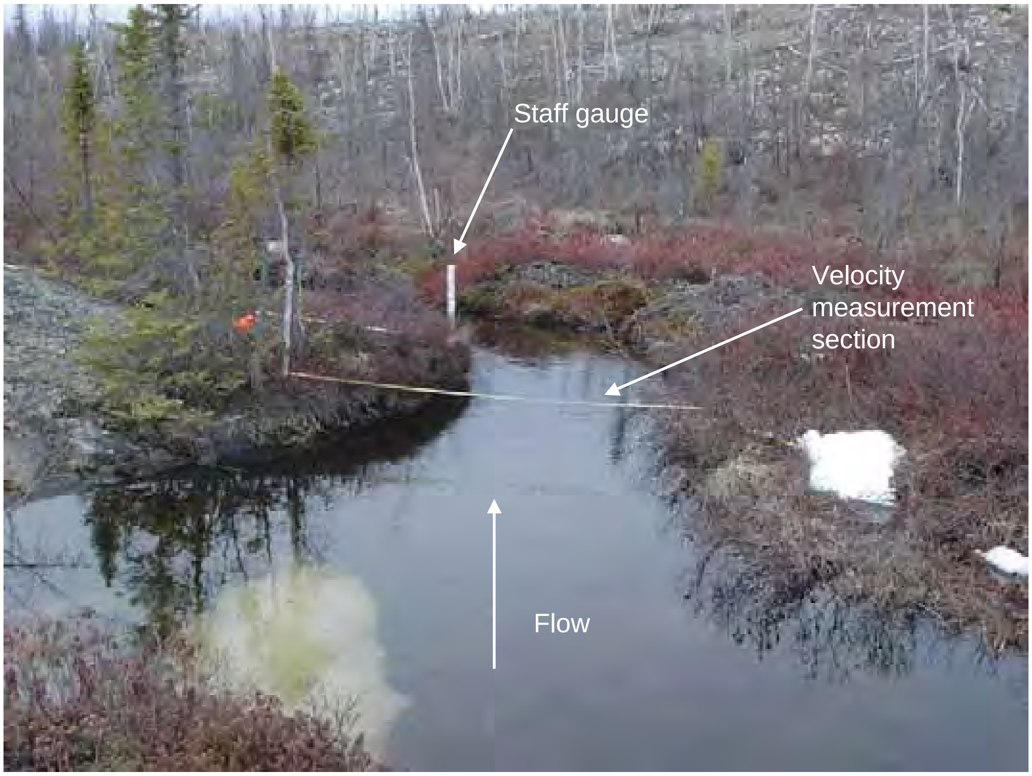


Photo A – Section of creek selected for hydrometric Station

Photo B –Creek flows from open channel to flow under the rock filled bed

HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION
SITE #6 – NICHOLAS LAKE OUTLET

FIG.
2.17

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

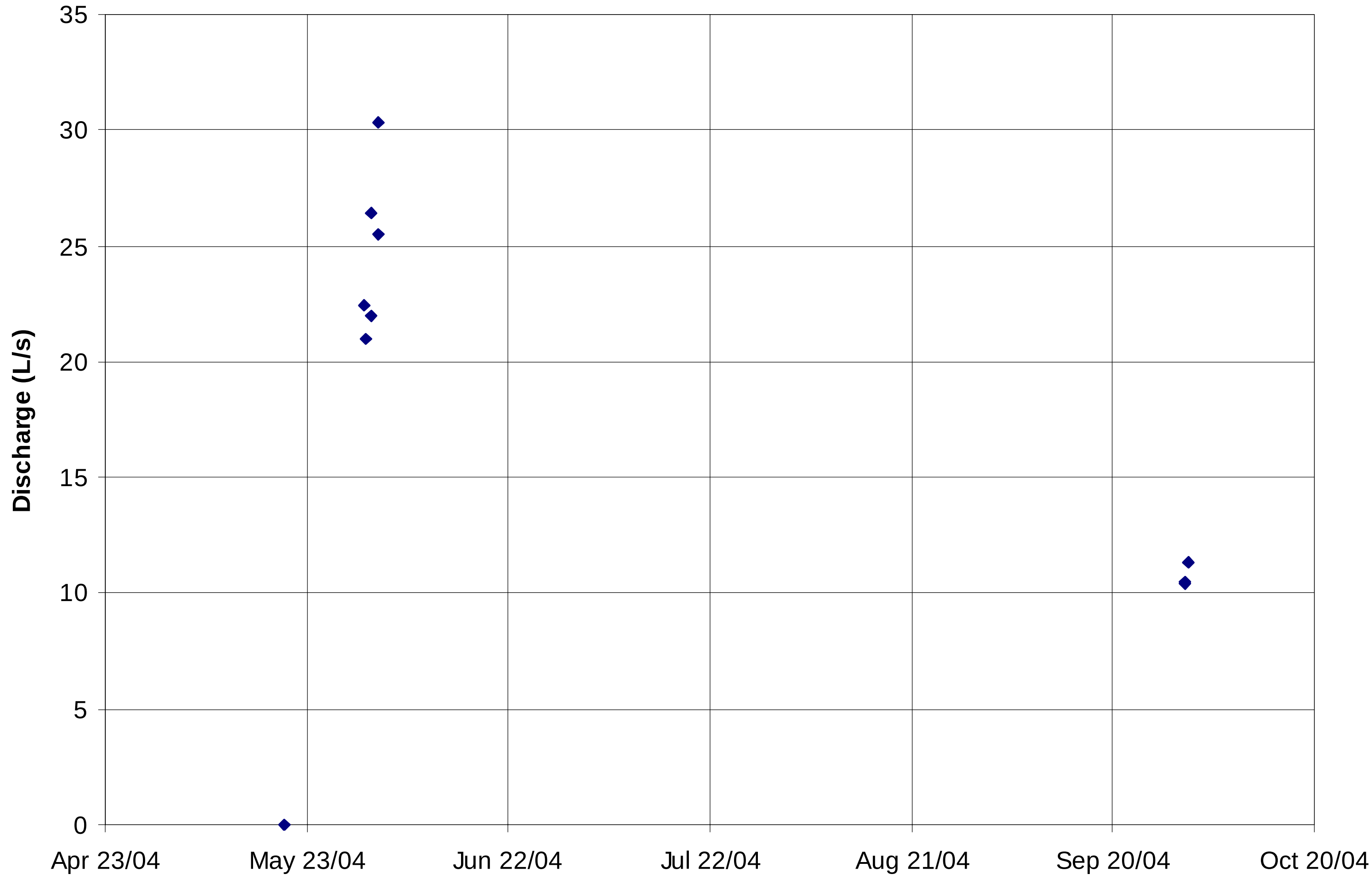
HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF STAGE

SITE#6 - NICHOLAS LAKE OUTLET

FIG. 2.18

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_6-Nicholas\Nicholas_Lake Discharge_History.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

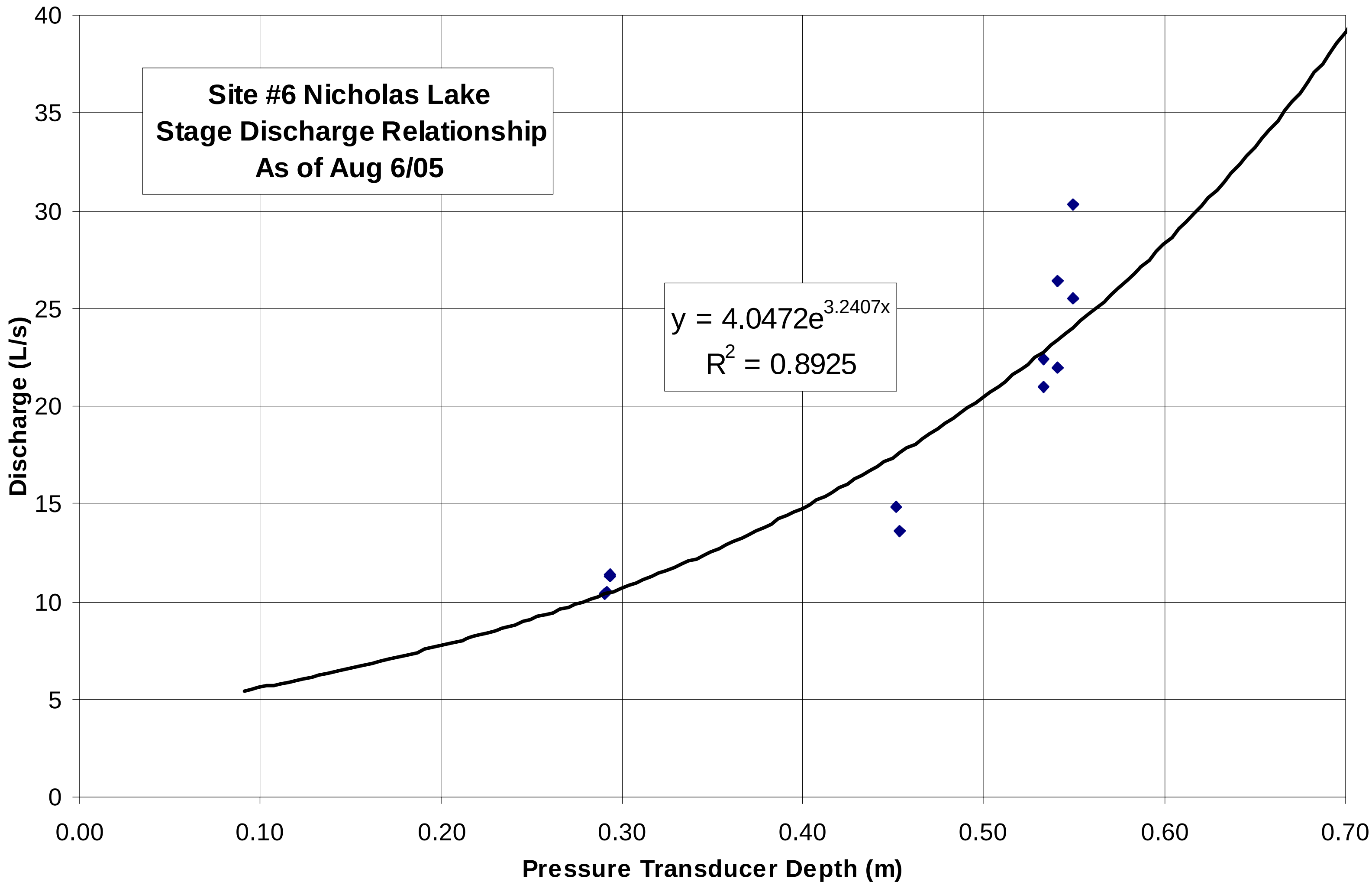
HYDROLOGY AND METEOROLOGY

2004 TIME HISTORY OF DISCHARGE

SITE#6 - NICHOLAS LAKE OUTLET

FIG. 2.19

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_6-Nicholas\Nicholas_Lake Discharge_History.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

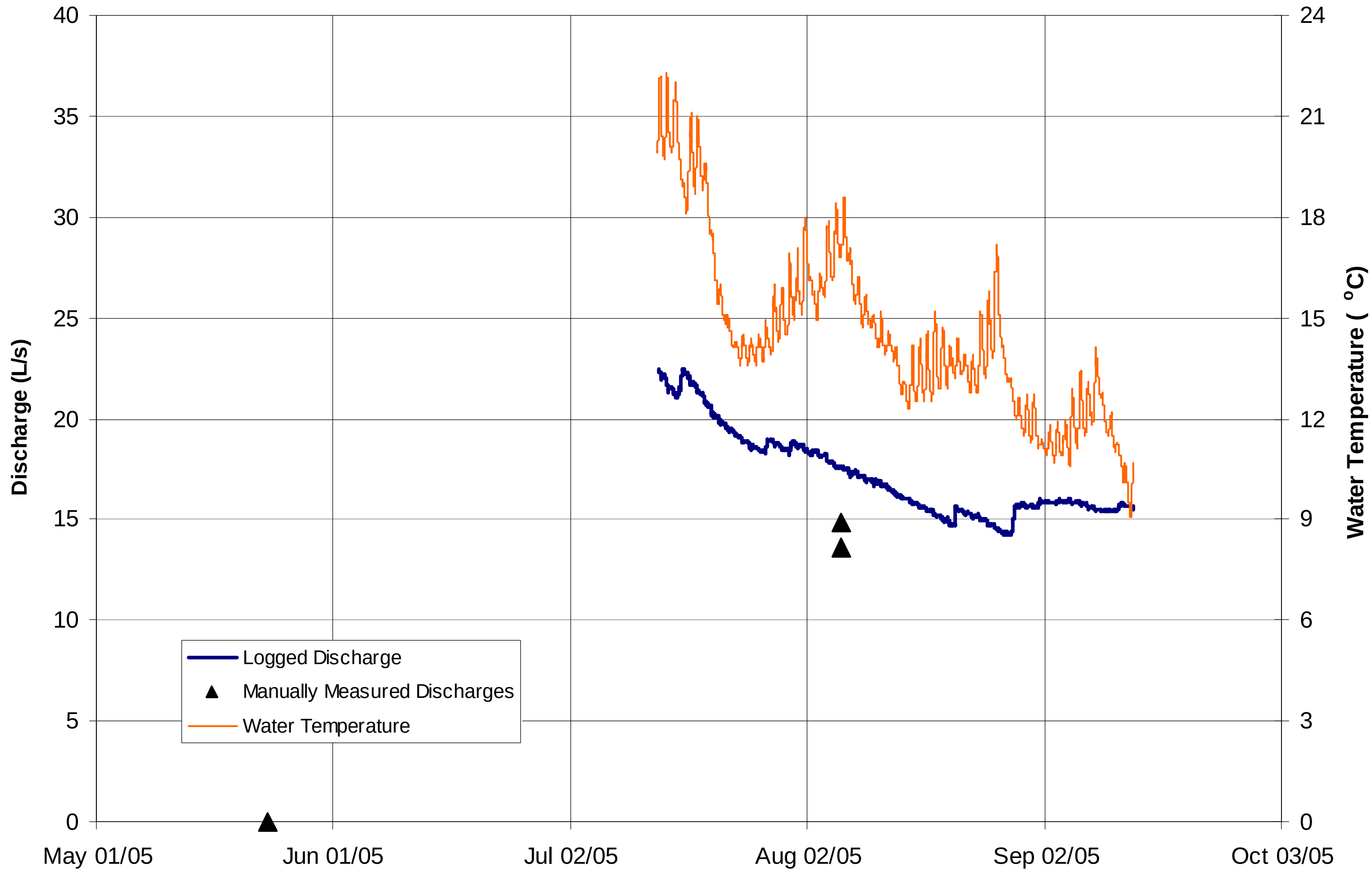
HYDROLOGY AND METEOROLOGY

STAGE-DISCHARGE RELATIONSHIP

SITE#6 - NICHOLAS LAKE OUTLET

FIG. 2.20

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_6-Nicholas\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

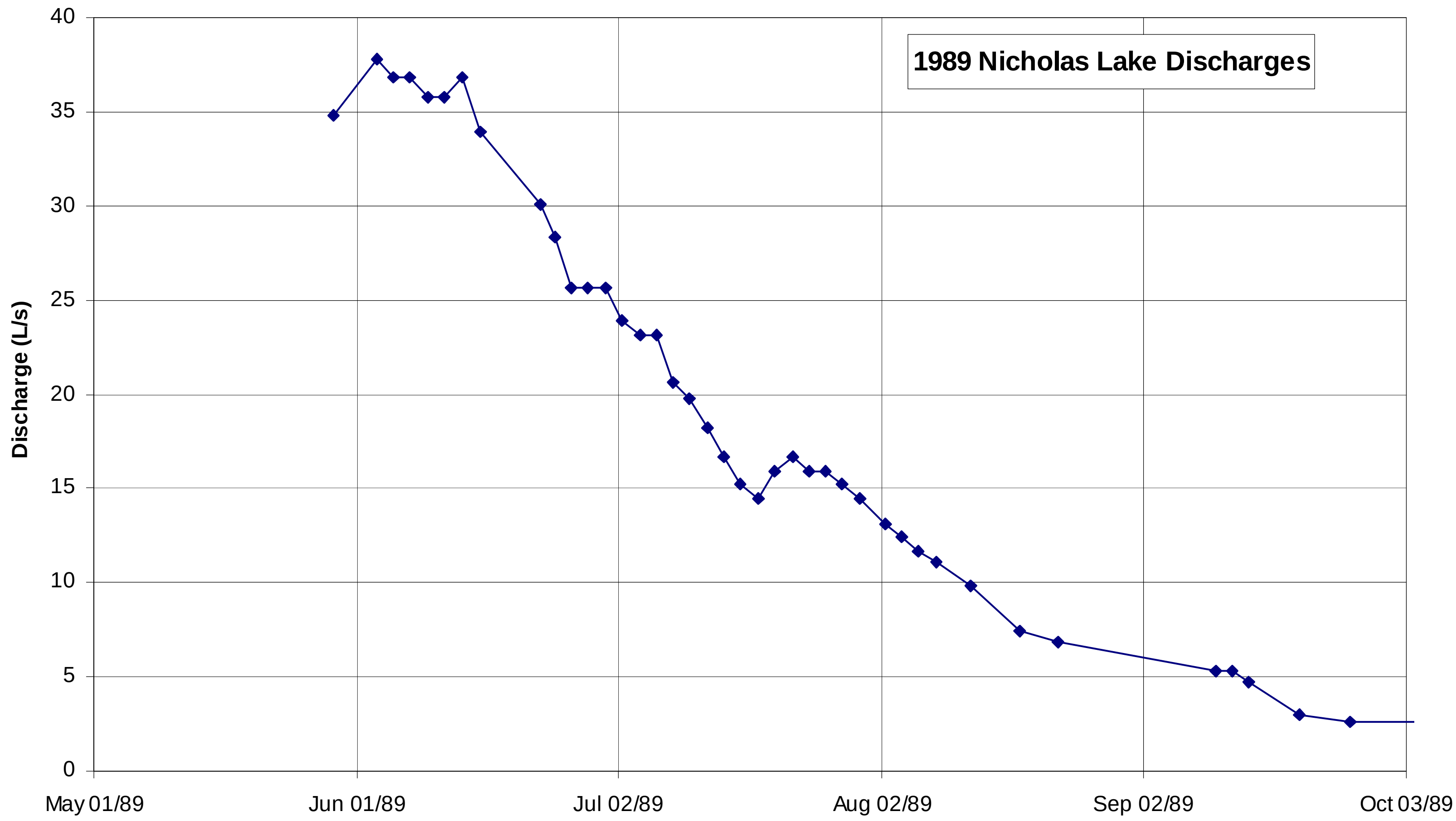
HYDROLOGY AND METEOROLOGY

2005 TIME HISTORY OF DISCHARGE

SITE#6 - NICHOLAS LAKE OUTLET

FIG.
2.21

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_6-Nicholas\Site1_Flowcalc.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

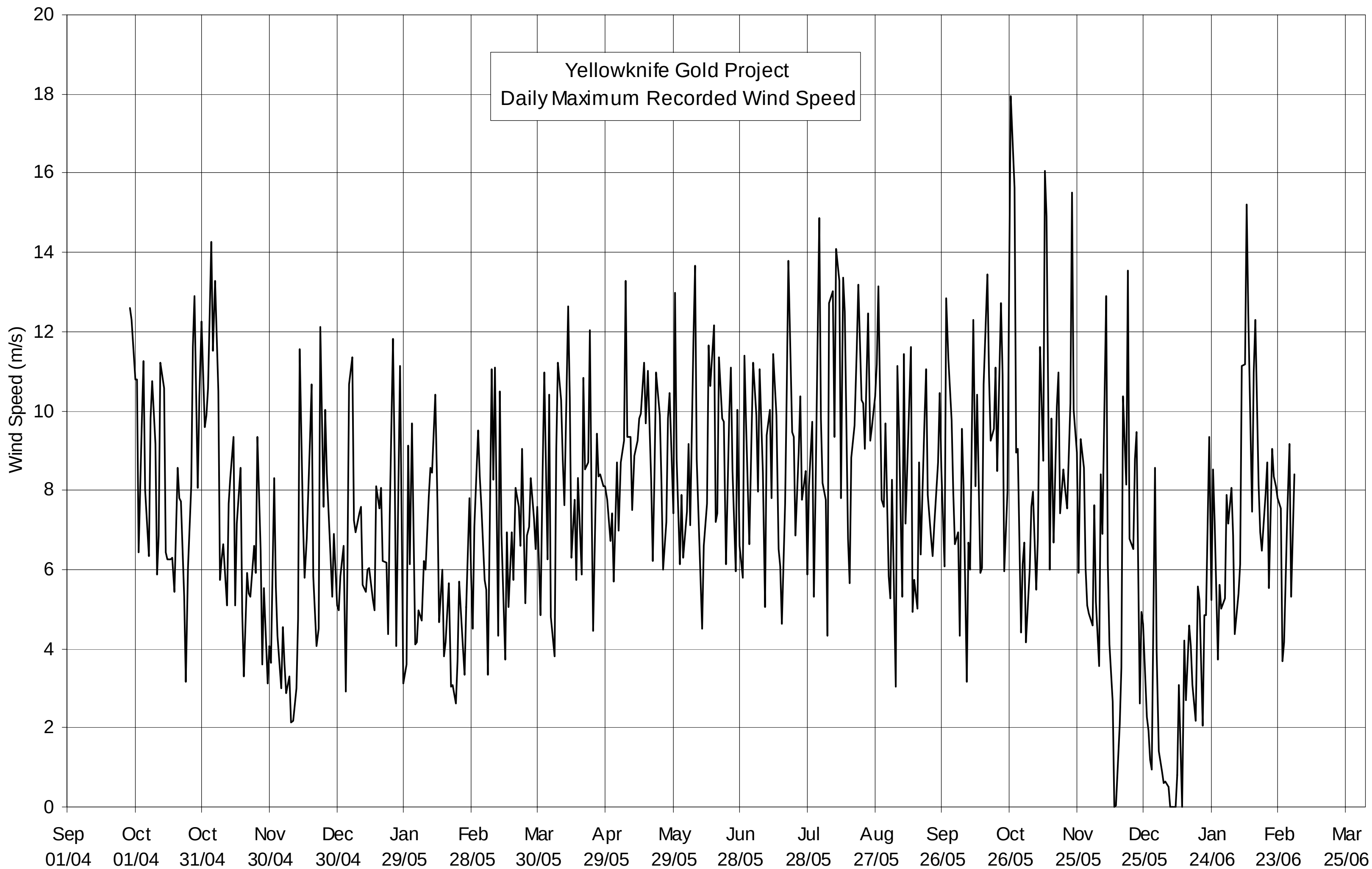
HYDROLOGY AND METEOROLOGY

1989 TIME HISTORY OF DISCHARGE

SITE#6 - NICHOLAS LAKE OUTLET

FIG. 2.22

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Site_6-Nicholas\Norecol_Nicholas_lake_data.xls



HAY & COMPANY CONSULTANTS

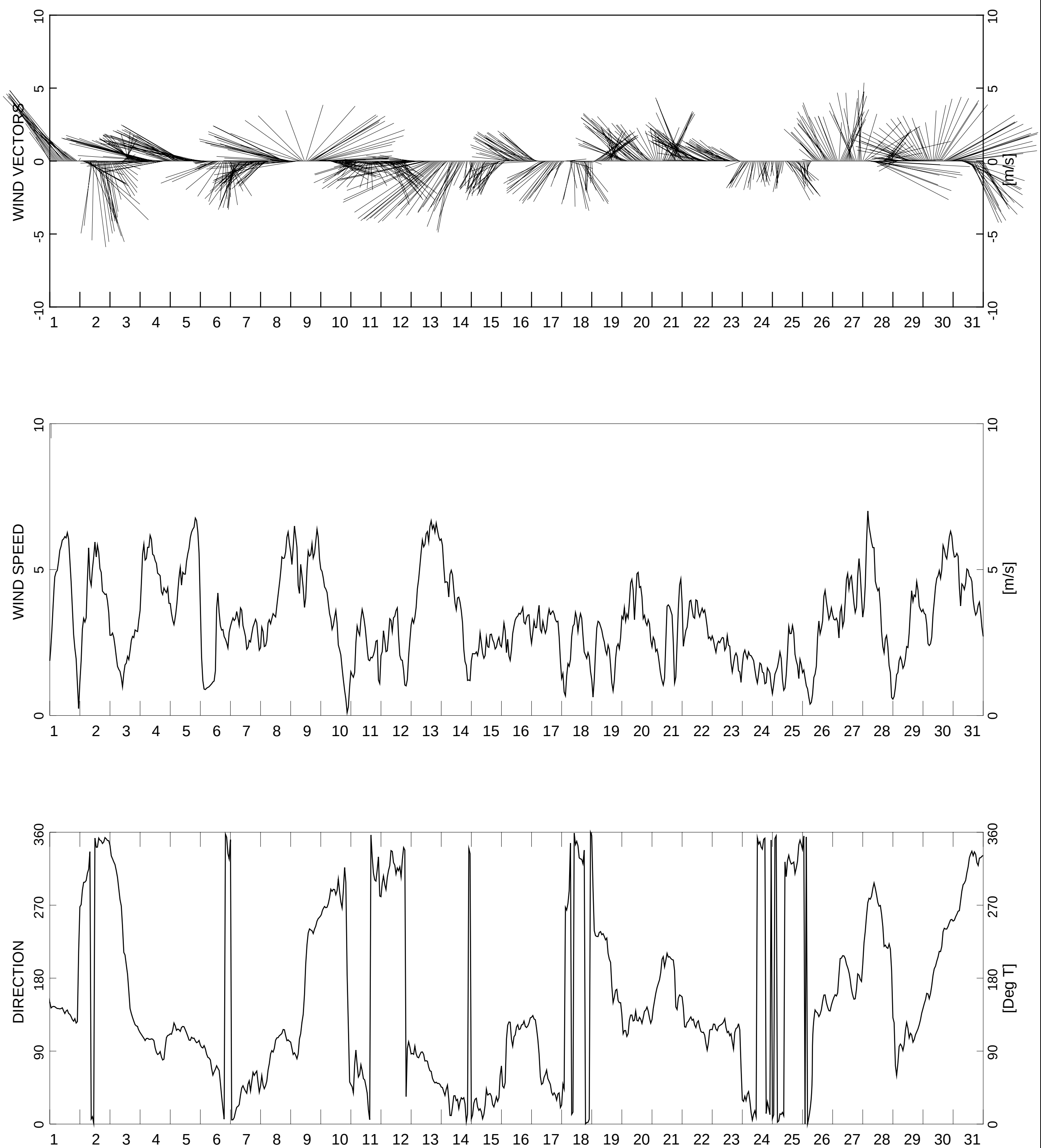
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

DAILY MAXIMUM RECORDED WIND SPEED
SITE#7 - TYHEE METEOROLOGICAL STATION

FIG. 3.1

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Met Station\Tyhee_daily_data.xls



HAY & COMPANY CONSULTANTS

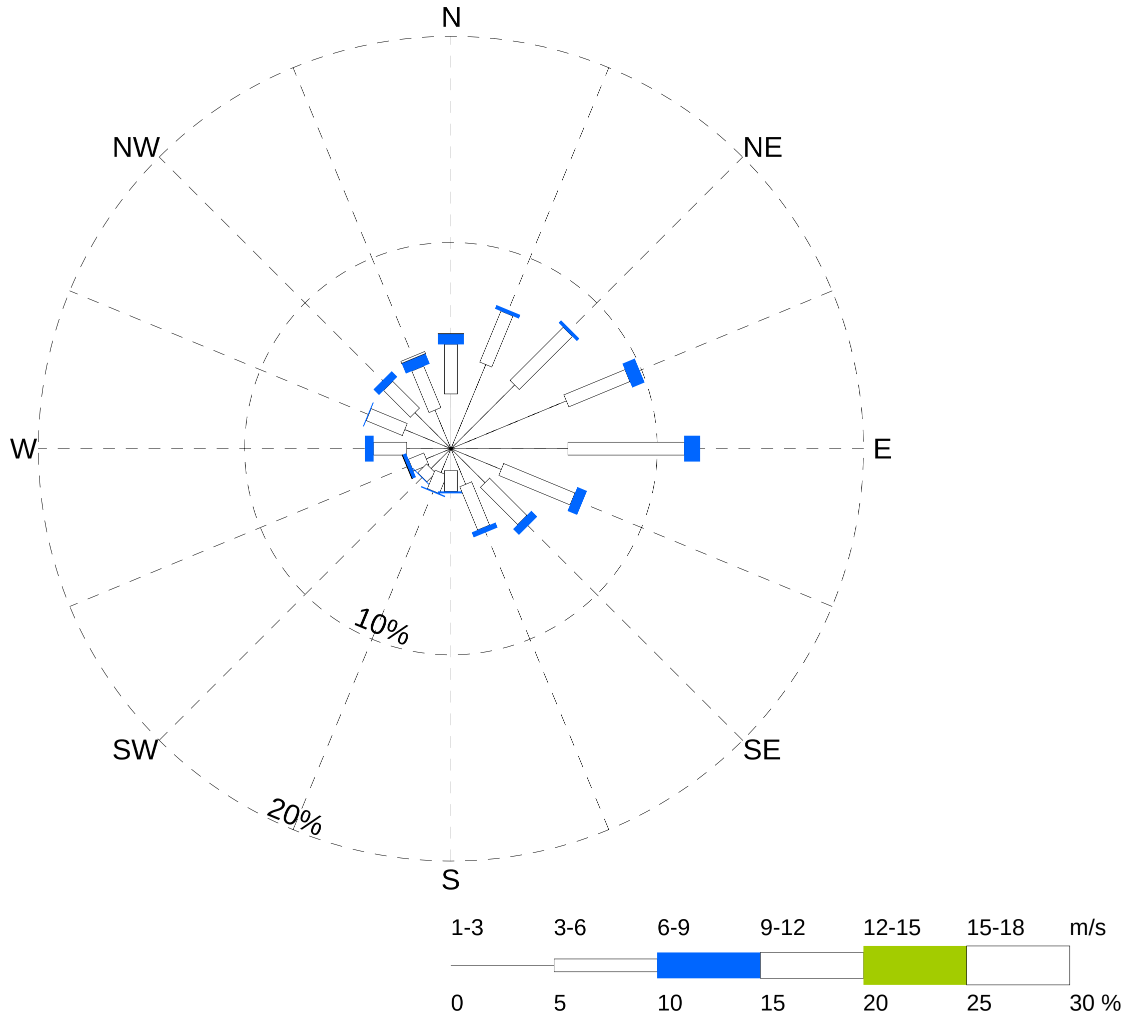
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
OCTOBER 2004

FIG.
3.2

Thu Apr 20 11:34:54 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



Wind Speed & Direction Frequency Distribution Table

Direction	Percent Occurrence (%) 0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	6.06	3.20	0.65	-	-	-	-	9.90
NE	-	4.37	3.64	0.17	-	-	-	-	8.18
NNE	-	4.42	2.67	0.19	-	-	-	-	7.28
N	-	2.66	2.40	0.51	0.02	-	-	-	5.58
NNW	-	2.02	2.18	0.54	0.10	-	-	-	4.84
NW	-	2.47	1.83	0.38	-	-	-	-	4.69
WNW	-	2.42	1.89	0.05	-	-	-	-	4.36
W	-	2.14	1.61	0.41	-	-	-	-	4.16
WSW	-	1.30	0.80	0.19	0.02	-	-	-	2.31
SW	-	1.36	0.60	0.04	-	-	-	-	2.01
SSW	-	1.26	0.97	0.06	-	-	-	-	2.29
S	-	1.06	1.01	0.10	-	-	-	-	2.17
SSE	-	1.87	2.26	0.26	-	-	-	-	4.40
SE	-	2.34	2.55	0.40	-	-	-	-	5.30
ESE	-	2.64	3.74	0.50	-	-	-	-	6.88
E	-	5.67	5.63	0.78	-	-	-	-	12.08
Calm	13.58	-	-	-	-	-	-	-	13.58
Total (%)	13.58	44.06	36.98	5.23	0.16	-	-	-	100.00

Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 520 days

Start Date: Sep. 28, 2004

End Date: Mar. 02, 2006

Comment:

HAY & COMPANY CONSULTANTS

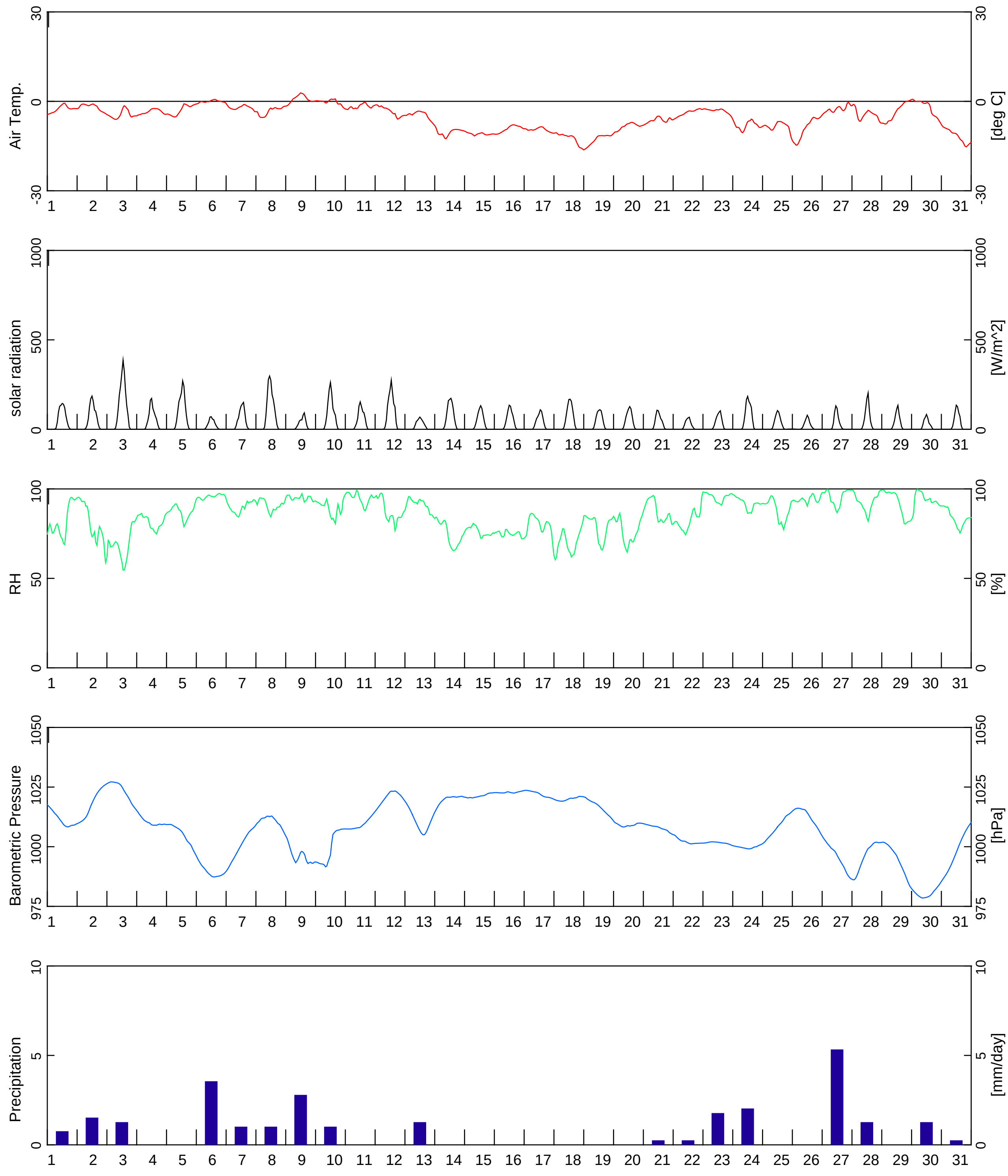
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
SEP, 2004 - MAR, 2006

FIG. 3.3

Thu Apr 27 13:30:30 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



HAY & COMPANY CONSULTANTS

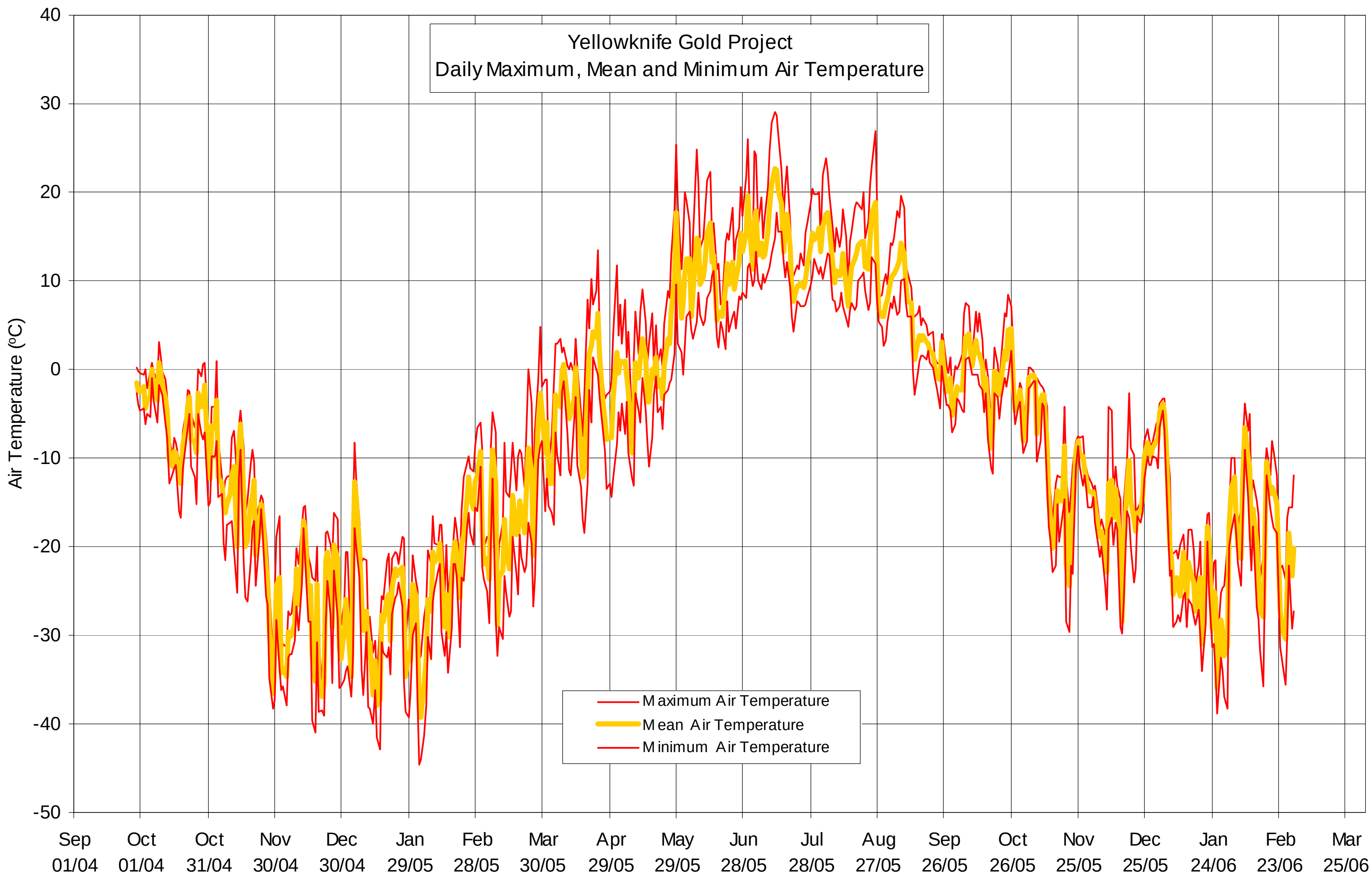
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
OCTOBER 2004

FIG.
3.4

Thu Apr 20 11:34:54 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

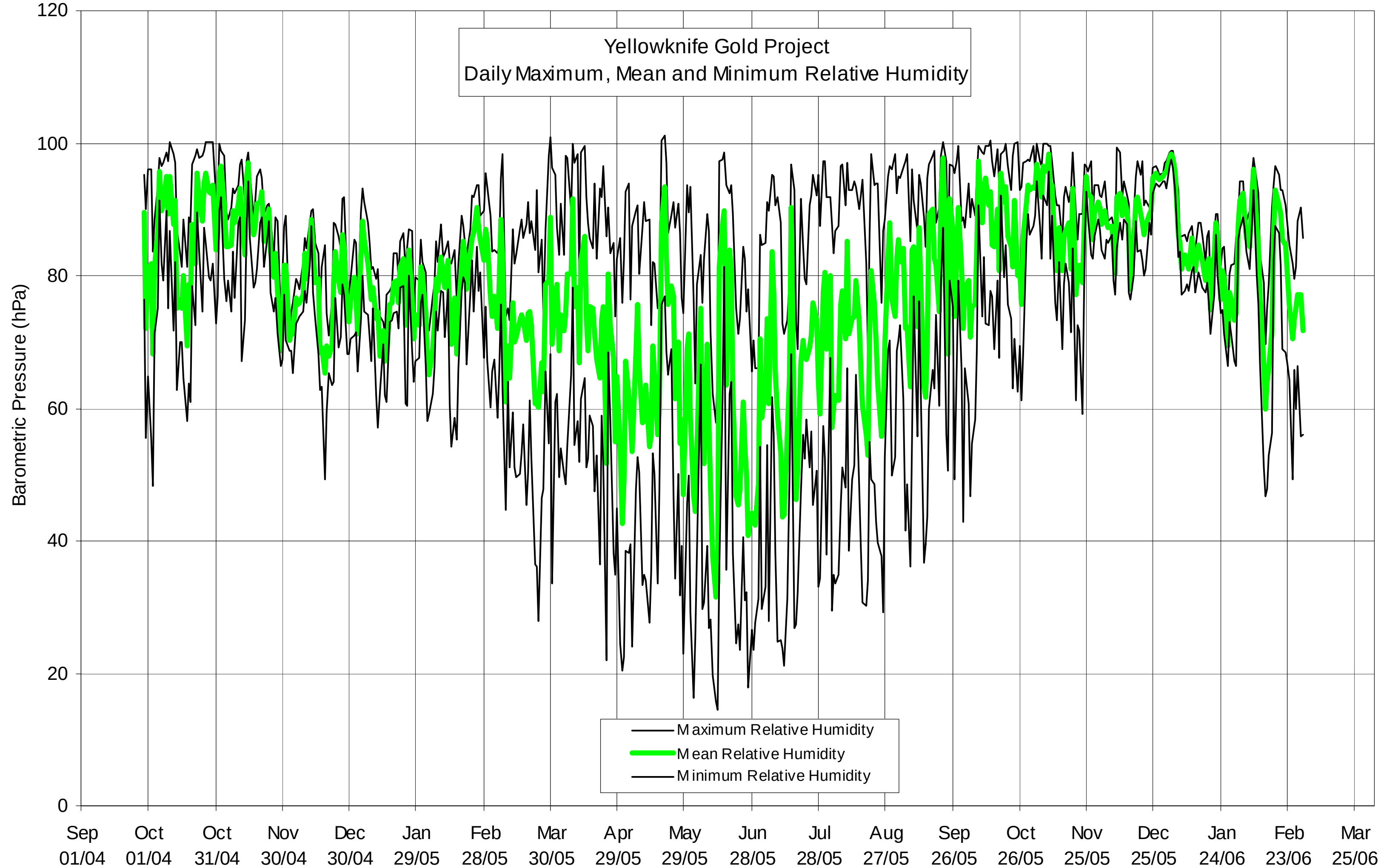
HYDROLOGY AND METEOROLOGY

DAILY MAXIMUM, MEAN AND MINIMUM

SITE#7 - AIR TEMPERATURE

FIG.
3.5

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Met Station\Tyhee_daily_data.xls



HAY & COMPANY CONSULTANTS

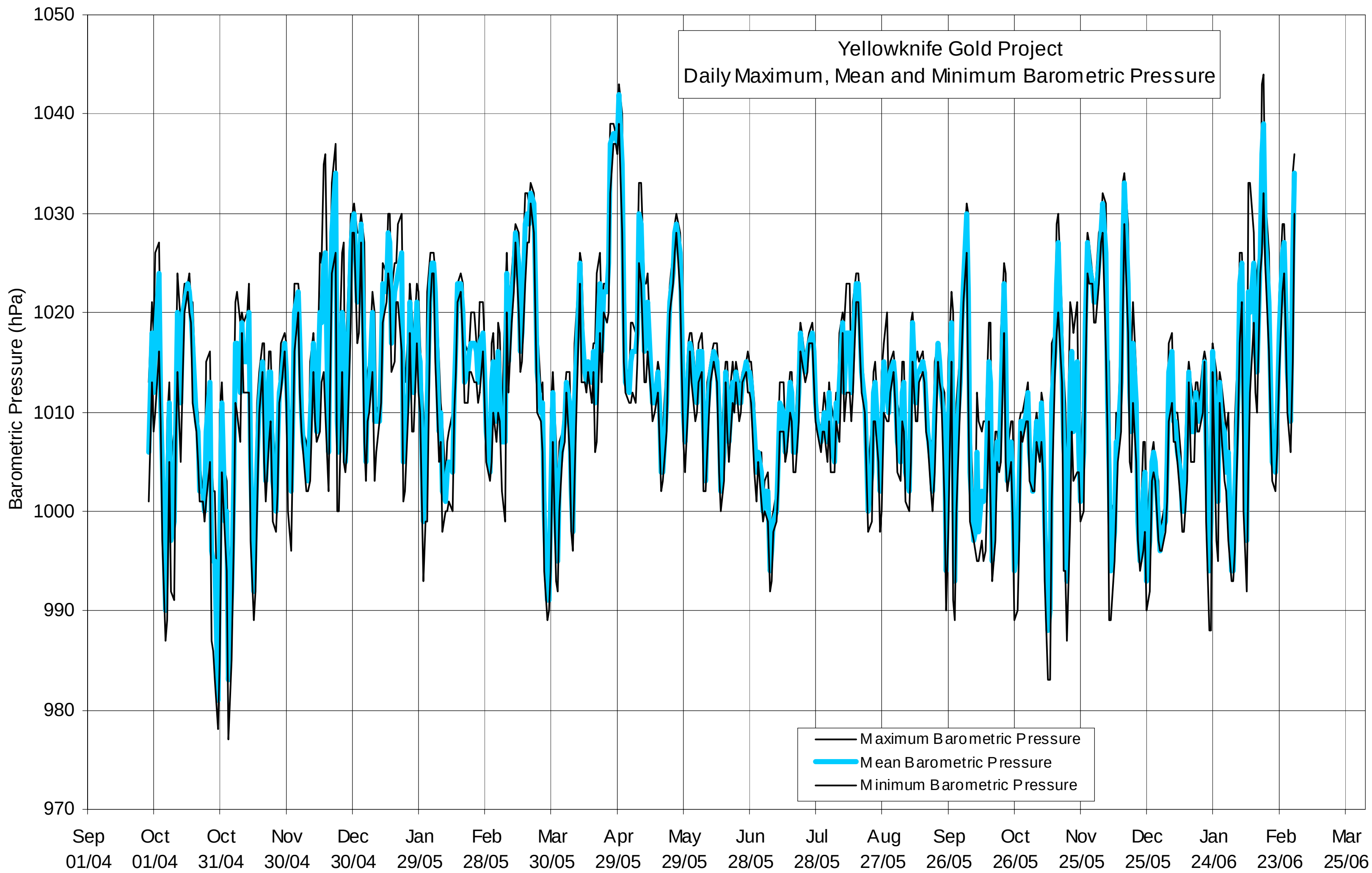
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

DAILY MAXIMUM, MEAN AND MINIMUM
SITE#7 - RELATIVE HUMIDITY

FIG. 3.6

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Met Station\Tyhee_daily_data.xls



HAY & COMPANY CONSULTANTS

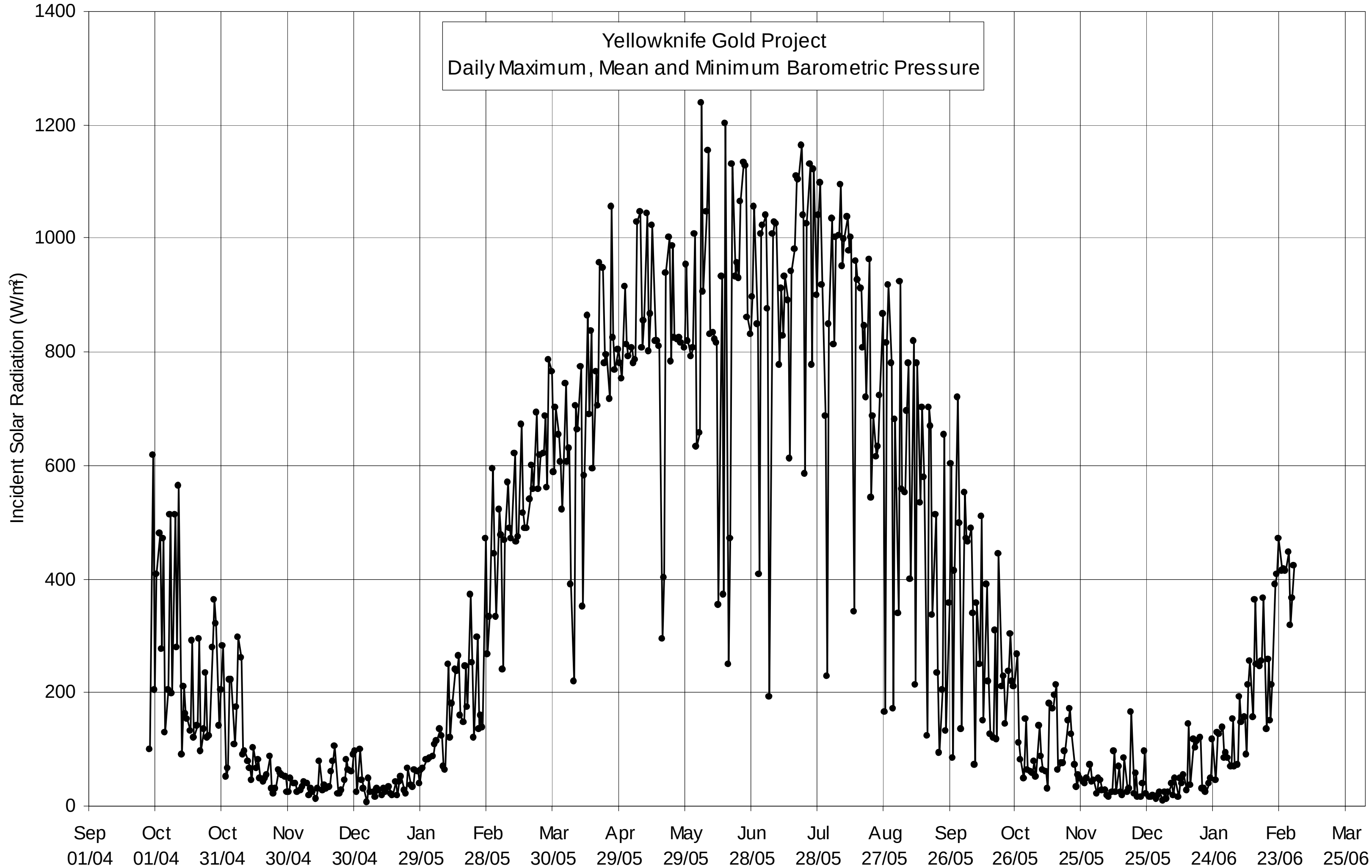
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

DAILY MAXIMUM, MEAN AND MINIMUM
SITE#7 - BAROMETRIC PRESSURE

FIG.
3.7

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Met Station\Tyhee_daily_data.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

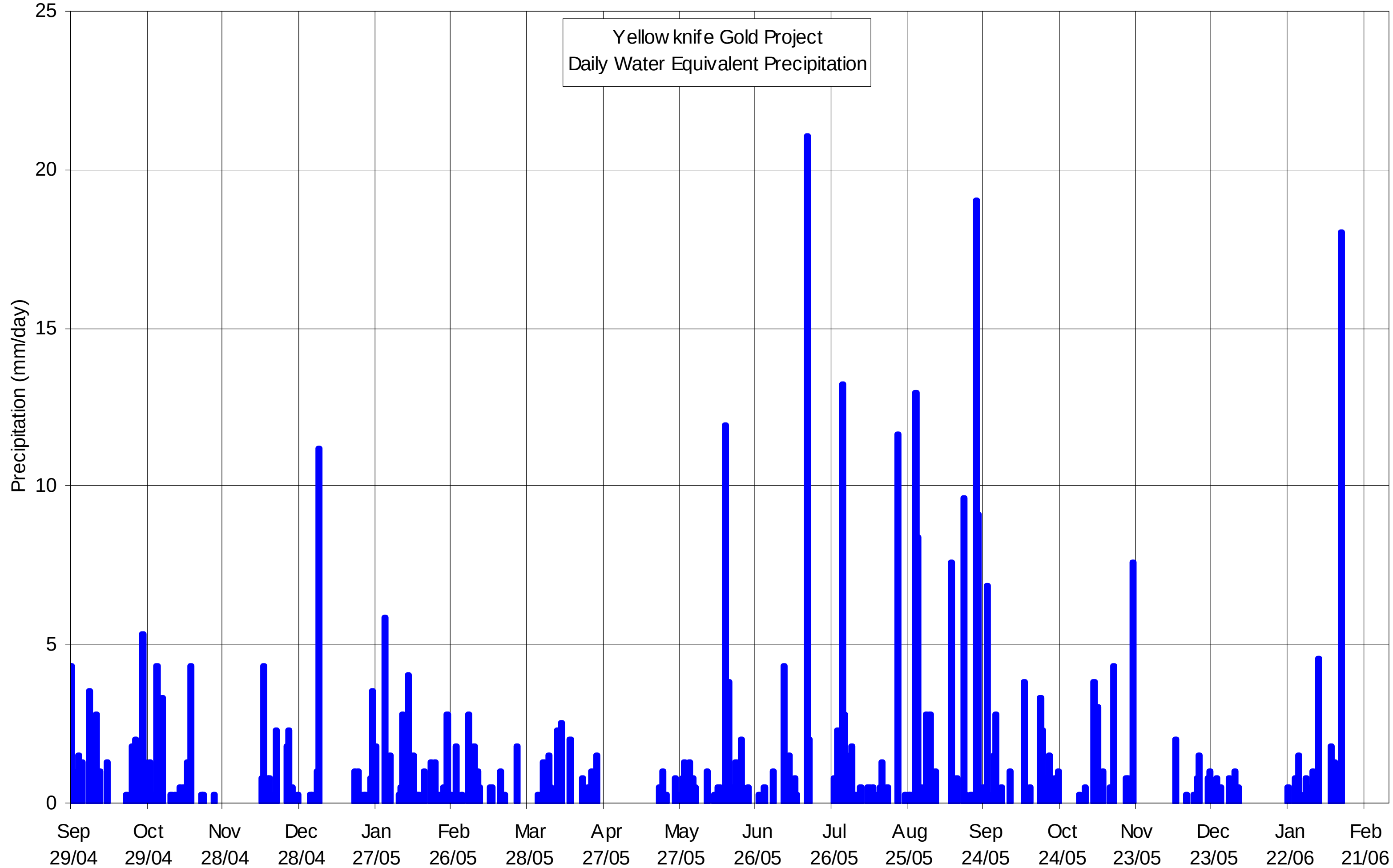
HYDROLOGY AND METEOROLOGY

MAXIMUM DAILY

SITE#7 - INCIDENT SOLAR RADIATION

FIG. 3.8

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Met Station\Tyhee_daily_data.xls



HAY & COMPANY CONSULTANTS

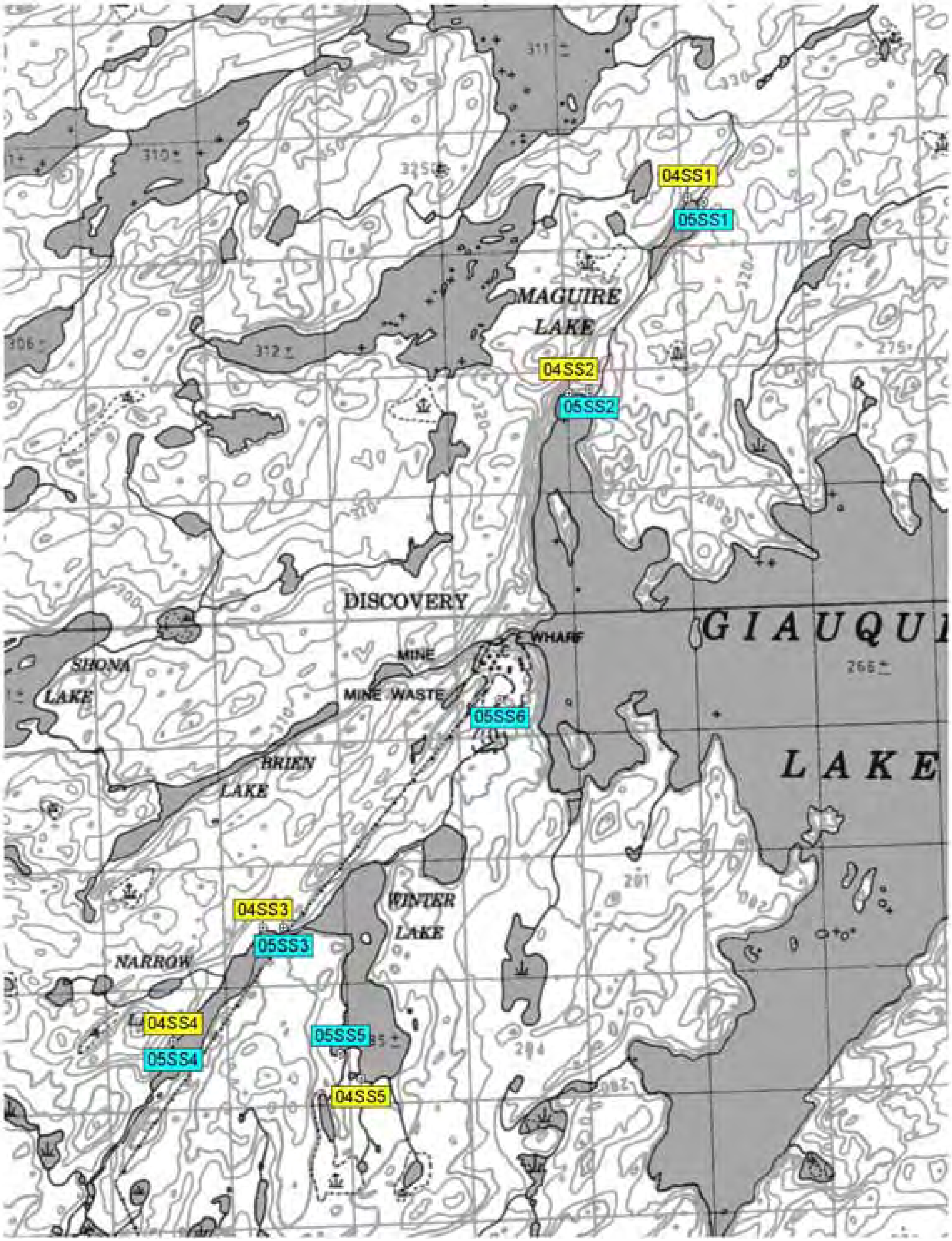
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

SITE #7 TOTAL DAILY WATER EQUIVALENT PRECIPITATION

FIG. 3.9

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Met Station\Tyhee_daily_data.xls



HAY & COMPANY CONSULTANTS

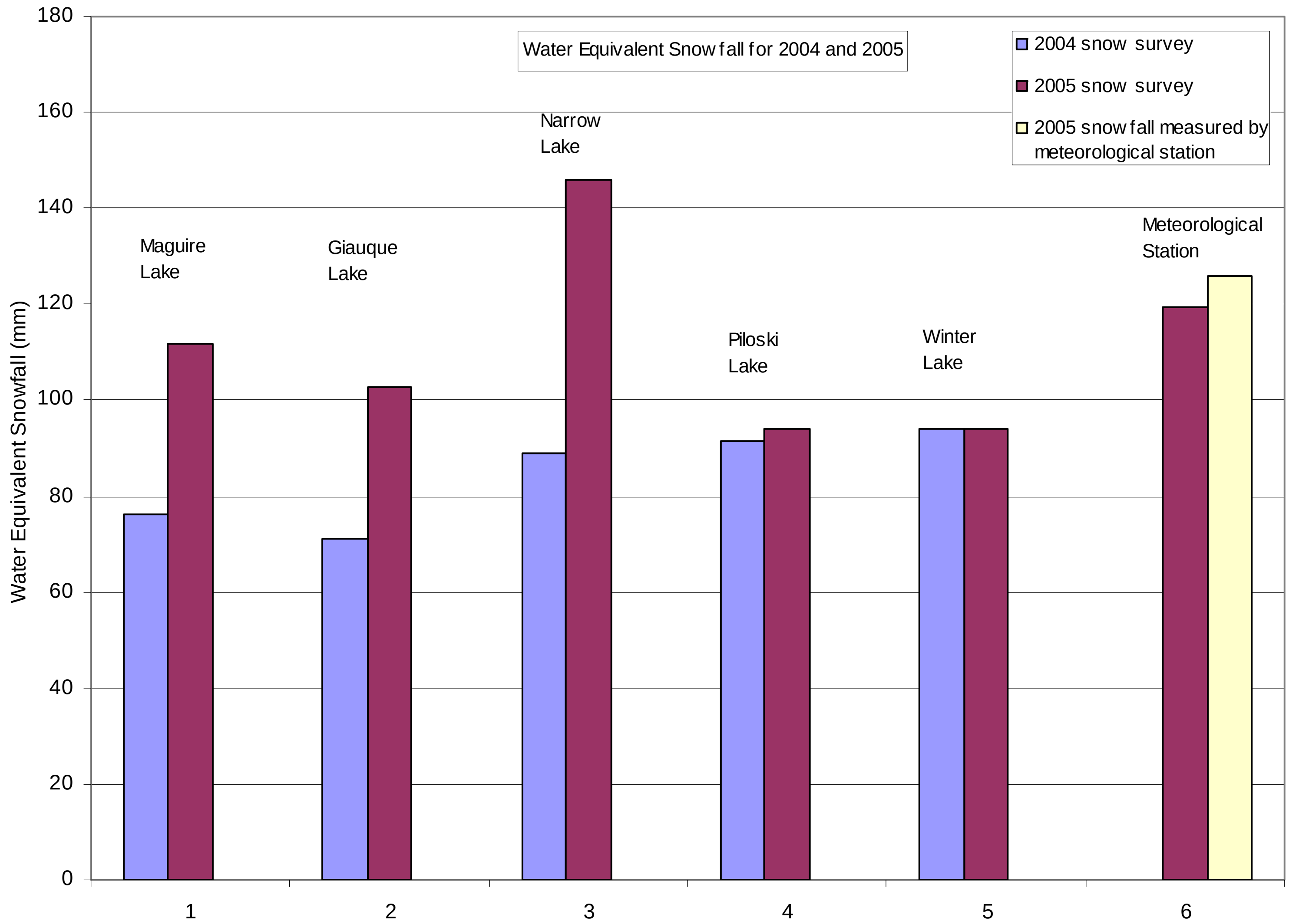
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2004, 2005 SNOW SURVEY
SITE LOCATIONS

FIG.
3.10

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Snow_survey\2004-2005_Snow Survey.xls



HAY & COMPANY CONSULTANTS

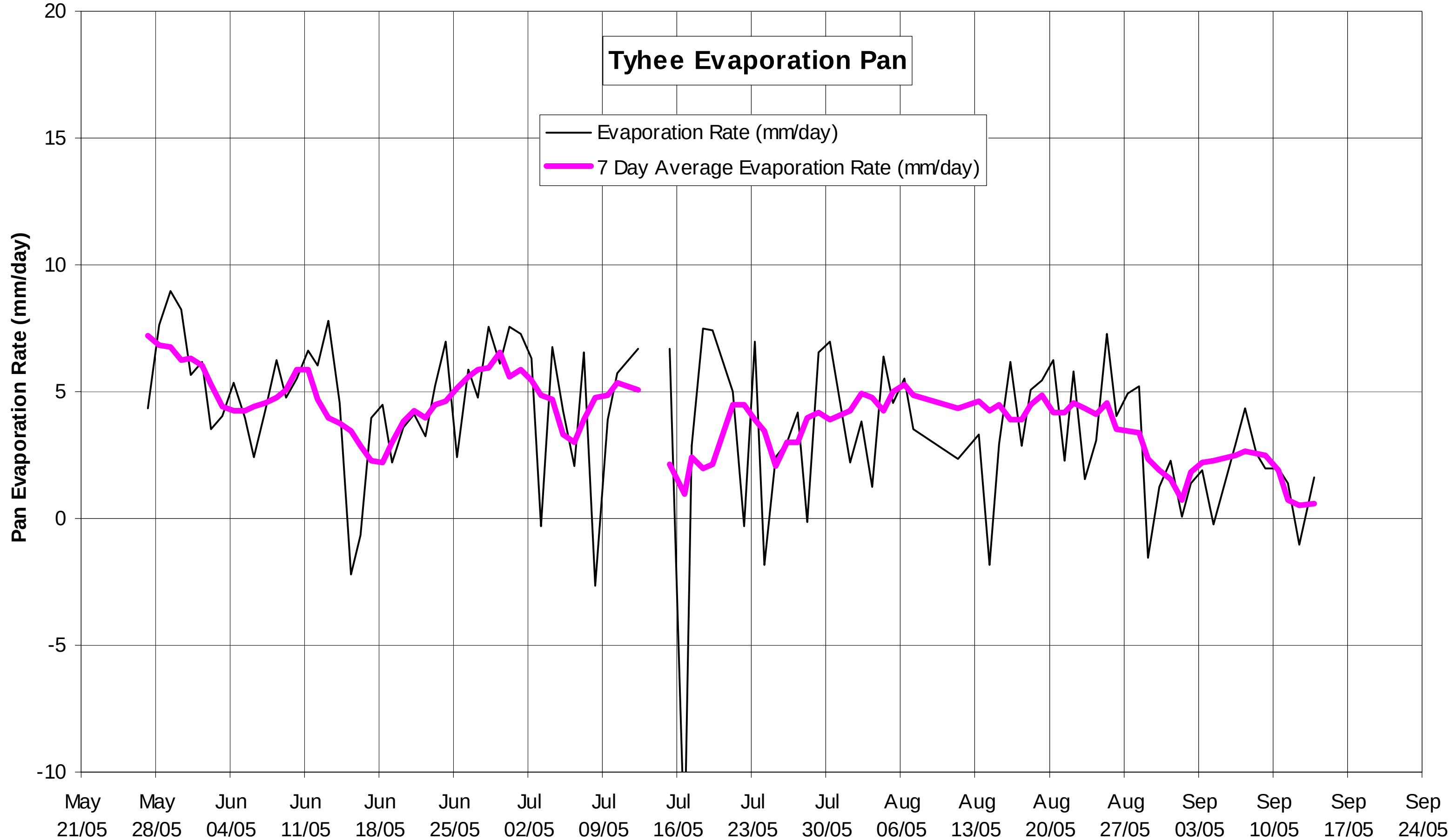
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

MEASURED SNOWFALL AT SITE FOR 2004 AND 2005

FIG. 3.11

EXCEL FILE: J:\1740180_Yellowknife_Gold\working\RED\Snow_survey\2004-2005_Snow Survey.xls



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

HYDROLOGY AND METEOROLOGY

DAILY PAN EVAPORATION RATES MEASURED AT SITE#7

FIG. 3.12

EXCEL FILE: Q:\Vancouver\Data\0804-water\Projects\1740180_Yellowknife_Gold\working\RED\Evaporation\Pan_Evaportation\Pan_Evap_summary.xls

TABLES

Table 1.0
Hydrometric and Meteorological Station Geographic Coordinates

Site #	Site Name	Latitude			Longitude		
		°	'	"	°	'	"
Site #1	Narrow Lake Outlet	63	9	15.0	113	57	18.4
Site #2	Brien Lake Outlet	63	10	52.3	113	57	54.0
Site #3	Winter Lake Outlet	63	10	3.8	113	55	51.2
Site #4	Round Lake Outlet	63	10	22.4	113	54	49.7
Site #5	Northeast Brien lake	63	11	7.0	113	55	7.1
Site #6	Nicholas Lake Outlet	63	15	20.2	113	46	6.7
Site #7	Meteorological Station	63	11	6.2	113	53	40.2

Note: All coordinates are referenced to Nad 27

Table 2.0

Summary of Discharge Measurements
Site#1 - Narrow Lake Outlet

Date/time MDST	Staff Gauge Reading m	Logger Reading m	Discharge L/s	Comments
2004				
May 19/04 12:00	Not installed	n/a	0.0	determined by inspection
May 28/04 15:13	0.194	n/a	10.2	
May 28/04 15:35	0.200	n/a	11.8	
May 28/04 16:15	0.212	n/a	16.2	
May 28/04 17:12	0.226	n/a	20.4	
May 28/04 18:10	0.238	n/a	24.5	
May 29/04 15:52	0.255	n/a	70.3	
May 29/04 16:37	0.254	n/a	69.5	
May 30/04 16:04	0.138	n/a	101.1	
May 30/04 16:50	0.136	n/a	99.6	
May 31/04 11:42	0.094	n/a	91.1	
May 31/04 11:58	0.094	n/a	96.4	
Jun 01/04 10:06	0.076	n/a	107.6	
Jun 01/04 10:38	0.075	n/a	102.5	
Jun 01/04 17:12	0.073	n/a	100.7	
Jun 01/04 17:41	0.073	n/a	102.4	
Jun 02/04 11:05	0.066	n/a	99.5	
Jun 02/04 11:48	0.066	n/a	98.2	
Jun 02/04 14:40	0.068	n/a	94.5	
Jun 02/04 15:05	0.068	n/a	99.2	
Staff gauge re-installed				
Sep 30/04 15:51	0.147	0.609	1.5	for stage-discharge relationship
Sep 30/04 16:06	0.147	0.609	1.6	for stage-discharge relationship
Oct 01/04 08:05	0.148	0.610	1.4	for stage-discharge relationship
Oct 01/04 08:14	0.148	0.610	1.6	for stage-discharge relationship
2005				
May 20/05 12:30	0.301	0.763	151.9	for stage-discharge relationship
May 20/05 13:12	0.300	0.762	155.3	for stage-discharge relationship
May 22/05 12:19	0.302	0.785	151.9	for stage-discharge relationship
May 22/05 12:45	0.302	0.785	149.3	for stage-discharge relationship
May 23/05 14:05	0.293	0.716	154.5	for stage-discharge relationship
May 23/05 14:31	0.293	0.719	147.7	for stage-discharge relationship
May 24/05 10:38	0.281	0.745	135.1	for stage-discharge relationship
May 24/05 11:08	0.281	0.744	138.6	for stage-discharge relationship
May 26/05 09:13	0.185	0.770	42.3	for stage-discharge relationship
Jul 11/05 12:24	0.185	0.646	42.5	for stage-discharge relationship
Jul 11/05 12:55	0.185	0.645	42.3	for stage-discharge relationship
Installed Parshall Flume				
Jul 18/05 14:48	0.275	0.167	44.0	Check Parshall Flume discharge
Jul 18/05 14:53	0.275	0.167	43.7	Check Parshall Flume discharge
Aug 06/05 10:49	0.224	0.121	25.0	Check Parshall Flume discharge
Aug 06/05 11:01	0.224	0.121	25.2	Check Parshall Flume discharge

Table 2.1

Summary of Discharge Measurements
Site#2 - Brien Lake Outlet

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Comments
May 19/04 14:00	not installed	0.0	inspection
May 29/04 13:54	0.458	159.9	Velocity Measurements
May 29/04 14:35	0.459	165.3	Velocity Measurements
May 29/04 17:20	0.457	151.9	Velocity Measurements
May 30/04 10:30	0.456	169.6	Velocity Measurements
May 30/04 11:26	0.457	166.1	Velocity Measurements
May 30/04 17:38	0.455	140.5	Velocity Measurements
May 30/04 18:18	0.454	154.4	Velocity Measurements
May 31/04 10:21	0.447	133.6	Velocity Measurements
May 31/04 10:56	0.447	144.8	Velocity Measurements
Jun 01/04 11:24	0.444	132.2	Velocity Measurements
Jun 01/04 12:08	0.444	128.5	Velocity Measurements
Jun 01/04 15:11	0.444	116.7	Velocity Measurements
Jun 01/04 15:50	0.444	117.7	Velocity Measurements
Jun 02/04 09:37	0.436	105.9	Velocity Measurements
Jun 02/04 10:17	0.436	114.8	Velocity Measurements
Jun 02/04 15:53	0.435	99.5	Velocity Measurements
Jun 02/04 16:40	0.435	103.6	Velocity Measurements
Sep 30/04 09:00	n/a	0.0	inspection

Table 2.2

Summary of Discharge Measurements
Site#3 - Winter Lake Outlet

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Comments
2005			
May 20/05 16:21	Not installed	43.0	
May 20/05 16:33	Not installed	46.8	
May 21/05 15:21	Not installed	47.6	
May 21/05 15:34	Not installed	49.5	
May 22/05 15:25	Not installed	45.5	
May 22/05 15:35	Not installed	45.8	
May 23/05 16:35	Not installed	48.4	
May 23/05 16:45	Not installed	48.3	
May 24/05 12:02	Not installed	52.6	
May 24/05 12:11	Not installed	50.7	
May 25/05 16:43	0.317	51.9	Installed Staff Gauge
May 25/05 17:08	0.317	52.3	
Installed the Parshall Flume			
Jul 16/06 15:14	0.220	29.1	Flume flow check
Jul 18/05 13:44	0.215	33.7	Flume flow check
Jul 18/05 11:09	0.215	29.4	Flume flow check
Aug 05/05 10:52	0.182	17.8	Flume flow check
Aug 05/05 11:09	0.182	17.8	Flume flow check

Table 2.3

Summary of Discharge Measurements
Site#4 - Round Lake Outlet

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Comments
2005			
May 21/05 18:14	Not installed	22.0	soft bed
May 21/05 18:27	Not installed	23.6	soft bed
May 22/05 16:49	Not installed	16.8	rock lined bed
May 22/05 17:02	Not installed	16.1	rock lined bed
May 24/05 17:39	0.201	14.9	rock lined bed
May 24/05 17:45	0.201	14.8	rock lined bed
May 25/05 17:35	0.191	14.4	rock lined bed
May 25/05 17:43	0.191	13.7	rock lined bed
Jul 10/05 12:46	0.185	14.0	rock lined bed
Installed Parshal Flume			
Jul 18/05 17:52	0.375	14.9	measured in flume
Jul 18/05 17:57	0.375	14.9	measured in flume
Aug 05/05 13:40	0.305	4.3	measured in flume
Aug 05/05 13:50	0.305	4.4	measured in flume

Table 2.4

Summary of Discharge Measurements
Site#6 - Nicholas Lake Outlet

Date/time MDST	Staff Gauge Reading m	Discharge l/s	Comments
May 19/04 16:00	Not installed	0.0	Ice filled creek bed
May 31/04 15:53	0.470	22.4	
May 31/04 16:39	0.470	21.0	
Jun 01/04 14:04	0.478	26.4	
Jun 01/04 14:26	0.478	22.0	
Jun 02/04 13:34	0.487	25.5	
Jun 02/04 13:57	0.487	30.3	
Sep 30/04 14:26	0.229	10.5	
Sep 30/04 14:52	0.228	10.4	
Oct 01/04 08:52	0.231	11.3	
Oct 01/04 09:02	0.231	11.2	
May 23/05 08:10	n/a	0.0	Ice filled creek bed
Aug 06/05 09:06	0.390	13.6	
Aug 06/05 09:28	0.390	14.8	

Table 2.5

Nicholas Lake Outlet Flows
May to October, 1989

Date / Time	Gauge Height (m)	Discharge (L/s)
May 29/89 09:30	0.167	34.8
Jun 03/89 09:00	0.202	37.8
Jun 05/89 09:00	0.174	36.8
Jun 07/89 08:50	0.174	36.8
Jun 09/89 08:55	0.171	35.8
Jun 11/89 08:50	0.171	35.8
Jun 13/89 11:35	0.174	36.8
Jun 15/89 16:00	0.165	33.9
Jun 22/89 20:00	0.152	30.1
Jun 24/89 09:10	0.146	28.3
Jun 26/89 09:00	0.137	25.6
Jun 28/89 07:00	0.137	25.6
Jun 30/89 11:30	0.137	25.6
Jul 02/89 11:40	0.131	23.9
Jul 04/89 11:50	0.128	23.1
Jul 06/89 10:40	0.128	23.1
Jul 08/89 10:00	0.119	20.6
Jul 10/89 09:30	0.116	19.8
Jul 12/89 09:30	0.110	18.2
Jul 14/89 08:45	0.104	16.7
Jul 16/89 08:15	0.098	15.2
Jul 18/89 09:00	0.094	14.5
Jul 20/89 09:00	0.100	15.9
Jul 22/89 11:15	0.104	16.7
Jul 24/89 11:30	0.100	15.9
Jul 26/89 11:00	0.100	15.9
Jul 28/89 09:00	0.098	15.2
Jul 30/89 10:00	0.094	14.5
Aug 02/89 11:00	0.088	13.1
Aug 04/89 09:00	0.085	12.4
Aug 06/89 10:00	0.082	11.7
Aug 08/89 09:00	0.079	11.1
Aug 12/89 11:00	0.073	9.79
Aug 18/89 09:30	0.061	7.41
Aug 22/89 19:00	0.058	6.85
Sep 10/89 10:00	0.049	5.27
Sep 12/89 09:35	0.049	5.27
Sep 14/89 10:00	0.046	4.77
Sep 20/89 10:30	0.034	2.97
Sep 26/89 09:30	0.030	2.57
Oct 04/89 10:00	0.030	2.57

Table 3.0

Yellowknife Gold Project
Daily Precipitation For 2004

Day	Daily Precipitation for Month in 2004											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.76	0.25	-
2	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.52	4.32	-
3	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.27	0.76	-
4	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	3.30	-
5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	-	-
6	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	3.56	-	-
7	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.02	0.25	-
8	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.02	-	-
9	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.79	0.25	-
10	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.02	-	-
11	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	0.51	-
12	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	0.51	-
13	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.27	0.25	0.76
14	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	1.27	4.32
15	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	4.32	0.76
16	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	-	0.76
17	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	-	-
18	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	-	0.25
19	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	0.25	2.29
20	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	0.25	-
21	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.25	-	-
22	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.25	-	-
23	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.78	-	1.78
24	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	2.03	0.25	2.29
25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	-	0.51
26	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	-	-	-
27	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	5.33	-	0.25
28	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.27	-	-
29	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	4.32	-	-	-
30	n/a		n/a	n/a	n/a	n/a	n/a	n/a	1.02	1.27	-	-
31	n/a		n/a		n/a		n/a	n/a		0.25		-
Total									**5.33**	**26.67**	**16.76**	**13.97**

Table 3.1

Yellowknife Gold Project
Daily Precipitation For 2005

Day	Daily Precipitation for Month in 2005											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	0.25	0.25	-	0.25	-	0.76	-	-	2.79	0.51	0.25	-
2	0.25	1.52	0.25	-	-	0.51	-	1.52	1.27	-	-	-
3	-	-	-	1.27	-	-	1.02	1.78	2.79	-	0.51	-
4	1.02	-	-	-	-	-	-	0.25	0.76	1.02	-	-
5	11.18	0.25	2.79	1.52	-	-	-	-	1.02	-	-	-
6	-	0.51	-	0.51	-	-	-	0.51	-	-	3.81	-
7	-	2.79	1.78	-	-	1.02	4.32	-	-	-	0.25	-
8	-	-	1.02	-	-	-	1.02	-	-	-	3.05	-
9	-	4.06	0.51	2.29	-	-	1.52	0.51	-	-	0.76	2.03
10	-	0.25	-	2.54	-	0.25	-	0.51	-	3.81	1.02	-
11	-	1.52	-	-	-	0.51	0.76	0.51	7.62	0.25	-	-
12	-	0.25	-	-	-	0.51	0.25	0.25	0.25	0.51	-	-
13	-	0.25	0.51	-	-	-	-	-	0.76	-	0.51	0.25
14	-	-	0.51	2.03	-	11.94	-	0.51	-	-	4.32	-
15	-	1.02	-	-	-	3.81	-	1.27	-	-	-	-
16	-	-	-	-	-	-	21.08	-	9.65	3.30	-	0.25
17	-	-	1.02	-	-	0.51	2.03	0.51	0.25	2.29	-	0.76
18	-	1.27	-	-	-	1.27	-	-	-	-	-	1.52
19	1.02	1.27	0.25	0.76	0.51	0.51	-	-	0.25	0.76	0.76	-
20	1.02	0.25	-	0.25	1.02	2.03	-	-	-	1.52	0.76	-
21	-	0.25	-	0.51	-	0.51	-	11.68	19.05	-	-	0.76
22	0.25	0.25	-	1.02	0.25	-	-	-	9.14	0.76	7.62	1.02
23	0.25	0.51	-	0.51	-	0.51	-	-	-	1.02	-	0.51
24	0.25	2.79	1.78	1.52	-	-	-	0.25	0.51	-	-	0.51
25	0.76	-	-	-	0.76	-	-	0.25	6.86	-	-	0.76
26	3.56	0.25	-	-	-	-	-	0.25	0.25	-	-	0.51
27	1.78	-	-	-	0.25	0.25	0.76	-	-	-	-	-
28	-	1.78	-	-	0.76	-	2.29	12.95	1.52	-	-	-
29	-	n/a	-	-	1.27	0.51	-	8.38	2.79	-	-	-
30	-		-	-	0.25	-	13.21	0.51	-	-	-	0.76
31	5.84		-		1.27		2.79	-		-		-
Total	**27.44**	**21.34**	**10.41**	**14.99**	**6.35**	**25.40**	**51.05**	**42.41**	**67.56**	**15.75**	**23.62**	**9.65**

Total water equivalent precipitation for 2005 = **316.0** mm

Table 3.2

Yellowknife Gold Project
Daily Precipitation For 2006

Day	Daily Precipitation for Month in 2006											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	1.02	1.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2	0.51	1.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3	-	4.57	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
7	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
8	-	1.78	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
9	-	1.27	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10	-	1.02	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
11	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
12	-	18.03	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
13	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
14	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
15	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
16	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
17	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
18	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
19	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
20	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
21	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
22	0.51	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
23	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
24	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
25	0.76	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
26	1.52	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
27	-	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
28	0.25	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
29	0.76	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
30	0.25	-	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
31	0.51		n/a		n/a		n/a	n/a		n/a		n/a
Total	**6.10**	**28.70**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

Table 3.3

Yellowknife Gold Project
Site Snow Survey Data Summary

Site ID	Site Name	Longitude			Latitude			Snow Depth (mm)	Water Equivalent (mm)	Snow Density
		deg	min	sec	deg	min	sec			
April 16, 2004 Snow Survey										
SS1	Maguire Lake	-113	51	52.9	63	13	20.0	483.9	76.2	15.7%
SS2	Giauque Lake	-113	53	0.1	63	12	27.9	467.4	71.1	15.2%
SS3	Narrow Lake	-113	55	56.9	63	10	3.9	501.7	88.9	17.7%
SS4	Piloski Lake	-113	56	50.3	63	9	32.9	394.3	91.4	23.2%
SS5	Winter Lake	-113	54	59.1	63	9	23.8	417.2	94.0	22.5%
	Average for 2004							**452.9**	**84.3**	**18.6%**
April 9, 2005 Snow Survey										
SS1	Maguire Lake	-113	51	42.6	63	13	19.4	759.5	111.8	14.7%
SS2	Giauque Lake	-113	52	49.1	63	12	28.8	727.7	102.9	14.1%
SS3	Narrow Lake	-113	55	46.8	63	10	4.4	730.3	146.1	20.0%
SS4	Piloski Lake	-113	56	51.1	63	9	33.7	582.9	94.0	16.1%
SS5	Winter Lake	-113	55	11.9	63	9	30.4	718.8	94.0	13.1%
SS6	Meteorological Station	-113	53	40.2	63	11	6.2	619.8	119.4	19.3%
	Average for 2005							**689.8**	**111.3**	**16.2%**

Note :NAD 27 Geographical Coodinates used

Table 3.4a

Yellowknife Gold Project
Total and Average Monthly Pan Evaporation Rates

Month	Total Pan Evaporation (mm)	Daily Rate (mm/day)	Comments
May 2005	34.9	7.0	May 27 to May 31/05
June 2005	136.4	4.5	full months data
July 2005	91.2	3.5	missing July 13/05
August 2005	96.0	3.6	full months data
September 2005	19.1	1.6	Sep. 1 to Sep 13/05
May 27 to Sep 13, 2005	**377.5**	**3.8**	Period of record

Table 3.4b

Yellowknife Gold Project
Total and Average Monthly Lake Evaporation Rates

Month	Total Lake Evaporation (mm)	Daily Rate (mm/day)	Comments
May 2005	24.4	4.9	May 27 to May 31/05
June 2005	95.5	3.2	full months data
July 2005	63.8	2.5	missing July 13/05
August 2005	67.2	2.5	full months data
September 2005	13.4	1.1	Sep. 1 to Sep 13/05
May 27 to Sep 13, 2005	**264.3**	**2.6**	Period of record

Note: A factor of 0.7 has been used to convert
pan evaporation to lake evaporation

APPENDIX A
SITE DESCRIPTIONS

Site Identification: **Site: #1** **Name: Narrow Lake Outlet**

Site GPS NAD27 Coordinates: 113^{o} 57' 18.4" West Longitude 63^{o} 9' 15.0" North Latitude

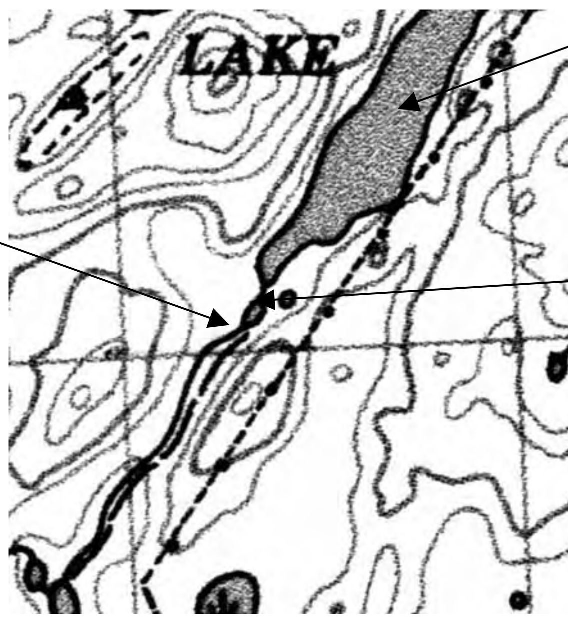
Site Location:
The station is located on the southwest end of Narrow Lake. It is about 10 m north of the winter road at the junction of the creek with the road. There are two small creeks, which flow out of Narrow Lake. Both creeks enter a small pond. A single creek flows out of this pond and for the first 50 m the flow is along a well-defined channel. The Narrow Lake outlet hydrometric Site#1 is located in this channel about 10 m downstream of the pond.

Description:
Two creeks flow southwest from Narrow Lake and merge again into a small pond. A single creek flows out of the southwest side of the pond. The creek bed is about 0.5 m below the typical bank elevation and is typically about 1 to 3 m in width. After approximately 100 m of defined creek channel, the channel disappear and the creek flow is diffuse in nature and in general meanders through stunted growth of birch, pine trees, willow shrubs and long grass.

Instrumentation:
A hydrometric station is installed at this site. The station includes a Parshall Flume and a continuous recording river stage logger and water level sensor. A staff gauge and creek discharge gauging station are located just upstream of the Parshall Flume.

Specifics on Measurements:

1000.000	m sea level, benchmark elevation at the site (assumed)
998.278	m sea level, elevation of zero reading on staff gauge (assumed)
1.722	m difference in elevation from BM to staff gauge zero reading
_______	m difference in elevation from BM to the base of the Parshall flume
2434006	pressure transducer / data logger serial number
0.038	m offset on transducer calibration for zero flow through the Parshall flume



Site#1: Map

Site#1: Aerial view looking upstream to the northeast to Narrow Lake

Site#1: Hydrometric gauging station with installed Parshall flume

Site Identification: **Site: #2** **Name: Brien Lake Outlet**

Site GPS NAD27 Coordinates: 113° 57’ 54.0” West Longitude 63° 10’ 52.3” North Latitude

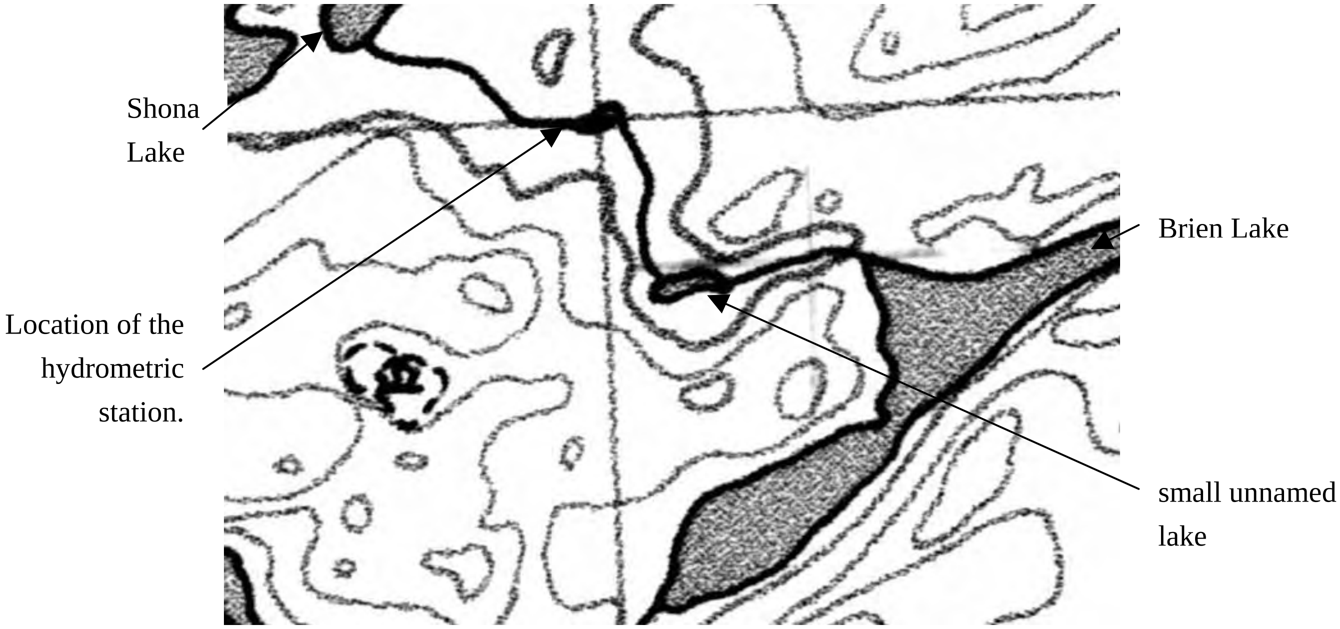
Site Location:
The site is located along the creek connecting Brien Lake to Shona Lake about 1 km downstream of Brien Lake outlet. This was the only location along the entire valley where the creek was observed to flow in a confined channel.

Description:
The creek meanders through a 30 to 100 m wide fully vegetated valley. A small lake is located about 200 m along the valley from Brien Lake to Shona Lake. The hydrometric station is located a further 300 m downstream from this small lake. A bedrock saddle confines the typically diffuse creek flow through a narrow well-defined section. This section is the site of the hydrometric station. During the winter of 2005 it was decided that the hydrometric program for this site was to be discontinued.

Instrumentation:
The hydrometric station instrumentation was removed from this site in the fall of 2004. A staff gauge and the creek flow gauging station housing were left installed should there be a need in the future to reinstall the instrumentation.

Specifics on Measurements:

1000.000	m sea level, benchmark elevation at the site (assumed)
998.265	m sea level, elevation of zero reading on staff gauge (assumed)
1.735	m difference in elevation from BM to staff gauge zero reading
n/a	m difference in elevation from BM to the base of the Parshall flume
2238003	pressure transducer / data logger serial number
n/a	m offset on transducer calibration for zero flow through the Parshall Flume



Site#2: Map

Site#2: Aerial view looking southeast along creek from Brien Lake to Shona Lake.

Site Identification: **Site: #3** **Name: Winter Lake Outlet**

Site GPS NAD27 Coordinates: 113° 55' 51.2" West Longitude 63° 10' 3.8" North Latitude

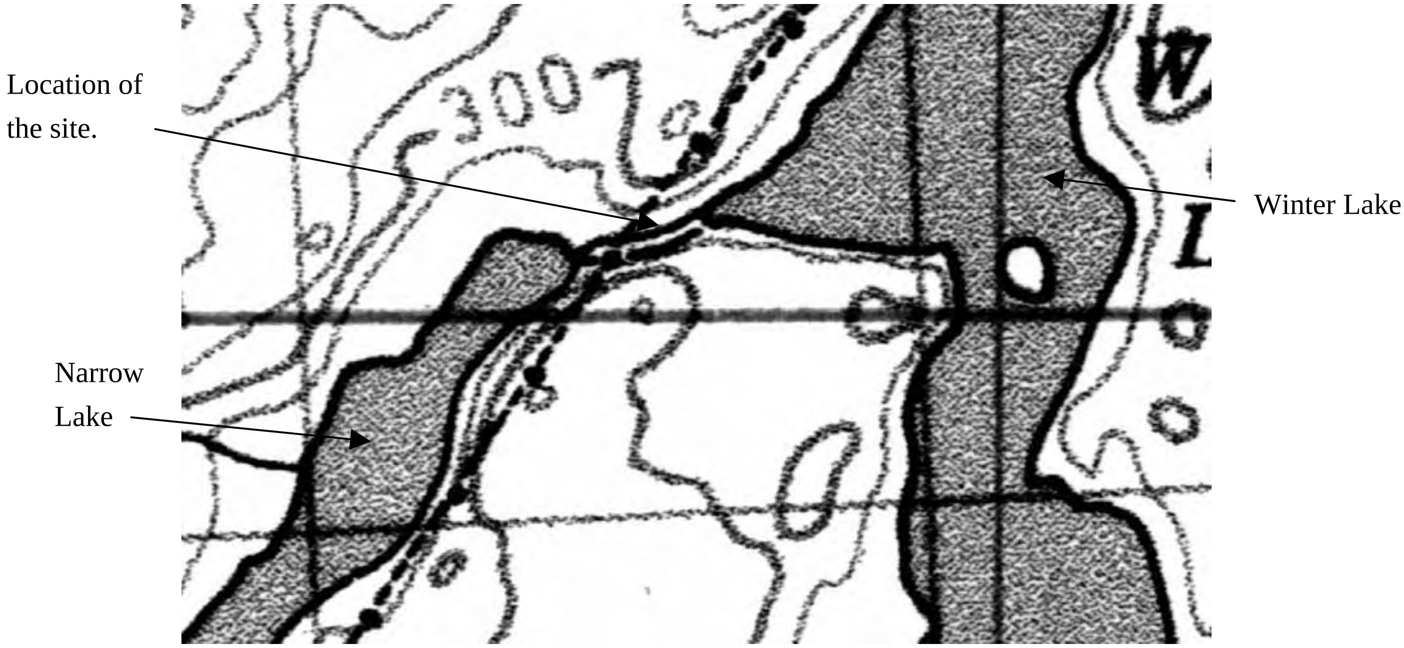
Site Location:
The site is located between Narrow Lake to the southwest and Winter Lake to the northeast. The Winter Lake outlet is located on the northwest portion of Winter Lake about 10 m to the south of the winter road. The hydrometric station is located 60 m downstream from the outlet.

Description:
The creek flows along the south side of the winter road to midway between Winter and Narrow Lakes. For this reach of the creek the channel is typically 30 to 60 cm wide by 15 to 20 cm deep. For the rest of the distance to Narrow Lake the creek flows along a poorly defined diffuse route down the winter road and discharges to Narrow Lake.

Instrumentation:
A hydrometric station is installed at this site. The station includes a Parshall flume and a continuous recording river stage logger and water level sensor. A creek discharge gauging station is located just downstream of the Parshall flume.

Specifics on Measurements:

1000.000	m sea level, benchmark elevation at the site (assumed)
999.188	m sea level, elevation of zero reading on staff gauge (assumed)
0.812	m difference in elevation from BM to staff gauge zero reading
_______	m difference in elevation from BM to the base of the Parshall flume
2434007	pressure transducer / data logger serial number
0.039	m offset on transducer calibration for zero flow through the Parshall flume



Site#3: Map

Site#3: Aerial view from Winter Lake looking southwest across site to Narrow Lake

Site#3: Hydrometric gauging station with installed Parshall flume

Site Identification: **Site: #4** **Name: Round Lake Outlet**

Site GPS Coordinates: 113° 54' 49.7" West Longitude 63° 10' 22.4" North Latitude

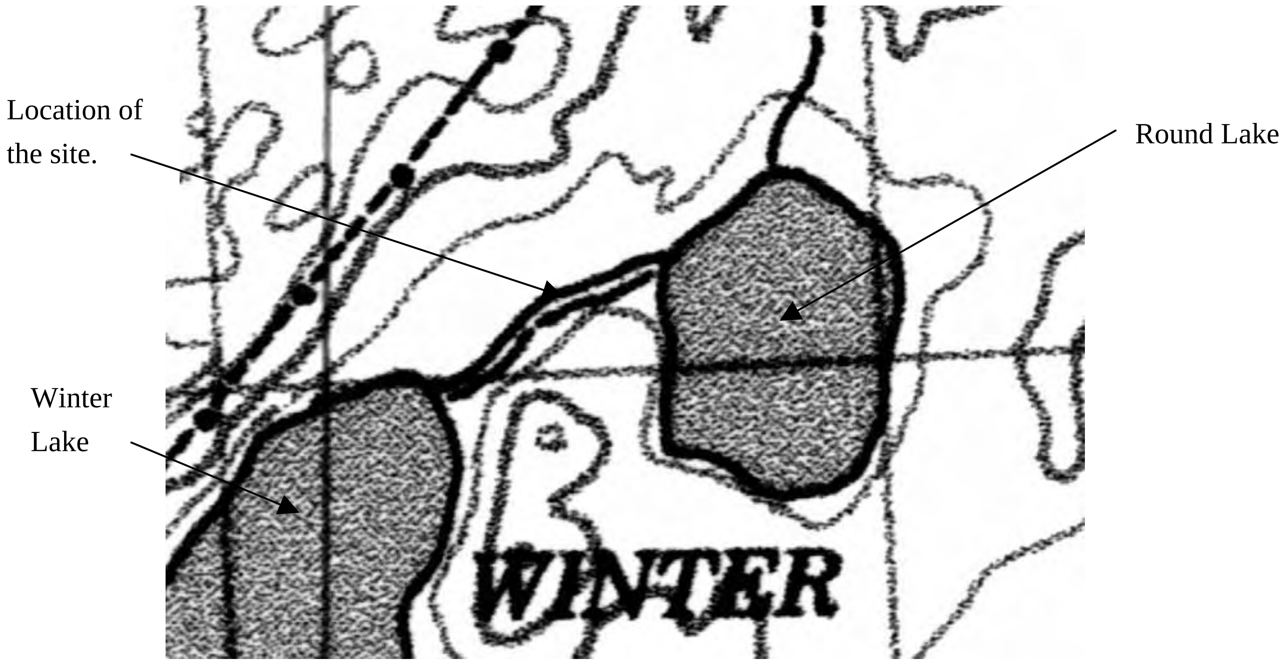
Site Location:
The site is located between Winter Lake to the southwest and Round Lake to the east. The station is located on the north side of the winter road, 75 metres northeast from the point the winter road intersects Round Lake. The flow outlet is situated on the northwest side of the Round Lake.

Description:
There is no distinct flow channel out of Round Lake but rather a diffuse flow through the muskeg into a small marsh approximately 5 metres downstream from the lake. The outlet from this marsh flows southwest into Winter Lake, typically as a vadose flow, through the muskeg and willow shrubs. At one point, about 25 meters southwest of the Round Lake outlet, the flow is contained in a single channel. The hydrometric station was installed here.

Instrumentation:
A hydrometric station is installed at this site. The station includes a Parshall flume and a continuous recording river stage logger and water level sensor. A staff gauge and creek discharge gauging station are located just upstream of the Parshall Flume.

Specifics on Measurements:

1000.000	m sea level, benchmark elevation at the site (assumed)
999.126	m sea level, elevation of zero reading on staff gauge (assumed)
0.874	m difference in elevation from BM to staff gauge zero reading
_______	m difference in elevation from BM to the base of the Parshall flume
2516008	pressure transducer / data logger serial number
0.039	offset on transducer calibration for zero flow through the Parshall flume



Site#4: Map

Site#4: Aerial view from Round Lake southwest across site to Winter Lake.

Site#4: Hydrometric Gauging Station With installed Parshall flume

Site Identification: **Site: #5** **Name: Northeast Brien Lake**

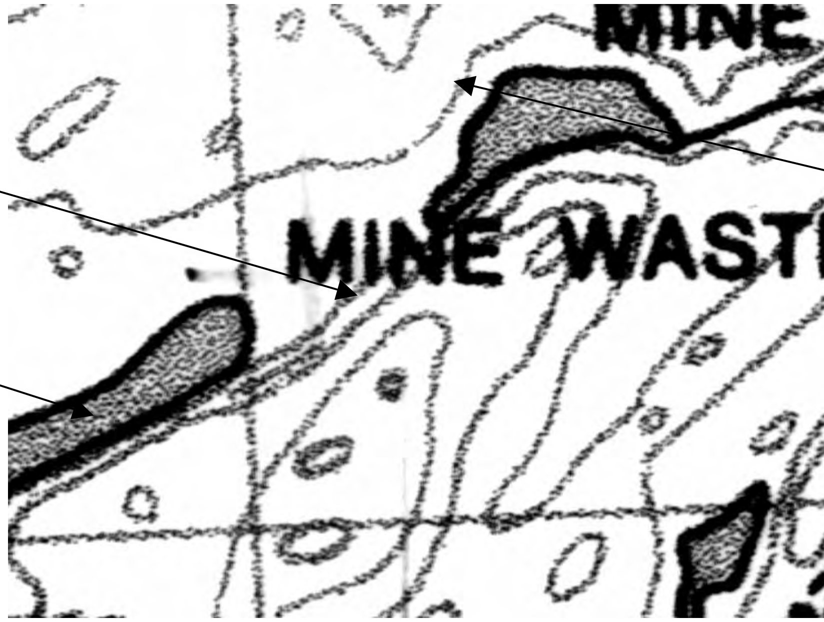
Site GPS Coordinates: 113° 55’ 7.1” West Longitude 63° 11’ 7” North Latitude

Site Location:
The site is located between Brien Lake to the southwest and a small unnamed lake to the northeast in the vicinity of the mine waste area.

Description:
The two lakes are separated by approximately 300 m of dry land. There is no obvious surface flow path between the two lakes.

Instrumentation:
No instrumentation is required for this site. It was required only to determine if there is water flow between the two lakes and, if so, in which direction. There is an estimated 2 m shoreline rise at the southwest end of the unnamed lake that would prevent any surface flow from travelling down to Brien Lake. If flow exists between the two lakes, it must be subsurface.

Specifics on Measurements:
No hydrometric station is to be installed at this site.



Site#5: Map

Site#5: Aerial view northeast from Brien Lake looking over the site.

Site Identification: **Site: #6** **Name: Nicholas Lake Outlet**

Site GPS Coordinates: 113° 46’ 6.7” West Longitude 63° 15’ 20.2” North Latitude

Site Location:

The site is located at the western end of the Northwest arm of Nicholas Lake just downstream of Nicholas Lake outlet. The discharge gauging station and staff gauge are located about 10 m downstream of the creek outlet at Nicholas Lake, in the open and well-defined channel. A further 5 m downstream from the staff gauge the hydrometric stage recorder housing is attached to a vertical rock face directly above the creek.

Description:

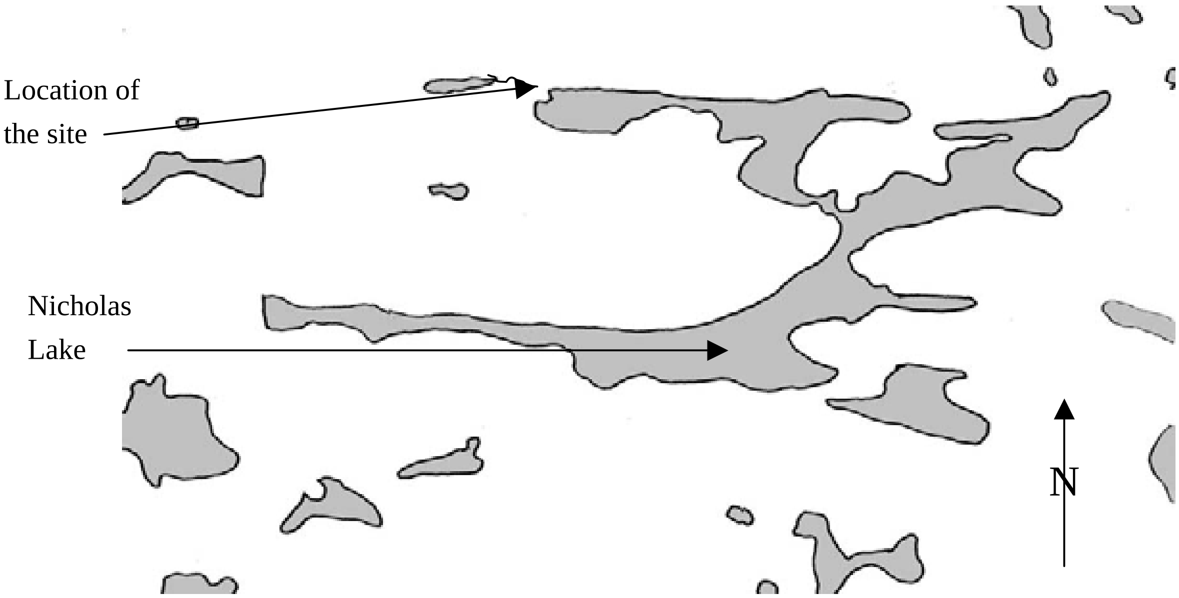
The creek exits Nicholas Lake in a well-defined bedrock channel. Within 30 m from the outlet of the lake, large boulders begin to occupy the streambed. Within 100 m of the outlet, boulders almost completely fill the creek channel restricting the flow area, which is around and under the numerous boulders. There are only small areas where the flow is visible under the rock-filled channel. The rock-filled channel extends the rest of the length of the creek.

Instrumentation:

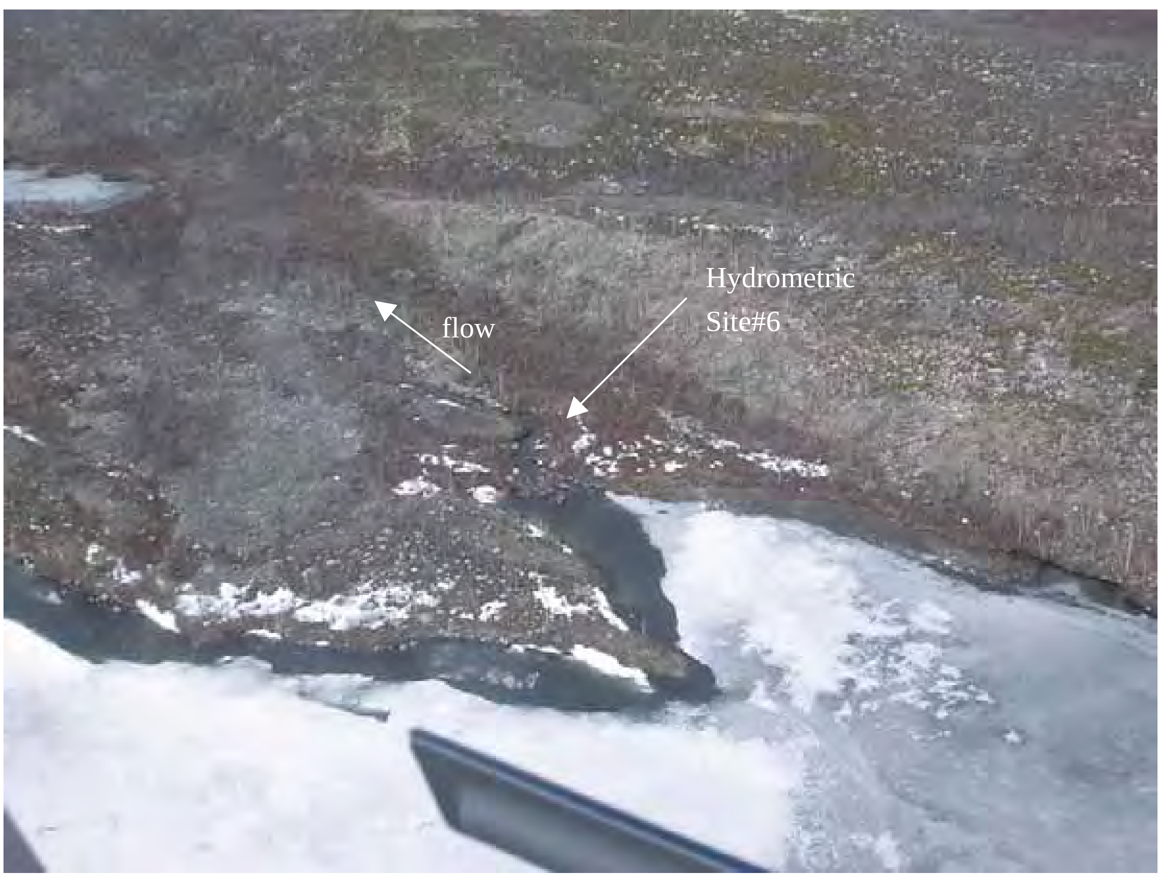
A hydrometric station is installed at this site. The station consists of a continuous recording river stage logger, with water level and temperature sensors. A staff gauge and creek discharge gauging station have been located near the creek stage logger site. Stage discharge techniques are used to determine time histories of discharge for this station.

Specifics on Measurements:

1000.000	m sea level, benchmark elevation at the site (assumed)
997.707	m sea level, elevation of zero reading on staff gauge (assumed)
2.293	m difference in elevation from BM to staff gauge zero reading
2524014	pressure transducer / data logger serial number
2.356	m difference in elevation from BM to the pressure transducer
997.645	m transducer elevation (assumed)



Site#6: Map

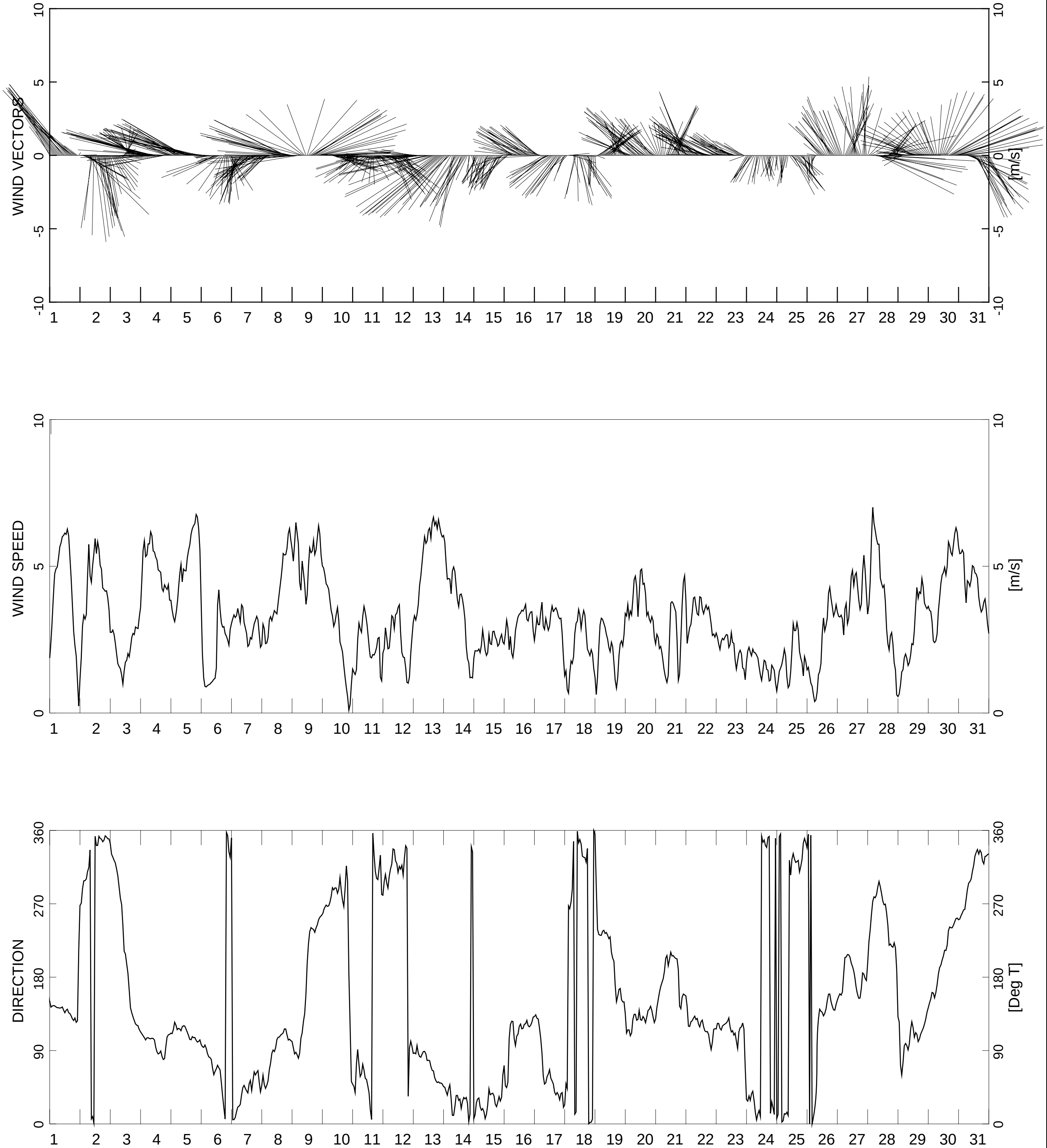


Site#6: View from Nicholas Lake northwest across site.

Site#6: Staff gauge and discharge gauging station

Site#6: Pressure transducer and data logger

APPENDIX B
MONTHLY WIND SUMMARIES
OCTOBER 2004 TO FEBRUARY 2006



HAY & COMPANY CONSULTANTS

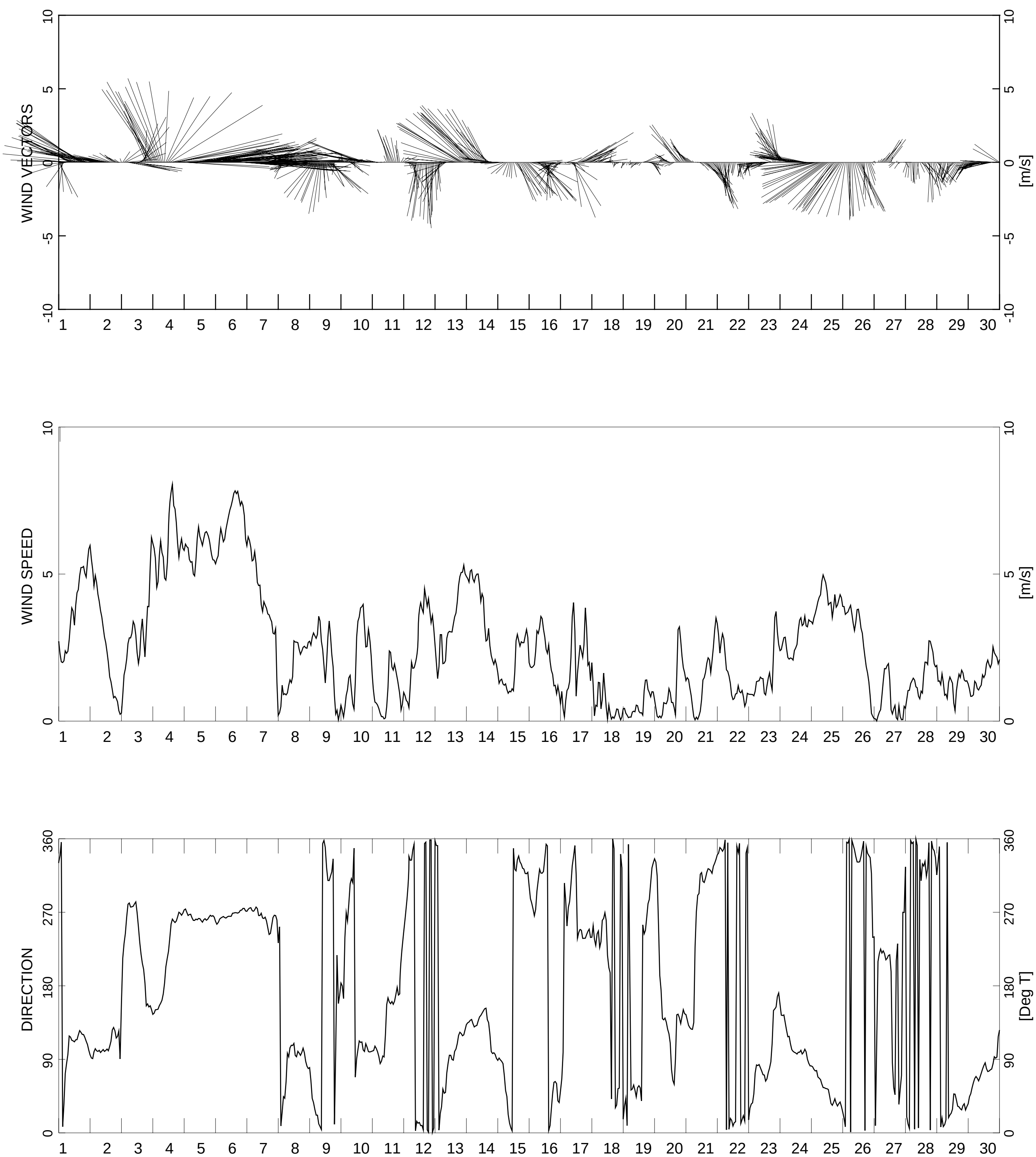
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
OCTOBER 2004

FIG.
B-01

Thu Apr 20 11:34:32 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO
HAY & COMPANY CONSULTANTS

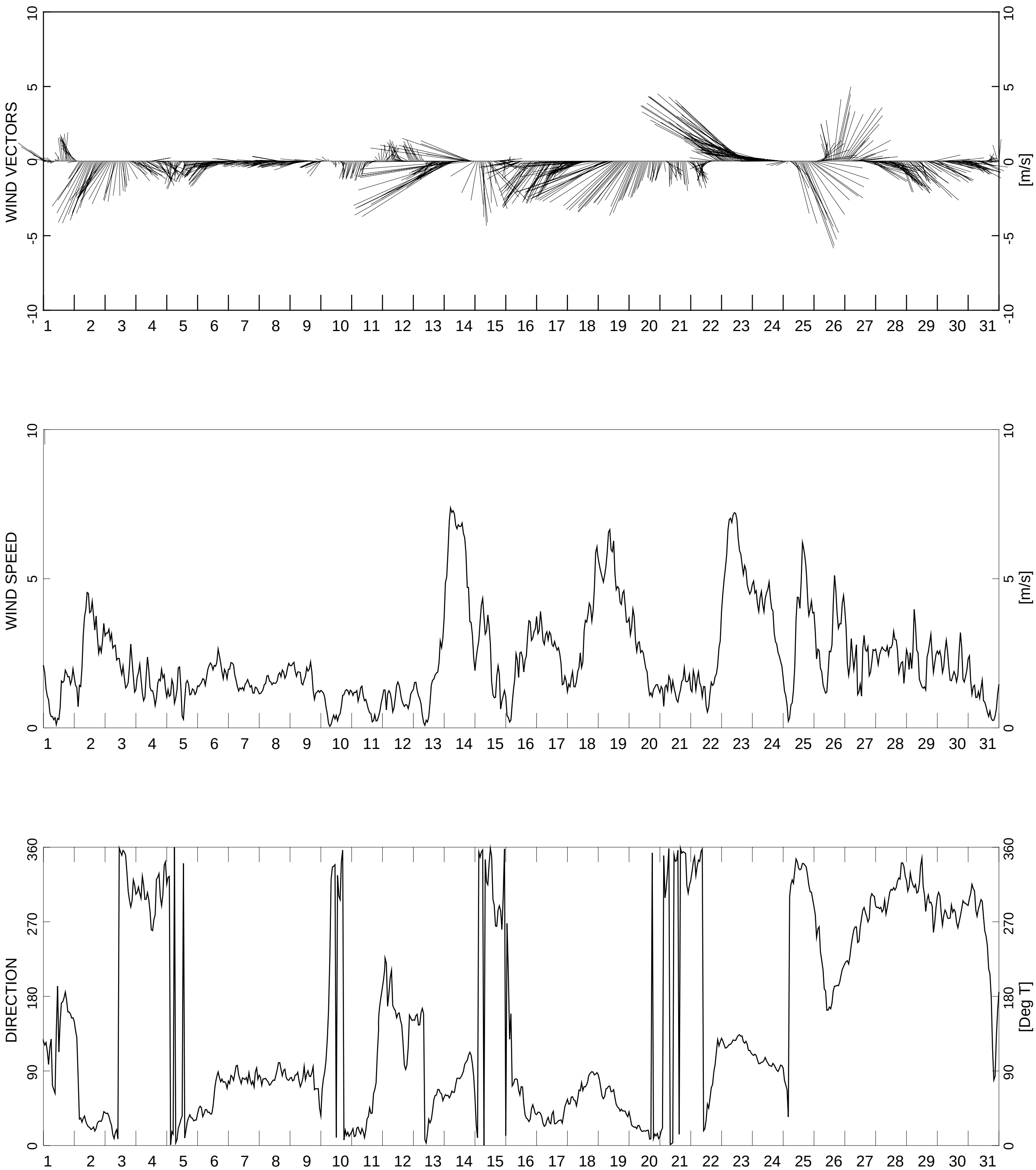
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
NOVEMBER 2004

FIG.
B-02

Thu Apr 20 11:34:34 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

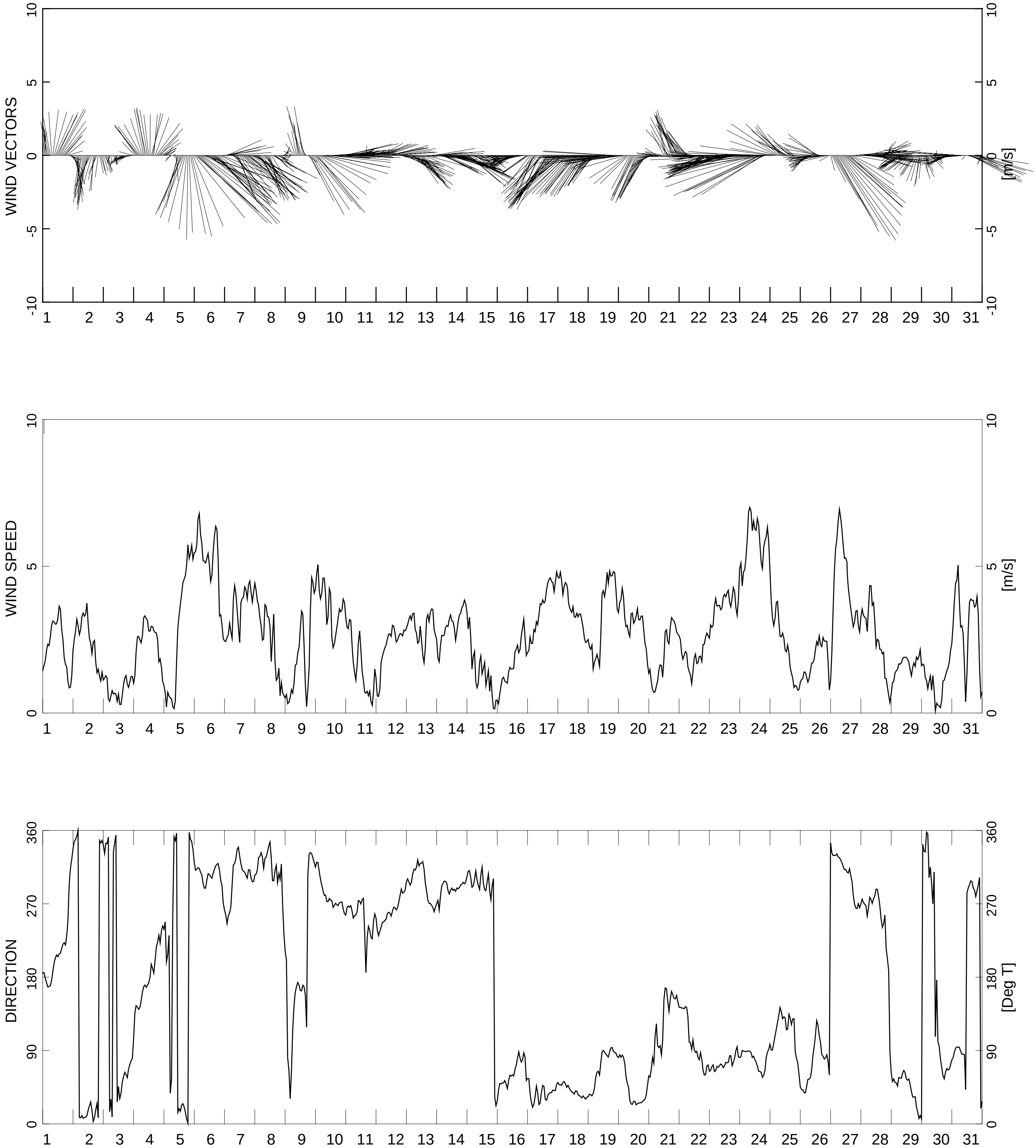
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
DECEMBER 2004

FIG.
B-03

Thu Apr 20 11:34:35 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO
HAY & COMPANY CONSULTANTS

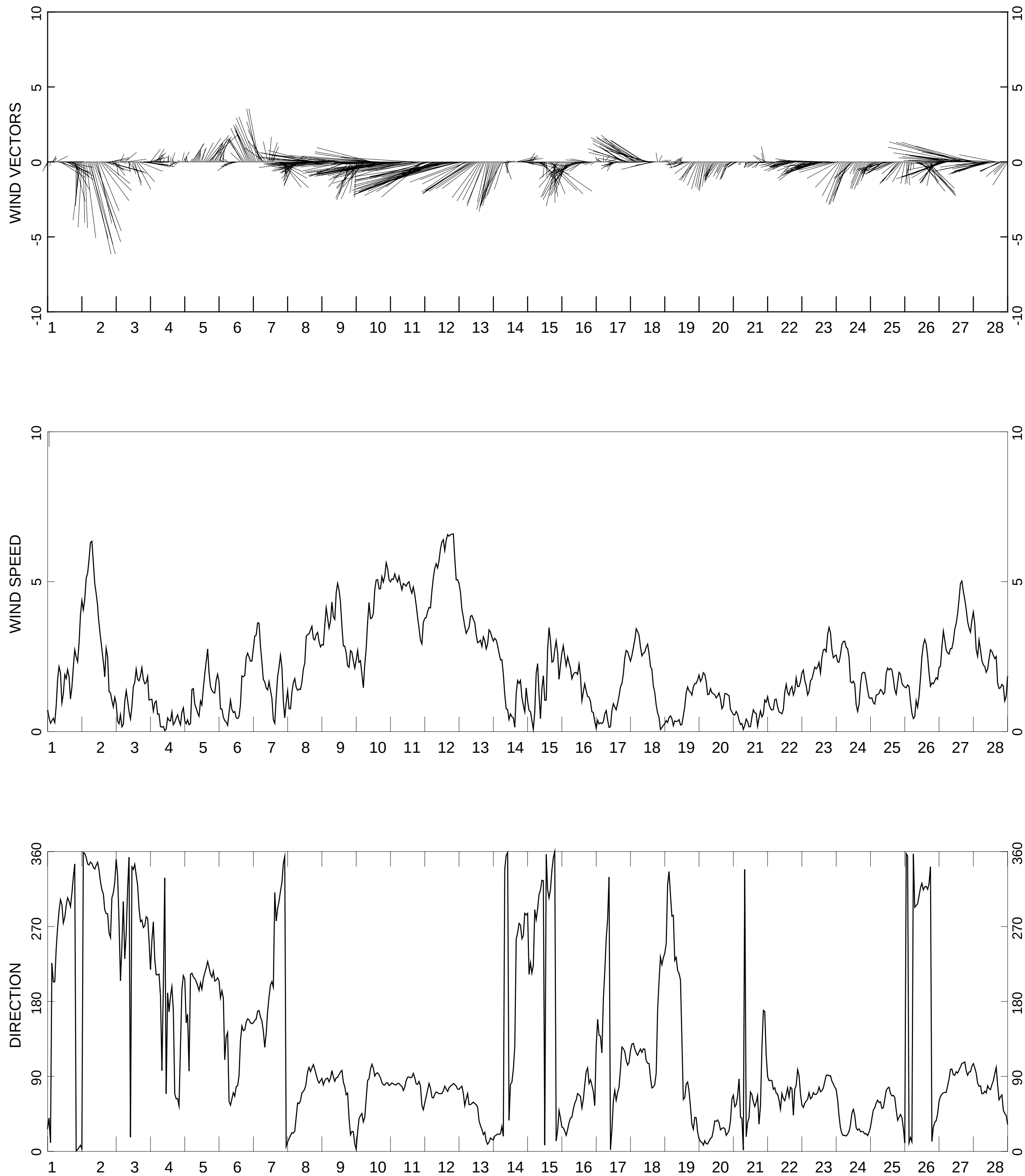
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
JANUARY 2005

FIG.
B-04

Thu Apr 20 11:34:36 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

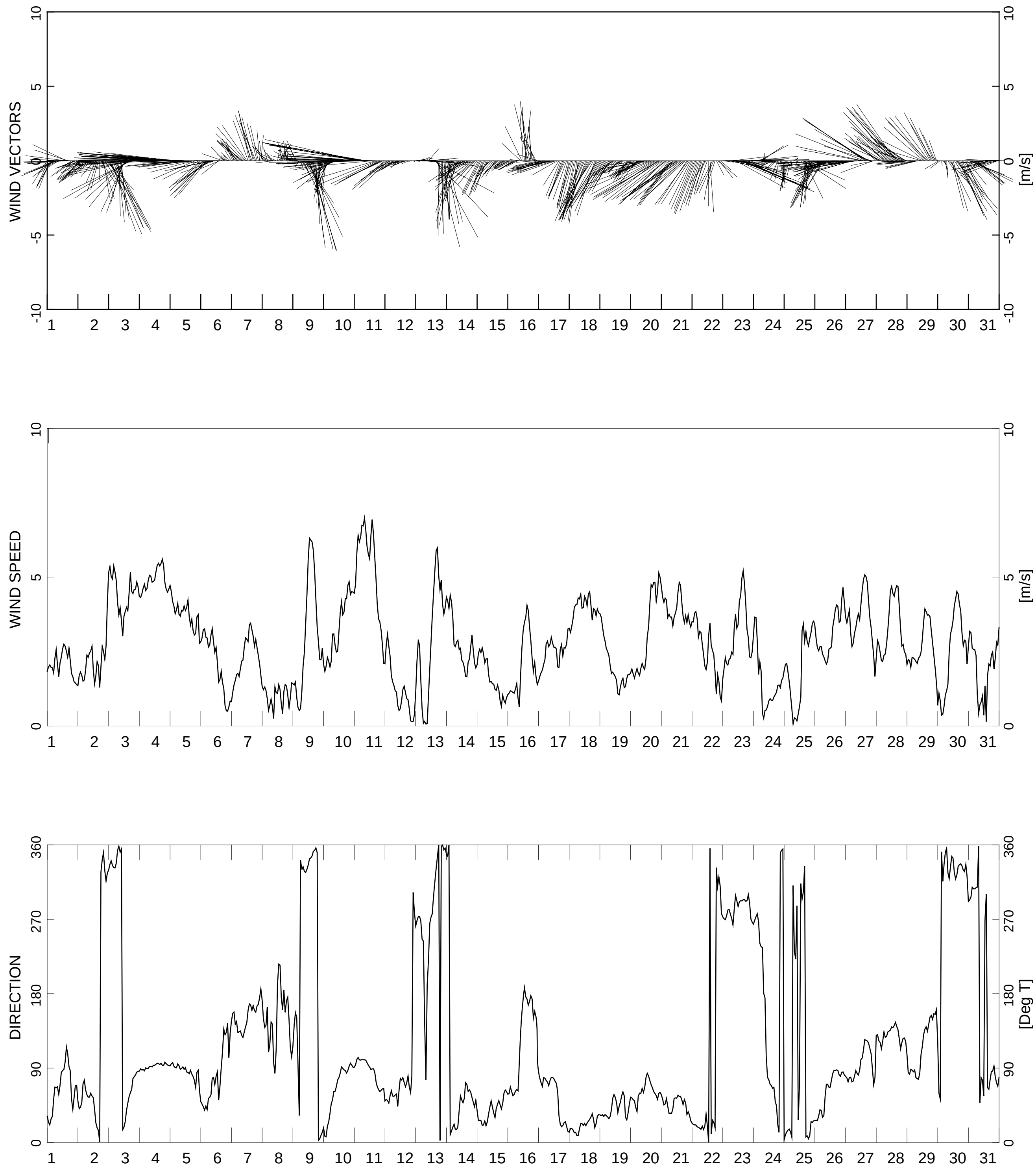
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
FEBRUARY 2005

FIG.
B-05

Thu Apr 20 11:34:38 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

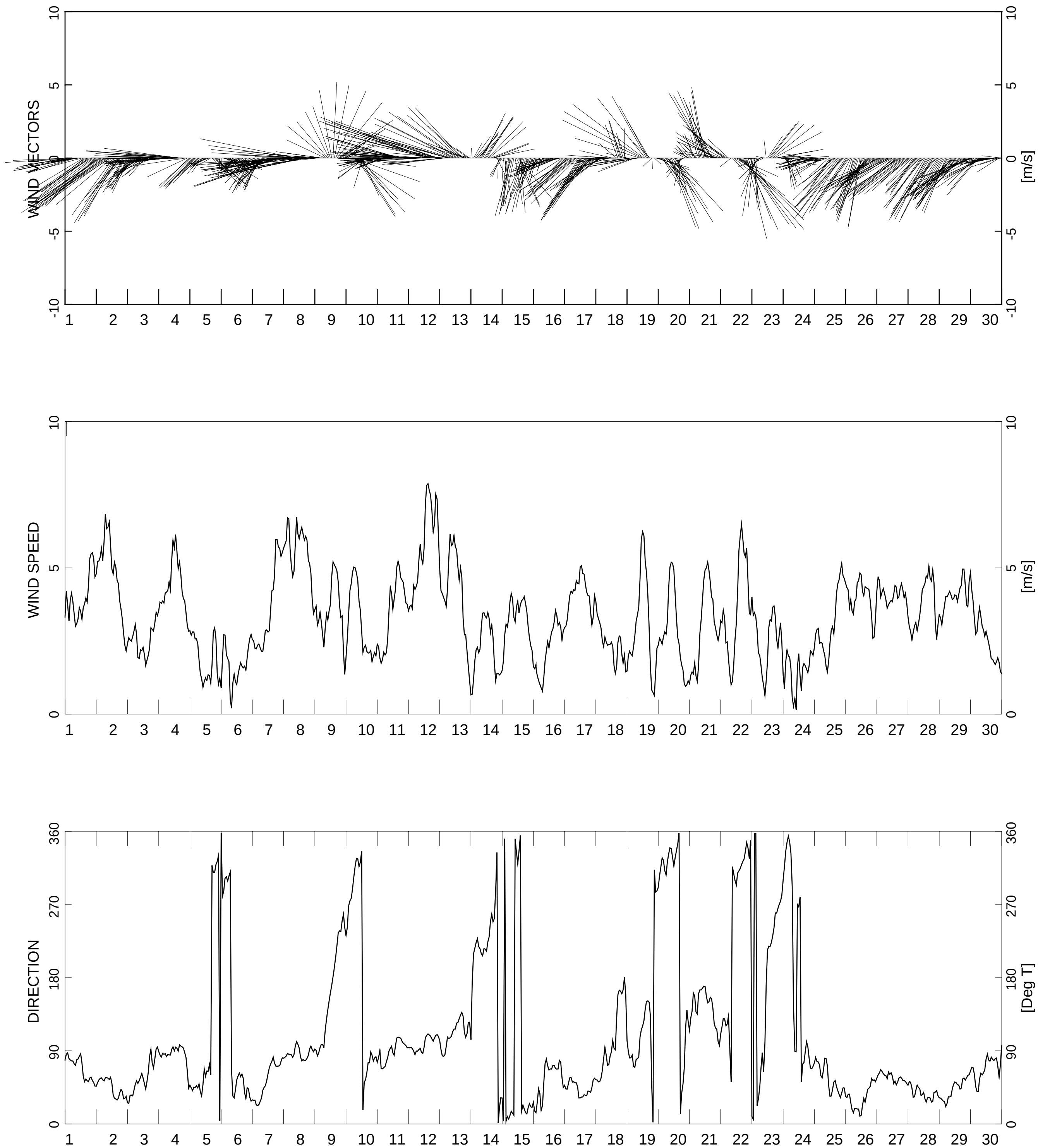
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
MARCH 2005

FIG.
B-06

Thu Apr 20 11:34:39 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO
HAY & COMPANY CONSULTANTS

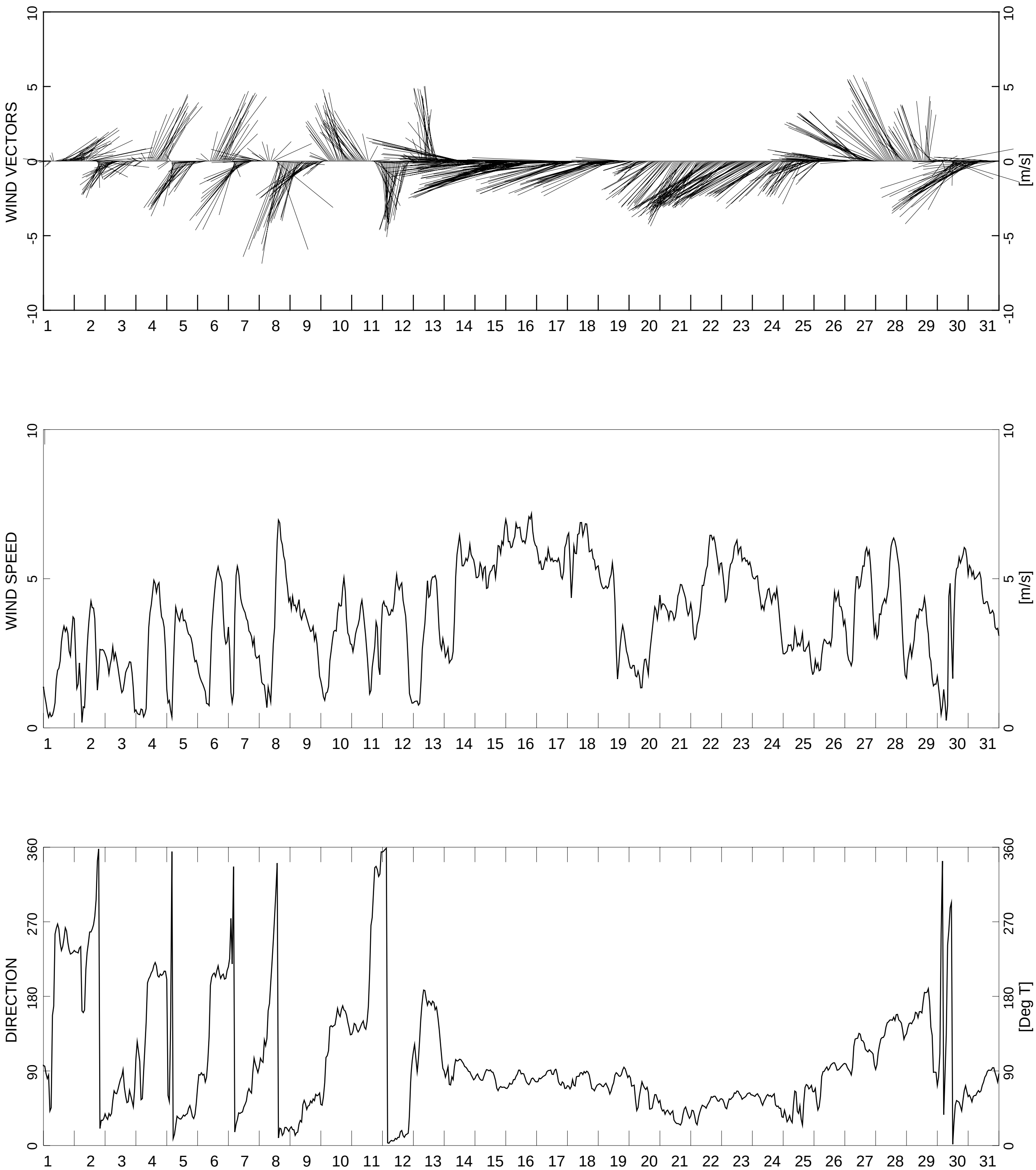
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
APRIL 2005

FIG.
B-07

Thu Apr 20 11:34:40 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO

HAY & COMPANY CONSULTANTS

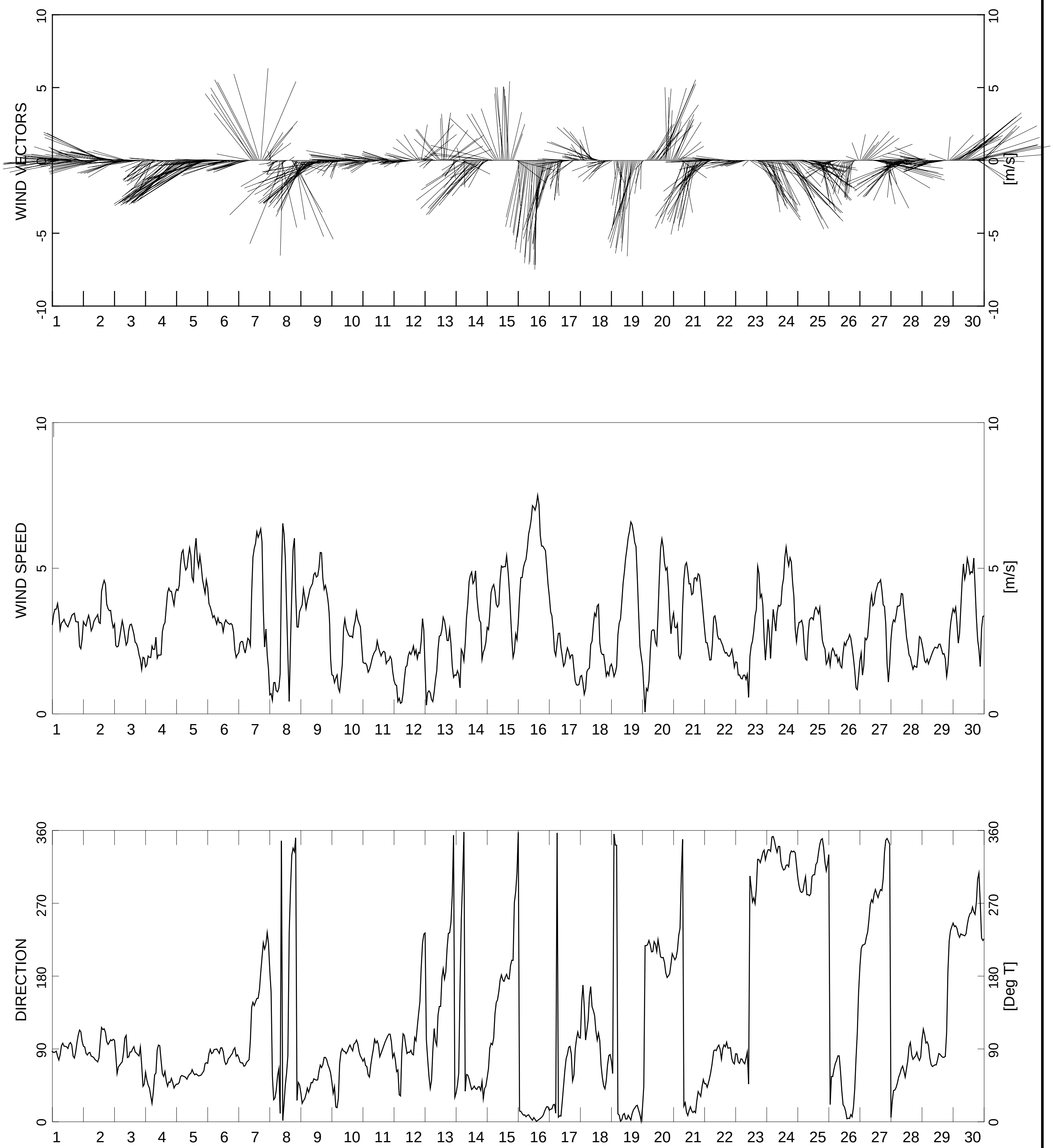
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
MAY 2005

FIG.
B-08

Thu Apr 20 11:34:41 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

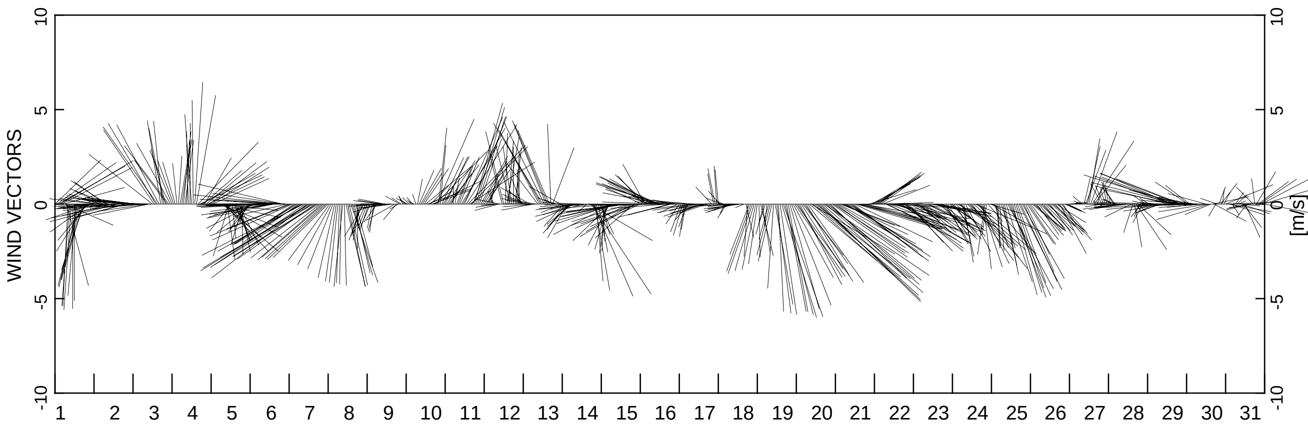
TYHEE NWT CORP

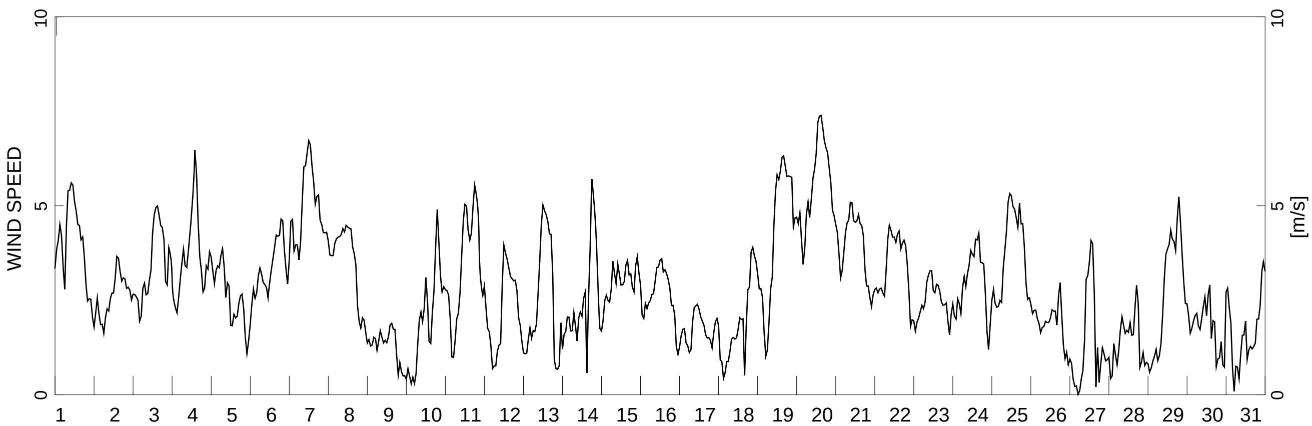
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

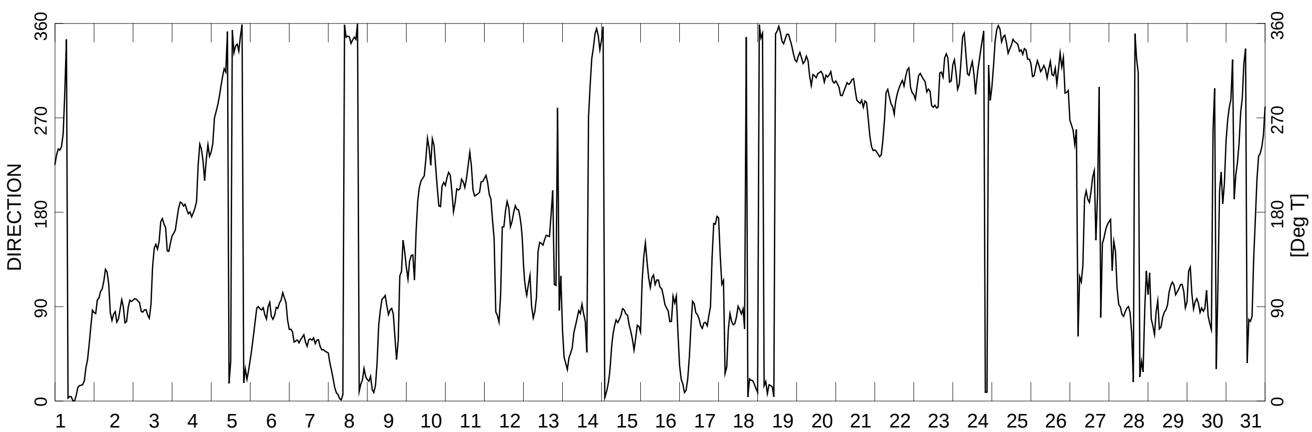
WIND SUMMARY
JUNE 2005

FIG.
B-09

Thu Apr 20 11:34:43 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction







HAYCO HAY & COMPANY CONSULTANTS

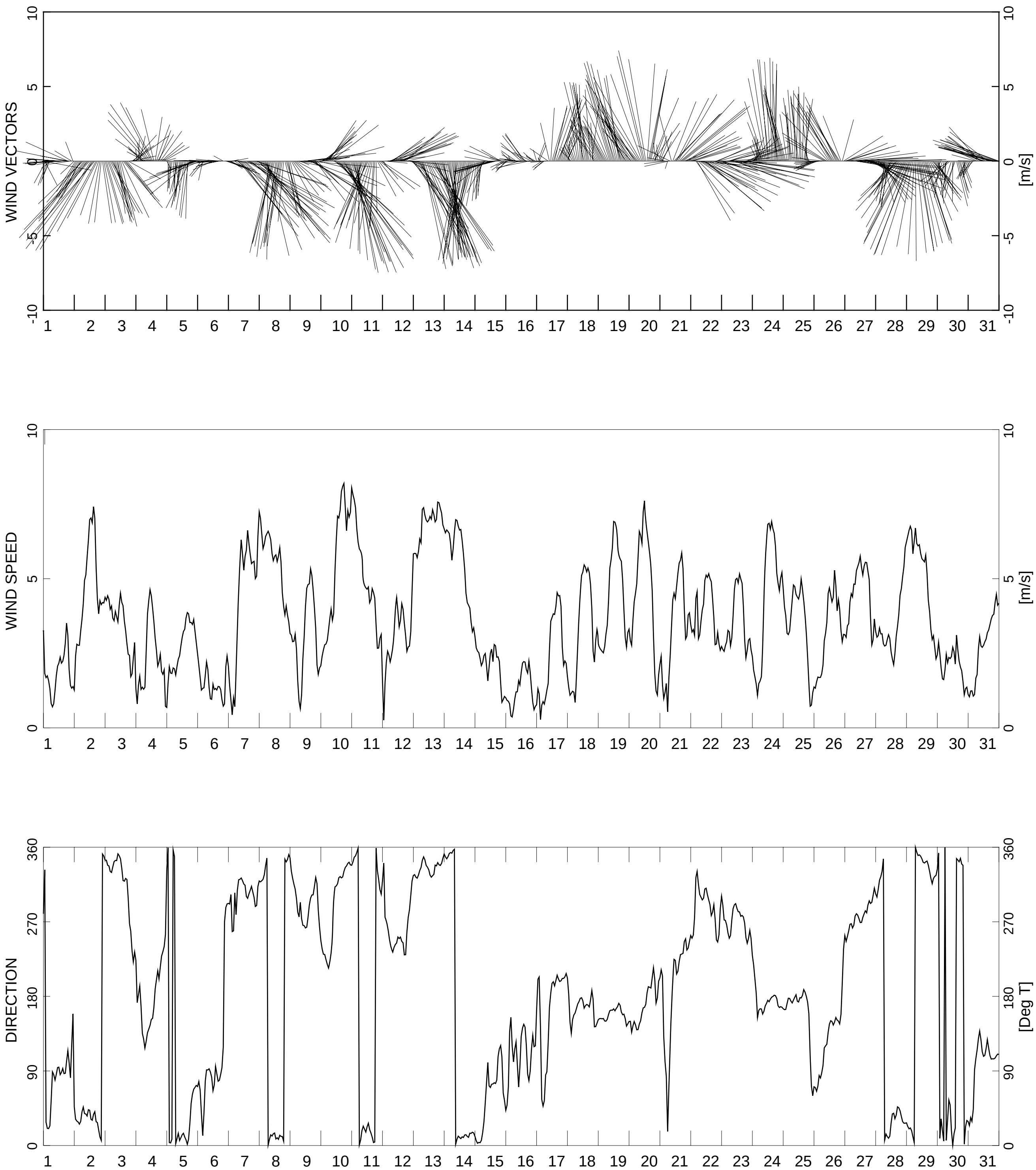
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
JULY 2005

FIG.
B-10

Thu Apr 20 11:34:44 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO

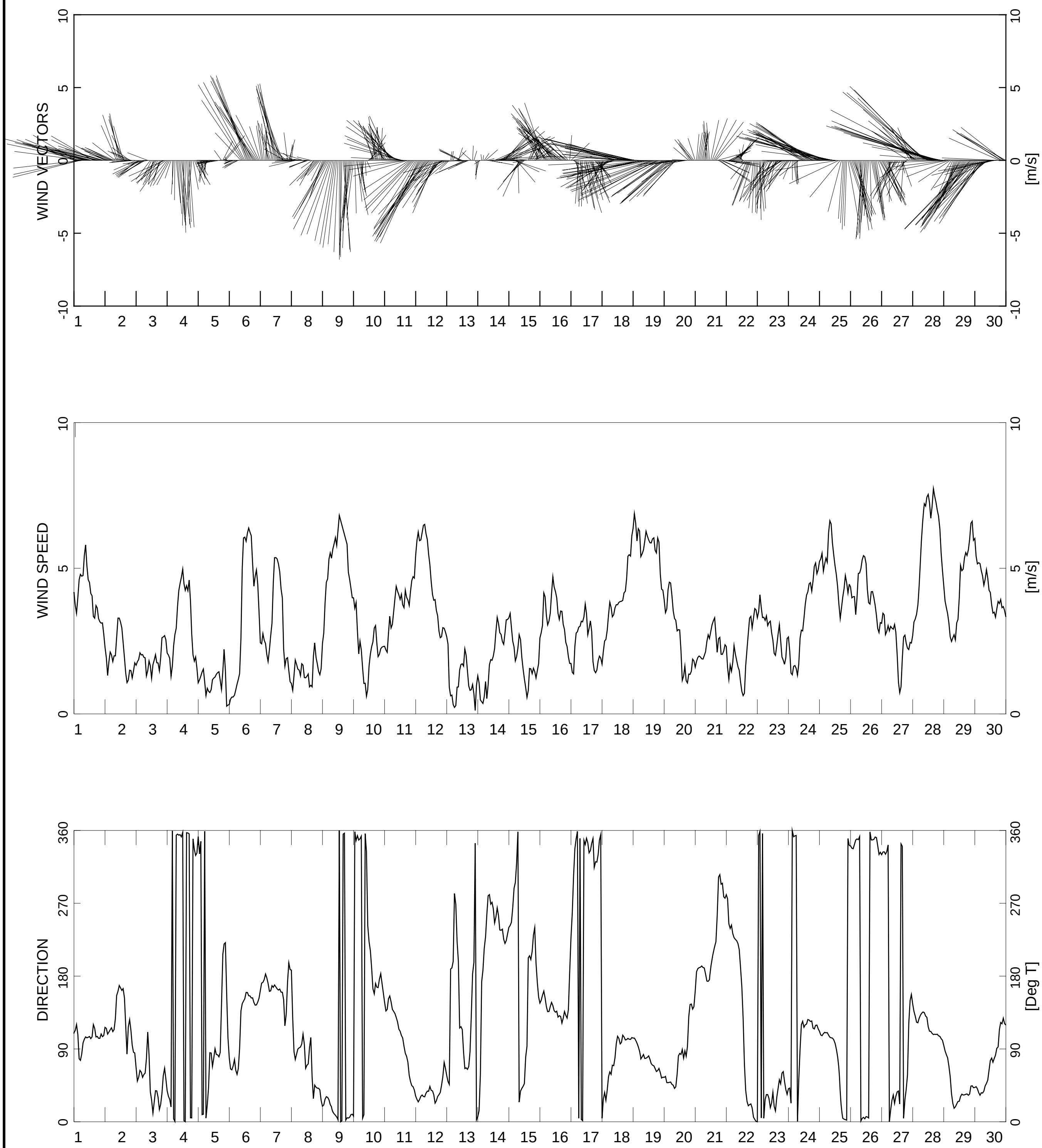
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
AUGUST 2005

FIG.
B-11



HAY & COMPANY CONSULTANTS

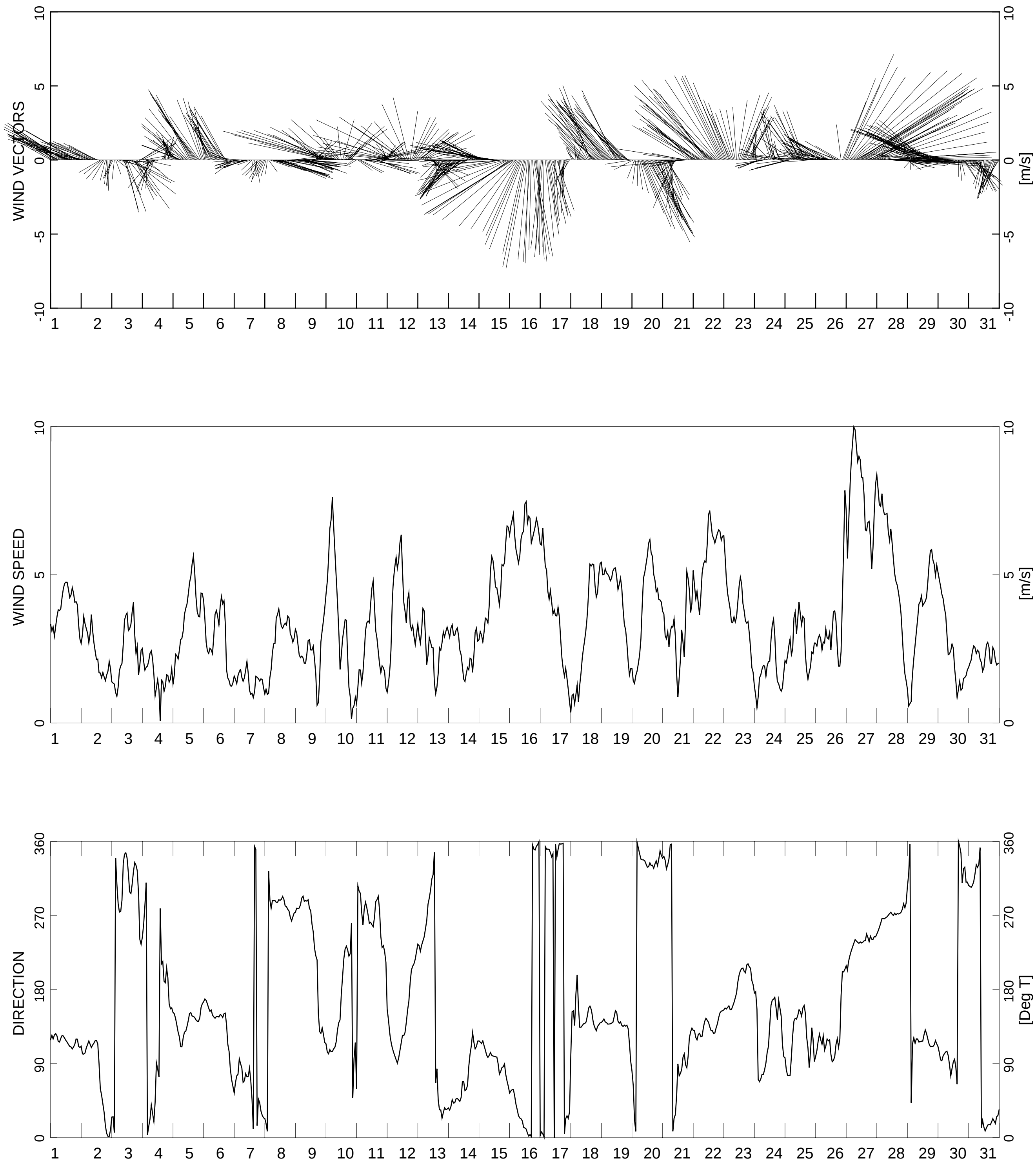
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
SEPTEMBER 2005

FIG.
B-12

Thu Apr 20 11:34:46 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

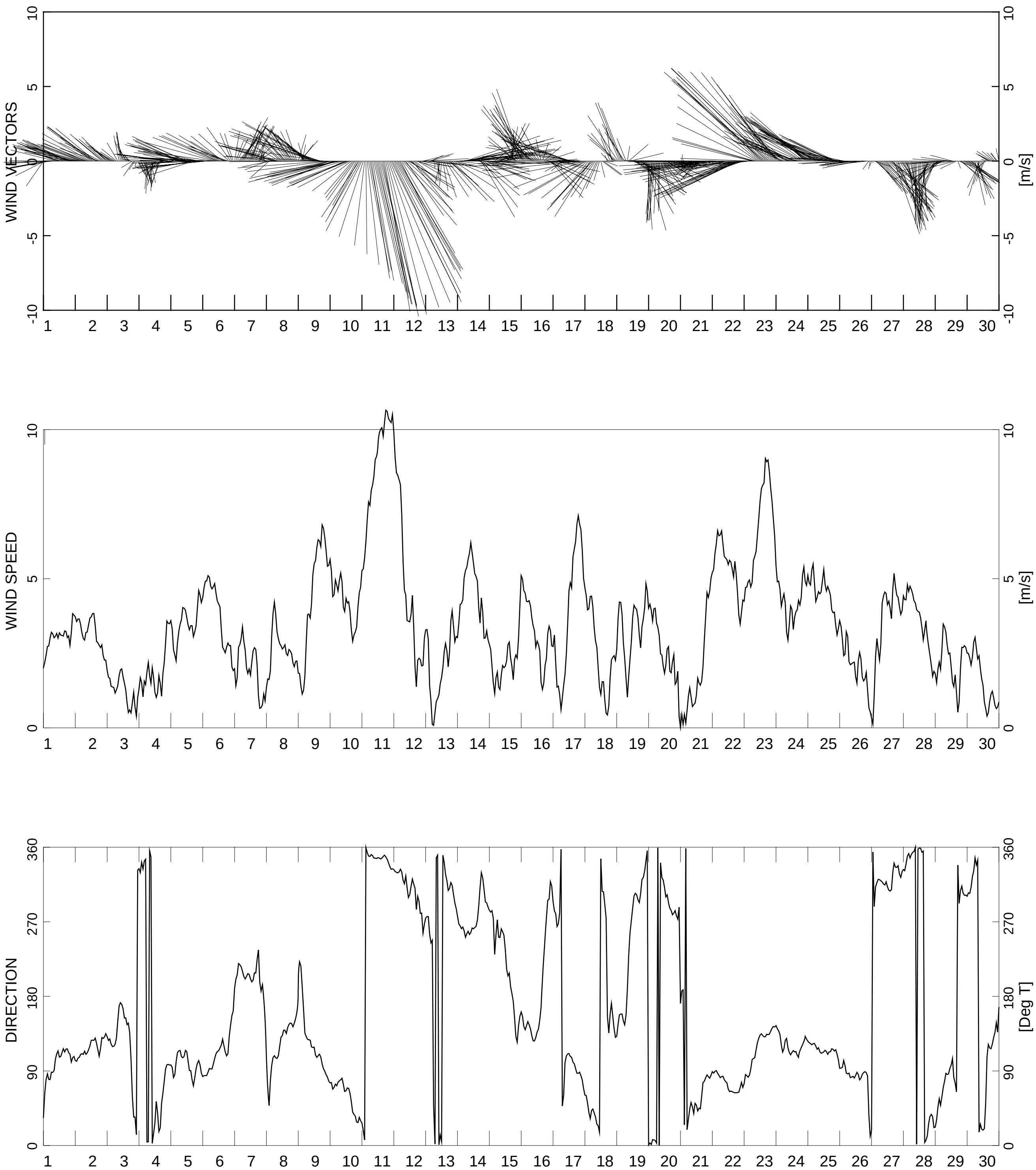
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
OCTOBER 2005

FIG.
B-13

Thu Apr 20 11:34:48 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



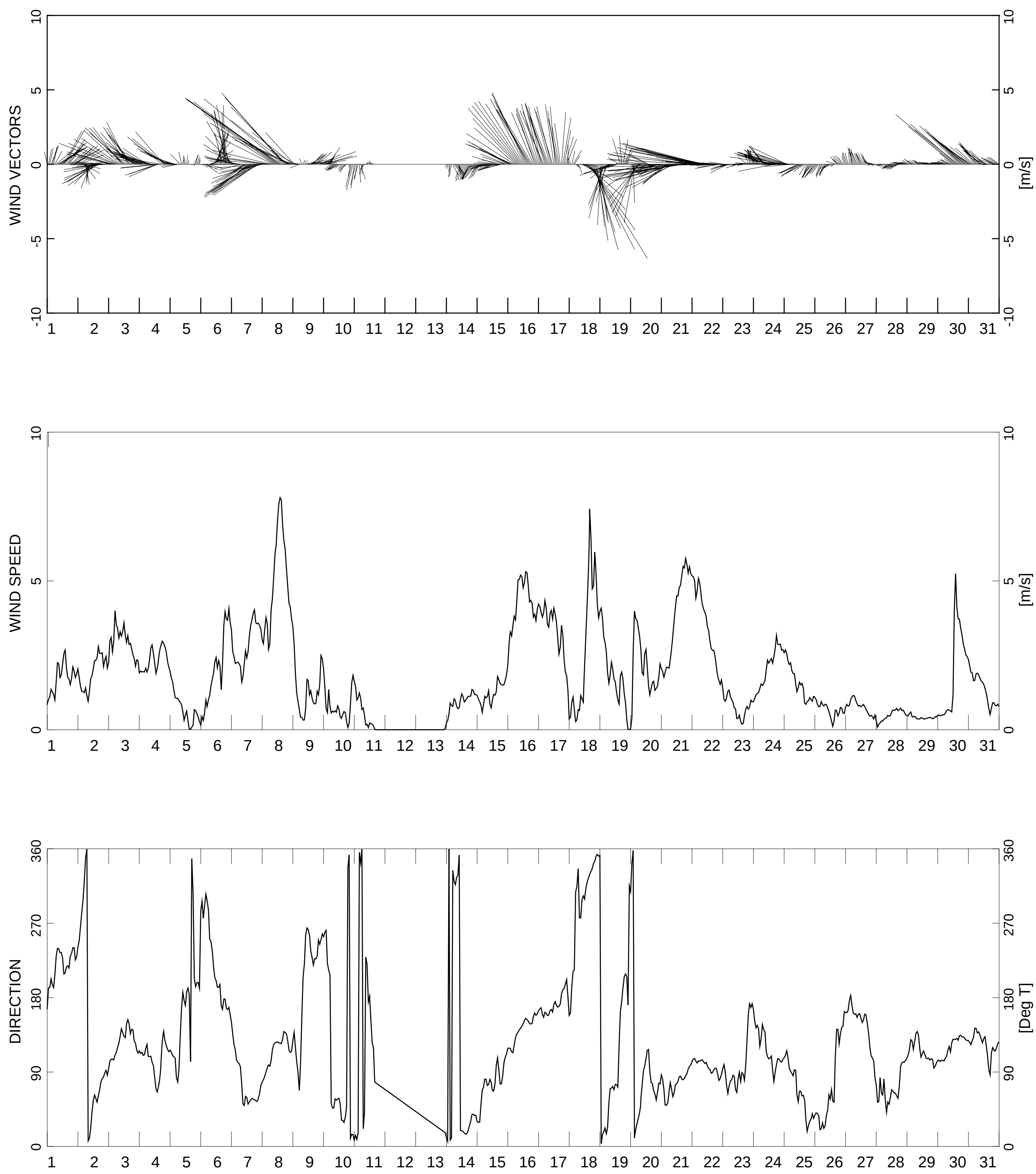
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
NOVEMBER 2005

FIG.
B-14



HAY & COMPANY CONSULTANTS

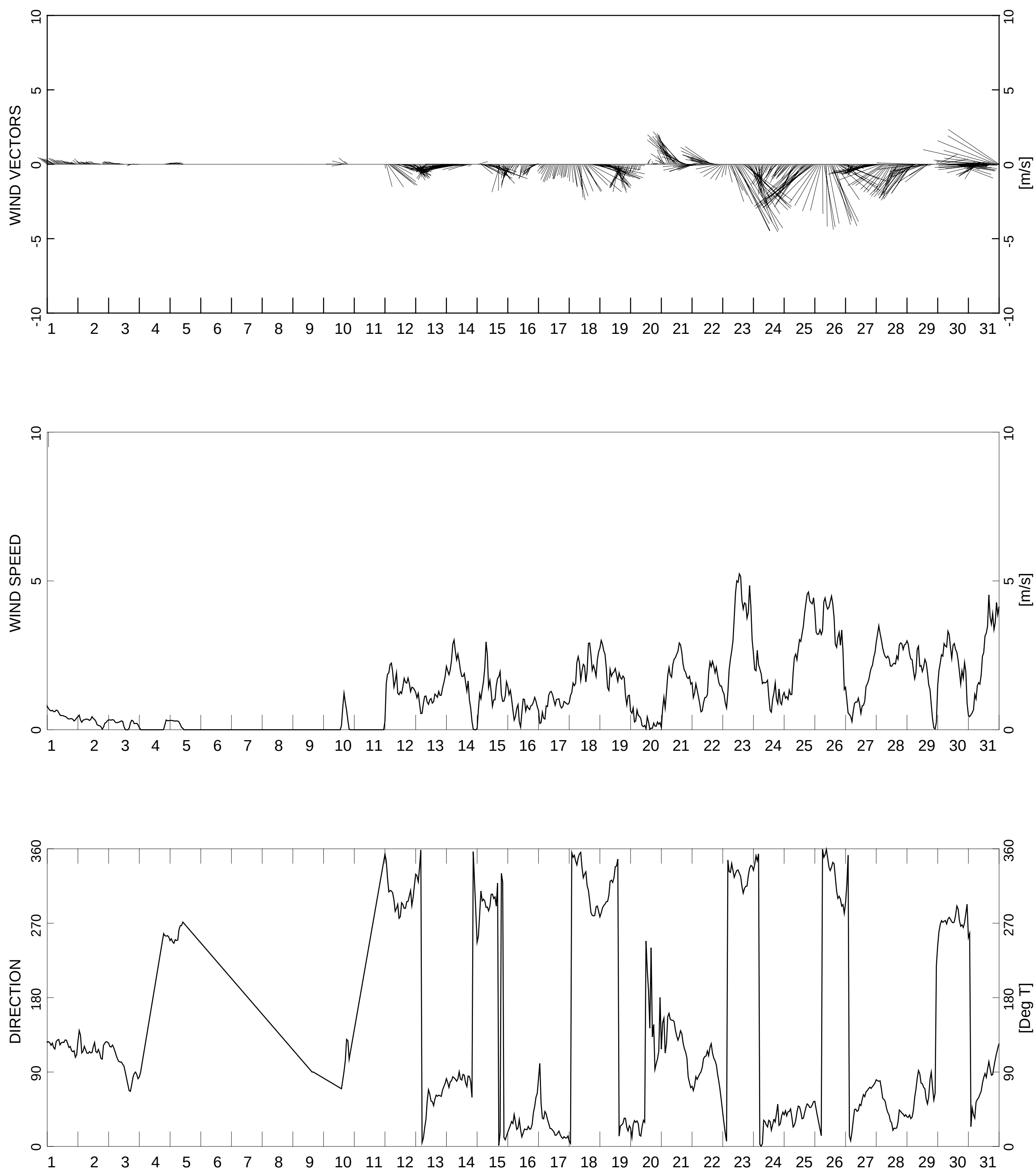
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
DECEMBER 2005

FIG.
B-15

Thu Apr 20 11:34:50 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

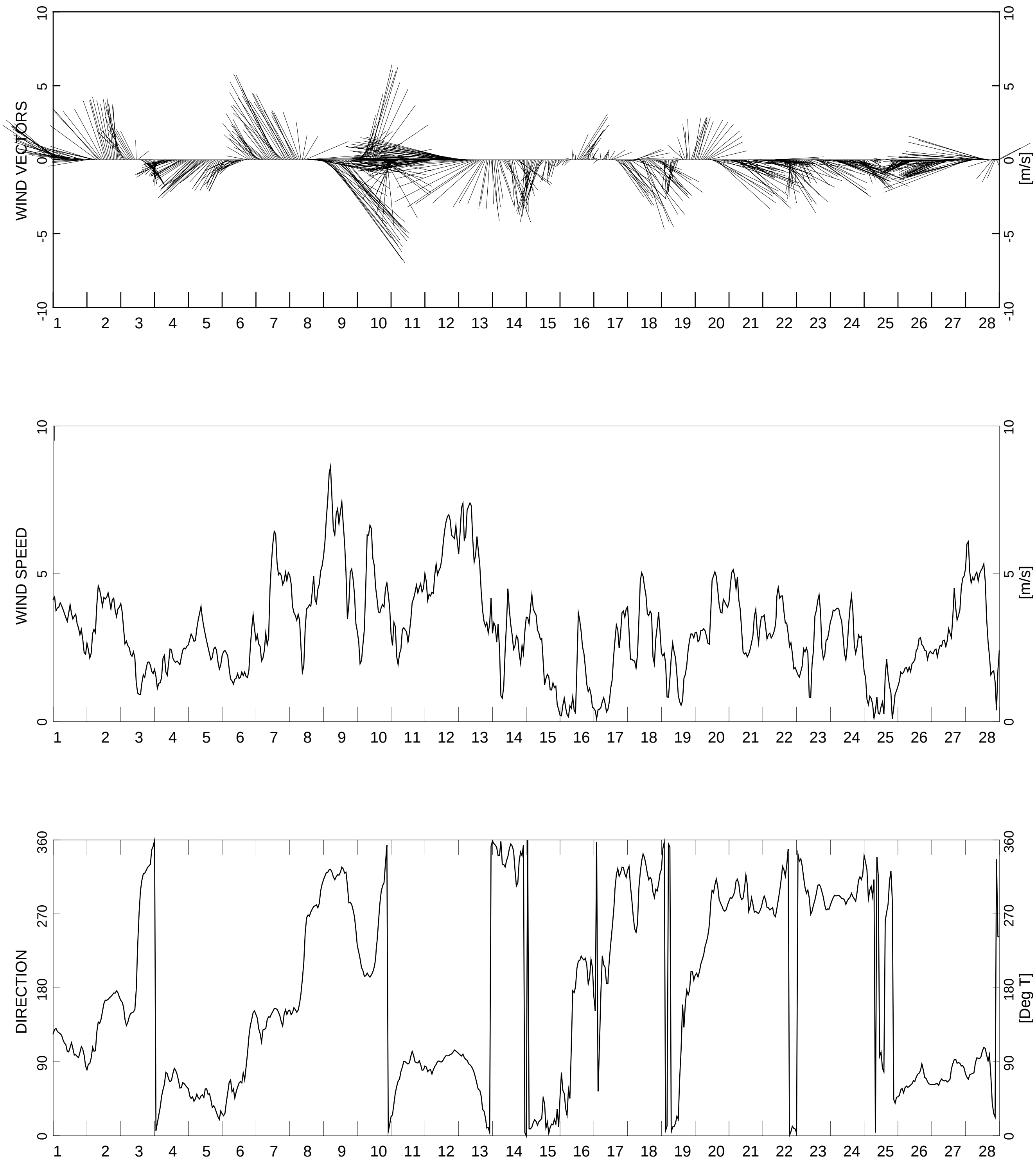
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
JANUARY 2006

FIG.
B-16

Thu Apr 20 11:34:52 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

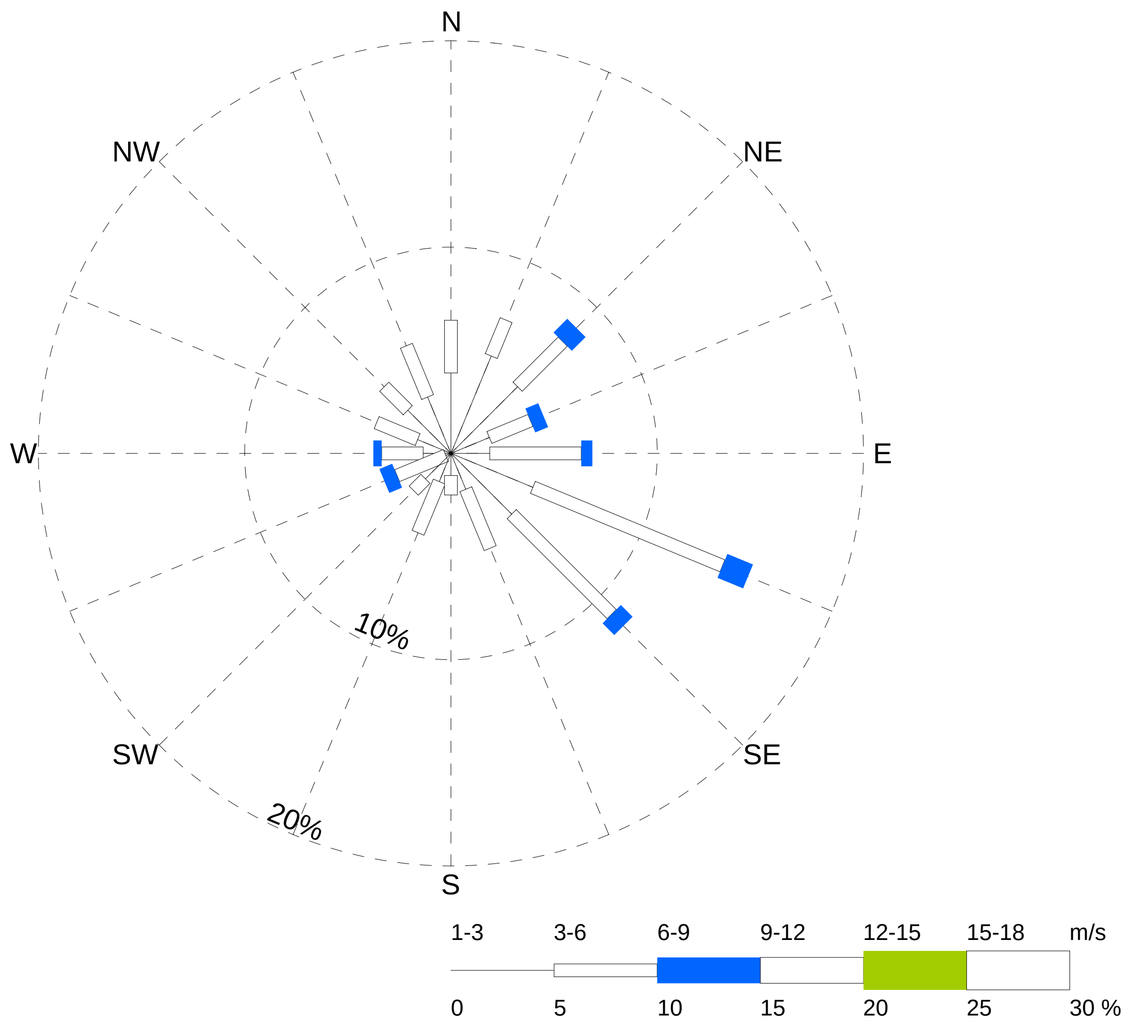
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WIND SUMMARY
FEBRUARY 2006

FIG.
B-17

Thu Apr 20 11:34:53 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction

APPENDIX C
SUMMARY OF MONTHLY WIND ROSES
OCTOBER 2004 TO FEBRUARY 2006



Wind Speed & Direction Frequency Distribution Table

Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
	Percent Occurrence (%)								
ENE	-	2.02	2.15	0.67	-	-	-	-	4.84
NE	-	4.57	3.09	0.94	-	-	-	-	8.60
NNE	-	5.11	1.88	-	-	-	-	-	6.99
N	-	3.90	2.55	-	-	-	-	-	6.45
NNW	-	2.96	2.69	-	-	-	-	-	5.64
NW	-	2.96	1.61	-	-	-	-	-	4.57
WNW	-	1.75	2.15	-	-	-	-	-	3.90
W	-	1.34	2.02	0.40	-	-	-	-	3.76
WSW	-	0.27	2.55	0.67	-	-	-	-	3.49
SW	-	1.75	0.81	-	-	-	-	-	2.55
SSW	-	1.48	2.69	-	-	-	-	-	4.17
S	-	1.08	0.94	-	-	-	-	-	2.02
SSE	-	1.88	3.09	-	-	-	-	-	4.97
SE	-	4.17	6.86	0.81	-	-	-	-	11.83
ESE	-	4.30	9.95	1.34	-	-	-	-	15.59
E	-	1.88	4.43	0.54	-	-	-	-	6.86
Calm	3.76	-	-	-	-	-	-	-	3.76
Total (%)	3.76	41.40	49.46	5.38	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Oct. 1, 2004
End Date: Oct. 31, 2004
Comment:

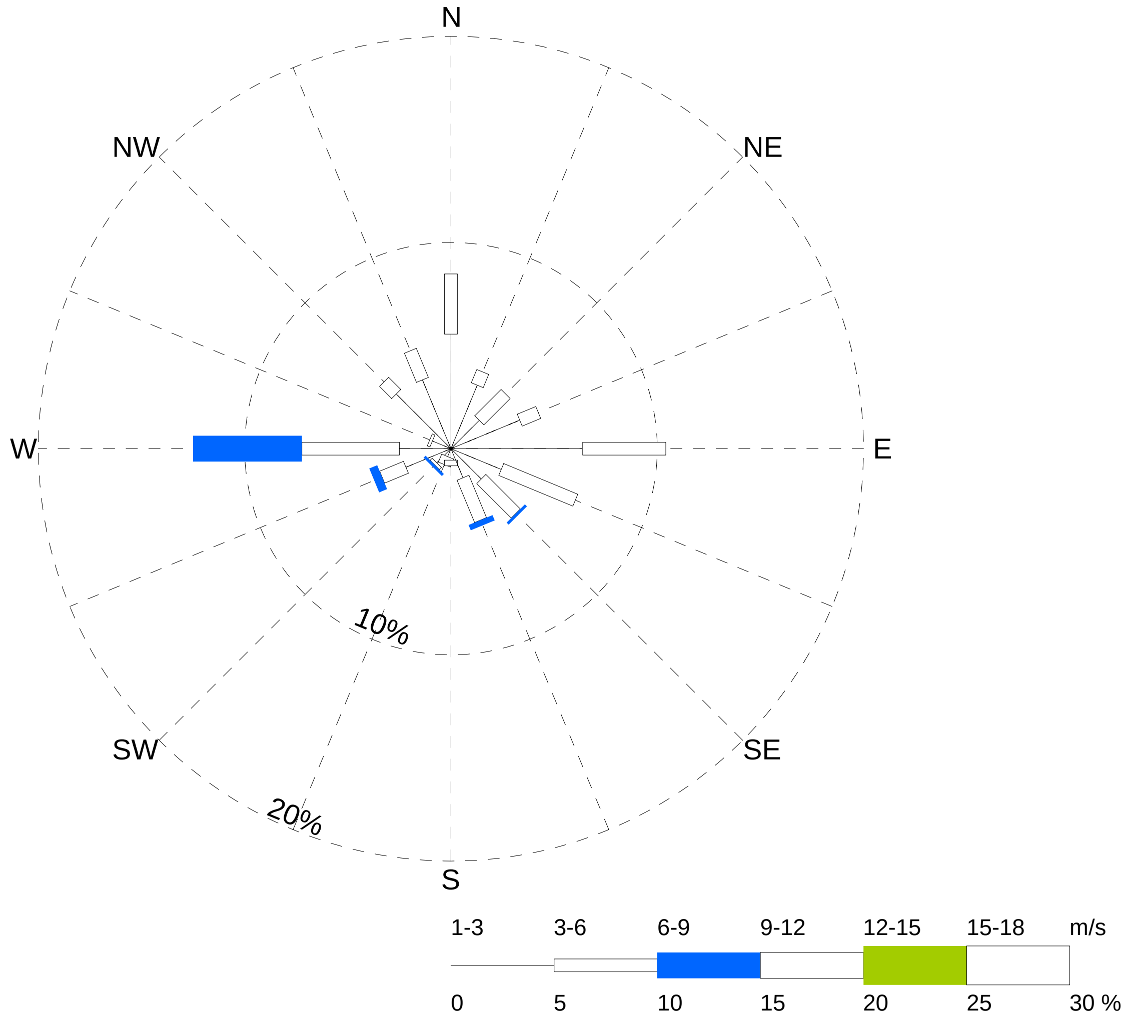
HAYCO
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
OCTOBER 2004

FIG.
C-01

Thu Apr 27 13:30:23 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Nov. 1, 2004

End Date: Nov. 31, 2004

Comment:

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	3.61	0.97	-	-	-	-	-	4.58
NE	-	1.94	1.81	-	-	-	-	-	3.75
NNE	-	3.33	0.69	-	-	-	-	-	4.03
N	-	5.56	2.92	-	-	-	-	-	8.47
NNW	-	3.61	1.53	-	-	-	-	-	5.14
NW	-	3.75	0.83	-	-	-	-	-	4.58
WNW	-	0.97	0.14	-	-	-	-	-	1.11
W	-	2.50	4.72	5.28	-	-	-	-	12.50
WSW	-	2.36	1.25	0.42	-	-	-	-	4.03
SW	-	0.97	0.14	0.14	-	-	-	-	1.25
SSW	-	0.42	0.42	-	-	-	-	-	0.83
S	-	0.56	0.28	-	-	-	-	-	0.83
SSE	-	1.53	2.22	0.28	-	-	-	-	4.03
SE	-	2.08	2.36	0.14	-	-	-	-	4.58
ESE	-	2.64	3.89	-	-	-	-	-	6.53
E	-	6.39	4.03	-	-	-	-	-	10.42
Calm	23.33	-	-	-	-	-	-	-	23.33
Total (%)	23.33	42.22	28.19	6.25	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

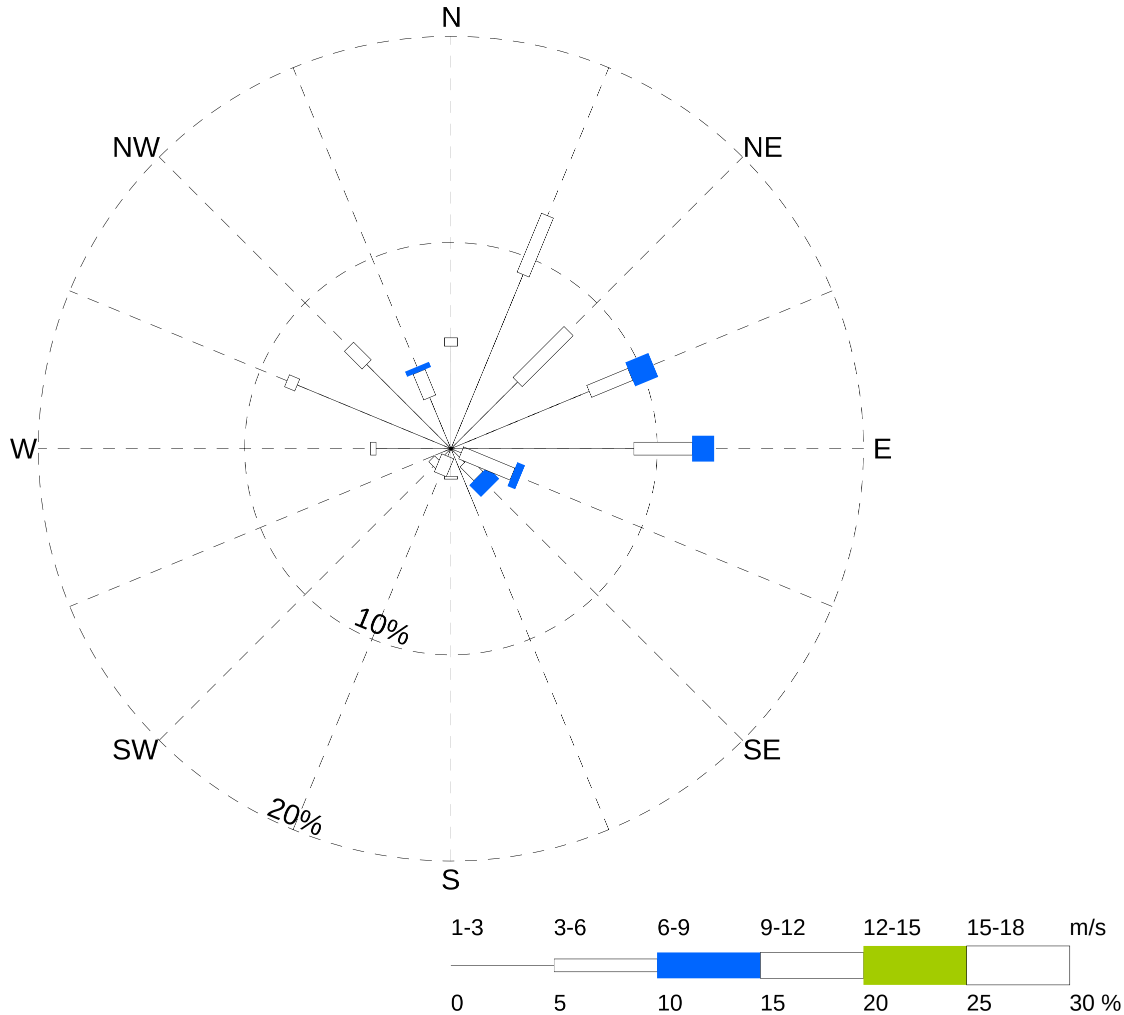
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
NOVEMBER 2004

FIG.
C-02

Thu Apr 27 13:30:24 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Station Name: Tyhee

NAD 27 Location:

N63° 11’ 6.2" W113° 53’ 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Dec. 1, 2004

End Date: Dec. 31, 2004

Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	7.26	2.15	1.21	-	-	-	-	10.62
NE	-	4.57	3.49	-	-	-	-	-	8.06
NNE	-	9.14	3.09	-	-	-	-	-	12.23
N	-	4.97	0.40	-	-	-	-	-	5.38
NNW	-	2.69	1.34	0.27	-	-	-	-	4.30
NW	-	5.78	1.21	-	-	-	-	-	6.99
WNW	-	8.06	0.54	-	-	-	-	-	8.60
W	-	3.63	0.27	-	-	-	-	-	3.90
WSW	-	0.81	-	-	-	-	-	-	0.81
SW	-	0.81	0.40	-	-	-	-	-	1.21
SSW	-	0.40	0.94	-	-	-	-	-	1.34
S	-	1.34	0.13	-	-	-	-	-	1.48
SSE	-	3.09	-	-	-	-	-	-	3.09
SE	-	0.94	0.94	0.81	-	-	-	-	2.69
ESE	-	0.54	2.69	0.40	-	-	-	-	3.63
E	-	8.87	2.82	1.08	-	-	-	-	12.77
Calm	12.90	-	-	-	-	-	-	-	12.90
Total (%)	12.90	62.90	20.43	3.76	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

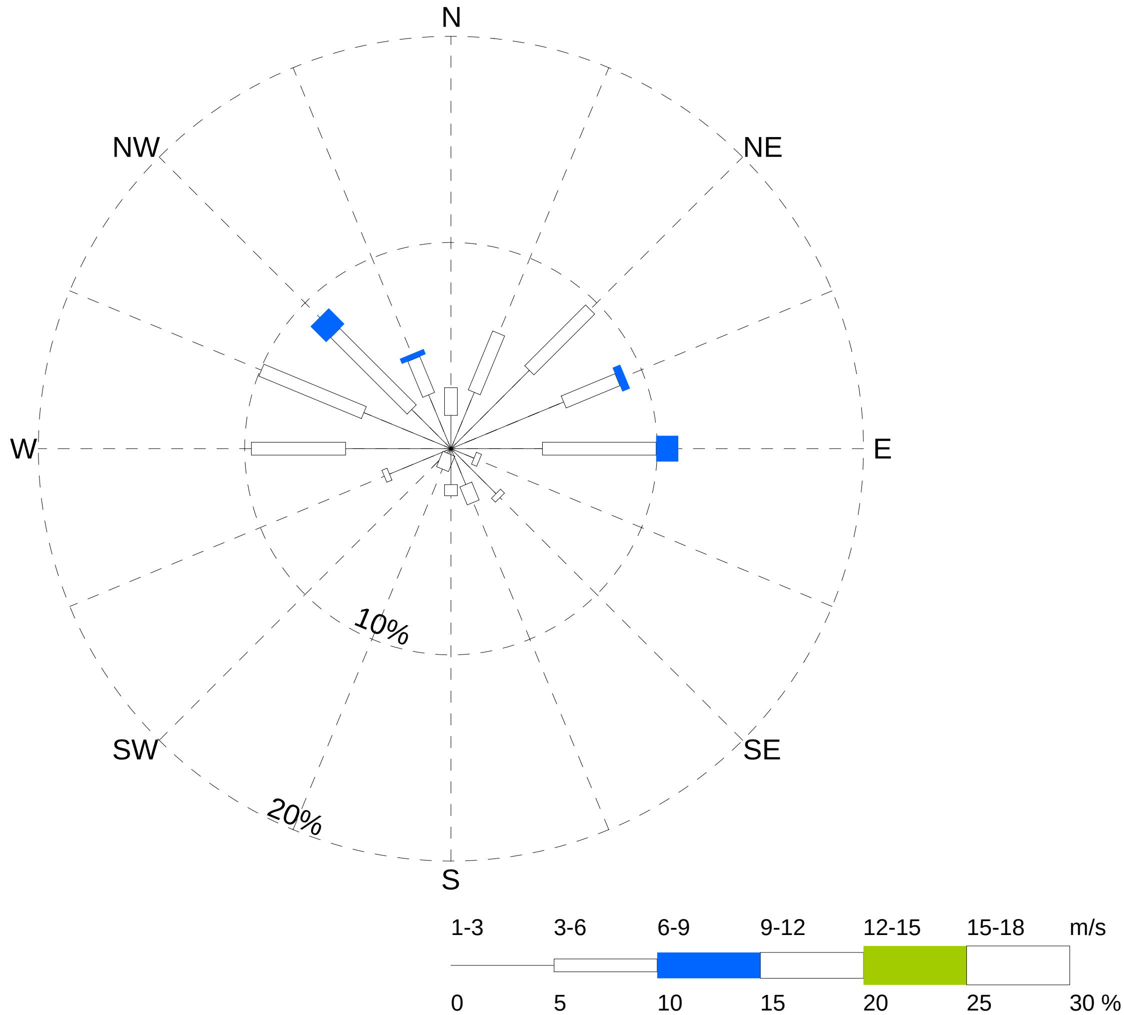
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
DECEMBER 2004

FIG.
C-03

Thu Apr 27 13:30:24 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Jan. 1, 2005

End Date: Jan. 31, 2005

Comment:

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	5.91	2.82	0.40	-	-	-	-	9.14
NE	-	5.38	4.17	-	-	-	-	-	9.54
NNE	-	2.96	3.09	-	-	-	-	-	6.05
N	-	1.61	1.34	-	-	-	-	-	2.96
NNW	-	2.82	1.88	0.27	-	-	-	-	4.97
NW	-	2.69	5.24	1.08	-	-	-	-	9.01
WNW	-	4.57	5.38	-	-	-	-	-	9.95
W	-	5.11	4.57	-	-	-	-	-	9.68
WSW	-	3.23	0.27	-	-	-	-	-	3.49
SW	-	1.34	-	-	-	-	-	-	1.34
SSW	-	0.27	0.81	-	-	-	-	-	1.08
S	-	1.75	0.54	-	-	-	-	-	2.29
SSE	-	1.88	0.94	-	-	-	-	-	2.82
SE	-	3.09	0.27	-	-	-	-	-	3.36
ESE	-	1.21	0.27	-	-	-	-	-	1.48
E	-	4.43	5.51	1.08	-	-	-	-	11.02
Calm	11.83	-	-	-	-	-	-	-	11.83
Total (%)	11.83	48.25	37.10	2.82	-	-	-	-	100.00

HAY & COMPANY CONSULTANTS

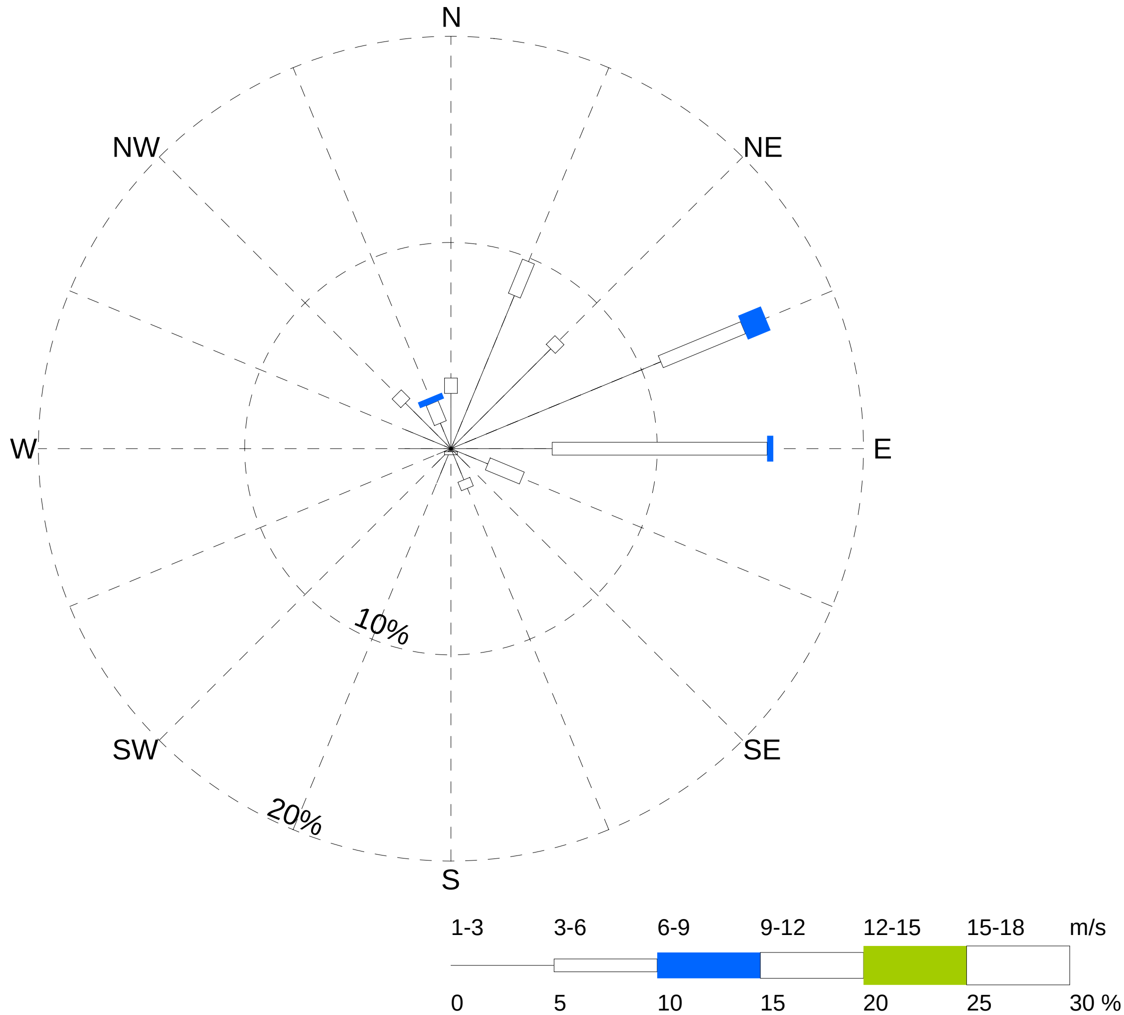
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
JANUARY 2005

FIG.
C-04

Thu Apr 27 13:30:24 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 28 days
Start Date: Feb. 1, 2005
End Date: Feb. 28, 2005
Comment:

Wind Speed & Direction Frequency Distribution Table

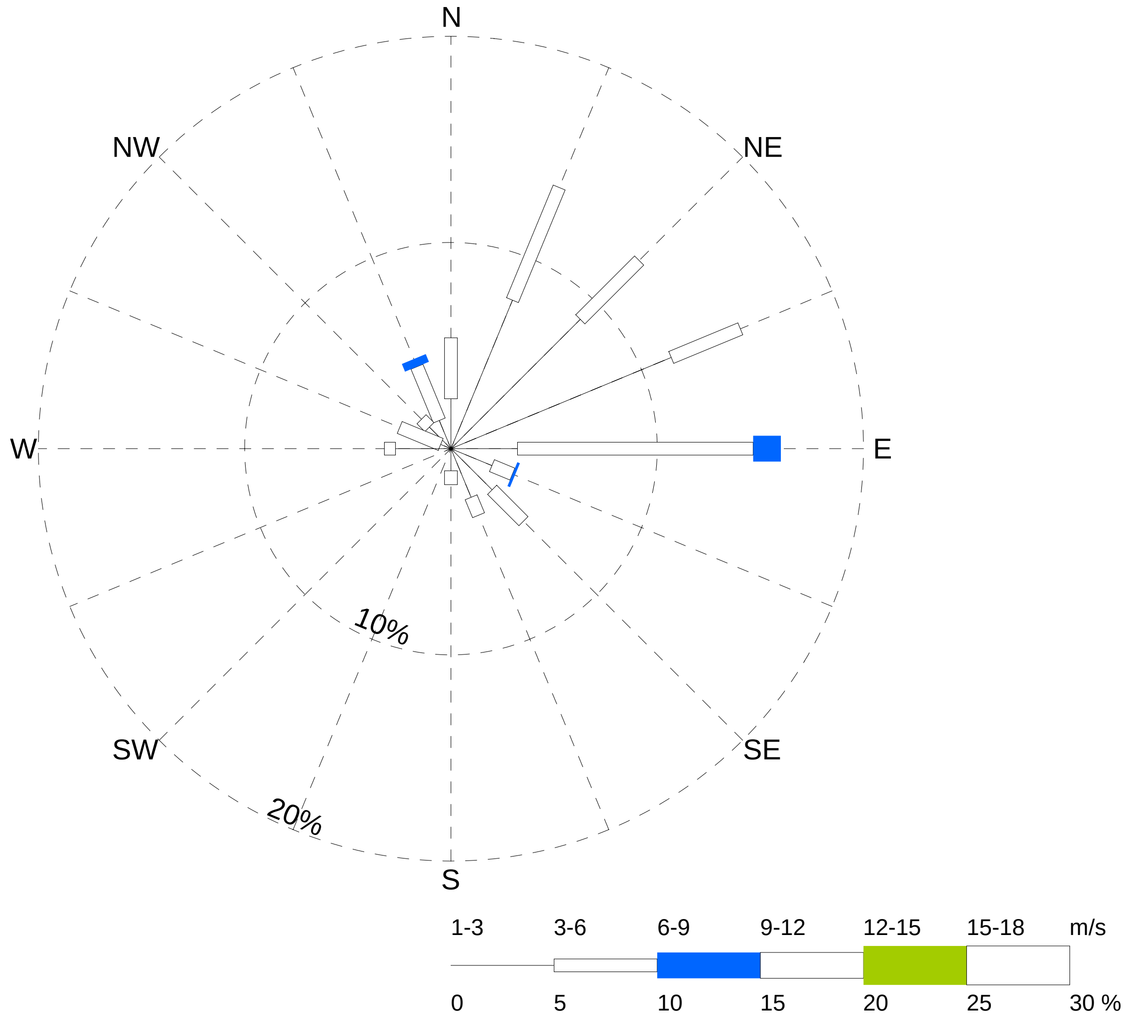
	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	11.01	4.32	1.19	-	-	-	-	16.52
NE	-	6.84	0.60	-	-	-	-	-	7.44
NNE	-	8.04	1.79	-	-	-	-	-	9.82
N	-	2.68	0.74	-	-	-	-	-	3.42
NNW	-	1.34	1.04	0.30	-	-	-	-	2.68
NW	-	3.12	0.60	-	-	-	-	-	3.72
WNW	-	2.38	-	-	-	-	-	-	2.38
W	-	2.23	-	-	-	-	-	-	2.23
WSW	-	0.74	-	-	-	-	-	-	0.74
SW	-	1.19	-	-	-	-	-	-	1.19
SSW	-	1.79	-	-	-	-	-	-	1.79
S	-	0.15	0.15	-	-	-	-	-	0.30
SSE	-	1.64	0.45	-	-	-	-	-	2.08
SE	-	1.19	-	-	-	-	-	-	1.19
ESE	-	1.93	1.79	-	-	-	-	-	3.72
E	-	4.91	10.42	0.30	-	-	-	-	15.62
Calm	25.15	-	-	-	-	-	-	-	25.15
Total (%)	25.15	51.19	21.88	1.79	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
FEBRUARY 2005

FIG.
C-05



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	11.56	3.63	-	-	-	-	-	15.19
NE	-	8.87	4.03	-	-	-	-	-	12.90
NNE	-	7.80	5.91	-	-	-	-	-	13.71
N	-	2.42	2.96	-	-	-	-	-	5.38
NNW	-	1.48	2.82	0.40	-	-	-	-	4.70
NW	-	1.48	0.54	-	-	-	-	-	2.02
WNW	-	0.54	2.15	-	-	-	-	-	2.69
W	-	2.69	0.54	-	-	-	-	-	3.23
WSW	-	0.27	-	-	-	-	-	-	0.27
SW	-	0.40	-	-	-	-	-	-	0.40
SSW	-	0.13	-	-	-	-	-	-	0.13
S	-	1.08	0.67	-	-	-	-	-	1.75
SSE	-	2.55	0.94	-	-	-	-	-	3.49
SE	-	2.82	2.15	-	-	-	-	-	4.97
ESE	-	2.15	1.08	0.13	-	-	-	-	3.36
E	-	3.23	11.43	1.34	-	-	-	-	15.99
Calm	9.81	-	-	-	-	-	-	-	9.81
Total (%)	9.81	49.46	38.84	1.88	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Mar. 1, 2005
End Date: Mar. 31, 2005
Comment:

HAYCO HAY & COMPANY CONSULTANTS

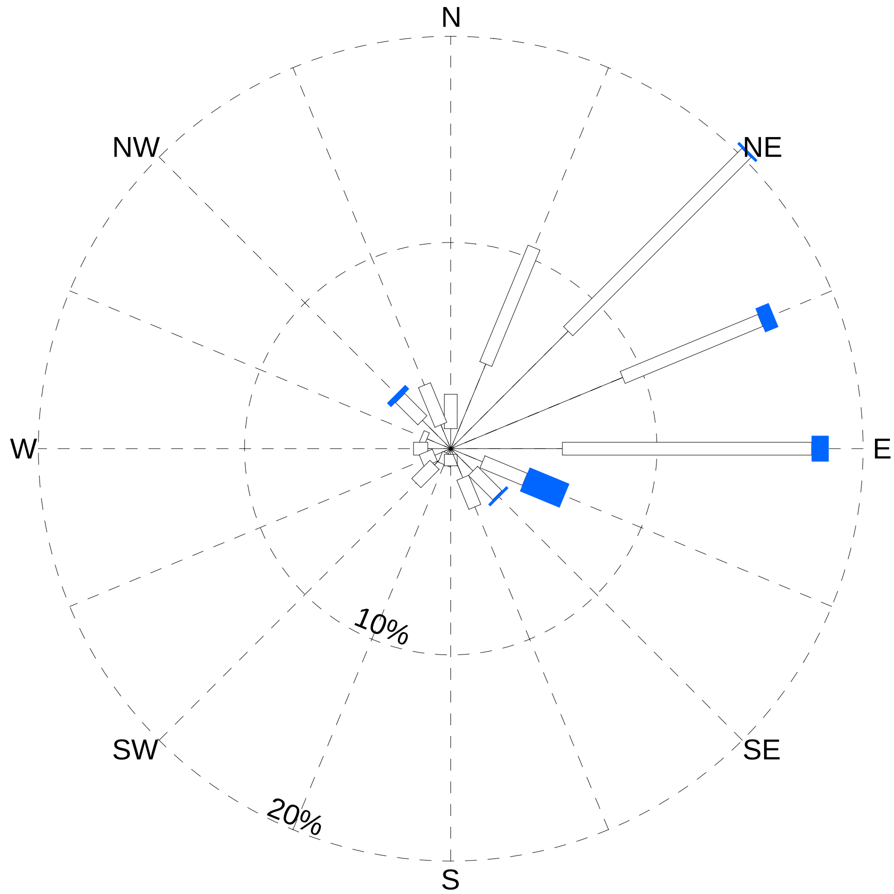
TYHEE NWT CORP

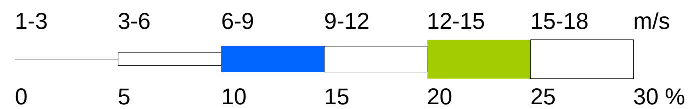
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
MARCH 2005

FIG.
C-06

Thu Apr 27 13:30:25 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses





Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	9.03	7.22	0.69	-	-	-	-	16.94
NE	-	8.06	12.22	0.14	-	-	-	-	20.42
NNE	-	4.44	6.11	-	-	-	-	-	10.56
N	-	0.97	1.67	-	-	-	-	-	2.64
NNW	-	1.25	2.08	-	-	-	-	-	3.33
NW	-	1.94	1.53	0.28	-	-	-	-	3.75
WNW	-	1.25	0.28	-	-	-	-	-	1.53
W	-	1.11	0.69	-	-	-	-	-	1.81
WSW	-	0.83	0.69	-	-	-	-	-	1.53
SW	-	1.11	1.25	-	-	-	-	-	2.36
SSW	-	0.28	0.56	-	-	-	-	-	0.83
S	-	0.28	0.56	-	-	-	-	-	0.83
SSE	-	1.53	1.53	-	-	-	-	-	3.06
SE	-	1.53	1.67	0.14	-	-	-	-	3.33
ESE	-	1.67	2.22	2.08	-	-	-	-	5.97
E	-	5.42	12.08	0.83	-	-	-	-	18.33
Calm	2.78	-	-	-	-	-	-	-	2.78
Total (%)	2.78	40.69	52.36	4.17	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 30 days
Start Date: Apr. 1, 2005
End Date: Apr. 30, 2005
Comment:

HAYCO HAY & COMPANY CONSULTANTS

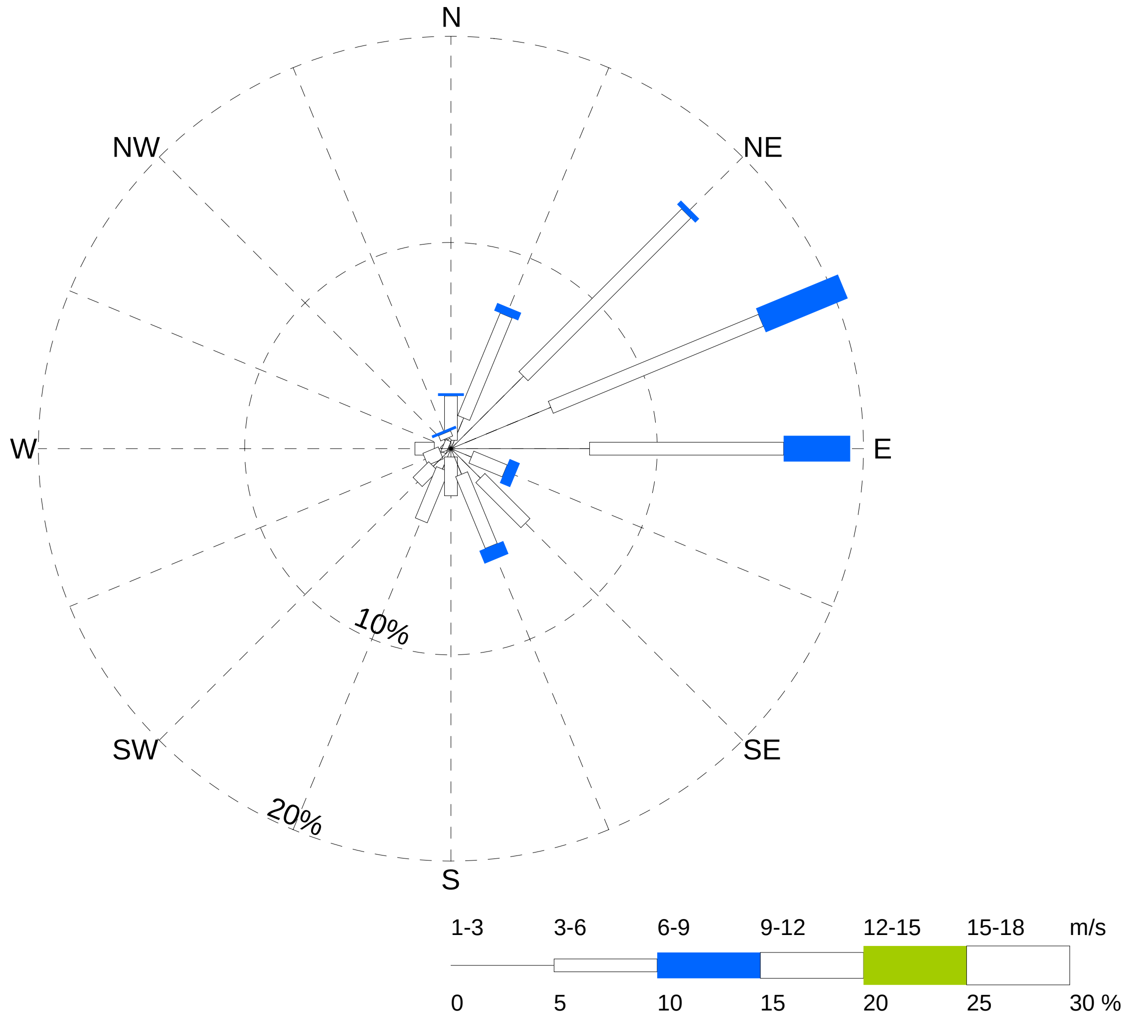
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
APRIL 2005

FIG. C-07

Thu Apr 27 13:30:25 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	5.24	11.02	4.30	-	-	-	-	20.57
NE	-	4.97	11.16	0.27	-	-	-	-	16.40
NNE	-	1.61	5.38	0.40	-	-	-	-	7.39
N	-	0.40	2.15	0.13	-	-	-	-	2.69
NNW	-	0.54	0.27	0.13	-	-	-	-	0.94
NW	-	0.27	0.13	-	-	-	-	-	0.40
WNW	-	0.13	0.27	-	-	-	-	-	0.40
W	-	0.81	0.94	-	-	-	-	-	1.75
WSW	-	0.54	0.81	-	-	-	-	-	1.34
SW	-	1.21	1.08	-	-	-	-	-	2.29
SSW	-	1.08	2.69	-	-	-	-	-	3.76
S	-	0.40	1.88	-	-	-	-	-	2.29
SSE	-	1.34	3.76	0.67	-	-	-	-	5.78
SE	-	2.02	3.09	-	-	-	-	-	5.11
ESE	-	1.08	1.75	0.54	-	-	-	-	3.36
E	-	6.72	9.41	3.23	-	-	-	-	19.35
Calm	6.18	-	-	-	-	-	-	-	6.18
Total (%)	6.18	28.36	55.78	9.68	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2"   W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: May. 1, 2005
End Date: May. 31, 2005
Comment:

HAYCO HAY & COMPANY CONSULTANTS

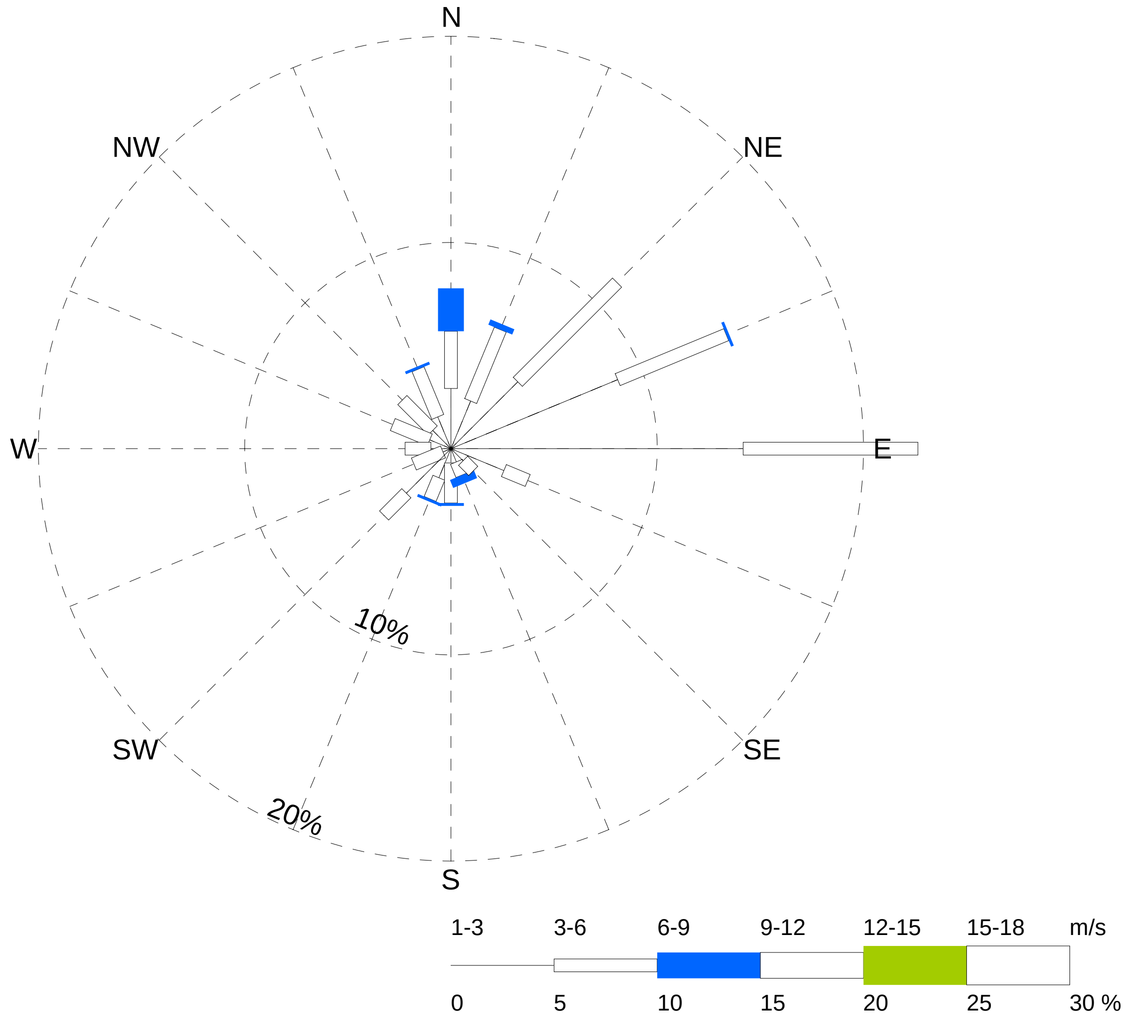
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
MAY 2005

FIG.
C-08

Thu Apr 27 13:30:25 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	8.75	5.69	0.14	-	-	-	-	14.58
NE	-	4.58	6.81	-	-	-	-	-	11.39
NNE	-	2.50	3.75	0.28	-	-	-	-	6.53
N	-	2.92	2.78	2.08	-	-	-	-	7.78
NNW	-	1.67	2.50	0.14	-	-	-	-	4.31
NW	-	1.25	2.08	-	-	-	-	-	3.33
WNW	-	1.11	1.94	-	-	-	-	-	3.06
W	-	0.97	1.25	-	-	-	-	-	2.22
WSW	-	0.42	1.53	-	-	-	-	-	1.94
SW	-	3.06	1.53	-	-	-	-	-	4.58
SSW	-	1.53	1.11	0.14	-	-	-	-	2.78
S	-	0.69	1.94	0.14	-	-	-	-	2.78
SSE	-	0.69	0.69	0.42	-	-	-	-	1.81
SE	-	0.83	0.69	-	-	-	-	-	1.53
ESE	-	2.78	1.25	-	-	-	-	-	4.03
E	-	14.17	8.47	-	-	-	-	-	22.64
Calm	4.72	-	-	-	-	-	-	-	4.72
Total (%)	4.72	47.92	44.03	3.33	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 30 days
Start Date: Jun. 1, 2005
End Date: Jun. 30, 2005
Comment:

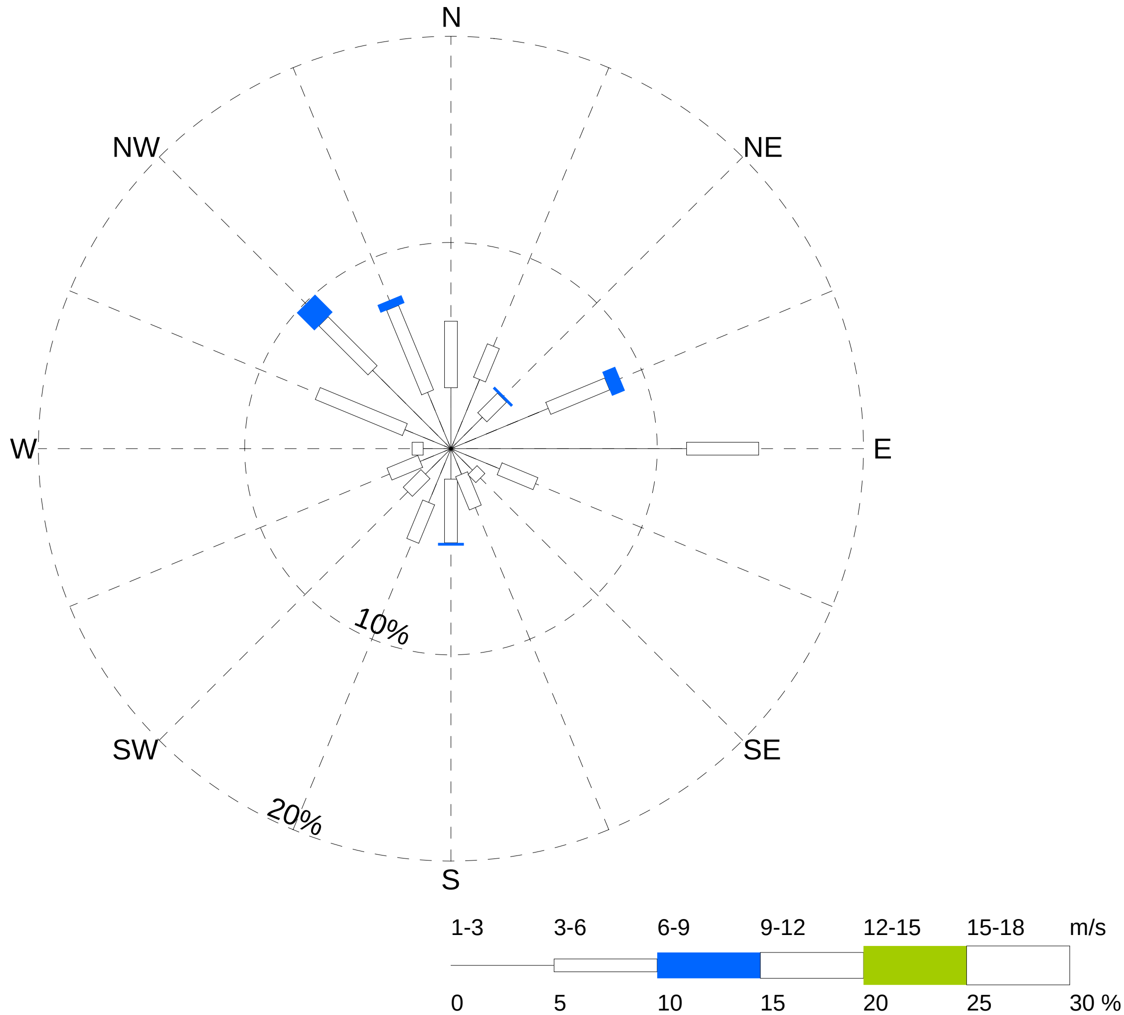
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
JUNE 2005

FIG. C-09

Thu Apr 27 13:30:26 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Jul. 1, 2005

End Date: Jul. 31, 2005

Comment:

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	5.11	3.09	0.67	-	-	-	-	8.87
NE	-	2.15	1.34	0.13	-	-	-	-	3.63
NNE	-	3.63	1.75	-	-	-	-	-	5.38
N	-	2.96	3.23	-	-	-	-	-	6.18
NNW	-	2.96	4.43	0.40	-	-	-	-	7.80
NW	-	5.38	3.36	1.21	-	-	-	-	9.95
WNW	-	2.42	4.57	-	-	-	-	-	6.99
W	-	1.34	0.54	-	-	-	-	-	1.88
WSW	-	1.61	1.61	-	-	-	-	-	3.23
SW	-	1.75	1.21	-	-	-	-	-	2.96
SSW	-	2.82	2.02	-	-	-	-	-	4.84
S	-	1.48	3.09	0.13	-	-	-	-	4.70
SSE	-	1.34	1.75	-	-	-	-	-	3.09
SE	-	1.48	0.54	-	-	-	-	-	2.02
ESE	-	2.55	1.88	-	-	-	-	-	4.43
E	-	11.43	3.49	-	-	-	-	-	14.92
Calm	9.14	-	-	-	-	-	-	-	9.14
Total (%)	9.14	50.40	37.90	2.55	-	-	-	-	100.00

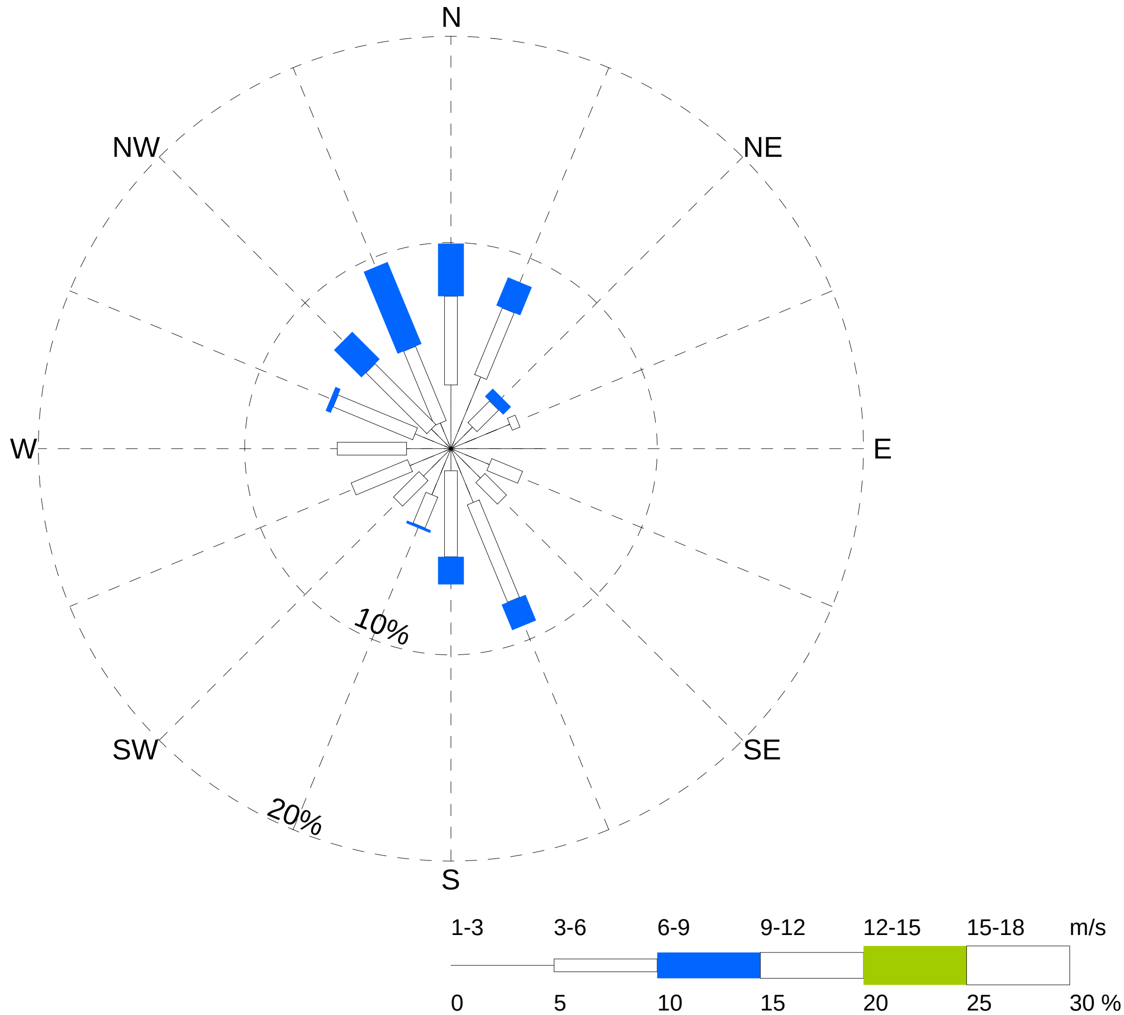
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
JULY 2005

FIG.
C-10



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	3.09	0.40	-	-	-	-	-	3.49
NE	-	1.48	1.48	0.54	-	-	-	-	3.49
NNE	-	3.76	3.49	1.48	-	-	-	-	8.74
N	-	3.09	4.30	2.55	-	-	-	-	9.95
NNW	-	1.34	3.90	4.30	-	-	-	-	9.54
NW	-	1.34	4.17	1.88	-	-	-	-	7.39
WNW	-	1.88	4.17	0.27	-	-	-	-	6.32
W	-	2.15	3.36	-	-	-	-	-	5.51
WSW	-	2.15	2.96	-	-	-	-	-	5.11
SW	-	1.88	1.75	-	-	-	-	-	3.63
SSW	-	2.42	1.61	0.13	-	-	-	-	4.17
S	-	1.08	4.17	1.34	-	-	-	-	6.59
SSE	-	2.82	5.11	1.34	-	-	-	-	9.27
SE	-	2.02	1.48	-	-	-	-	-	3.49
ESE	-	2.02	1.61	-	-	-	-	-	3.63
E	-	4.43	-	-	-	-	-	-	4.43
Calm	5.24	-	-	-	-	-	-	-	5.24
Total (%)	5.24	36.96	43.95	13.84	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Aug. 1, 2005
End Date: Aug. 31, 2005
Comment:

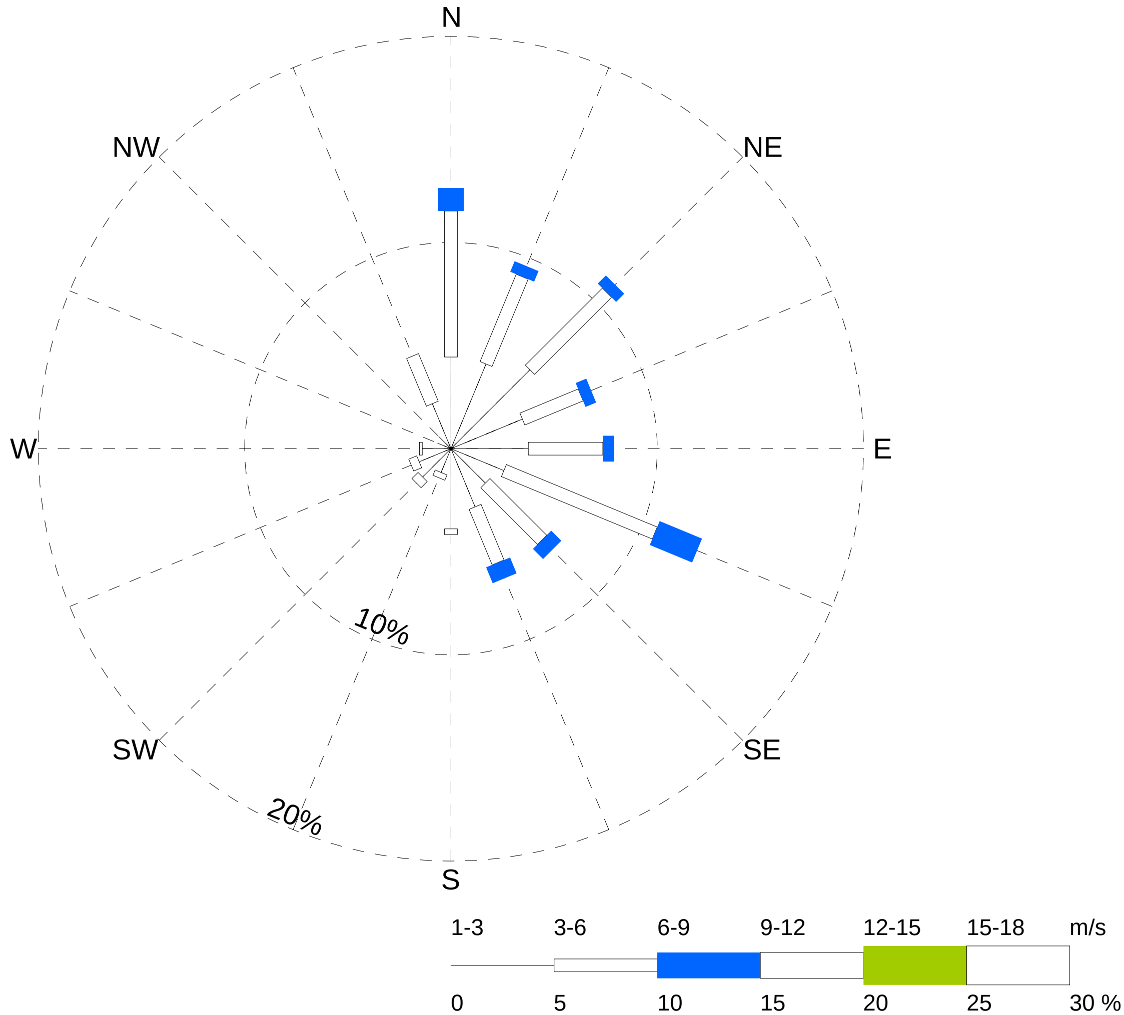
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
AUGUST 2005

FIG.
C-11

Thu Apr 27 13:30:27 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 30 days

Start Date: Sep. 1, 2005

End Date: Sep. 30, 2005

Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	3.75	3.06	0.56	-	-	-	-	7.36
NE	-	5.42	5.28	0.56	-	-	-	-	11.25
NNE	-	4.44	4.58	0.56	-	-	-	-	9.58
N	-	4.44	7.08	1.11	-	-	-	-	12.64
NNW	-	2.36	2.50	-	-	-	-	-	4.86
NW	-	0.83	-	-	-	-	-	-	0.83
WNW	-	0.69	-	-	-	-	-	-	0.69
W	-	1.39	0.14	-	-	-	-	-	1.53
WSW	-	1.67	0.42	-	-	-	-	-	2.08
SW	-	1.94	0.42	-	-	-	-	-	2.36
SSW	-	1.25	0.28	-	-	-	-	-	1.53
S	-	3.89	0.28	-	-	-	-	-	4.17
SSE	-	3.06	2.92	0.83	-	-	-	-	6.81
SE	-	2.36	3.89	0.69	-	-	-	-	6.94
ESE	-	2.78	7.92	2.22	-	-	-	-	12.92
E	-	3.75	3.61	0.56	-	-	-	-	7.92
Calm	6.53	-	-	-	-	-	-	-	6.53
Total (%)	6.53	44.03	42.36	7.08	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

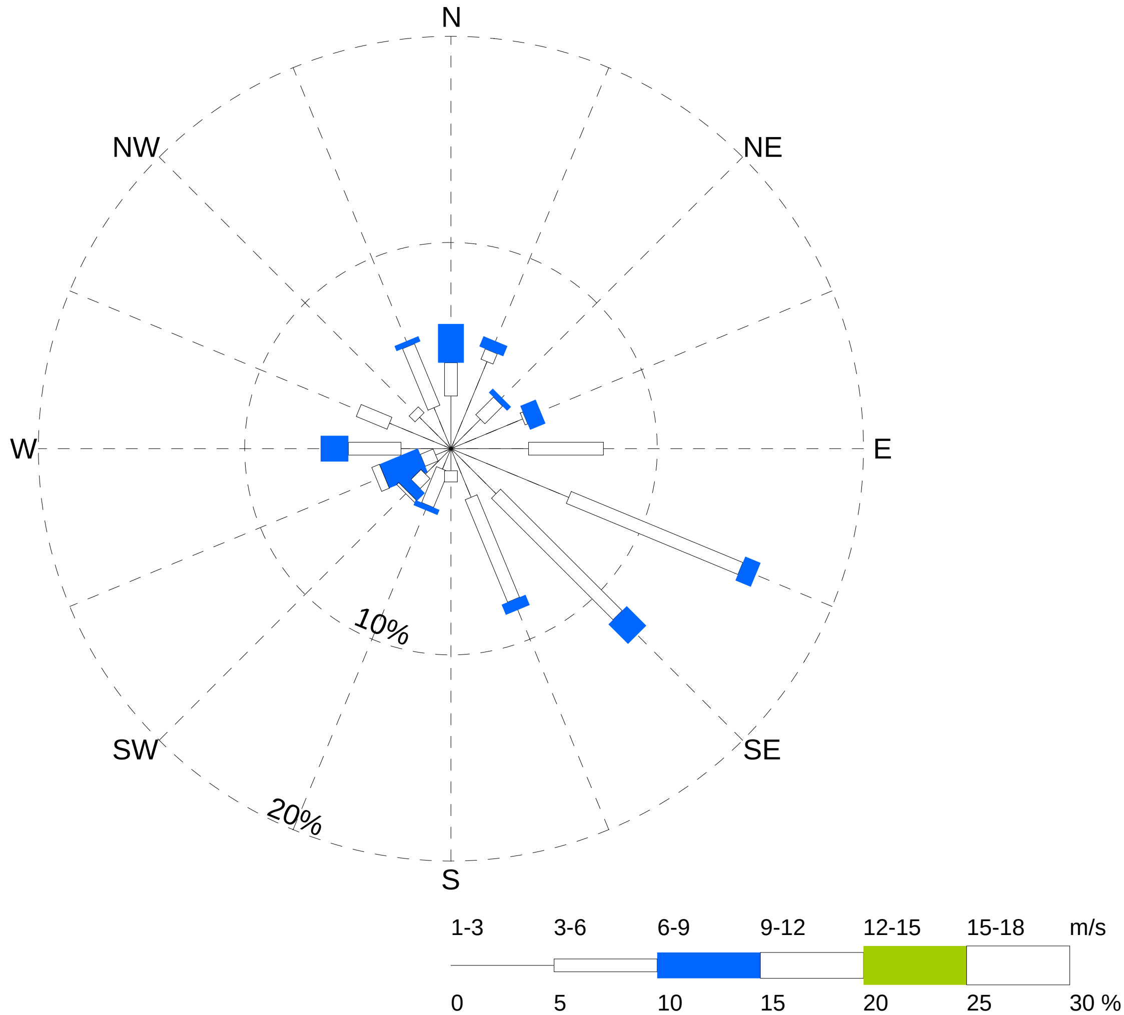
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
SEPTEMBER 2005

FIG.
C-12

Thu Apr 27 13:30:28 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Station Name: Tyhee

NAD 27 Location:

N63° 11’ 6.2" W113° 53’ 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Oct. 1, 2005

End Date: Oct. 31, 2005

Comment:

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	3.76	0.13	0.81	-	-	-	-	4.70
NE	-	2.02	1.21	0.27	-	-	-	-	3.49
NNE	-	4.57	0.54	0.54	-	-	-	-	5.64
N	-	2.55	1.61	1.88	-	-	-	-	6.05
NNW	-	2.15	3.23	0.27	-	-	-	-	5.64
NW	-	2.15	0.40	-	-	-	-	-	2.55
WNW	-	3.23	1.61	-	-	-	-	-	4.84
W	-	2.42	2.55	1.34	-	-	-	-	6.32
WSW	-	0.81	0.67	2.02	0.40	-	-	-	3.90
SW	-	1.75	0.67	0.54	0.13	-	-	-	3.09
SSW	-	1.08	1.88	0.27	-	-	-	-	3.23
S	-	1.08	0.54	-	-	-	-	-	1.61
SSE	-	2.55	5.38	0.54	-	-	-	-	8.47
SE	-	3.09	8.33	1.34	-	-	-	-	12.77
ESE	-	6.18	9.01	0.81	-	-	-	-	15.99
E	-	3.76	3.63	-	-	-	-	-	7.39
Calm	4.30	-	-	-	-	-	-	-	4.30
Total (%)	4.30	43.15	41.40	10.62	0.54	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

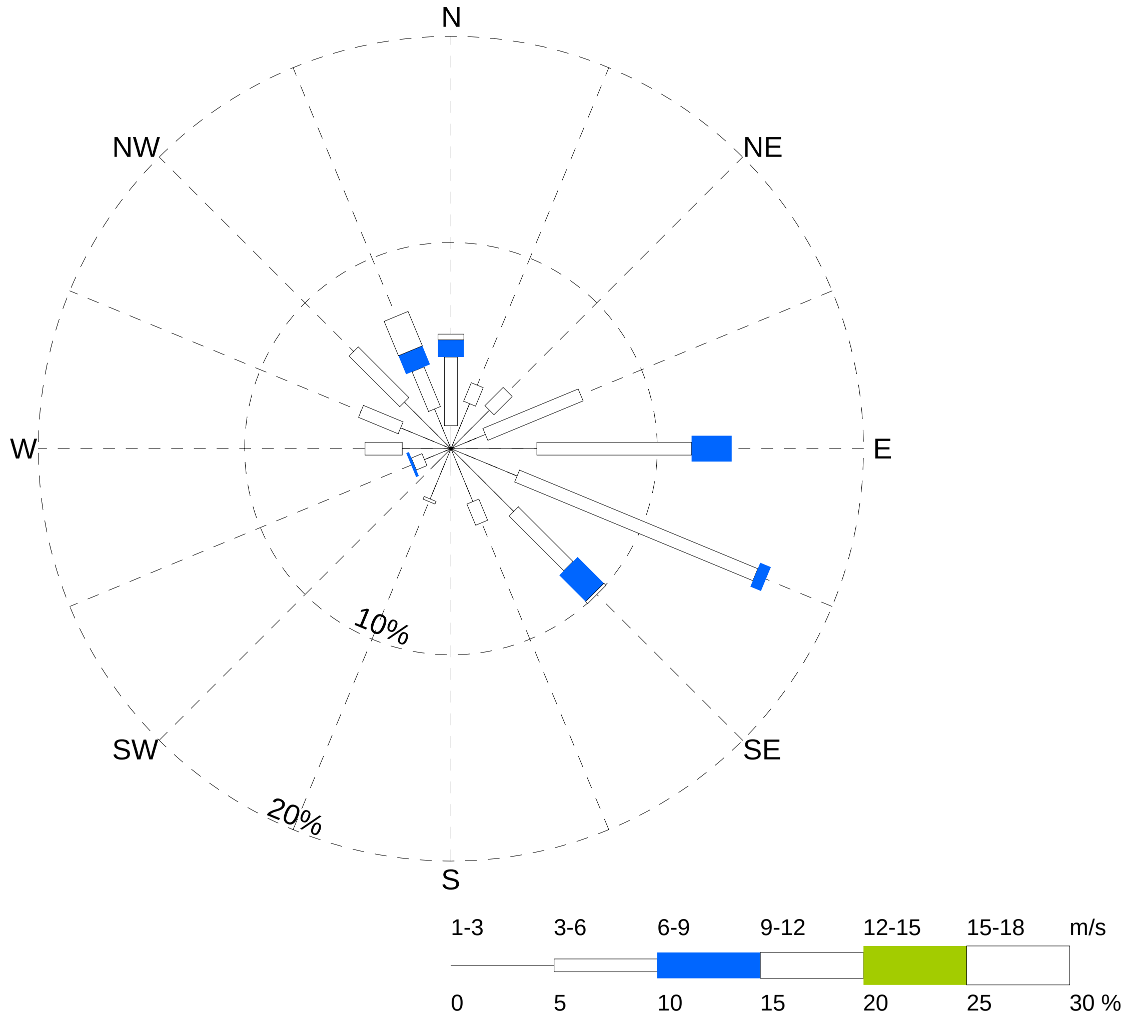
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
OCTOBER 2005

FIG.
C-13

Thu Apr 27 13:30:28 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Nov. 1, 2005

End Date: Nov. 31, 2005

Comment:

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	1.81	5.00	-	-	-	-	-	6.81
NE	-	2.64	1.25	-	-	-	-	-	3.89
NNE	-	2.36	0.97	-	-	-	-	-	3.33
N	-	1.11	3.33	0.83	0.28	-	-	-	5.56
NNW	-	2.08	2.08	0.97	1.81	-	-	-	6.94
NW	-	3.19	3.47	-	-	-	-	-	6.67
WNW	-	2.64	2.08	-	-	-	-	-	4.72
W	-	2.36	1.81	-	-	-	-	-	4.17
WSW	-	1.39	0.56	0.14	-	-	-	-	2.08
SW	-	1.39	-	-	-	-	-	-	1.39
SSW	-	2.64	0.14	-	-	-	-	-	2.78
S	-	1.11	-	-	-	-	-	-	1.11
SSE	-	2.78	1.11	-	-	-	-	-	3.89
SE	-	4.31	3.75	1.81	0.14	-	-	-	10.00
ESE	-	3.47	12.50	0.56	-	-	-	-	16.53
E	-	4.17	7.50	1.94	-	-	-	-	13.61
Calm	6.53	-	-	-	-	-	-	-	6.53
Total (%)	6.53	39.44	45.56	6.25	2.22	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

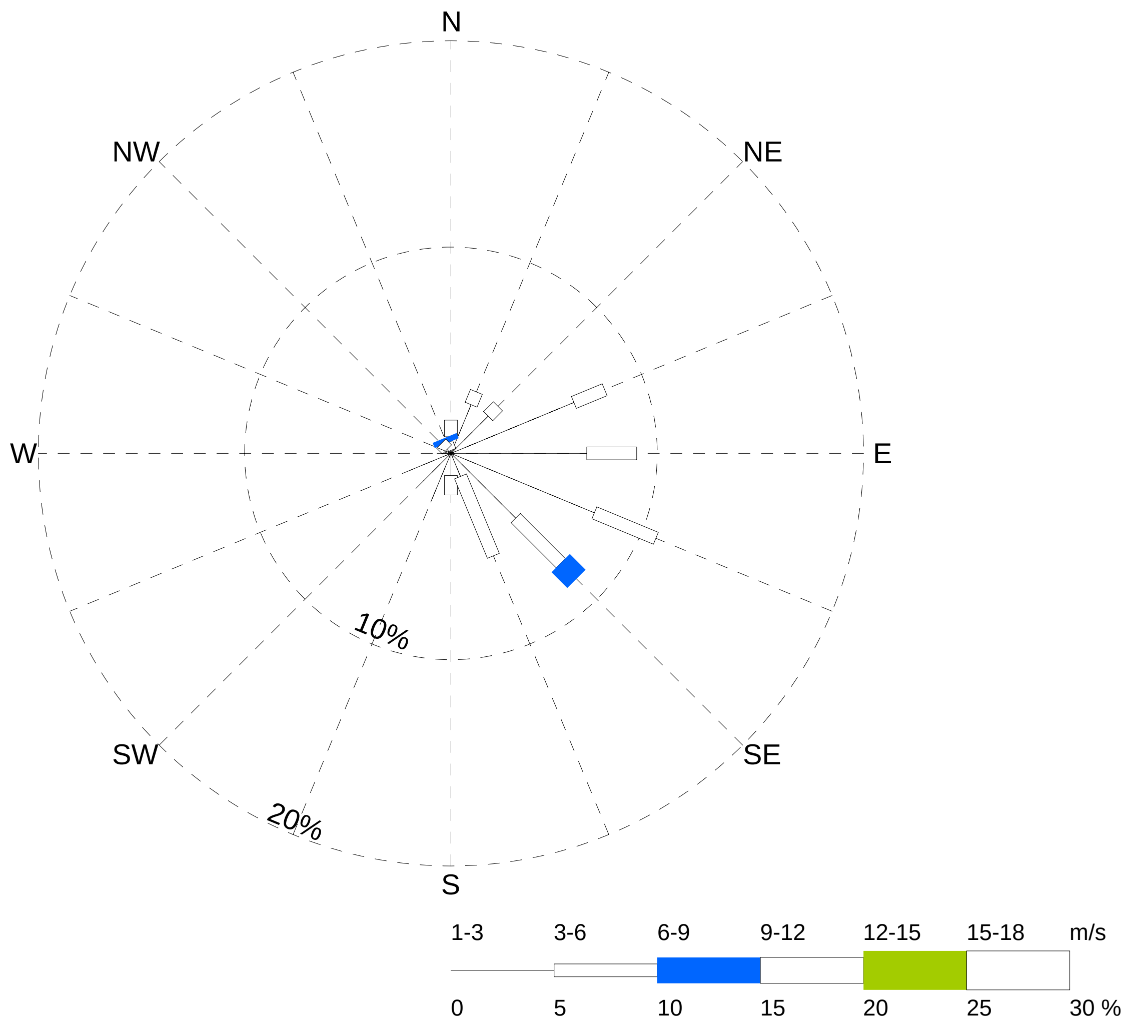
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
NOVEMBER 2005

FIG.
C-14

Thu Apr 27 13:30:28 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	6.45	1.61	-	-	-	-	-	8.06
NE	-	2.55	0.67	-	-	-	-	-	3.23
NNE	-	2.55	0.67	-	-	-	-	-	3.23
N	-	0.81	0.81	-	-	-	-	-	1.61
NNW	-	0.13	0.40	0.27	-	-	-	-	0.81
NW	-	0.27	0.40	-	-	-	-	-	0.67
WNW	-	0.67	-	-	-	-	-	-	0.67
W	-	0.67	-	-	-	-	-	-	0.67
WSW	-	2.15	-	-	-	-	-	-	2.15
SW	-	1.88	-	-	-	-	-	-	1.88
SSW	-	2.55	-	-	-	-	-	-	2.55
S	-	1.08	0.94	-	-	-	-	-	2.02
SSE	-	1.21	4.17	-	-	-	-	-	5.38
SE	-	4.43	3.09	1.08	-	-	-	-	8.60
ESE	-	7.53	3.23	-	-	-	-	-	10.75
E	-	6.59	2.42	-	-	-	-	-	9.01
Calm	38.71	-	-	-	-	-	-	-	38.71
Total (%)	38.71	41.53	18.41	1.34	-	-	-	-	100.00

Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Dec. 1, 2005

End Date: Dec. 31, 2005

Comment:

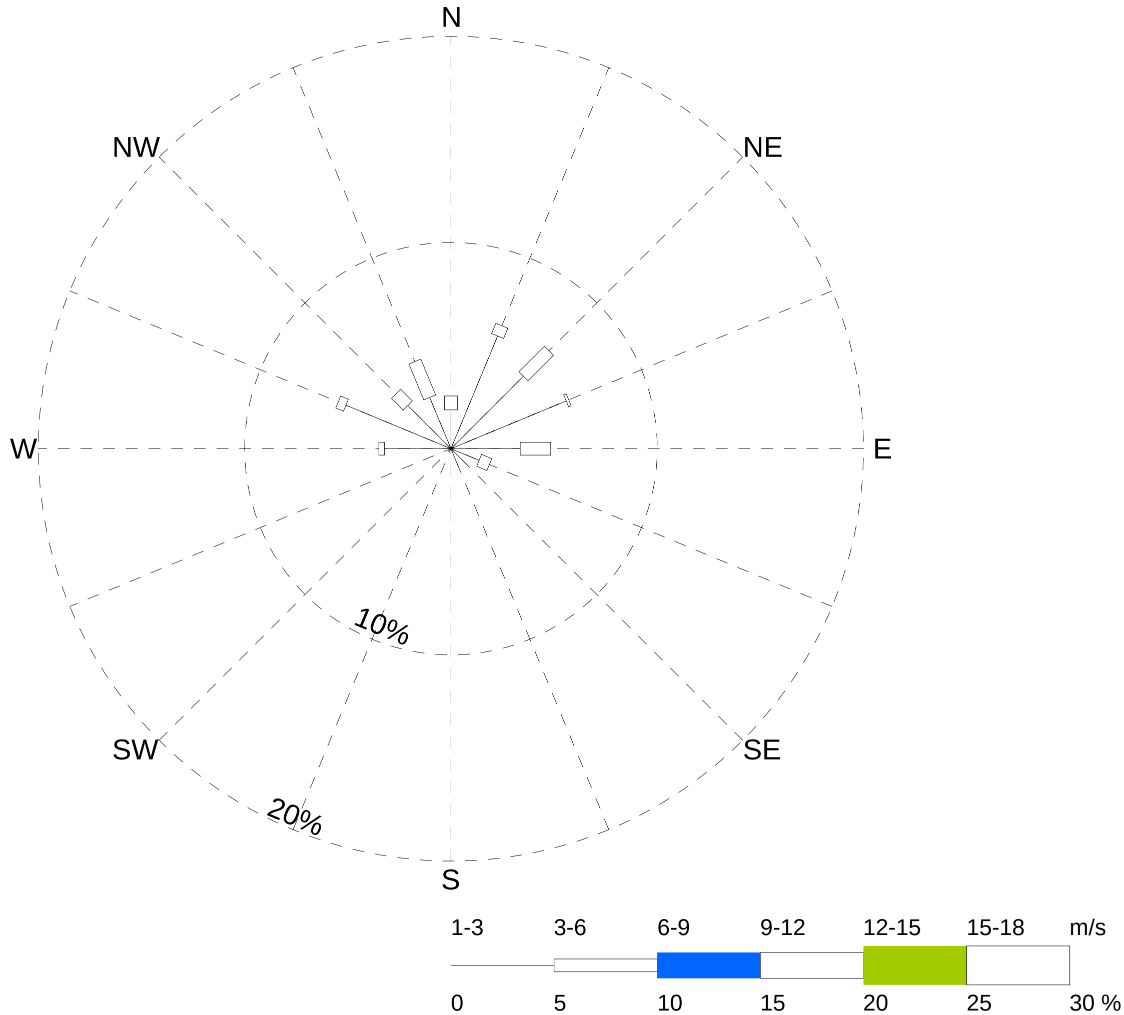
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
DECEMBER 2005

FIG. C-15



Wind Speed & Direction Frequency Distribution Table

Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
	Percent Occurrence (%)								
ENE	-	6.05	0.13	-	-	-	-	-	6.18
NE	-	4.97	1.75	-	-	-	-	-	6.72
NNE	-	5.91	0.54	-	-	-	-	-	6.45
N	-	1.88	0.67	-	-	-	-	-	2.55
NNW	-	2.69	1.88	-	-	-	-	-	4.57
NW	-	2.96	0.81	-	-	-	-	-	3.76
WNW	-	5.51	0.40	-	-	-	-	-	5.91
W	-	3.23	0.27	-	-	-	-	-	3.49
WSW	-	0.13	-	-	-	-	-	-	0.13
SW	-	-	-	-	-	-	-	-	-
SSW	-	-	-	-	-	-	-	-	-
S	-	-	-	-	-	-	-	-	-
SSE	-	0.94	-	-	-	-	-	-	0.94
SE	-	1.21	-	-	-	-	-	-	1.21
ESE	-	1.48	0.54	-	-	-	-	-	2.02
E	-	3.36	1.48	-	-	-	-	-	4.84
Calm	51.21	-	-	-	-	-	-	-	51.21
Total (%)	51.21	40.32	8.47	-	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11’ 6.2" W113° 53’ 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Jan. 1, 2006
End Date: Jan. 31, 2006
Comment:

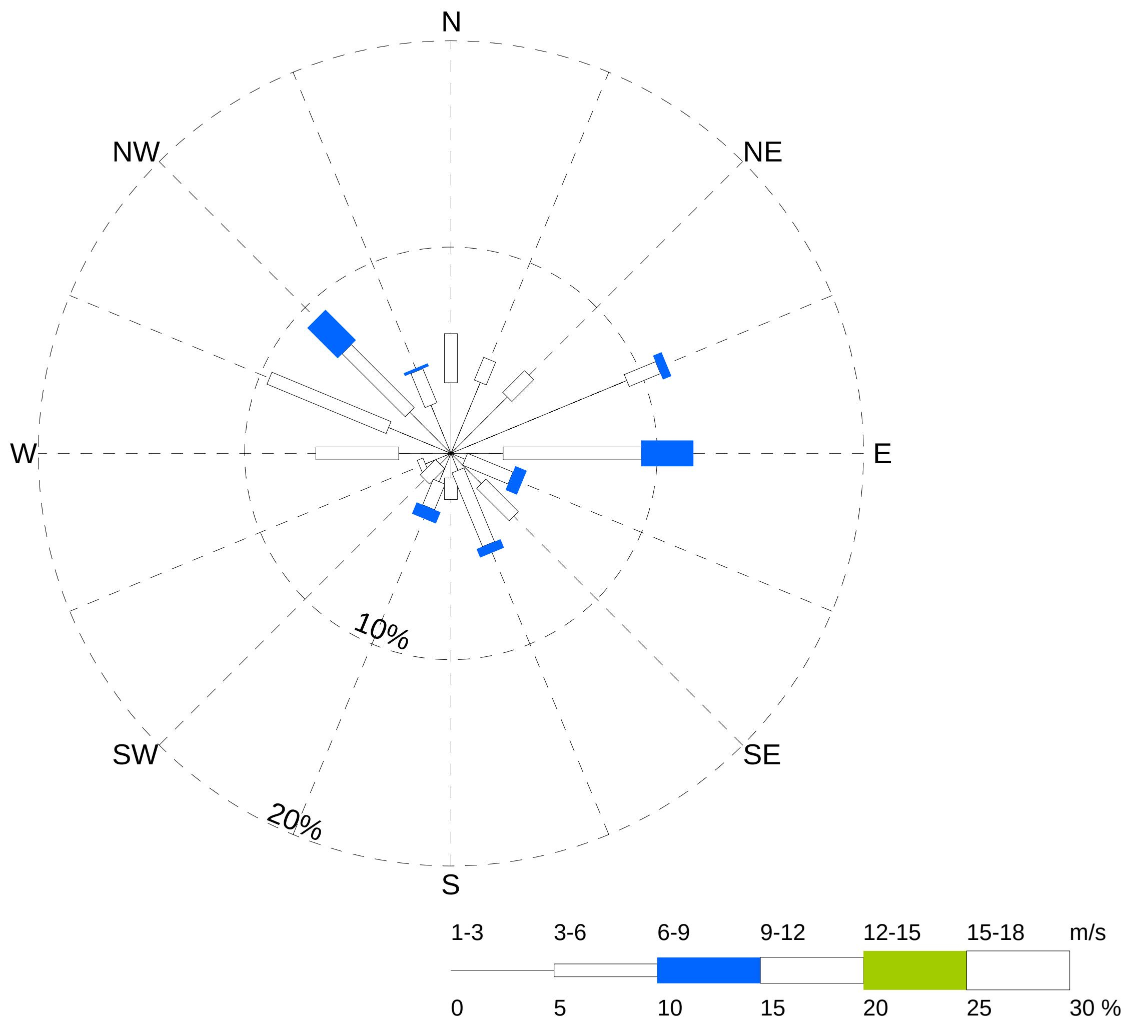
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
JANUARY 2006

FIG. C-16

Thu Apr 27 13:30:29 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Station Name: Tyhee
NAD 27 Location:
N63° 11’ 6.2" W113° 53’ 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 28 days
Start Date: Feb. 1, 2006
End Date: Feb. 28, 2006
Comment:

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	9.23	1.64	0.45	-	-	-	-	11.31
NE	-	3.87	1.49	-	-	-	-	-	5.36
NNE	-	3.72	1.19	-	-	-	-	-	4.91
N	-	3.42	2.38	-	-	-	-	-	5.80
NNW	-	2.53	1.79	0.15	-	-	-	-	4.46
NW	-	2.83	4.32	2.08	-	-	-	-	9.23
WNW	-	3.27	6.25	-	-	-	-	-	9.52
W	-	2.53	4.02	-	-	-	-	-	6.55
WSW	-	1.34	0.30	-	-	-	-	-	1.64
SW	-	0.74	1.04	-	-	-	-	-	1.79
SSW	-	1.49	1.34	0.60	-	-	-	-	3.42
S	-	1.19	1.04	-	-	-	-	-	2.23
SSE	-	0.89	3.87	0.45	-	-	-	-	5.21
SE	-	2.08	2.23	-	-	-	-	-	4.32
ESE	-	0.74	2.38	0.60	-	-	-	-	3.72
E	-	2.53	6.70	2.53	-	-	-	-	11.76
Calm	8.78	-	-	-	-	-	-	-	8.78
Total (%)	8.78	42.41	41.96	6.84	-	-	-	-	100.00

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

TYHEE WIND ROSE
FEBRUARY 2006

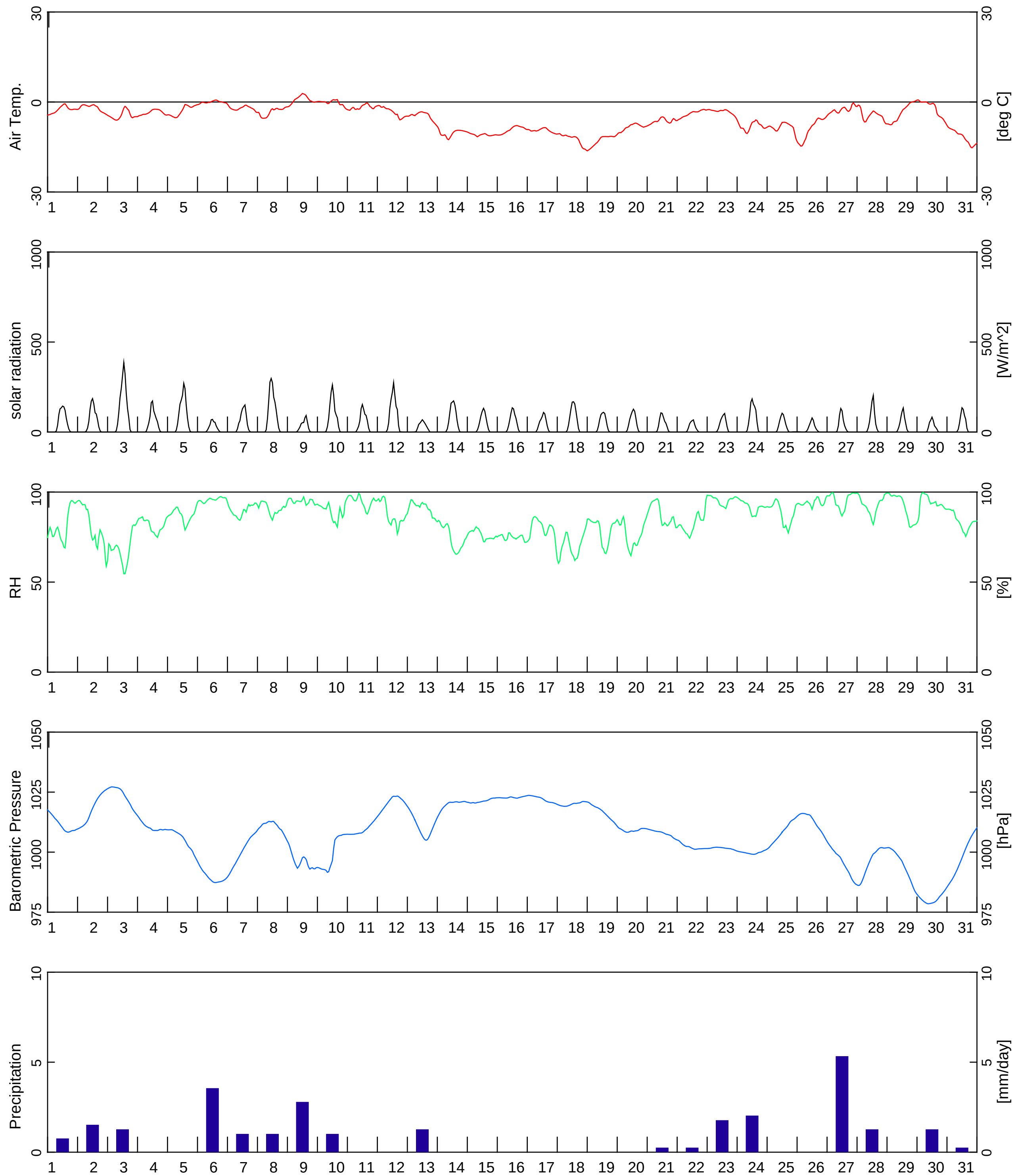
FIG.
C-17

Thu Apr 27 13:30:29 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Wind_roses

APPENDIX D

SUMMARY OF MONTHLY WEATHER PARAMETERS

OCTOBER 2004 TO FEBRUARY 2006



HAY & COMPANY CONSULTANTS

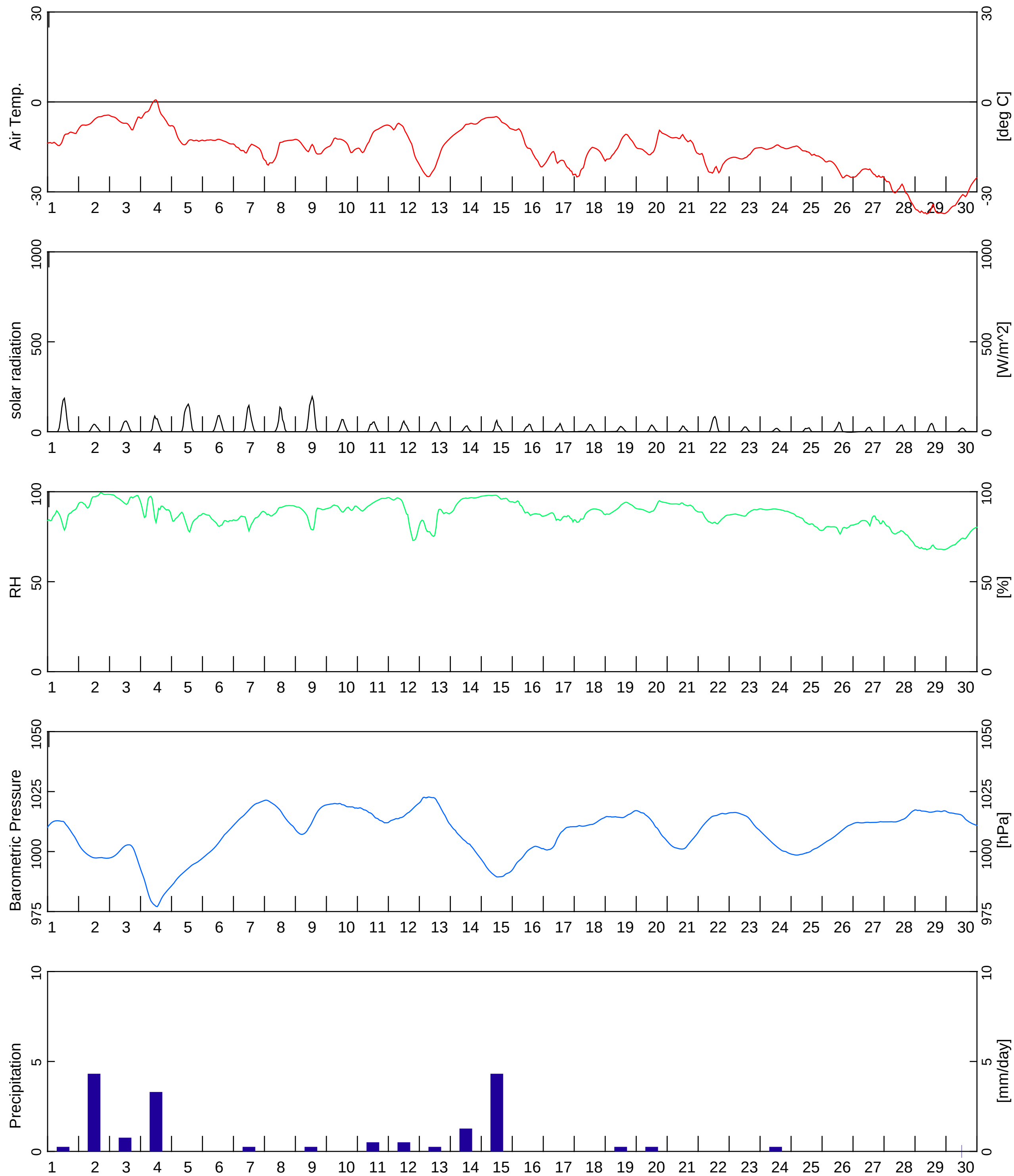
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
OCTOBER 2004

FIG.
D-01

Thu Apr 20 11:34:33 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO
HAY & COMPANY CONSULTANTS

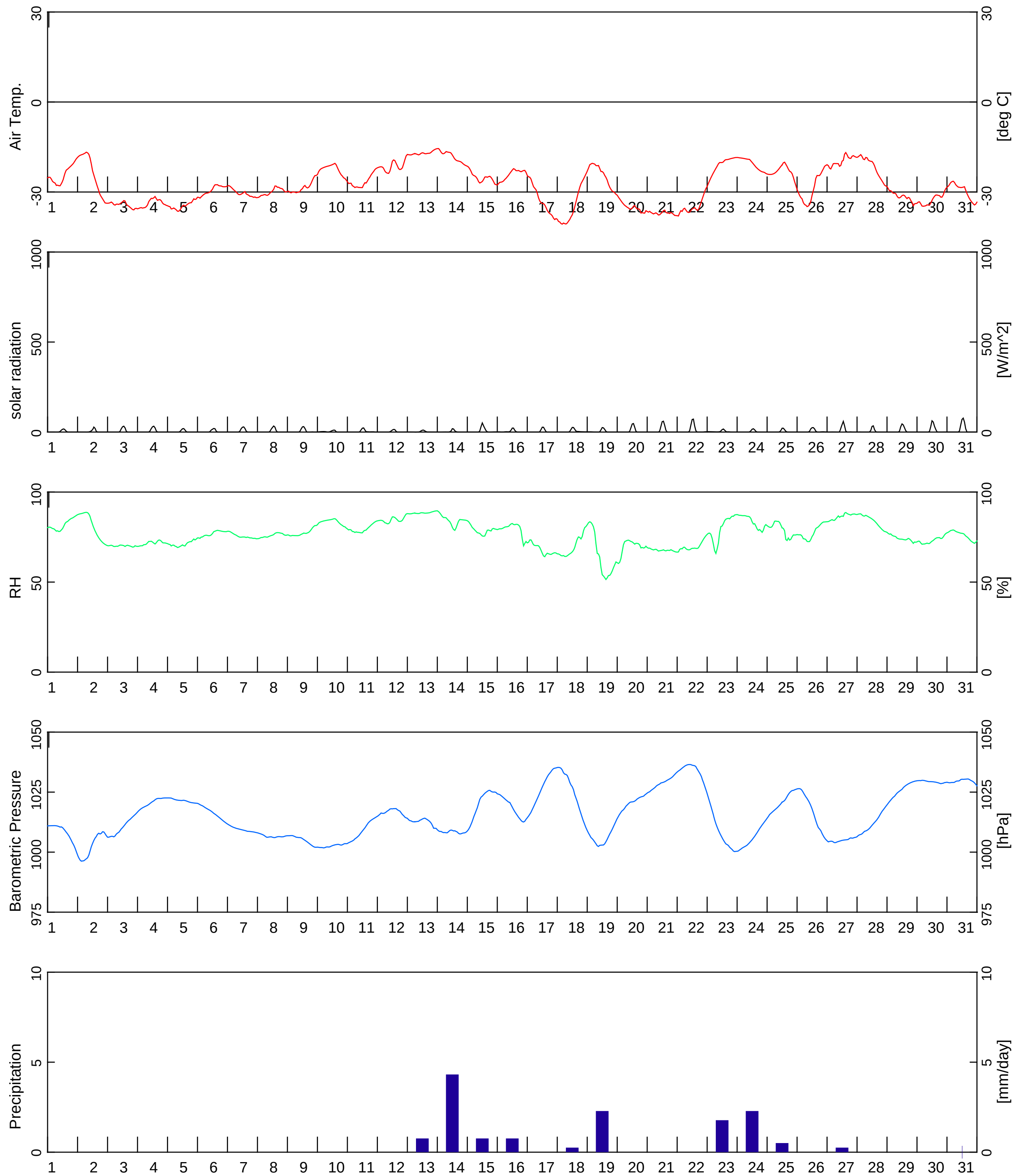
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
NOVEMBER 2004

FIG.
D-02

Thu Apr 20 11:34:34 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

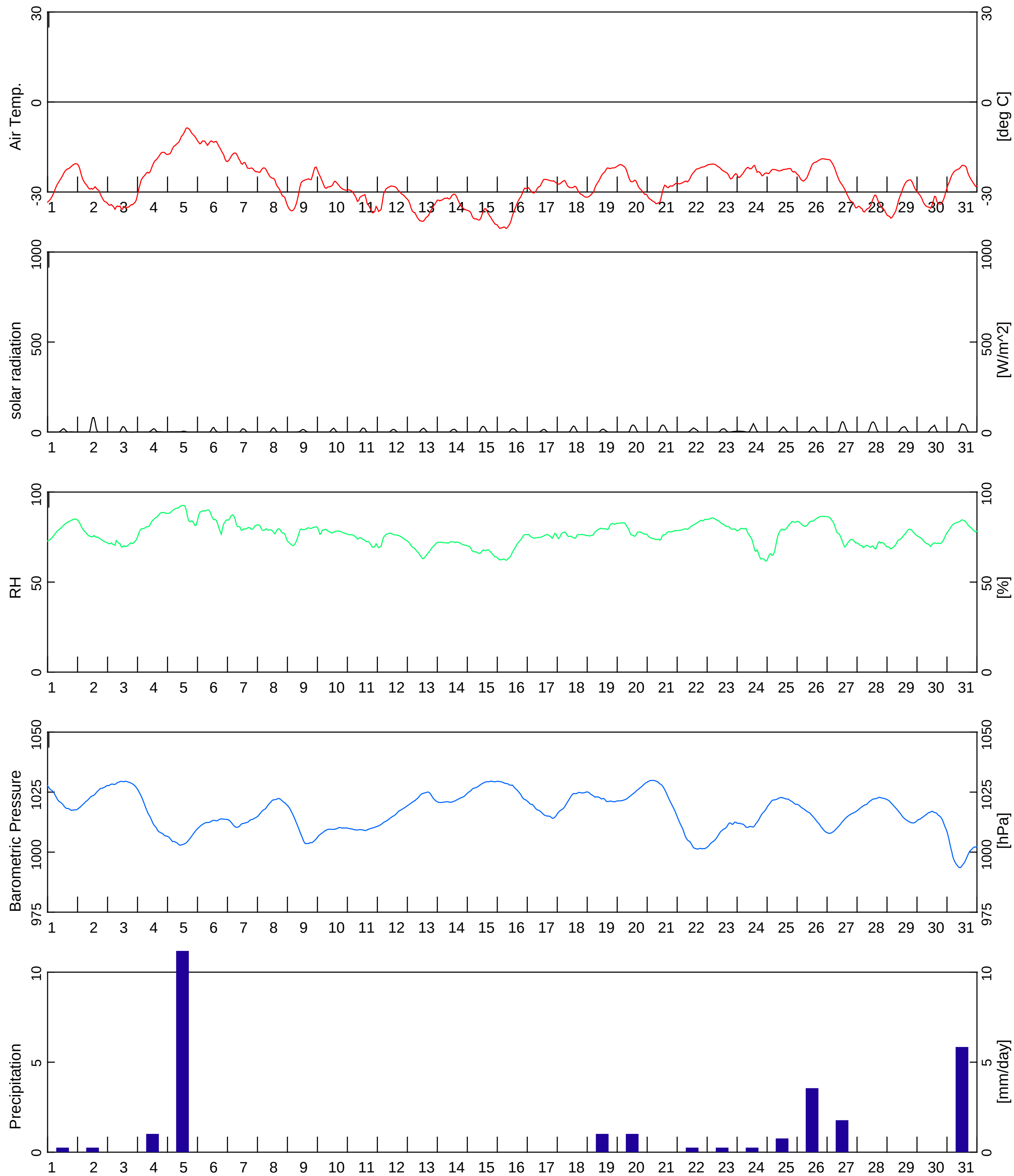
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
DECEMBER 2004

FIG.
D-03

Thu Apr 20 11:34:36 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

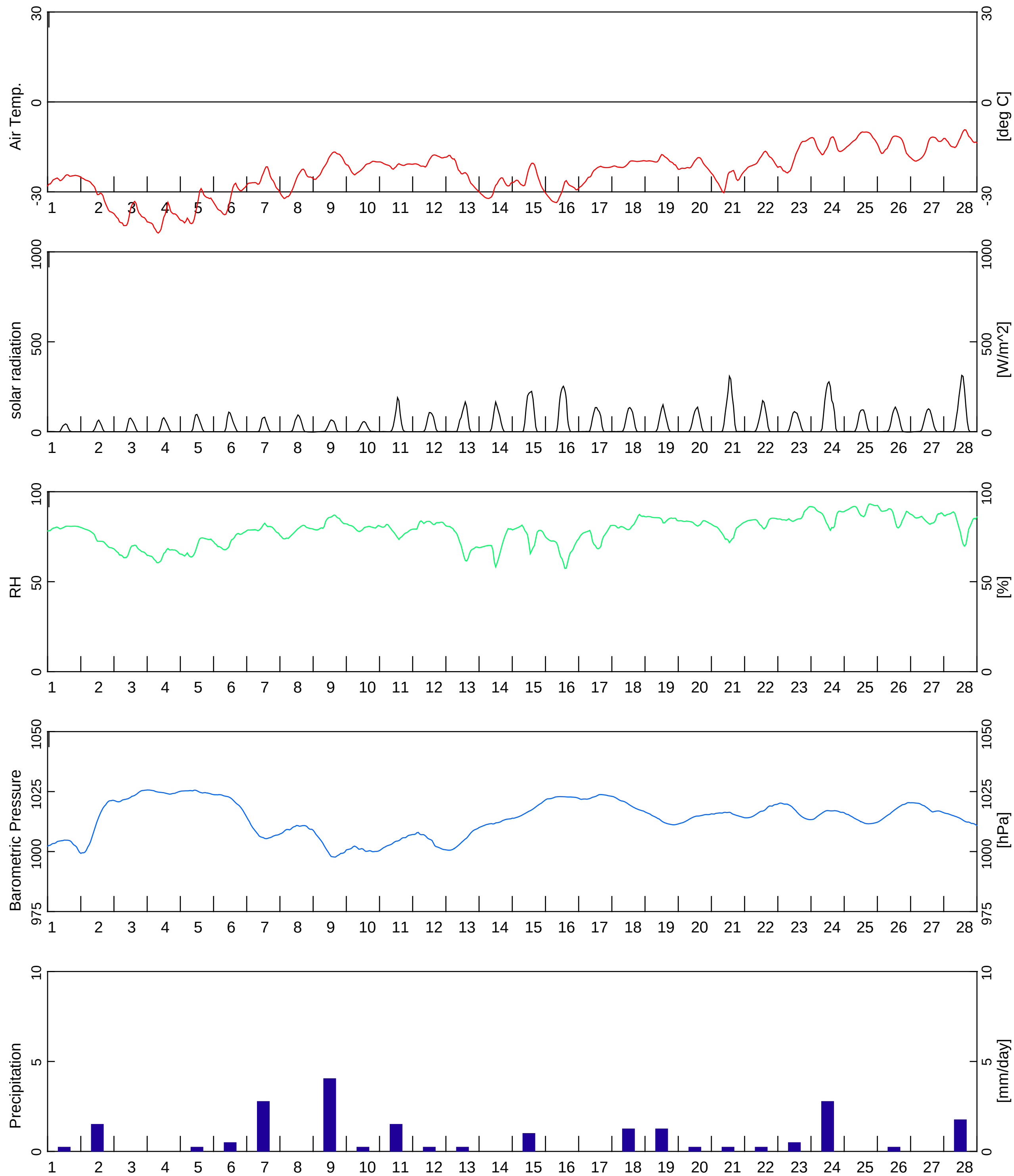
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
JANUARY 2005

FIG.
D-04

Thu Apr 20 11:34:37 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO
HAY & COMPANY CONSULTANTS

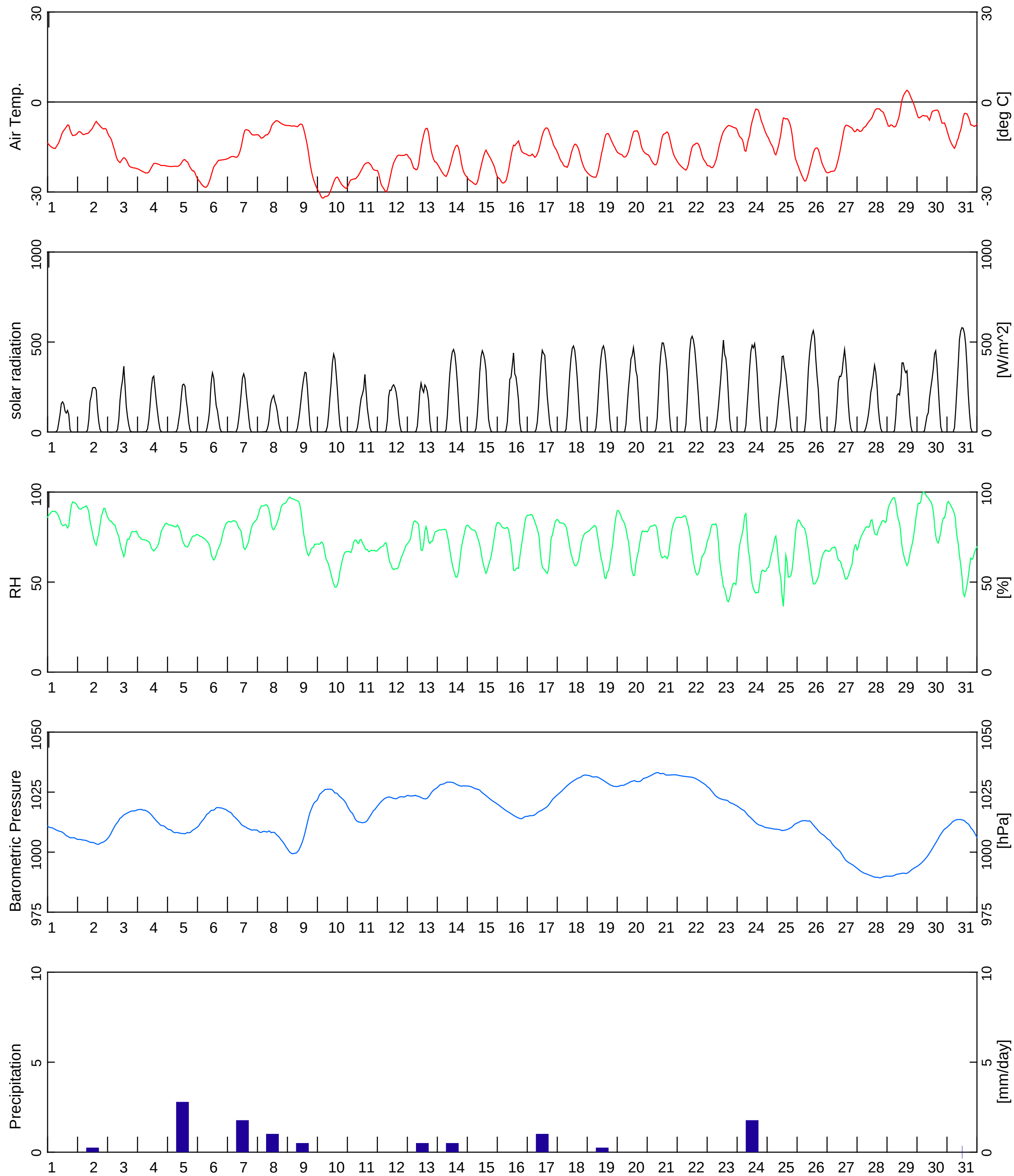
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
FEBRUARY 2005

FIG.
D-05

Thu Apr 20 11:34:38 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO

HAY & COMPANY CONSULTANTS

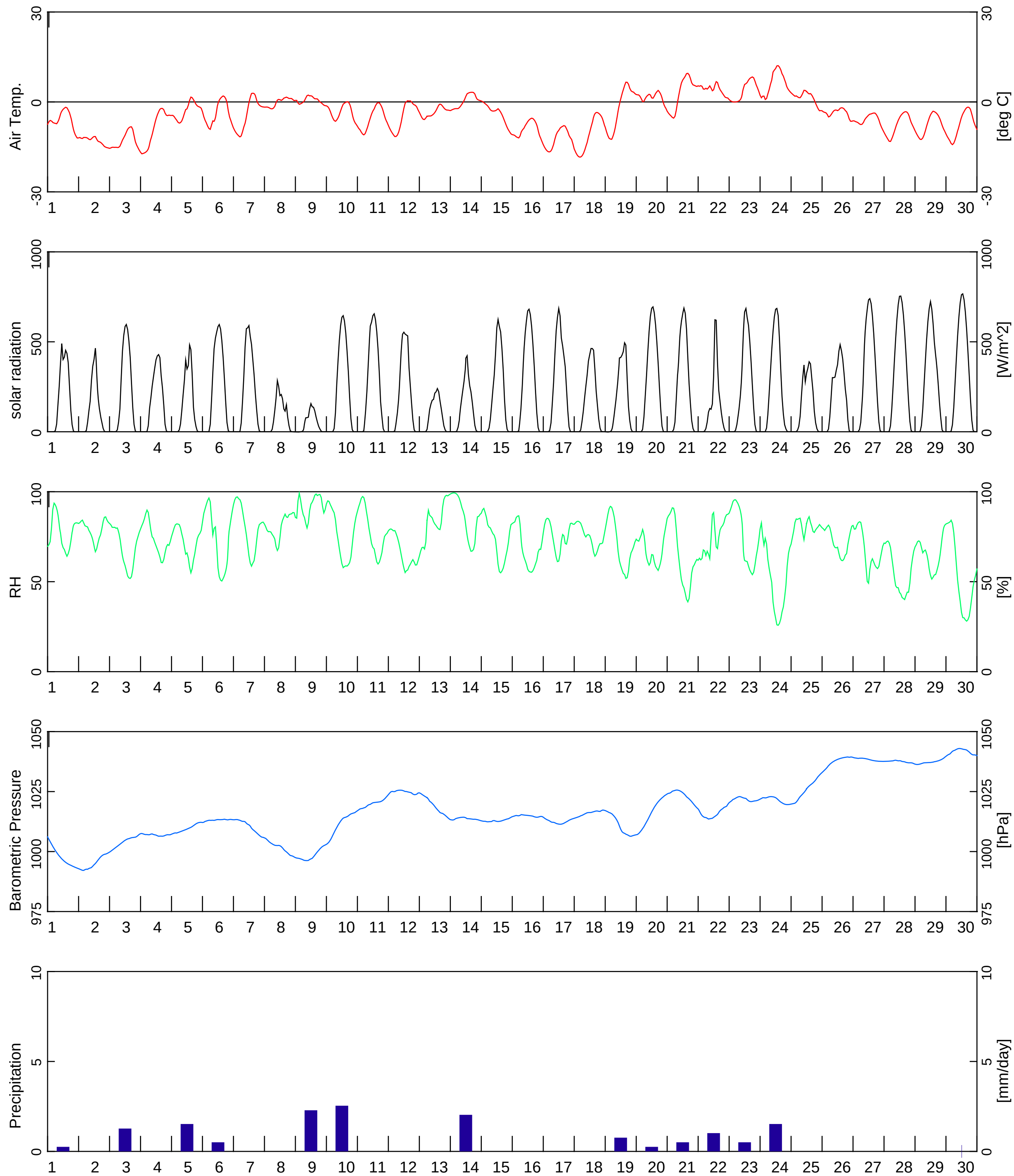
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
MARCH 2005

FIG.
D-06

Thu Apr 20 11:34:39 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



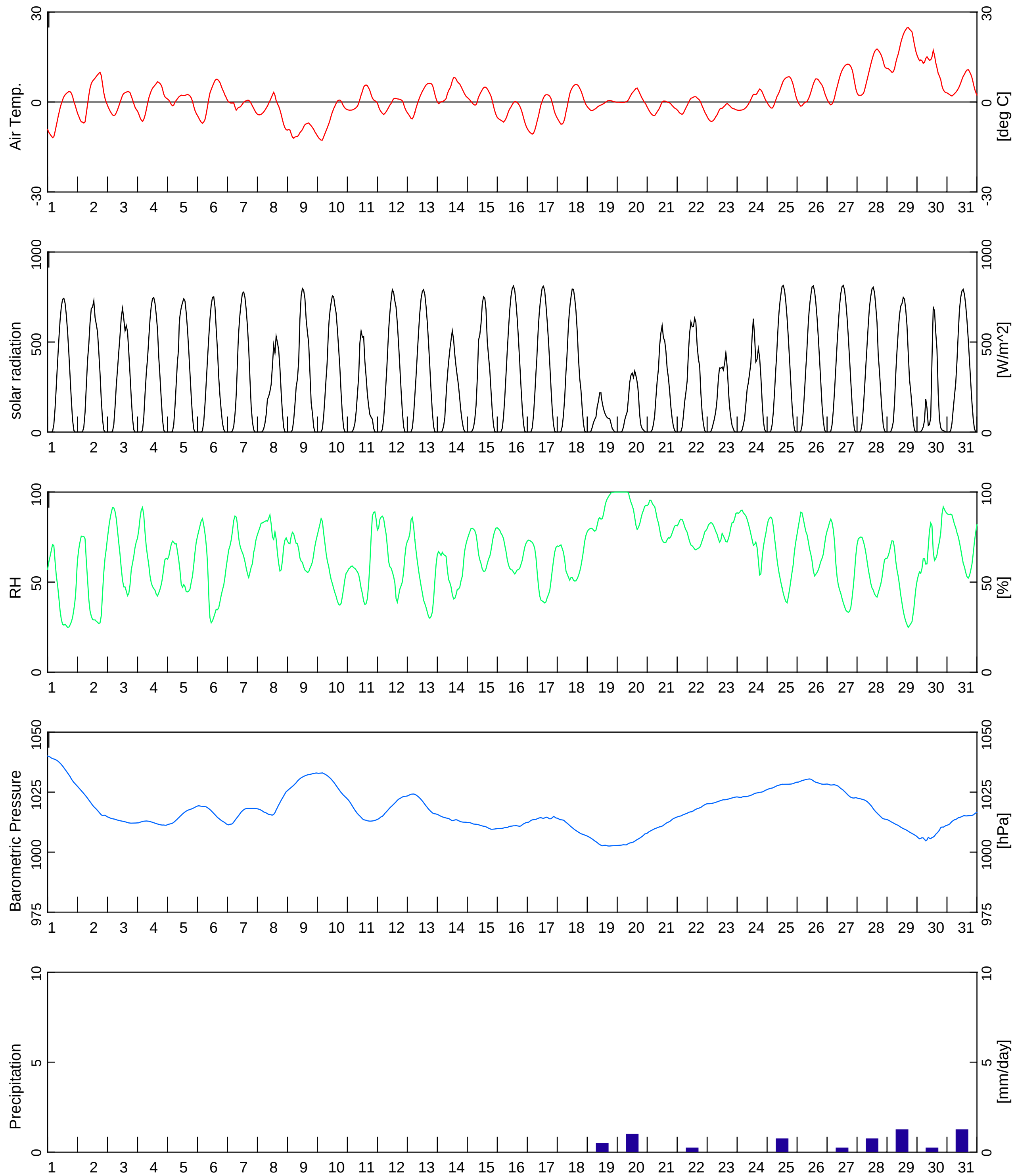
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
APRIL 2005

FIG.
D-07



HAY & COMPANY CONSULTANTS

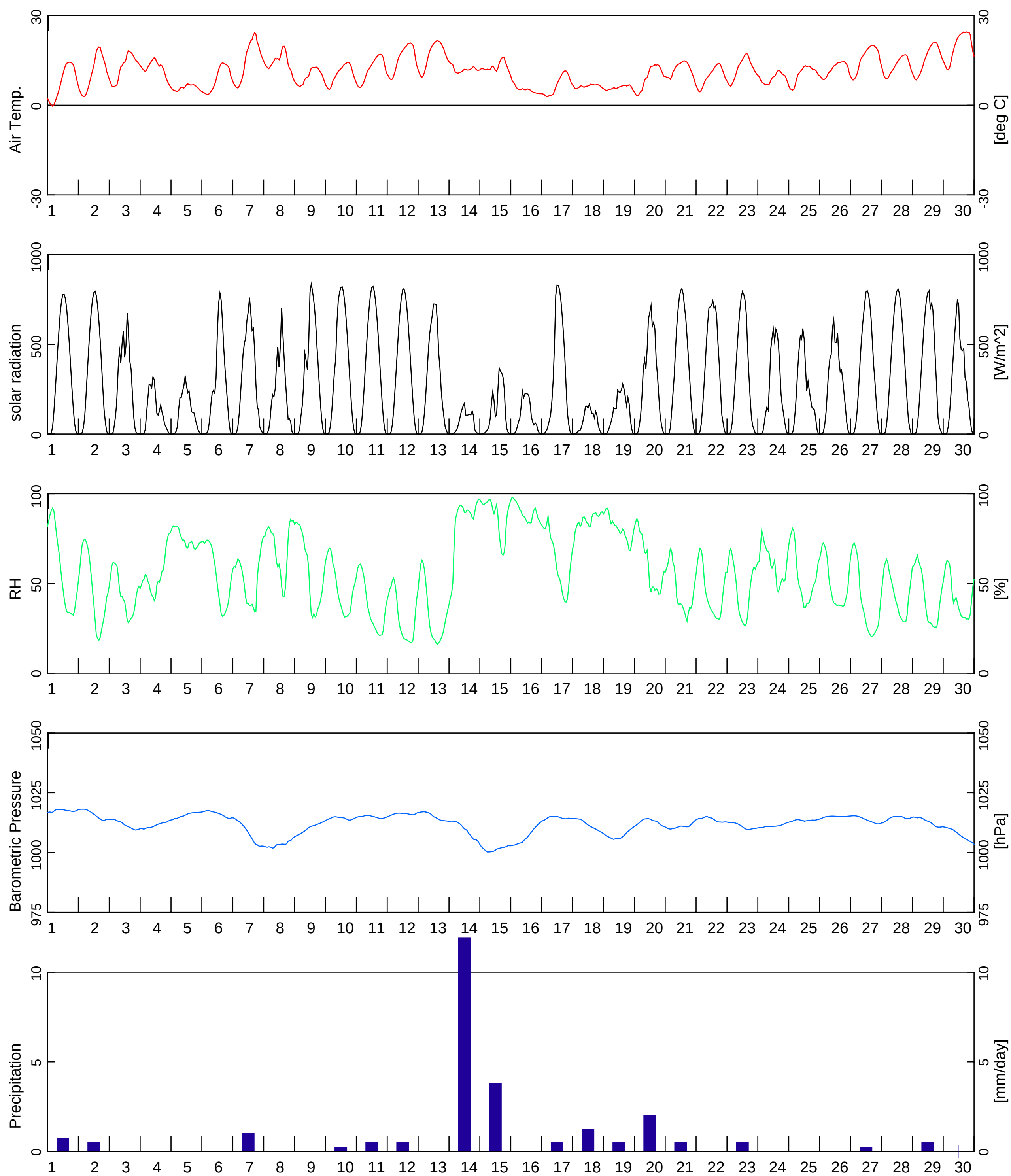
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
MAY 2005

FIG.
D-08

Thu Apr 20 11:34:42 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

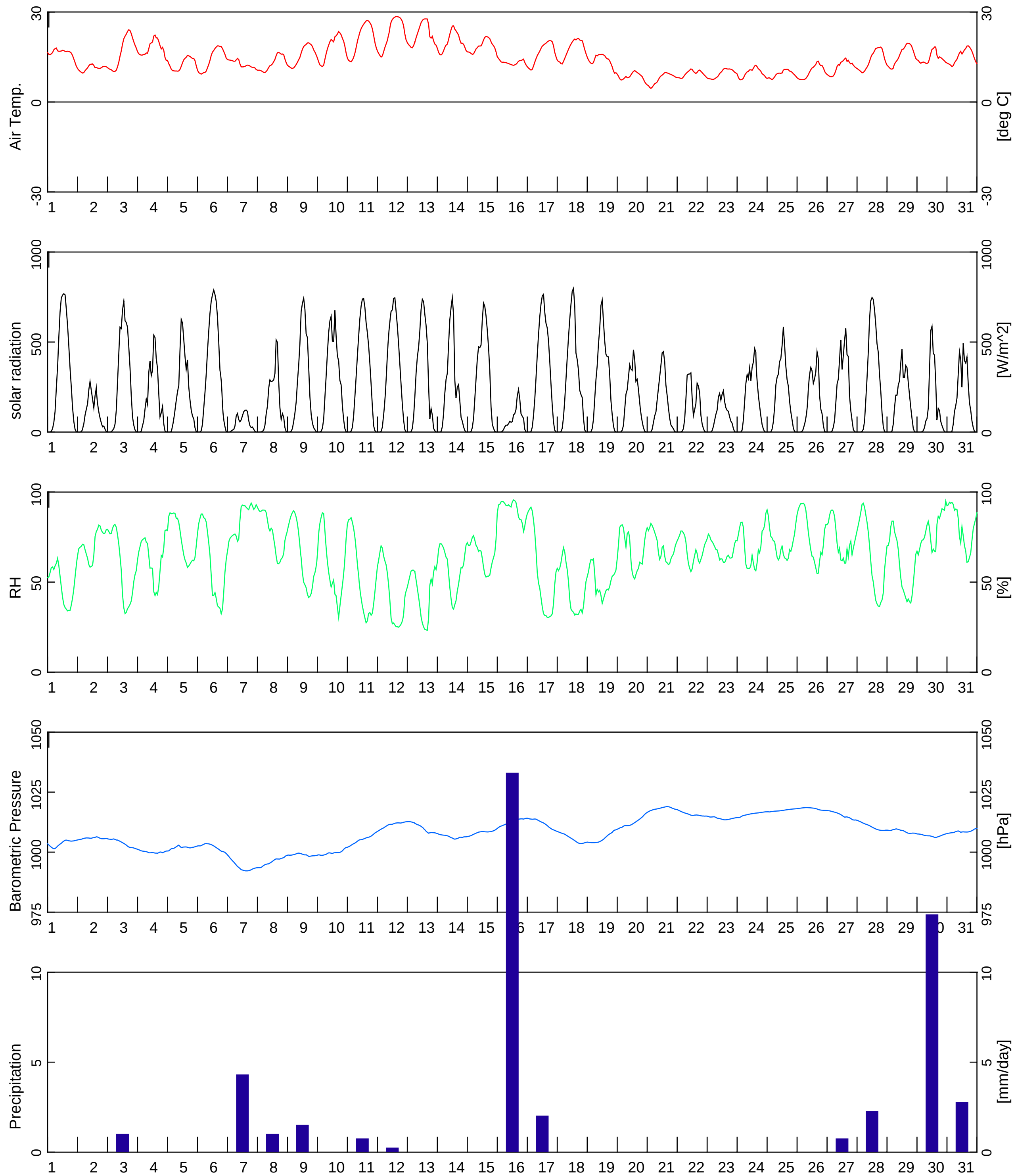
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
JUNE 2005

FIG.
D-09

Thu Apr 20 11:34:43 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



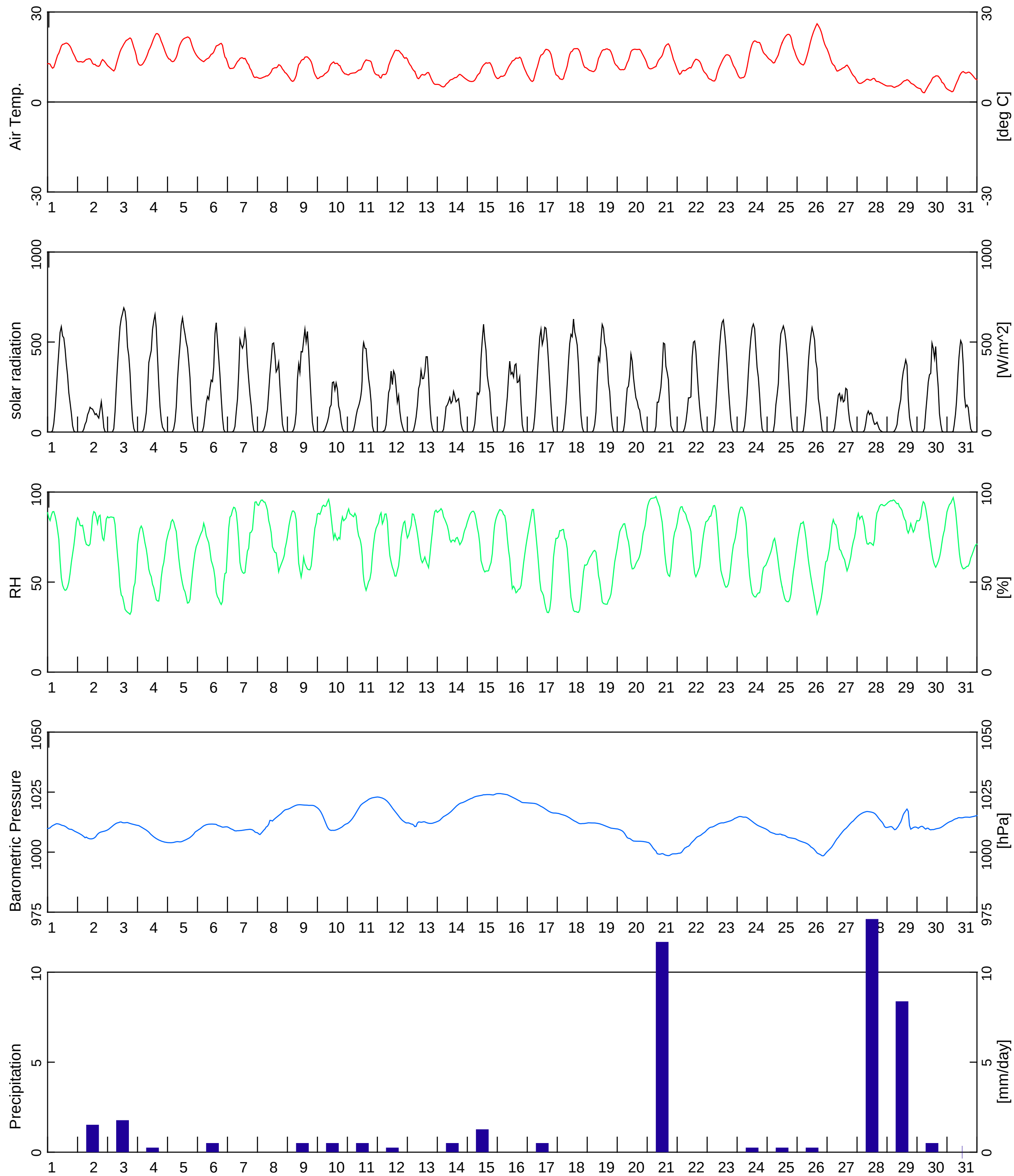
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
JULY 2005

FIG.
D-10



HAYCO

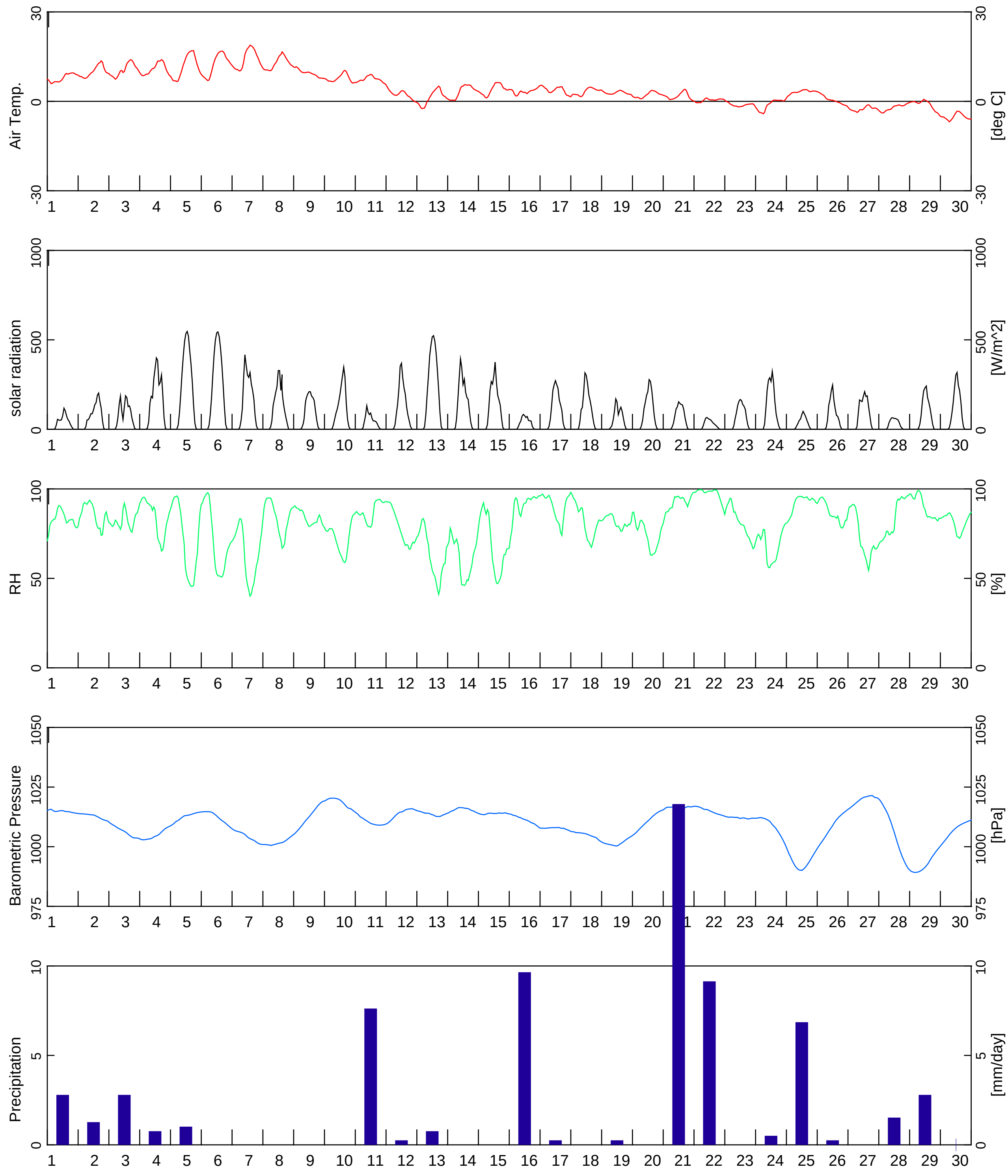
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
AUGUST 2005

FIG.
D-11



HAY & COMPANY CONSULTANTS

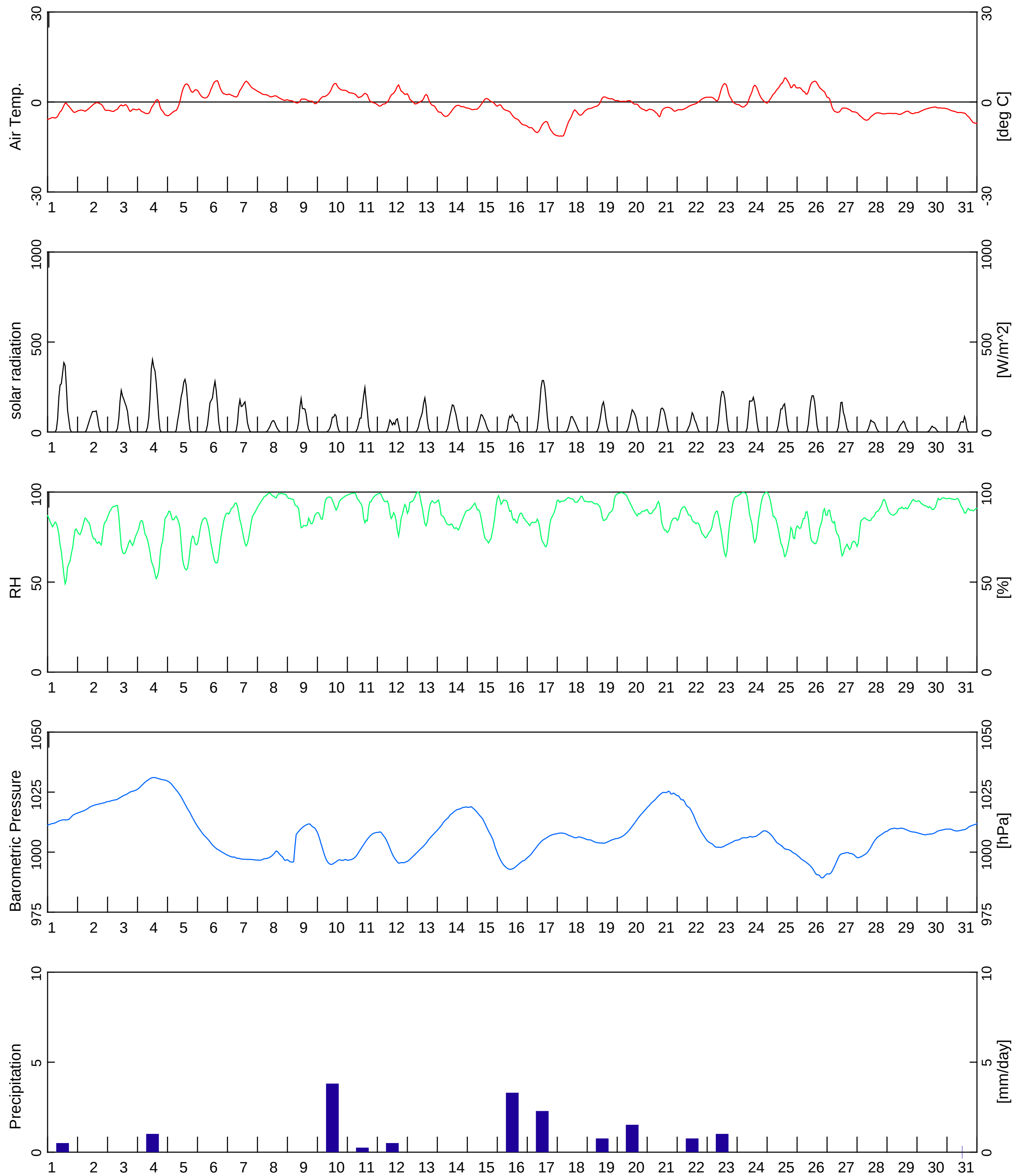
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
SEPTEMBER 2005

FIG.
D-12

Thu Apr 20 11:34:47 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



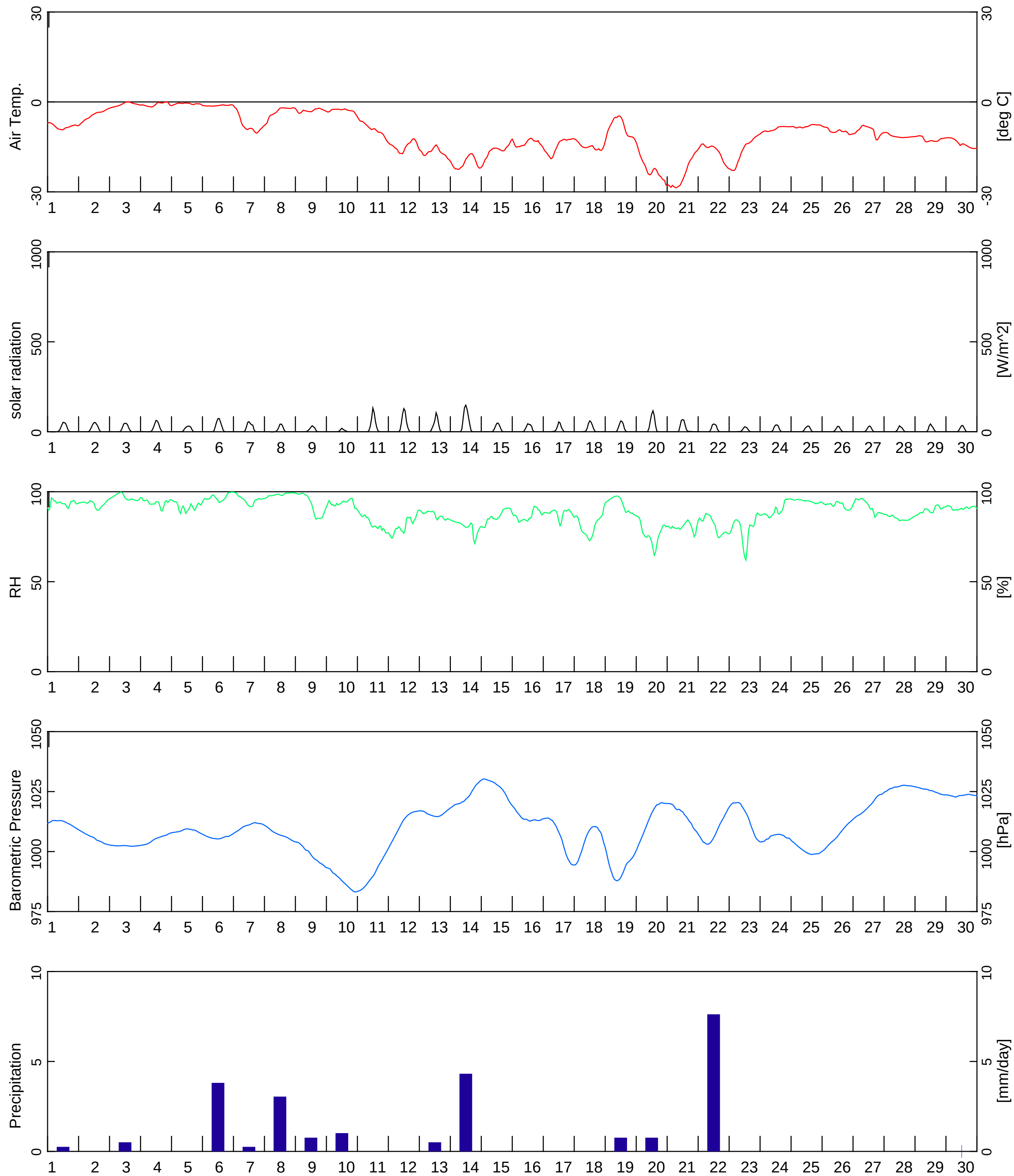
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
OCTOBER 2005

FIG.
D-13



HAY & COMPANY CONSULTANTS

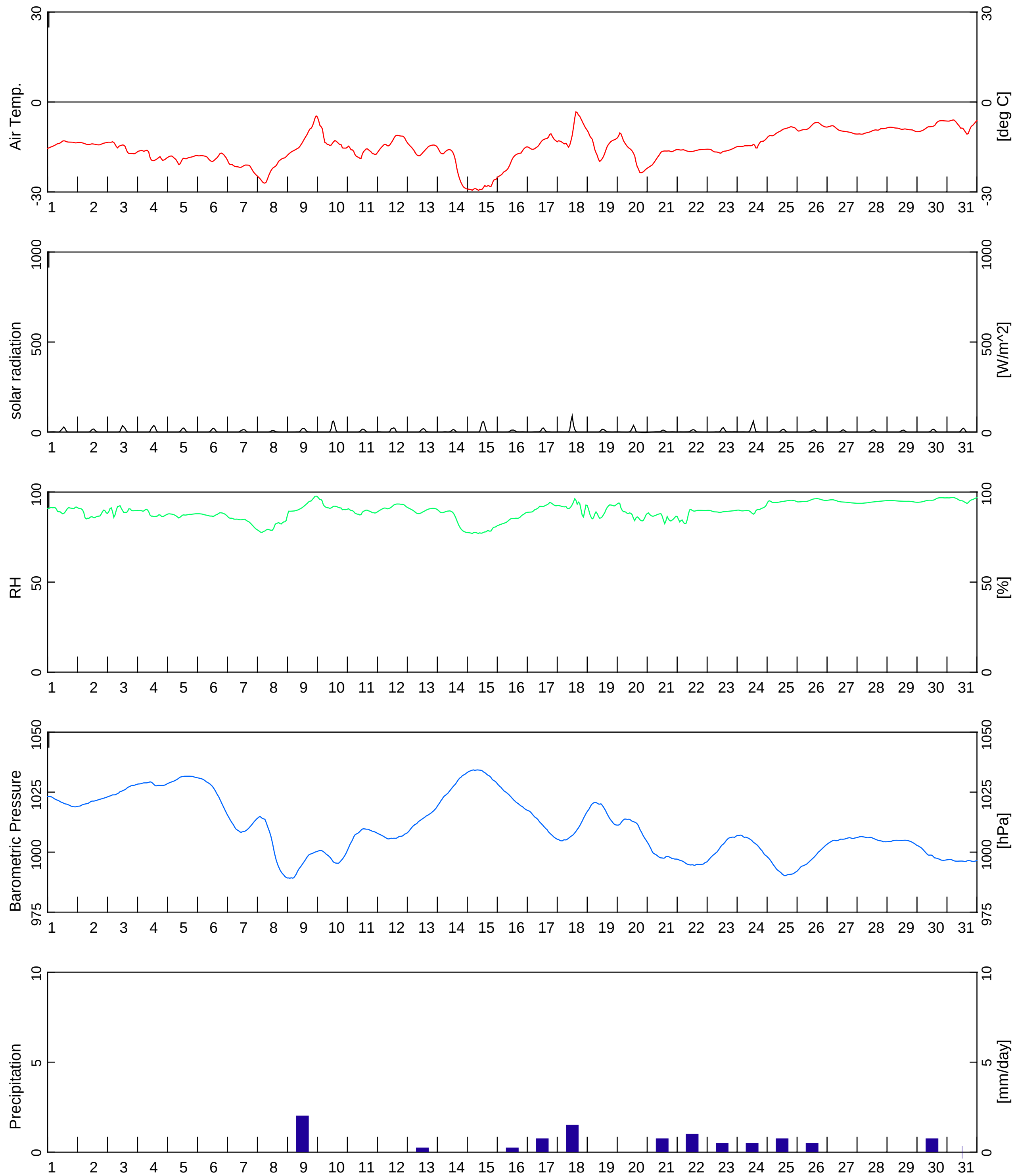
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
NOVEMBER 2005

FIG.
D-14

Thu Apr 20 11:34:49 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

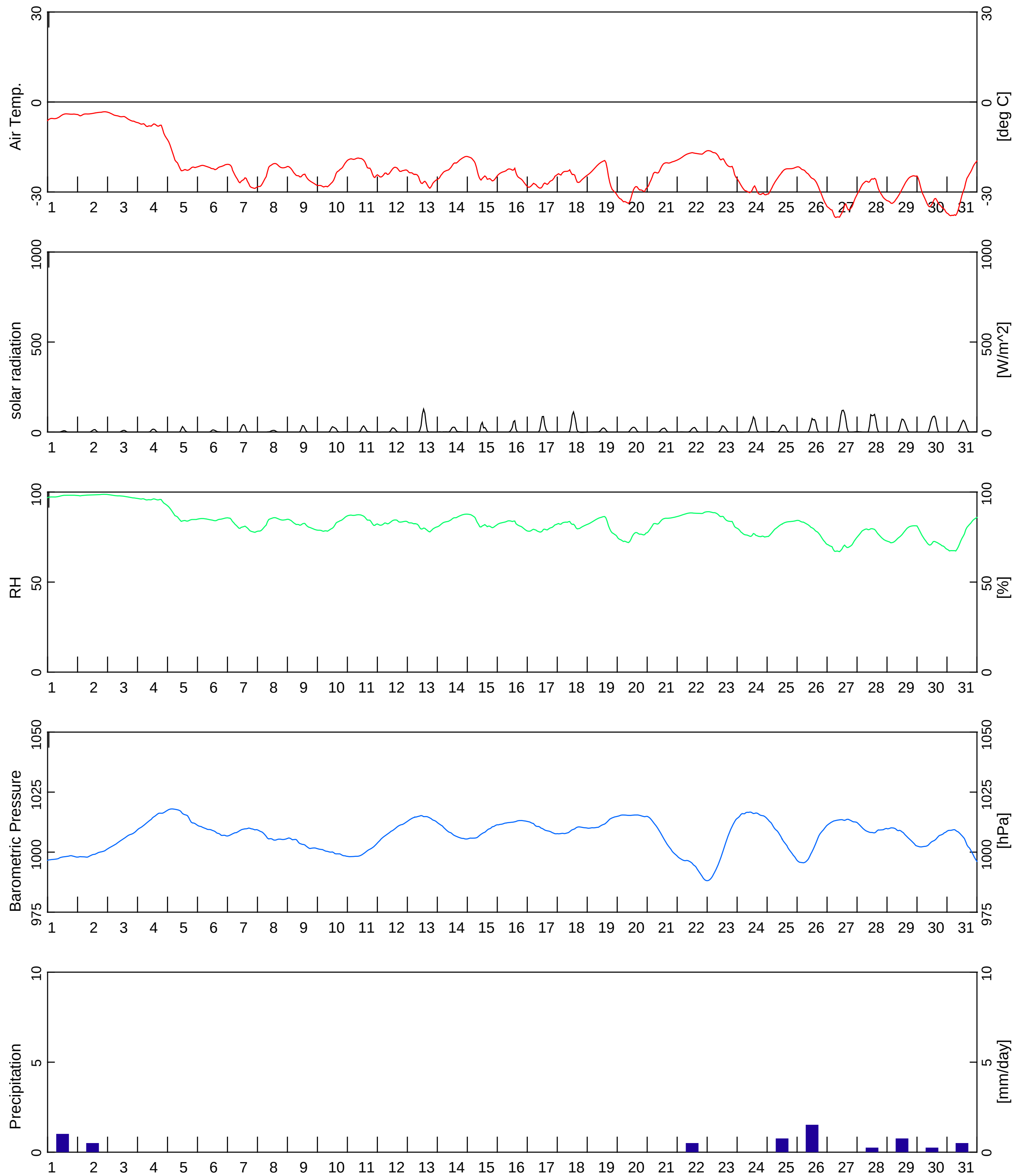
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
DECEMBER 2005

FIG.
D-15

Thu Apr 20 11:34:51 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAYCO

HAY & COMPANY CONSULTANTS

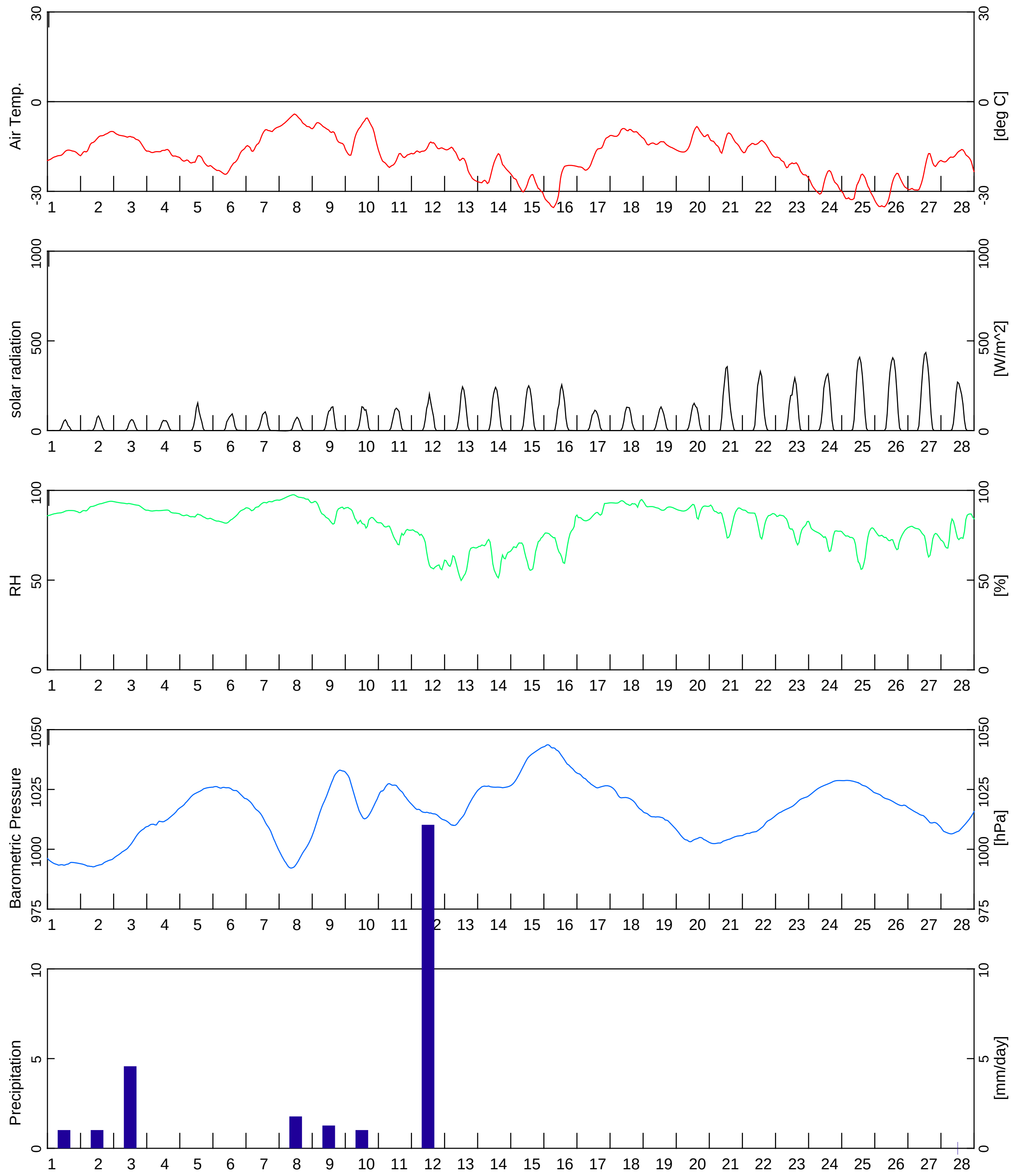
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
JANUARY 2006

FIG.
D-16

Thu Apr 20 11:34:52 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

WEATHER PARAMETERS
FEBRUARY 2006

FIG.
D-17

Thu Apr 20 11:34:53 2006:J:\1740180_Yellowknife_Gold\working\RED\Met Station\Data_reduction

Tyhee NWT Corp.

YELLOWKINFE GOLD PROJECT
2006 HYDROLOGY AND METEOROLOGY REPORT

Y22101001

April 2007

H A Y & C O M P A N Y C O N S U L T A N T S – A Division of EBA Engineering Consultants Ltd.
p. 604.875.6391 • f. 604.875.8363
#900 - 1066 West Hastings Street • Vancouver, British Columbia V6E 3X2 • CANADA

EXECUTIVE SUMMARY

Foreword

Tyhee NWT Corp. is conducting baseline environmental studies on its Yellowknife Gold Project site as part of the development of a gold mine in the area. In 2004, Hay and Company Consultants, a division of EBA Engineering Consultants Ltd. began the hydrology and meteorology baseline studies for the Yellowknife Gold Project.

This report is a summary of the meteorological and hydrological data collected on site during 2006 and is a continuation of the report submitted to Tyhee NWT Corp. in April of 2006 by Hay and Company Consultants entitled "Yellowknife Gold Project Hydrology and Meteorology Report".

Only a single field survey was conducted during 2006. This was required for servicing of the Parshall flumes initially installed on the outlets of Narrow, Winter and Round Lakes during the summer of 2005.

The 2006 hydrology data indicate that the maximum measured Narrow Lake Outlet discharge occurred on June 9, 2006 and was 108.2 L/s with a base summer flow of approximately 25 L/s. The minimum measured discharge was 18 L/s on August 19, 2006. The average daily total discharge for the period of record in 2006 was 1,842 m^3/day. These flows consist of Narrow Lake drainage and Winter Lake Outlet flows. Analysis of just the Narrow Lake basin flows yield a basin runoff of 49.5 mm.

The maximum recorded Winter Lake Outlet discharge, which occurred on June 9, 2006, was 56 L/s with a base summer flow of approximately 10 L/s. The minimum recorded discharge was 3.6 L/s on August 18, 2006. The average daily measured total discharge for the summer of 2006 was 1,026 m^3/day. These flows consist of Winter Lake drainage and Round Lake Outlet flows. The Winter Lake basin had a runoff of 24.4 mm for the period of record.

The maximum recorded Round Lake Outlet discharge occurred on June 9, 2006 and was 17.9 L/s with a base summer flow of approximately 3 L/s. The minimum measured discharge was less than 1.0 L/s and occurred during mid August 2006. The average daily total discharge for the summer of 2006 was 347 m^3/day. These flows consist of only Round Lake basin drainage. Analysis of the Round Lake basin flows yields a runoff of 29.6 mm.

The objective of the meteorological component of the study was to continuously record weather conditions at the Tyhee property site. The meteorological station installed on September 28, 2004 continuously recorded meteorological parameters for 2006. These parameters are wind speed and direction, air temperature, relative humidity, solar incident radiation and precipitation. Typical winds are in the range of 7 to 8 m/s, however; wind speeds greater than 17.5 m/s were recorded. Air temperatures at camp are typically 10 to 25°C during the summer with a maximum recorded temperature of 30°C on June 14, 2006. Typical winter temperatures range from -5 to -30°C and the lowest recorded temperature for 2006 was -38.8°C which occurred on January 27, 2006. Relative humidity is typically near 90%, but frequently it can drop to as low as 30% for periods of up to a day. Peak solar incident radiation during the summer is in the vicinity of 900 W/m^2. However, during the winter period (December to January) the radiation is near 50 W/m^2. The total precipitation recorded for 2006 was 286.7 mm.

Evaporation rates determined at meteorological station by means of an evaporation pan are 4.4 mm/day with a total of 445 mm over the period of record from June 9 to September 21, 2006. The estimated lake evaporation rates determined using a factor of 0.7 (Chow V. T. (1964) Handbook of Applied Hydrology, McGraw-Hill Book Co., New York, USA) are 3.1 mm/day with a total evaporation of 311.5 mm for the period of record.

TABLE OF CONTENTS

PAGE

TABLE OF CONTENTS

PAGE

TABLE OF CONTENTS

TABLES

FIGURES

TABLE OF CONTENTS

APPENDICES

1.0 INTRODUCTION

Tyhee NWT Corp. has conducted baseline environmental studies on its Yellowknife Gold Project site as part of the development of a gold mine in the area. In 2004, Hay and Company Consultants, a division of EBA Engineering Consultants Ltd., began the hydrology and meteorology baseline studies for the Yellowknife Gold Project. This report is a summary of the meteorological and hydrological data collected at the site during 2006 and is a supplement to earlier reports, submitted to Tyhee NWT Corp. in April of 2006 by Hay and Company Consultants entitled "Yellowknife Gold Project Hydrology and Meteorology Report".

Only a single field survey was conducted during 2006 to service the Parshall flumes that had previously been installed in the summer of 2005 on the outlets from Narrow, Winter and Round Lakes. These flumes are factory calibrated discharge measurement devices that do not require field calibrations. This means there is no need for repeated site visits to develop a stage-discharge relationship for each creek outlet. The tasks for the field survey conducted from June 8 to June 11, 2006 were:

1. Inspect the three hydrometric station flumes and repair any damage which may have occurred over the winter to either the flume or the bulkhead.
2. Velocity data were collected in the each of the three flumes and the flume discharge determined by the area velocity technique. This discharge was compared to the flume measured discharge to ensure the flumes were still calibrated correctly for each hydrometric site.
3. Photograph and document each of the three hydrometric sites for 2006.
4. Inspection and downloading of the meteorological station installed on the project site.
5. Replacement of the flange and vertical shaft bearings on the meteorological station anemometer to ensure accurate measurements of wind speed and direction.
6. Installation of the evaporation pan for the collection of pan evaporation rates during the summer.
7. Training of Tyhee staff with respect to downloading the meteorological station and accurate collection of evaporation data.

A few of the previously reported hydrometric sites were dropped from the 2006 hydrological program at the request of Tyhee NWT Corp. Figure 1.0 is a site location map showing a portion of a 1:50,000 scale topographic map of the area on which the sites are indicated. Both active and inactive sites are shown. Table 1.0 lists the GPS positions for each hydrometeorological site. The three hydrometric sites and the meteorological station site that continued to be monitored during 2006 are listed below along with the purpose of each station.

- Site #1 – Narrow Lake Outlet, collect creek discharge and stage data.
- Site #3 – Winter Lake Outlet, collect creek discharge and stage data.
- Site #4 – Round Lake Outlet, collect creek discharge and stage data.
- Site #7 – Meteorological station, record various weather parameters.

Further detailed information on these four sites has been provided in the site description documents included in Appendix A. Section 2 of this report presents the hydrological component of the study program, Section 3 discusses the meteorological component and Section 4 is recommendations.

2.0 HYDROLOGY

2.1 METHOD

To gain an understanding of the hydrological conditions in the Yellowknife Gold Project study area hydrometric stations were installed at the three sites identified above. The Parshall flumes which were installed at each of the sites during the summer of 2005, were re-activated for the 2006 study. A Parshall flume is installed in a creek such that all flow passes through it. The flume has a unique design that enables the determination of creek discharge by measuring the depth of water in the upstream part of the flume and applying the factory calibration relationship. The creek stage upstream of the flume is recorded by a data logger every 15 minutes and the data used in the flume calibration relationship to determine creek discharge.

Note that not all the Outlet flows were monitored by the hydrometric station. Discharges that occurred after spring thaw but before the hydrometric station instruments were installed as well as discharges that occurred after the instrumentation was removed prior to the winter freeze have not been considered. Therefore the actual flow through the station will be greater than the estimated discharges stated in this report. Also the combined basin average runoff and mean daily discharge will be greater.

2.2 OUTLET OF NARROW LAKE (SITE #1)

The outlet of Narrow Lake is located at the southwest end of the lake and consists of two creeks that enter a small pond about 100 m southwest of the lake, near the existing winter road. A single creek flows out of this pond. The hydrometric station is located on this single creek, in a well-defined channel, about 10 m downstream of the pond. Downstream of the station, there is no well-defined channel and the flow meanders generally southwest through muskeg and stunted growth of birch and conifers. Discharge from the Narrow Lake basin flows southwest to Morris Lake (el. 278 m), and eventually to the Yellowknife River.

Figure 2.0 is an aerial view of the Narrow Lake Outlet, showing the southwest portion of Narrow Lake, the small pond, the winter road and the location of the Site #1 hydrometric station. Figure 2.1 shows the 12 inch Parshall flume installed in the Narrow Lake Outlet creek.

2.2.1 Station History

The Narrow Lake Outlet flow monitoring station was established shortly after the spring thaw in 2004. During the summer of 2004 a staff gauge was installed at the site and spot measurements of flow and stage were manually recorded.

On May 22, 2005 an automated stage and temperature recorder was installed at this station. A survey monument was also installed at this site, to provide a known reference point, for elevation surveys of the site instrumentation. This station was removed from service on July 15, 2005 to accommodate site improvements.

On July 17, 2005 the hydrometric station was upgraded by installing a Parshall flume.

On June 9, 2006 the Parshall flume and bulkhead was inspected for damage or leakage. No problems were observed and the pressure transducer and data logger were reinstalled to collect discharge data over the summer of 2006.

On September 19, 2006 the instrumentation was removed for the season.

2.2.2 Stage Measurements

The 2006 freshet began in late May, prior to installation of the automatic stage recorder on June 9, 2006. Narrow Lake Outlet Parshall flume data were recorded every 15 minutes over the summer until the logger was removed on September 19, 2006 prior to the outlet freezing up for the winter.

The pressure transducer/logger combination enabled the determination of creek stages at the location of the hydrometric site. A fixed value, representing the vertical distance from the upstream floor of the flume to the creek bed, was added to the depth of water in the flume recorded by the data logger to determine creek stages. The time history of Narrow Lake Outlet stages is presented in Figure 2.2.

2.2.3 Flume Calibration Discharge Measurements

During the three day site survey during 2006 two Narrow Lake Outlet flows were determined using a velocity meter and calculating the discharge by velocity area techniques. These discrete discharge determinations were use to ensure the flume was still installed correctly, had no flow leaks and the calibration algorithm for the determination of flow was still accurate. A summary these flume calibration results obtained since the Parshall flume was originally installed on July 17, 2005 is presented in Table 2.0. For 2006 the discharge determined by the Parshall flume was within ±6.3% of the discharge determined by velocity area calculations indicating correct flume operation.

2.2.4 Narrow Lake Parshall Flume Calibration Curve

The selected Parshall flume had a throat width of 30.48 cm (12 inches) and a flow measurement range of between 3.0 L/s and 455 L/s. Figure 2.3 represents the calibration curve for this flume.

The Narrow Lake Parshall flume calibration formula, used to calculate discharge from the flume head:

$$Q = 690.917 \times H^{1.522}$$

Where Q = outlet discharge (L/s)

H = recorded water depth (flume head) (m)

2.2.5 Time History of Discharge

The 2006 time history of discharge, for Narrow Lake Outlet is shown in Figure 2.4 as a solid blue line. The yellow triangles with the black border represent manually collected discharge data used to check the flume discharge calibration. The fact that the two triangles straddle the blue line indicates that the flume is correctly calibrated.

The maximum recorded flow for 2006, of 108.2 L/s, occurred on June 9, 2006, shortly after spring thaw. However judging from the downwards trend in the discharge data in early June it is likely that earlier Narrow Lake Outlet discharges were somewhat higher than this. The minimum measured flow of 15 L/s occurred on August 18, 2006.

The creek does not flow during the winter months from approximately November to mid May.

Based on the time history of the Narrow Lake Outlet creek discharges for the data collected in 2006, the following observations were made:

1. The creek was flowing prior to the June 9, 2006 installation of the hydrometric station instrumentation.
2. The peak discharges were likely not recorded in 2006 as the hydrometric station was installed during the second week of June and possibly missed the highest flow period.
3. From June 9 to June 30 the flow gradually reduced from 100 L/s to about 40 L/s.
4. On June 30 the creek flow increased from 40 L/s to 55 L/s in response to a large precipitation event during which almost 30 mm of rain fell in the first half of the day.
5. From July 1 to the middle of August outlets flows gradually decreased from 55 L/s to 15 L/s.
6. Over the last two weeks in August flow gradually increased from 15 L/s to 22 L/s, primarily due to three precipitation events which occurred on August 14, 18 and 23. During these three days the precipitation was greater than 15 mm/day. (See Appendix Figure D8.)

7. From September 1 to the end of the record on September 19, 2006 flows remained approximately 22 L/s, but on a slight downward trend as there was only 5.3 mm of precipitation during this period.

2.2.6 Narrow Lake Basin Characteristics

Narrow Lake basin is approximately 3.9 km by 1.5 km and has a catchment area of 3.8 km^2. The elevation of Narrow Lake is approximately 282 m above mean sea level (asl) and the maximum elevation in the basin is approximately 350 m asl. Inflows to Narrow Lake consist of the Narrow Lake basin runoff as well as the outflows from Winter Lake.

The data collected from the Narrow Lake hydrometric station enables the total volume of water that has passed the gauging station over the recording period to be calculated. For the 102.2 day period of discharge monitoring a total of 328,610 m^3 passed through the hydrometric station. However this flow consists of inputs from not only the Narrow Lake drainage basin (3.8 km^2) but from Winter (4.3 km^2) and Round Lake (1.2 km^2) drainage basins as well. The Narrow Lake drainage basin alone contributed 188,233 m^3 to the total yearly discharge passing the hydrometric station.

The calculated average runoff for the Narrow Lake basin is estimated at 49.5 mm and the Narrow Lake basin contribution to the total daily volume of water passing Site #1 hydrometric station is estimated at 1,842 m^3/day. A summary of the drainage basin observations for 2006 is contained in Tables 2.3a and 2.3b.

2.3 WINTER LAKE OUTLET (SITE #3)

Winter Lake Outlet flows from the northwest portion of Winter Lake at a location about 10 m to the south of the existing winter road between Winter and Narrow Lakes. The creek channel is typically 30 to 60 cm wide by 15 to 20 cm deep at the hydrometric station. Figure 2.5 provides an aerial view of Winter Lake Outlet showing the creek channel, the location of the hydrometric station and the winter road. The creek meanders southwest through a vegetated creek bed until about midway between Winter and Narrow Lakes, where it aligns with the existing winter road and flows to Narrow Lake along a poorly-defined diffuse route. Figure 2.6 is a photograph of the 9 inch Parshall flume installed at this hydrometric site.

2.3.1 Station History

A site was selected for the Winter Lake hydrometric station on May 20, 2005 during the first hydrometric site visit of that year. Only manually determined discharges were recorded during the 2005 field survey. A Parshall flume was sized and ordered as well as the necessary hydrometric station instrumentation.

The Parshall flume was installed and instrumented on July 14, 2005. A continuous record of outlet stages and discharges was obtained until the removal of the instrumentation on September 12, 2005, to prevent damage due to freezing.

On June 9, 2006 the Winter Lake hydrometric station Parshall flume and bulkhead were inspected for damage. No repairs were necessary to this station. The station was then re-instrumented for the collection of stage and discharge data for the summer/fall of 2006. Instrumentation was removed on September 19, 2006 for the winter.

2.3.2 Stage Measurements

Creek stages just upstream of the 9 inch Parshall flume were recorded every 15 minutes by a pressure transducer and saved in the data logger over the summer until the removal of the instrumentation on September 19, 2006. The stages presented in Figure 2.7 approximate the maximum creek depth directly upstream of the Parshall flume, which, over the period of record, fluctuated near 0.3 m depth.

2.3.3 Flume Calibration Discharge Measurements

During the 2006 site survey two Winter Lake Outlet flows were obtained using a velocity meter and calculating the discharge by velocity area techniques. These discrete discharge determinations were use to ensure the flume was still calibrated. A summary these flume calibration results obtained since the Parshall flume was originally installed on July 16, 2005 is presented in Table 2.1. For 2006 the discharge determined by the Parshall flume was within ±1.0% of the discharge determined by velocity area calculations, indicating accurate flume operation.

2.3.4 Winter Lake Parshall Flume Calibration Curve

The selected Parshall flume had a throat width of 22.9 cm (9 inches) and a flow measurement range of between 2.8 and 251.0 L/s. Figure 2.8 represents the calibration curve for this flume.

The Winter Lake Parshall flume calibration formula, used to calculate discharge from the flume head:

$$Q = 535.343 \text{ x } H^{1.53}$$

Where Q = outlet discharge (L/s)

H = recorded water depth (flume head) (m)

2.3.5 Time History of Discharge

The record for the time history of discharge for the Winter Lake Outlet began after the Parshall flume was re-instrumented on June 9, 2006 and corresponding discharges are presented in Figure 2.9. The blue line is the discharge determined by the Parshall flume. The yellow triangles are discharges determined by the velocity-area method, based on data collected during the site visits. The four yellow triangles, almost co-incident with the discharges determined by flume, serve as a check on the accuracy of the flume calibration.

Based on the time history of the Winter Lake Outlet creek discharges for the data collected in 2006, the following observations were made:

1. The creek was flowing prior to the June 9, 2006 installation of the hydrometric station instrumentation.
2. The peak discharges were not recorded this year as the hydrometric station was not installed until the second week of June, unfortunately missing the highest flow period.
3. From June 9 to June 30 the flows reduced from 56 L/s to about 14 L/s.
4. On June 30 the creek discharge increased from 14 L/s to 23 L/s in response to the large precipitation event that occurred during the first half of that day.
5. From July 1 to the middle of August the discharge decreased from 23 L/s to 3.6 L/s.
6. During the last two weeks in August flow increased from 3.6 to 17 L/s, again in response to the three late August precipitation events.
7. From September 1 to the end of the record on September 19, 2006, flows gradually decreased from 17 L/s to 12 L/s.

2.3.6 Winter Lake Basin Characteristics

Winter Lake basin is approximately 4.3 km by 1.4 km and has a catchment area of 4.3 km^2. The elevation of Winter Lake is approximately 285 m above mean sea level (asl) and the maximum elevation in the basin is approximately 330 m asl. Inflows to Winter Lake consist of the Winter Lake basin runoff as well as the outflows from the Round Lake basin.

For the 102.2 day period of record of discharge monitoring a total of 140,377 m^3 passed through the hydrometric station. This flow consists of inputs from not only the Winter Lake drainage basin (3.8 km^2) but from the Round Lake (1.2 km^2) drainage basin as well. The Winter Lake drainage basin alone contributed 104,868 m^3 to the total yearly discharge passing the hydrometric station.

The calculated runoff for the Winter Lake basin for the period of record is estimated at 24.4 mm and this basin's contribution to the total daily volume of water passing Site #3 hydrometric station is estimated at 1,026 m^3/day. Tables 2.3a and 2.3b provide a summary of the drainage basin observations for 2006.

2.4 ROUND LAKE OUTLET (SITE #4)

The outlet from Round Lake, which flows into Winter Lake, is situated on the northwest side of Round Lake. There is no distinct flow channel out of Round Lake but rather a diffuse flow through the muskeg into a small marsh approximately 5 m downstream of the lake, see Figure 2.10 for an aerial view of the outlet area. The outlet creek flows southwest into Winter Lake, typically as a subsurface flow, through the muskeg and willow. At one point, about 25 m southwest of the Round Lake Outlet the flow is contained in a single channel. This site was selected for the hydrometric station. Figure 2.11 shows the site and the installed Parshall flume.

2.4.1 Station History

A site was selected for the Round Lake hydrometric station on May 21, 2005 during the first hydrometric site visit of that year. Only manually-determined discharges were recorded during this field survey. A Parshall flume was sized and ordered as well as the required hydrometric station instrumentation.

The Parshall flume was installed and instrumented on July 18, 2005. A continuous record of outlet stages and discharges was recorded until the removal of the instrumentation on September 12, 2005 to prevent damage due to freezing.

On June 9, 2006 the Round Lake hydrometric station Parshall flume and bulkhead were inspected, the leak in the bulkhead was repaired and the station re-instrumented. The instrumentation was removed on Oct 3, 2006 prior to freezing conditions.

2.4.2 Stage Measurements

Using the Parshall flume instrumentation, Round Lake Outlet stages were logged every 15 minutes from June 9 to October 3, 2006. Figure 2.12 summarizes the creek stages recorded in 2006. The stage was determined by adding a fixed value, representing the measured distance from the floor of the flume to the deepest part of the creek bed, to the flume depth recorded by the data logger/pressure transducer combination. Creek stages were typically 0.3 m.

2.4.3 Flume Calibration Discharge Measurements

During the 2006 three-day site survey, four Round Lake Outlet flows were determined using a velocity meter and calculating the discharge by velocity area techniques. These discrete discharge determinations were used to ensure the flume was properly calibrated.

The first set of manual discharge measurements conducted to check the flume calibration indicated a 44% discrepancy in discharge from that determined by the flume. Re-inspection of the station revealed a large underwater leak at the base of the bulkhead. This leak was repaired using sandbags and geotextile and the discharges were checked again. This time only a 1% error was observed and the hydrometric station was deemed calibrated and ready for the collection of stage and discharge data for the summer/fall of 2006.

A summary of the flume calibration results obtained since the Parshall flume was originally installed on July 18, 2005 is presented in Table 2.2.

2.4.4 Round Lake Parshall Flume Calibration Curve

The selected Parshall flume had a throat width of 15.24 cm (6 inches) and a flow measurement range of between 1.6 and 110.0 L/s. Figure 2.13 represents the calibration curve for this flume.

The Round Lake Parshall flume calibration formula, used to calculate discharge from the flume head:

$$Q = 381.206 \times H^{1.58}$$

Where Q = outlet discharge (L/s)

H = recorded water depth (flume head) (m)

2.4.5 Time History of Discharge

By using the logged water depths and the flume calibration formula, a time history of creek discharges was determined. This history is presented in Figure 2.14. The points indicated on the graph as triangles, are discharges measured by velocity-area techniques and verify that the flume is calibrated. The solid line represents discharges as determined by the Parshall flume every 15 minutes.

The maximum recorded flow for 2006, of 17.9 L/s, occurred on June 9, 2006, after spring thaw. However, judging from the downward trend in the discharge data in early June it is likely that Round Lake Outlet discharges were somewhat higher than the recorded maximum flow. The minimum measured flow of less than 1.0 L/s occurred on August 6, 2006.

From September 22 to October 3, Round Lake discharge increased from 2.5 L/s on September 20 to over 22 L/s on October 3, just prior to the hydrometric instrumentation being removed for the season. This increase in discharge is due to Aboriginal Engineering Ltd. (AEL) dewatering of the silty-clay borrow pit and discharging the water into Round Lake. AEL reports that the pumping began on September 20, 2006 at a flow rate of 46 L/s for 15 days. The total of 58,043 m^3 was transferred to Round Lake.

The creek does not flow during the winter months from approximately mid October to mid May.

Based on the 2006 time history of the Round Lake Outlet creek discharges the following observations were made:

1. The creek was flowing prior to the June 9, 2006 installation of the hydrometric station instrumentation.
2. The peak discharges were probably not recorded this year as the hydrometric station was installed during the second week of June and likely missed the highest flow period. This observation is based on the 2005 time history of discharge for this station.
3. From June 9 to June 30 the flow decreased from 17.8 L/s to about 2.7 L/s.
4. On June 30 the creek flow increased from 2.7 L/s to over 6.0 L/s in response to a large precipitation event where almost 30 mm of rain fell over the first half of the day.
5. From July 1 to the middle of August outlet flows decreased from 6.0 L/s to less than 1.0 L/s.
6. Over the last two weeks in August flow increased from less than 1.0 to 4.5 L/s.

7. From September 1 to the end of the record on September 19, 2006 flows declined from 4.5 to 2.5 L/s.
8. From September 20, 2006 to October 3/06 flows increased from2.5 L/s to 22 L/s due to the dewatering of the clay borrow pit.

2.4.6 Round Lake Basin Characteristics

Round Lake basin is about 1.8 km by 0.8 km with a catchment area of 1.2 km^2. The estimated elevation of Round Lake is 288 m asl and basin elevations extend up to approximately 330 m asl. Inflows to Round Lake consist only of Round Lake drainage basin runoff.

For the 102.2 day period from June 9 to September 19, 2006 of a total of 35,509 m^3 passed through the hydrometric station. This flow consists only of runoff from the Round Lake drainage basin.

The calculated average runoff for the Round Lake basin is estimated at 29.6 mm and this basin's total daily volume of water passing Site #4 hydrometric station is estimated at 347 m^3/day. Tables 2.3a and 2.3b provide a summary of the drainage basin observations for 2006.

2.5 DRAINAGE BASIN CHARACTERISTICS

Table 2.3a is a summary of each basin or combined basin hydrological parameters for the period of record from June 9 to September 19, 2006. These parameters are total annual discharge, total annual basin runoff and the average daily discharge and they have been discussed briefly in their respective sections in this report. The two combined basins consist of Winter and Round Lake together and Narrow, Winter and Round Lake basins combined.

Total basin runoff is computed by dividing the annual discharge by the basin area and is given in mm of water. Narrow Lake basin has a total basin runoff of 49.5 mm, roughly double that of Winter (24.4 mm) and Round (29.4 mm) Lakes. This is attributed to the fact that a good portion of Narrow Lake basin consists of exposed rock, which tends to be somewhat impervious, supports less vegetation and hence has a higher runoff value. Both Round and Winter Lake basins have fewer rock outcrops and more swampy and vegetated terrain, which increase infiltration and evapotransporation.

An estimate of the basin losses can be made when the runoff is compared to the precipitation, including snow pack which accumulates over the winter and then melts during the spring. The basin losses are mainly due to ground water infiltration, evapotransporation and sublimation of the snow pack. The recorded precipitation from the fall of 2005 to September 19, 2006 was 263 mm. The basin loss estimate for each basin and both combined basins are summarized in Table 2.3b.

3.0 METEOROLOGY

On September 28 2004, a meteorological station was installed at the Yellowknife Gold Project site at a location approximately 50 m east of the north end of the airstrip. The NAD 27 GPS coordinates for the station are provided in Table 1.0.

The station measures wind speed and direction, air temperature, barometric pressure, relative humidity, incident solar radiation, precipitation and evaporation during the summer period. All the data, with the exception of the evaporation data, are saved to a logger at 15-minute intervals and the logger produces a 24-hour daily summary. The data are retrieved by downloading, at convenient times, using a laptop computer.

3.1 METEOROLOGICAL STATION INSTRUMENTATION

The weather station consists of a standard 10 m meteorological tower with instrumentation to measure all the above mentioned parameters except evaporation. Figure 3.0 is a view of the meteorological station showing the 10 m tower evaporation pan and the all-weather precipitation gauge. The meteorological station is powered by a 12 V DC battery and 20 watt solar panel. Data are recorded to a Campbell Scientific CR10X data logger.

Specifications of the instruments installed on the weather station, a photograph of the station, and a map showing the station location are contained in the site description for the meteorological station included in Appendix A. Brief descriptions of these instruments, based on material provided by the manufacturers, are provided below.

3.1.1 Wind Speed and Direction Monitor

Model 05103-10-L Wind Speed and Direction Monitor is manufactured by R.M. Young. It is composed of a four-blade propeller mounted on a torpedo-shaped wind vane. Rotation of the propeller produces an alternating current with a frequency that is directly proportional to the wind speed. Wind direction is sensed by a potentiometer that is excited by an applied voltage. The potentiometer produces a voltage that is directly proportional to the azimuth angle. Wind data are collected every five seconds and the mean wind vector magnitude and direction are calculated and stored at 15 -minute intervals. The standard deviation of wind direction is also computed and indicates the variability of wind direction over the archiving period.

3.1.2 Temperature and Relative Humidity Probe

The HMP25C212-L relative humidity and air temperature probe contains a Vaisala capacitive relative humidity sensor and a YSI 44212 thermistor. Both sensors are enclosed in a 10-plate gill radiation shield designed to shield the sensors from rainfall and solar radiation.

3.1.3 Barometric Pressure Sensor

A 61205V barometric pressure sensor is enclosed inside the data logger housing. Atmospheric pressure is maintained inside the sealed logger housing with a hydrophobic filter and entry seal which prevent moisture and insects from entering the housing, while allowing the inside of the housing to maintain atmospheric pressure.

3.1.4 Pyranometer

A pyranometer is a device used to measure incident solar radiation. The CM3 Kipp & Zonen pyranometer consists of a thermopile sensor coated with a black absorbent coating, which converts the incident solar radiation to heat. The resultant temperature difference is converted to a voltage by a copper-constantan thermocouple. The thermopile is encapsulated inside the pyranometer's glass dome such that it has a field of view of 180 degrees. It has a flat spectral sensitivity between 300 and 3000 nm.

3.1.5 All-Weather Precipitation Gauge

The all-weather precipitation gauge consists of 3 devices. These are a tipping bucket for the measurement of water equivalent precipitation, a precipitation adaptor to convert snowfall to water, and a device to ensure catchment of all snow and rainfall.

The TE525WS is an adaptation of the standard US Weather Bureau tipping bucket rain gauge. The output is a switch closure for each bucket tip. Each tip represents 0.254 mm of water equivalent precipitation.

To enable the TE525WS gauge to measure snowfall a CS705 precipitation adaptor is mounted on top of the tipping bucket rain gauge. The CS705 consists of a catch tube, antifreeze reservoir and overflow tube. Snow is captured in the catch tube and melts into the antifreeze solution contained in the reservoir and as the snow melts the level in the reservoir rises causing the water antifreeze mix to flow through the overflow tube onto the tipping bucket, thereby measuring the quantity of precipitation.

The Alter windscreen is to prevent snow and rain from blowing past the rain gauge catch tube during periods of high wind velocities. The Alter windscreen prevents strong updrafts and induces turbulence around the rain gauge catch tube. This aids in reducing airflow streams over the rain gauge resulting in better collection of precipitation during windy periods and, therefore, increasing the accuracy of the precipitation measurements.

3.1.6 Data Storage

Data are recorded to a Campbell Scientific CR10X-2M data logger. The archiving interval for all parameters, except evaporation, is 15 minutes but this can be adjusted to suit specific data collection requirements. At a 15-minute sample frequency, the station will log up to one year of data before filling the memory. Meteorological data on all instruments are collected at 5-second intervals, then averaged over the archiving period and saved to the logger memory.

At the conclusion of each 24-hour period a daily summary of the meteorological data is saved to the logger memory. Other variables, which are indicative of the status of the meteorological station, such as battery power, internal temperatures and low voltage counts are also saved. Refer to the site description document in Appendix A for further information on the daily summary.

3.1.7 Station Power

The meteorological station is powered by a 12 V DC battery, a 20 watt solar panel and a charge regulator, all of which are attached to the 10 m tower. With this power configuration the station can run unattended for more than a year.

3.2 WINDS

Wind data for the Yellowknife Gold Project site have been collected continuously since the installation of the meteorological station on September 28, 2004. The data collected during 2006 have been summarized and presented in three different forms, as described below.

3.2.1 Maximum Wind Speed

The maximum gust wind speed for the day is recorded by the meteorological station at midnight. These data, collected over the period between January 1, 2006 and December 31, 2006 are displayed in Figure 3.1.

The maximum wind gust of 17.5 m/s was recorded on June 27, 2006. The average maximum gust on a daily basis is approximately 7 to 8 m/s. On a calm day maximum wind gusts are typically 2 m/s, whereas on a typical windy day maximum gusts are approximately 12 m/s.

3.2.2 Wind Speed and Direction Stick Plots

Figure 3.2 is a sample of the wind direction figures presented in Appendix B which contains 12 monthly wind summary graphs representing the winds on a monthly basis from January to December 2006. Each figure consists of three panels.

The upper panel is a stick plot that displays the hourly wind vector; direction is indicated by the angle of each hourly stick; true north is towards the top of the page. The wind speed is indicated by the length of the stick which is determined using the scale in m/s given at the left and right of the plot. For example in Figure 3.2 on November 21, 2006, winds were blowing from the northeast at a speed of about 6 m/s. The next day the wind changed to a southwest wind, at about 1 m/s, tapering off near the end of the day.

The central panel indicates the hourly wind speed in m/s. This panel is useful as an indicator of windstorms or periods of calm.

The lower panel in Figure 3.2 shows the hourly wind direction.

3.2.3 Wind Roses

A wind rose is a useful tool that can display an entire period of recorded wind data on a single graph. The total duration of wind occurring within a specified speed range and compass direction is determined as a percentage of the total period of record. Figure 3.3 is an example of a wind rose calculated using the wind record measured by the Tyhee meteorological station from January to December 2006. Wind speeds are grouped into ranges from 0 to 1 m/s (calm), 1 to 3 m/s, 3 to 6 m/s etc., in 3 m/s ranges, to 18+ m/s. The wind direction is also grouped into 16 compass direction ranges of 22.5 degrees starting at north. These data are summarized in the wind speed and direction frequency distribution table, which is located in the lower right of Figure 3.3. The wind rose displays graphically the data contained within the table.

The line types used to display winds in each compass direction are indicative of the wind speed. For example, in Figure 3.3, viewing the data in the east compass direction four line types are displayed. The single thin line closest to the centre of the rose indicates that 6.04% of the time the winds are blowing from the east at between 1 and 3 m/s. The next line type is a thicker light blue line, which indicates that 4.92% of the time winds are blowing from the east at between 3 and 6 m/s. The dark blue line near the end indicates wind speeds between 6 and 9 m/s, blowing from the east for 0.64% of the time. Finally the short green line (barely noticeable) at the end indicates winds blowing from the east between 9 to 12 m/s for 0.08% of the year long period of record.

The winds at Tyhee, recorded for 2006 are summarized in Figure 3.3. It is evident from this wind rose that during the period of record the wind had been blowing primarily from the northeast quadrant 37.34% of the time (11.68% E; 11.34% ENE; 7.88% NE and 6.44% NNE). The wind was calm (less than 1 m/s) for 13.24% of the time. For the remaining 49.42% of the time, the wind was blowing from the other 12 compass directions at greater than 1 m/s.

It is also possible to determine the percentage of time the wind blows at specific speeds by viewing the "total %" row at the bottom of the frequency distribution table. For the Tyhee meteorological station location, over the year of 2006, the wind speed was less than 1 m/s 13.24% of the time, between 1 and 3 m/s 46.30% of the time, between 3 and 6 m/s for 35.21%, between 6 and 9 m/s for 5.16% of the time and between 9 and 12 m/s for 0.09% of the time. There were no extended periods when the wind speed was greater than 12 m/s.

The wind rose for 2006 is very similar to the wind rose for the period of September 2004 to March 2006 presented in the hydrology field report entitled "Yellowknife Gold Project Hydrology and Meteorology Report" previously submitted in April 2006 by Hay & Company Consultants. This is indicative of the stability of the wind regime for the area.

Appendix C contains 12 wind rose figures, one for each month of 2006. Viewing all of these wind roses indicates the prevailing winds are from the northeast and that there is little to no seasonal variability in the wind direction.

3.3 OTHER METEOROLOGICAL PARAMETERS

Figure 3.4 is a sample of the 12 figures contained in Appendix D. These figures show the meteorological parameters of air temperature, solar radiation, relative humidity, barometric pressure, and precipitation measured by the meteorological station between January 1 and December 31, 2006.

Figure 3.4 documents the parameters for the entire year whereas each figure in Appendix D shows the data on a monthly basis. The monthly plots show much more detail than the year long plot.

Appendix D presents all the recorded 2006 monthly meteorological data. Using these figures it is possible to determine the weather for any day within the period of record. For example, referring to Figure 3.4 on June 30, 2006, the day of the large precipitation event, the bottom panel indicates the total daily precipitation of 29.46 mm. The incident solar radiation was 200 W/m^2 (second panel from top) indicating that the day was quite cloudy (clear skies would be about 800-1000 W/m^2), air temperature was near 11.5°C (top panel), somewhat cooler than the normal for that period, relative humidity was 91%, which is higher than normal (third panel from the top). Barometric pressure (fourth panel from the top) was near 1001 hPa.

3.3.1 Air Temperature

Air temperatures are discussed in terms of daily extreme and mean temperatures as well as the hourly data.

3.3.1.1 Daily Extremes for Air Temperature

The maximum, minimum and mean air temperatures for any day are recorded by the meteorological station at midnight. The data summarized in Figure 3.5 were collected from January 1 to December 31, 2006 and show the mean air temperatures for each day as a thick orange line bounded by the maximum and minimum temperatures for the day indicated by thin red lines. Generally the daily variance is ±10°C from the mean daily air temperature.

Viewing Figure 3.5 a sinusoidal pattern to air temperature is evident. The warmest period is from May to July with a mean daily temperature of 15°C. During this period temperatures could range as high as 30°C and as low as 2°C. Between August and November the temperatures start to drop to the winter normals.

The coldest period for the site occurs between November and January. During this period the mean daily temperature is -28°C, however, temperatures can be as low as –39°C or as high as -4°C. In February it starts to warm up to the normal summer temperature typically starting in May.

3.3.1.2 Hourly Air Temperatures

Figure 3.4 is used as an example of the 12 monthly weather parameter figures contained in Appendix D. The upper panel in Figure 3.4 and the figures in Appendix D show the temperatures measured by the station for 2006 for each hour of the day. These figures are useful for viewing temperature trends for a particular day or for a short period of time.

3.3.2 Solar Incident Radiation

Solar incident radiation is discussed in terms of daily extremes as well as hourly data.

3.3.2.1 Daily Extremes for Incident Solar Radiation

At the conclusion of each day the station records the maximum incident solar radiation in W/m^2 (Watts per metre squared) for the day. The minimum daily incident solar radiation should always be zero as at this latitude it gets dark for at least a short time each day. Figure 3.6 shows the daily maximum recorded incident solar radiation plotted over 2006.

There is a strong sinusoidal pattern to the data set. Over the winter period from mid October to mid January the sun is lowest in the sky, hence the solar radiation is at a minimum, typically in the order of less than 100 W/m^2. During this winter period daily variations to the maximum incident solar radiation are typically less than 50 W/m^2.

During the summer period from April to mid July the solar radiation is at it highest, peak values average about 900 W/m^2. The maximum solar incident radiation recorded, 1168 W/m^2 occurred on June 6, 2006. During the summer months there are large changes to the daily maximums due to heavy cloud cover. This cloud cover can reduce the measured maximum daily incident solar radiation from an average of 900 W/m^2 to less than 200 W/m^2 for the day.

3.3.2.2 Hourly Incident Solar Radiation

Figure 3.4 is used as an example of the 12 monthly weather parameter figures contained in Appendix D. The second panel from the top shows the solar incident radiation, measured by the station, for each hour during the month.

The peaks typically occur at midday, when the sun is at its highest. The radiation drops to zero over the night.

The data can be used to determine the number of daylight hours at site for any day of the year, or to determine the incident solar radiation at any point in time.

3.3.3 Relative Humidity

Relative humidity is discussed in terms of daily extremes and means as well as data recorded hourly by the meteorological station.

3.3.3.1 Daily Extremes for Relative Humidity

Over the period of record the relative humidity varies from a low of 17% in mid summer to a high of 100%, which could occur at any time of the year. At the conclusion of each day the station records the maximum, mean and minimum relative humidity for the day. Figure 3.7 shows the relative humidity data plotted for 2006. The thick green line in the figure represents the mean relative humidity for the day. The maximum and minimum relative humidity results are indicated by black lines.

There is a slight sinusoidal pattern to the mean relative humidity recorded on site. For October to November the mean relative humidity is near 90%. The relative humidity exhibits a slow decline from this peak over the winter and spring until the minimum mean relative humidity occurs between April and August. From August the relative humidity increases back to the peak daily means in October.

The variance of relative humidity is indicated by the envelope of maximum and minimum relative humidity. Over the winter period between October and February the maximum and minimum relative humidity vary only ±15% from the mean. However, for the summer period the daily variation of relative humidity can be as much as ±40%.

3.3.3.2 Hourly Relative Humidity

Figure 3.4 is used as an example of the 12 monthly weather parameter figures contained in Appendix D. The third panel from the top shows the relative humidity measured by the station for each hour in the particular month.

3.3.4 Barometric Pressure

Barometric pressures are discussed in terms of daily extreme temperatures and means as well as the hourly data.

The barometric pressures recorded by the meteorological station have been corrected to represent the equivalent air pressures referenced to mean sea level. This is a standard meteorological convention used to enable direct comparison of meteorological station data regardless of the station elevation. To correct the barometric pressures presented in this report to the actual barometric pressures experienced at site, it is necessary to reduce the stated pressure by 35.525 hPa. (The hPa is the metric equivalent to a millibar (mbar) and represents 0.1 kPa pressure.)

3.3.4.1 Daily Extremes for Barometric Pressure

At the conclusion of each day the station records the maximum, mean and minimum barometric pressure in hPa for the day. Figure 3.8 is a graph showing the maximum, mean and minimum barometric pressure data collected for 2006. The thick light blue line in the figure represents the mean barometric pressure measured for the day. The maximum and minimum barometric pressures are indicated by black lines bounding the mean pressure.

Over the period of record the barometric pressure varies from a low of 979 hPa to a high of 1044 hPa. There is little seasonal variation to barometric pressure and the yearly mean is typically near 1010 hPa. On a day-to-day basis the barometric pressure can change by more than 30 hPa.

The variance of barometric pressure for a single day is indicated by the maximum and minimum barometric pressure shown as black lines on Figure 3.8. Typically the variance of pressure is ±10 hPa from the daily mean.

3.3.4.2 Hourly Barometric Pressure

Figure 3.4 is used as an example of the figures contained in Appendix D. The fourth panel from the top shows the barometric pressure measured by the station for each hour in the month.

3.3.5 Precipitation

Precipitation at site can occur as either rain or snow. Generally the precipitation is in the form of rain between June and August, and as snow from October to April. During the months of May and September there is equal possibility of rain or snow. It is possible to determine if a particular day's precipitation is rain or snow by examining the hourly air temperature data for the day using the figures contained in Appendix D.

3.3.5.1 Recorded Precipitation

Precipitation has been recorded by the meteorological station at a frequency of 15 minutes for 2006. Both rain and snow are recorded by this gauge as water equivalent. The instrumentation for the continuous measurement of all forms of precipitation is outlined in Section 3.1.5 of this report "All-Weather Precipitation Gauge".

A summary of daily precipitation is presented in Figure 3.9 as a histogram. The maximum daily precipitation recorded over the period of record was 29.5 mm/day of rain on June 30, 2006. Generally, however, the precipitation falling during a typical rainy day is about 2 to 3 mm. Heavy daily precipitation is typically over 10 mm. Heavy precipitation days usually occur during the summer months, but can also occasionally occur as snowfall, as was the case on February 12, 2006 when 18.3 mm water equivalent precipitation (20.0 cm snowfall) occurred during the day.

The daily precipitation data collected over 2006 have been summarized, in Table 3.0. The total water equivalent precipitation is shown at the bottom of each month column. There was a total of 280.7 mm of precipitation during 2006.

Figure 3.4 provides an example of the 12 monthly weather parameter figures contained in Appendix D. The bottom panel in these figures shows the daily precipitation measured by the station during each day of 2006.

3.4 EVAPORATION

On June 9, 2006 the evaporation pan was re-installed near the meteorological station, and data were recorded from this date until September 21, 2006 when the pan was decommissioned. The water level in the pan was typically measured daily at 07:00 hours using a point gauge, accurate to ±0.5 mm. Daily evaporation was calculated by determining the change in the pan water level and subtracting the increase in the pan depth due to precipitation for the same period. For the days the point gauge was read at times other than at 07:00 hours a ratio of 24 hours to the time difference between the two consecutive readings was used to correct the evaporation to a 24 hour period.

The equivalent daily evaporation rate is shown as a black line in Figure 3.10. On days when the evaporation is less than zero, it is assumed that water was added to the pan by condensation. The pink line in Figure 3.10 is a seven-day running average of the daily evaporation rate.

Table 3.1a summarizes the pan evaporation daily rates and totals for each month over the period the evaporation pan was operational.

The average pan evaporation rate for the summer of 2006 was 4.4 mm/day and the total pan evaporation was 445.0 mm for the same period (June 9 to September 21, 2006).

Research into evaporation pan rates has shown that lake evaporation rates are lower than pan evaporation rates by a factor of 0.7 to 0.8. A factor of 0.7 was used to convert the pan evaporation data to the lake evaporation rate. These data are summarized in Table 3.1b. The lake evaporation rate for the summer of 2006 was 3.1 mm/day and the total lake evaporation rate was 311.5 mm.

4.0 RECOMMENDATIONS

It is recommended that the hydrology and meteorology programs be continued through 2007, so as to extend the period of record for both flows and weather parameters. Tyhee NWT Corp. has indicated that the mineral resource at Nicholas Lake will likely be developed in conjunction with the Ormsby resource; therefore, the Nicholas Lake hydrometric station should be re-installed and activated for the 2007 hydrological field program.

5.0 CLOSURE

We trust this report meets your requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Yours sincerely,
Hay & Company Consultants

Report prepared by:

R.E. Draho

R.E. Draho, B.Sc.
Senior Project Scientist
Direct Line: 604.875.6391 x245
bdraho@hayco.com

Reviewed by:

A.G. Chantler

Dr. A.G. Chantler, P.Eng.
Principal
Direct Line: 604.875.6391 x258
achantler@hayco.com

and

R.A.W. Hoos, M.Sc. R.P. Bio
Principal Consultant
Direct Line: 604.875.6391 x239
rhoos@eba.ca

TABLES

Table 1.0
Hydrological and Meteorological Station
Geographic Coordinates

Site #	Site Name	Longitude			Latitude		
		deg	min	sec	deg	min	sec
Site #1	Narrow Lake Outlet	63	9	16.4	113	57	7.3
Site #2	Brien Lake Outlet	63	10	52.3	113	57	54.0
Site #3	Winter Lake Outlet	63	10	4.8	113	55	38.5
Site #4	Round lake Outlet	63	10	30.3	113	54	27.2
Site #5	Northeast Brien lake	63	11	6.0	113	55	4.0
Site #6	Nicholas Lake Outlet	63	15	20.1	113	46	4.4
Site #7	Meteorological Station	63	11	6.2	113	53	40.2

Note: All coordinates are referenced to NAD 27

Table 2.0

Summary of Flume Calibration Discharge Measurements
Site #1 - Narrow Lake Outlet

Date/time MDST	Outlet Stage U/S Flume (m)	Data Logger Depth (m)	Manually Measured Discharge (L/s)	Logger determined Discharge (L/s)	Percent Error (%)	Comments
Installed Parshall Flume 2005						
Jul 18/05 14:48	0.347	0.167	44.0	45.4	3.2%	Check flume calibration
Jul 18/05 14:53	0.347	0.167	43.7	45.4	3.8%	Check flume calibration
Aug 06/05 10:49	0.301	0.121	25.0	27.7	9.7%	Check flume calibration
Aug 06/05 11:01	0.301	0.121	25.2	27.7	9.2%	Check flume calibration
Parshall Flume 2006						
Jun 09/06 09:40	0.473	0.293	100.0	106.7	6.3%	Check flume calibration
Jun 09/06 10:01	0.473	0.293	112.1	106.7	-5.0%	Check flume calibration

Table 2.1

Summary of Flume Calibration Discharge Measurements
Site #3 - Winter Lake Outlet

Date/time MDST	Outlet Stage U/S Flume (m)	Data Logger Depth (m)	Manually Measured Discharge (L/s)	Discharge Measured By Flume (L/s)	Percent Error (%)	Comments
Installed Parshall Flume 2005						
Jul 16/06 15:14	0.342	0.142	29.117	27.044	7.1%	Check flume calibration
Jul 18/05 13:44	0.334	0.134	29.647	24.626	16.9%	Check flume calibration
Jul 18/05 11:09	0.339	0.139	29.353	26.027	11.3%	Check flume calibration
Aug 05/05 10:52	0.306	0.106	17.769	17.331	2.5%	Check flume calibration
Aug 05/05 11:09	0.310	0.110	17.790	18.395	-3.4%	Check flume calibration
Parshall Flume 2006						
Jun 09/06 11:15	0.429	0.229	56.139	56.231	-0.2%	Check flume calibration
Jun 09/06 11:25	0.427	0.227	55.953	55.442	0.9%	Check flume calibration

Table 2.2

Summary of Flume Calibration Discharge Measurements
Site #4 - Round Lake Outlet

Date/time MDST	Outlet Stage U/S Flume (m)	Data Logger Depth (m)	Manually Measured Discharge (m^3/s)	Discharge Measured By Flume (m^3/s)	Percent Error (%)	Comments
Installed Parshall Flume 2005						
Jul 18/05 17:52	0.375	0.112	14.911	11.971	19.7%	Check Flume Calibration
Jul 18/05 17:57	0.375	0.112	14.886	11.971	19.6%	Check Flume Calibration
Aug 05/05 13:40	0.305	0.054	4.333	3.811	12.0%	Check Flume Calibration
Aug 05/05 13:50	0.305	0.054	4.362	3.811	12.6%	Check Flume Calibration
Parshall Flume 2006						
Jun 09/06 15:12	0.377	0.119	9.155	13.224	-44.4%	Bulkhead Leaking
Jun 09/06 15:27	0.377	0.119	9.204	13.224	-43.7%	Bulkhead Leaking
Jun 09/06 17:05	0.400	0.142	17.359	17.516	-0.9%	After reparing bulkhead
Jun 09/06 17:22	0.401	0.143	17.825	17.653	1.0%	After reparing bulkhead

Table 2.3a

Summary of Tyhee Drainage Basin Parameters During 2006

Gauging Station Site ID	Basin Name	*Length (m)	*Width (m)	*Drainage Area (m^2)	[1] Total Discharge Volume (m^3)	[1] Total Basin Runoff (mm)	[1] Average Basin Daily Flow (m^3/day)
Individual basins							
Site #1	Narrow Lake	3900	1500	3.80E+06	188233	49.5	1842
Site #3	Winter Lake	4300	1400	4.30E+06	104868	24.4	1026
Site #4	Round Lake	1800	800	1.20E+06	35509	29.6	347
Combined basins							
Site #3+#4	Winter - Round Lake	4600	1700	5.50E+06	140377	25.5	1374
Site #1+#3+#4	Narrow - Winter - Round Lake	4600	3400	9.30E+06	328610	35.3	3215

* Note basin areas, lengths and widths are determined only up to the location of the gauging station.

[1] Based on the period of record from Jun. 9/06 @ 09:27 to Sep. 19/06 @ 14:12 a total of 120.2 days

Table 2.3b

Summary of Tyhee Drainage Basin Losses During 2006

Gauging Station Site ID	Basin or Combined Basin Name	[2] Basin Precip-itation (mm)	[3] Basin Losses (mm)
Individual basins			
Site #1	Narrow Lake	263	213.5
Site #3	Winter Lake	263	238.6
Site #4	Round Lake	263	233.4
Combined basins			
Site #3+#4	Winter - Round Lake	263	237.5
Site #1+#3+#4	Narrow - Winter - Round Lake	263	227.7

[2] Basin Precipitation refers to the water equivalent snowfall and rain measured by the meteorological station from the fall of 2005 to the end of the 2006 hydrological monitoring program period of record on September 19, 2007.

[3] Basin losses are calculated by taking the difference between the precipitation and the runoff.

Table 3.0

Yellowknife Gold Project
Daily Precipitation For 2006

Day	Daily Precipitation for Month in 2006											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
1	1.02	1.02	-	0.76	-	1.02	1.78	-	0.25	-	-	-
2	0.51	1.02	-	-	-	-	1.02	-	1.27	0.51	-	-
3	-	4.57	-	0.51	-	-	1.52	0.51	0.76	-	-	-
4	-	-	-	-	-	4.06	-	-	-	-	0.76	0.25
5	-	-	-	-	-	-	1.27	-	-	-	0.25	-
6	-	-	-	-	-	0.76	-	-	2.29	-	-	-
7	-	-	-	0.76	0.25	0.76	-	1.27	-	-	-	2.29
8	-	1.78	-	-	-	1.27	-	1.02	-	0.51	10.67	-
9	-	1.27	-	2.03	3.05	1.52	-	0.76	0.76	-	0.25	-
10	-	1.02	-	-	1.02	1.27	-	0.76	-	-	-	0.25
11	-	-	-	0.25	0.76	0.51	-	1.27	-	-	-	-
12	-	18.03	-	0.51	-	-	9.91	0.51	-	-	-	-
13	-	-	-	0.76	-	0.25	3.05	2.79	-	-	-	-
14	-	-	-	-	-	1.02	1.02	15.49	-	-	-	-
15	-	-	-	10.41	-	-	1.02	0.25	-	-	-	-
16	-	-	-	-	-	-	1.52	1.02	-	-	2.54	-
17	-	-	-	-	-	-	-	-	-	-	17.02	-
18	-	-	-	-	-	-	-	17.02	-	-	-	-
19	-	-	-	0.25	-	-	-	3.81	-	-	0.25	-
20	-	-	-	-	-	-	1.02	0.25	-	-	-	-
21	-	-	-	-	4.83	-	0.51	-	-	-	-	0.51
22	0.51	-	-	-	4.32	-	-	0.51	-	-	-	-
23	-	-	-	-	0.76	-	-	15.49	0.76	-	-	-
24	-	-	-	0.76	1.02	-	2.03	7.37	0.51	0.51	-	-
25	0.76	-	-	-	-	-	1.27	1.02	-	3.56	-	0.25
26	1.52	-	-	-	2.29	-	0.51	-	-	0.51	-	-
27	-	-	-	-	2.29	0.25	-	-	0.25	0.76	-	-
28	0.25	-	0.51	-	-	-	-	2.54	1.52	-	-	-
29	0.76		2.79	-	1.02	-	-	-	2.03	-	-	-
30	0.25		-	-	1.27	29.46	0.51	-	0.76	3.30	-	-
31	0.51		1.52		0.51		-	0.76		-		-
Total	**6.10**	**28.70**	**4.83**	**17.01**	**23.37**	**42.16**	**27.94**	**74.42**	**11.18**	**9.65**	**31.75**	**3.56**

Total water equivalent precipitation for 2006 = **280.7** mm

Table 3.1a

Yellowknife Gold Project
Total and Average Monthly Pan Evaporation Rates

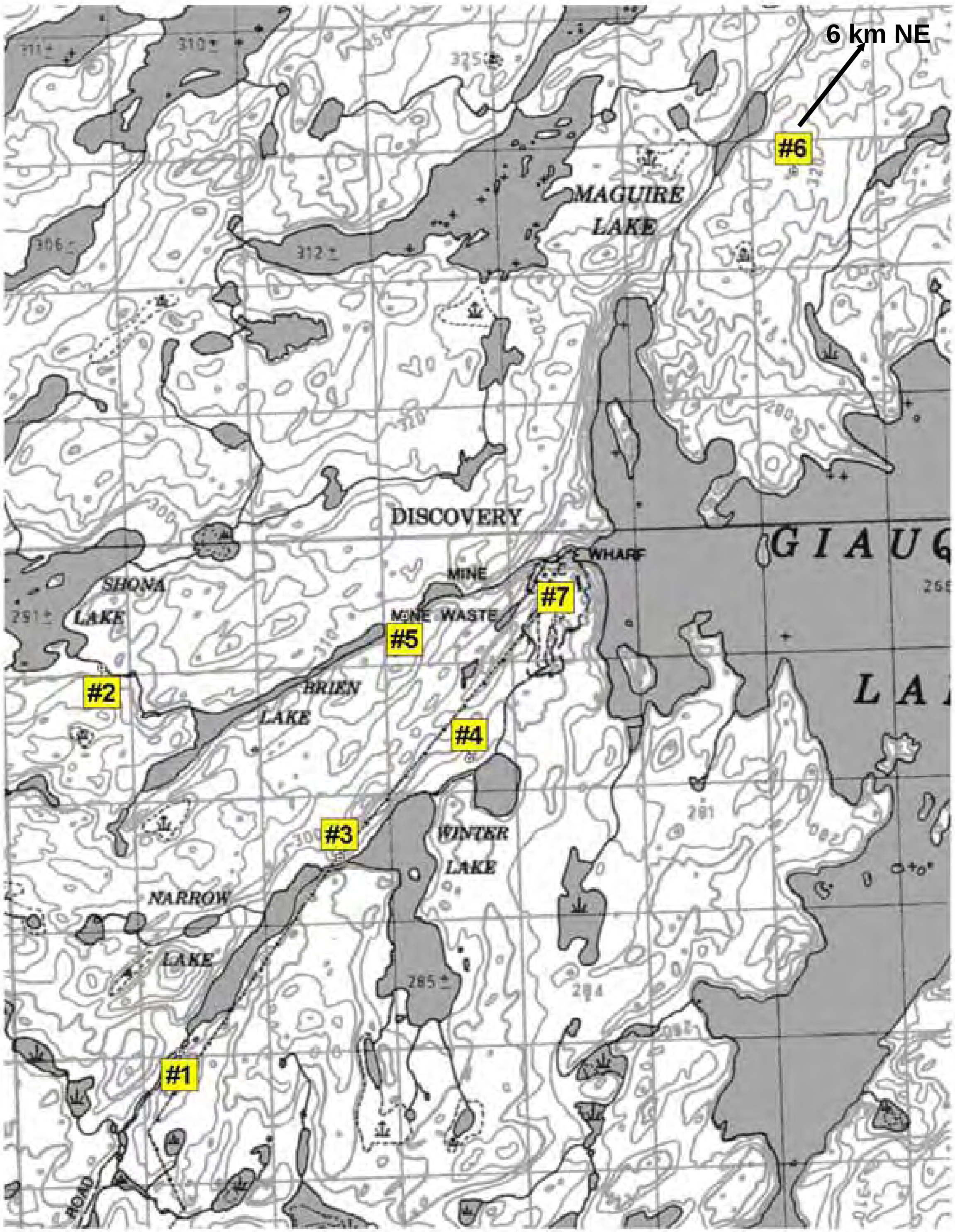
Month	Total Pan Evaporation (mm)	Daily Rate (mm/day)	Comments
May 2006			No data
June 2006	138.4	7.3	Missing Jun 1-8
July 2006	156.7	5.1	Full Month
August 2006	112.6	3.6	Full Month
September 2006	43.2	2.1	Missing Sep 22-30
Jun 9 to Sep 21, 2006	**445.0**	**4.4**	Period of record

Table 3.1b

Yellowknife Gold Project
Total and Average Monthly Lake Evaporation Rates

Month	Total Lake Evaporation (mm)	Daily Rate (mm/day)	Comments
May 2006			No data
June 2006	96.9	5.1	Missing Jun 1-8
July 2006	109.7	3.5	Full Month
August 2006	78.8	2.5	Full Month
September 2006	30.2	1.4	Missing Sep 22-30
Jun 9 to Sep 21, 2006	**311.5**	**3.1**	Period of record

Note: A factor of 0.7 has been used to convert pan evaporation to lake evaporation



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

SITE LOCATION MAP

FIG. 1.0

FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Apr07_Report_portrait_figures.ppt

FIGURES

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AERIAL VIEW OF SITE #1
NARROW LAKE OUTLET

FIG
2.0

FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Apr07_Report_Landscape_figures.ppt

HAYCO HAY & COMPANY CONSULTANTS

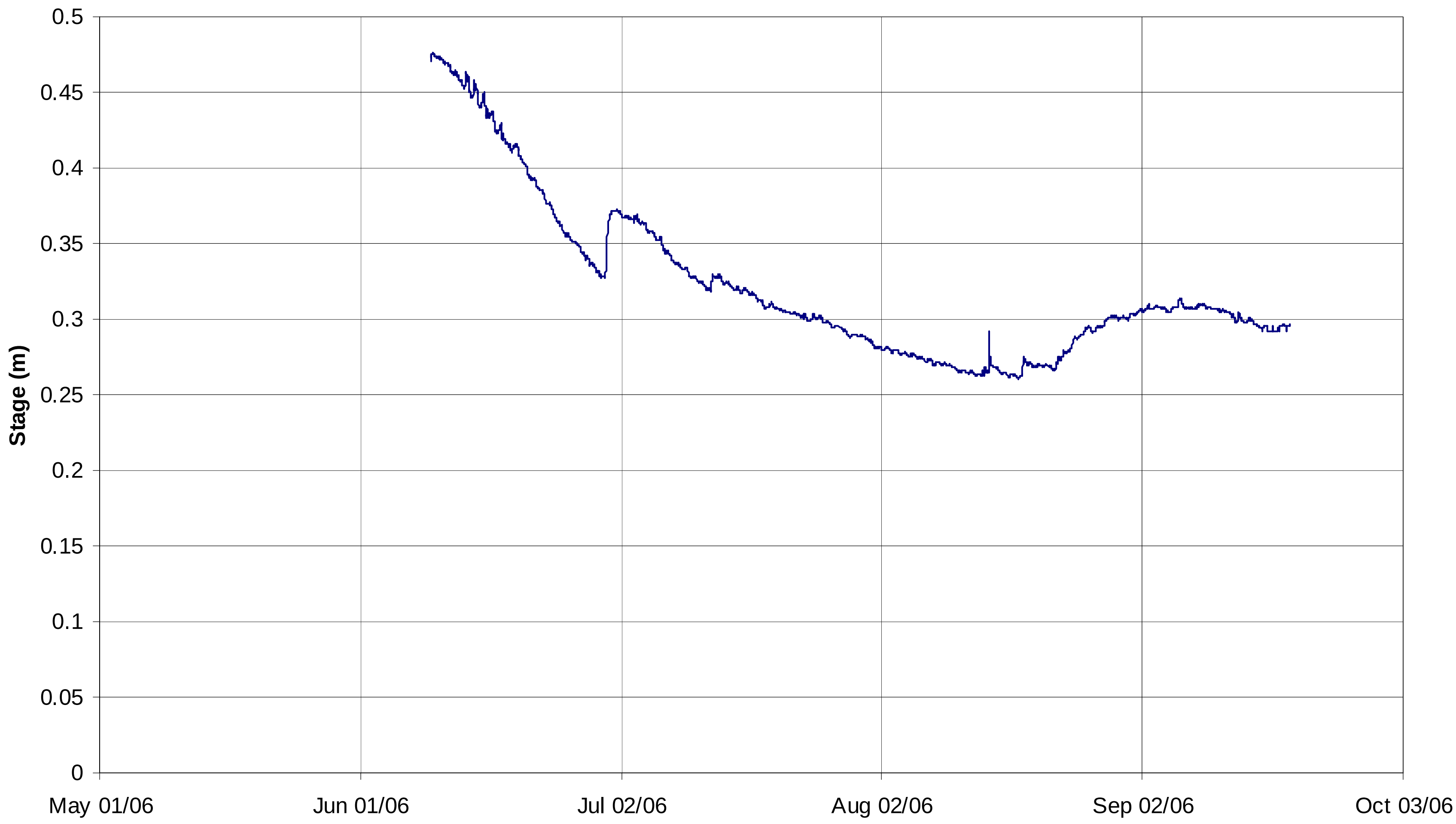
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION - JUNE 11, 2006
SITE #1 - NARROW LAKE OUTLET

FIG
2.1

FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Apr07_Report_Landscape_figures.ppt



HAY & COMPANY CONSULTANTS

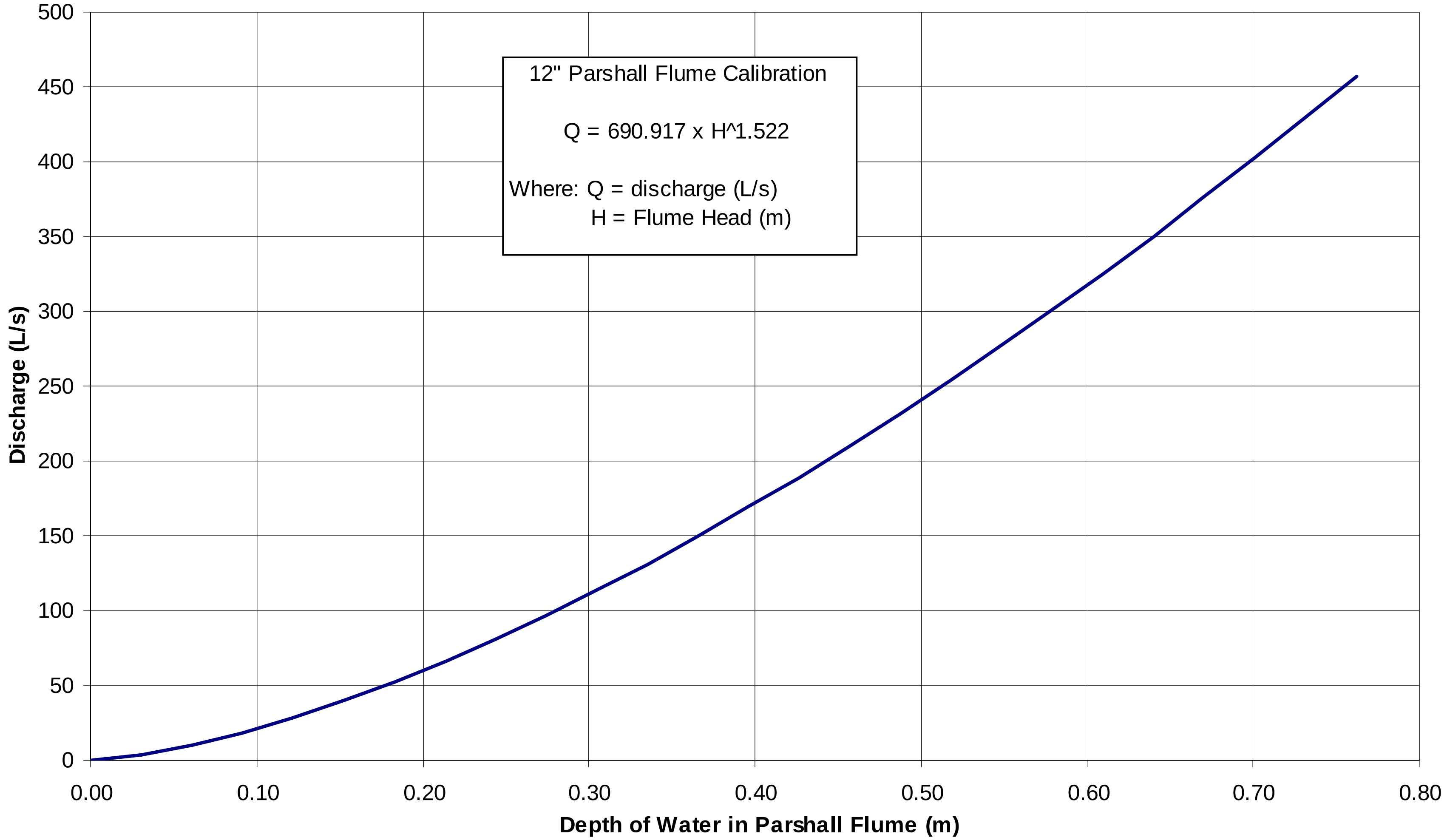
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TIME HISTORY OF STAGE
SITE #1 - NARROW LAKE OUTLET

FIG.
2.2

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_1-Narrow\2006



HAY & COMPANY CONSULTANTS

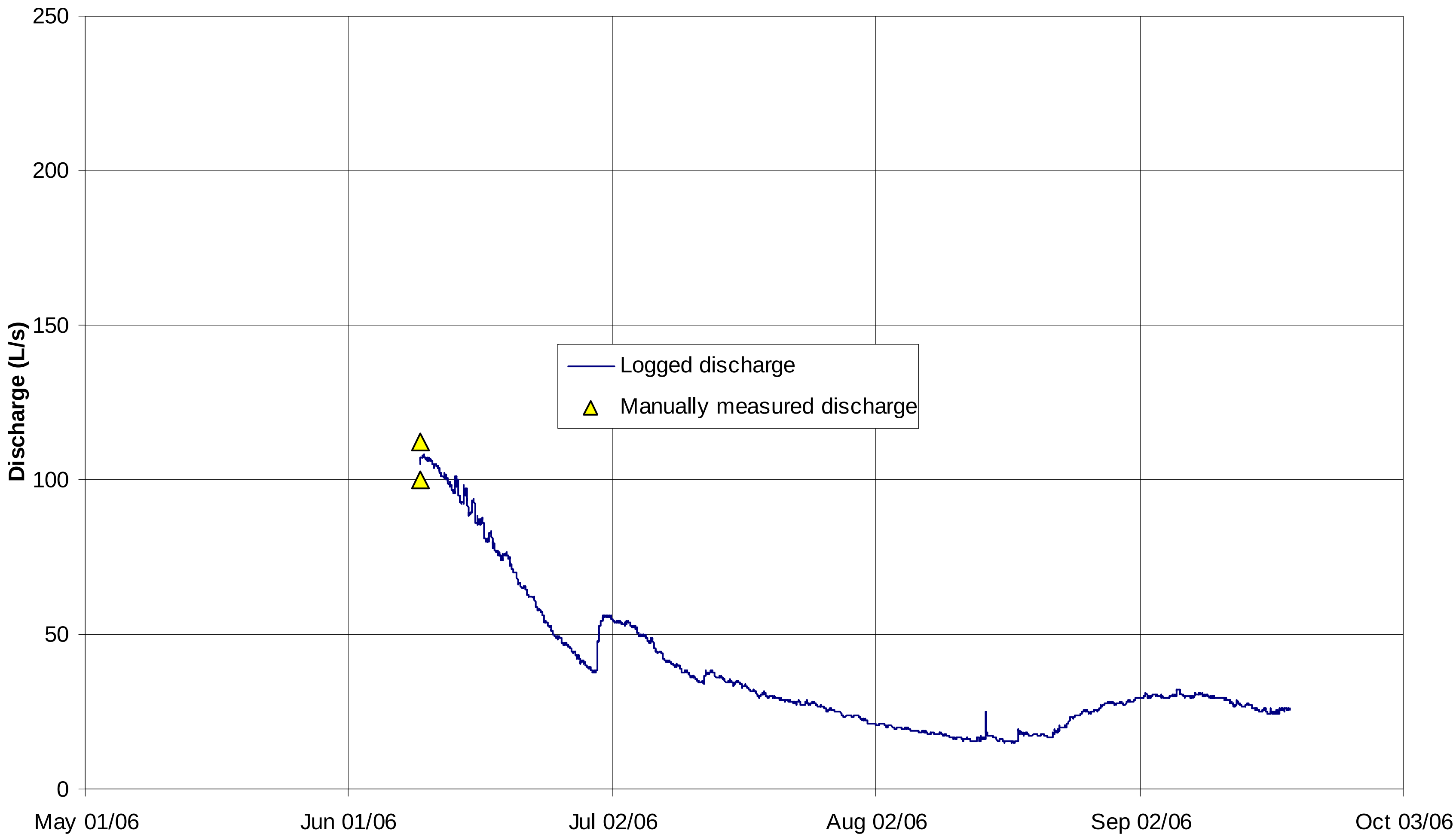
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

12" PARSHALL FLUME CALIBRATION
SITE #1 - NARROW LAKE OUTLET

FIG. 2.3

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_1-Narrow\2006



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TIME HISTORY OF DISCHARGE
SITE #1 - NARROW LAKE OUTLET

FIG.
2.4

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_1-Narrow\2006

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AERIAL VIEW OF SITE #3
WINTER LAKE OUTLET

FIG. 2.5

FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Apr07_Report_portrait_figures.ppt

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION - JUNE 9, 2006
SITE #3 - WINTER LAKE OUTLET

FIG 2.6

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt

HAY & COMPANY CONSULTANTS

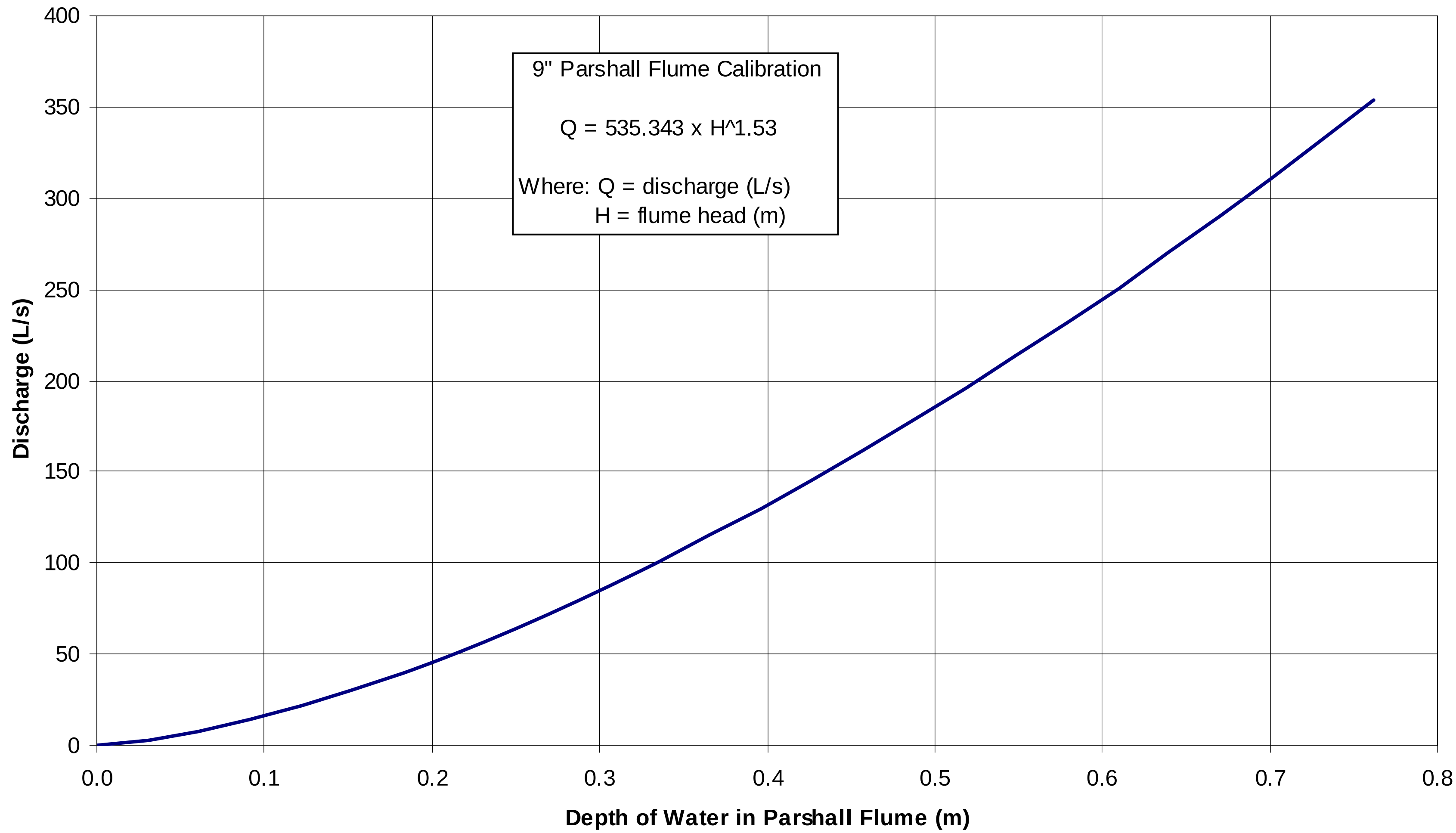
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TIME HISTORY OF STAGE
SITE #3 - WINTER LAKE OUTLET

FIG. 2.7

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_3-Winter\2006



HAY & COMPANY CONSULTANTS

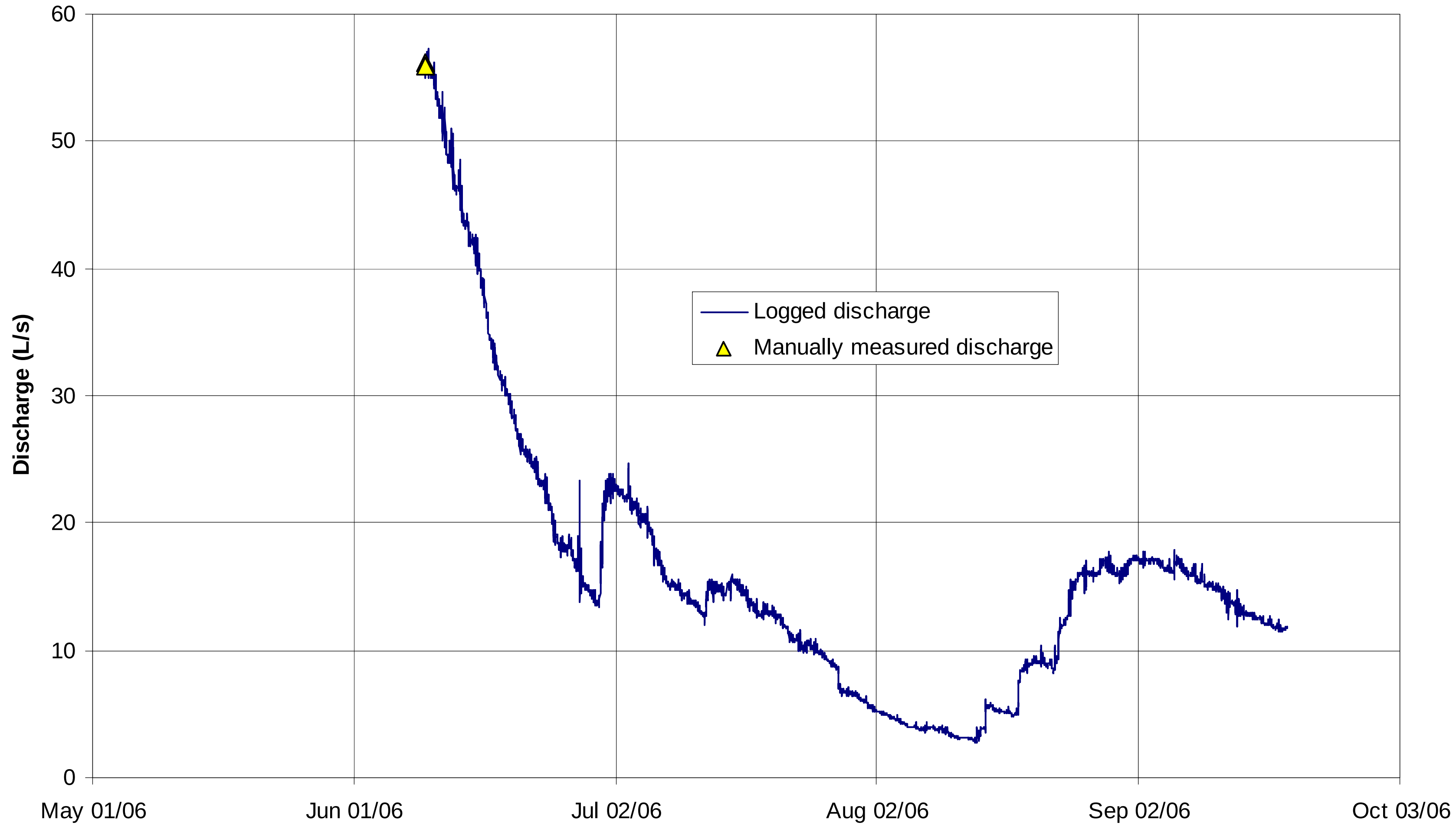
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

9" PARSHALL FLUME CALIBRATION
SITE #3 - WINTER LAKE OUTLET

FIG. 2.8

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_3-Winter\2006



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TIME HISTORY OF DISCHARGE
SITE #3 - WINTER LAKE OUTLET

FIG.
2.9

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_3-Winter\2006

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AERIAL VIEW OF SITE #4
ROUND LAKE OUTLET

FIG
2.10

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt

HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

HYDROMETRIC STATION JUNE 9, 2006
SITE #4 - ROUND LAKE OUTLET

FIG
2.11

FILE: J:\1740180_Yellowknife_Gold\working\RED\Streamflow\Apr06_Report_Landscape_figures.ppt

HAY & COMPANY CONSULTANTS

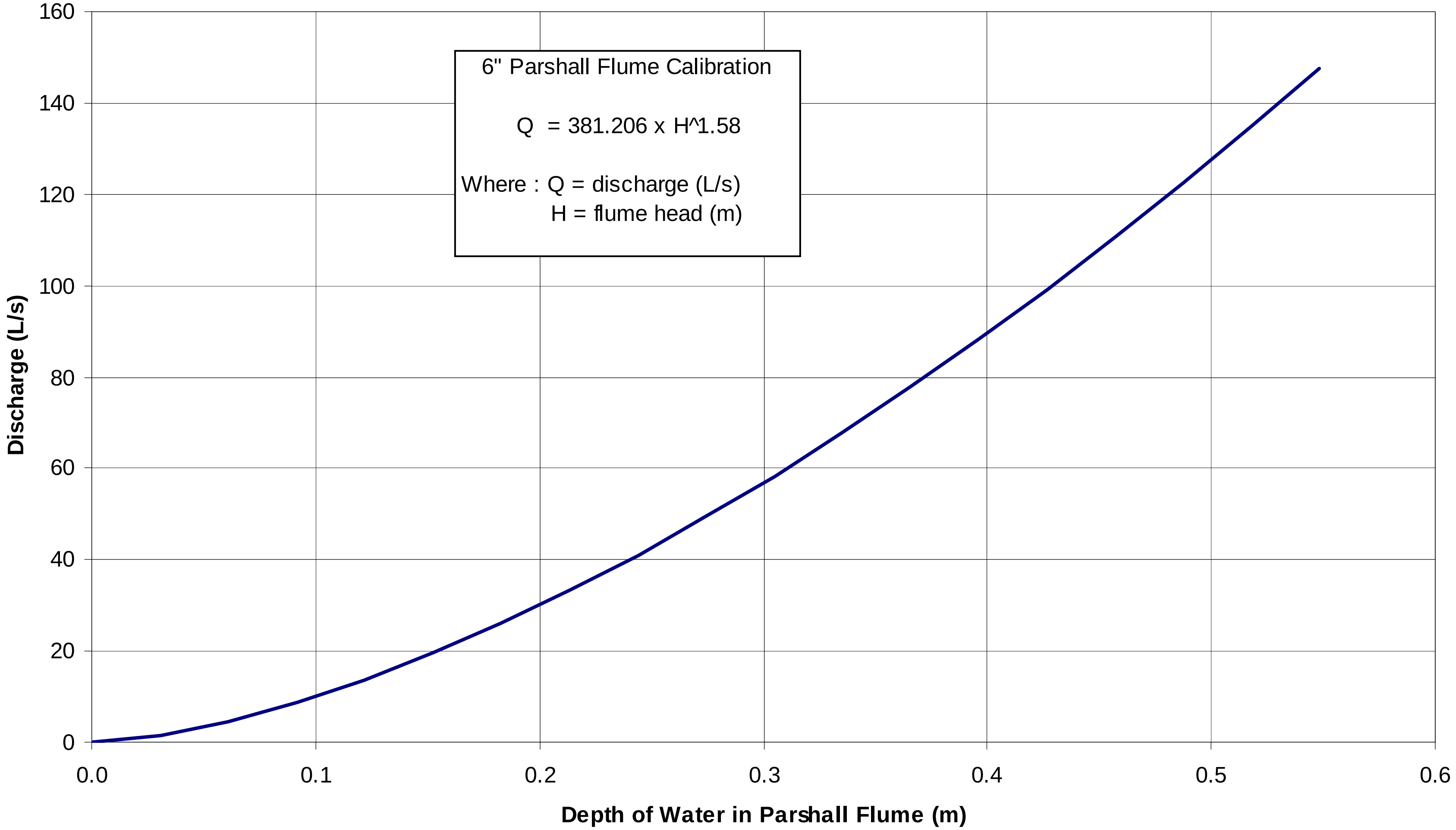
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TIME HISTORY OF STAGE
SITE #4 - ROUND LAKE OUTLET

FIG. 2.12

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_4-Round\2006



HAY & COMPANY CONSULTANTS

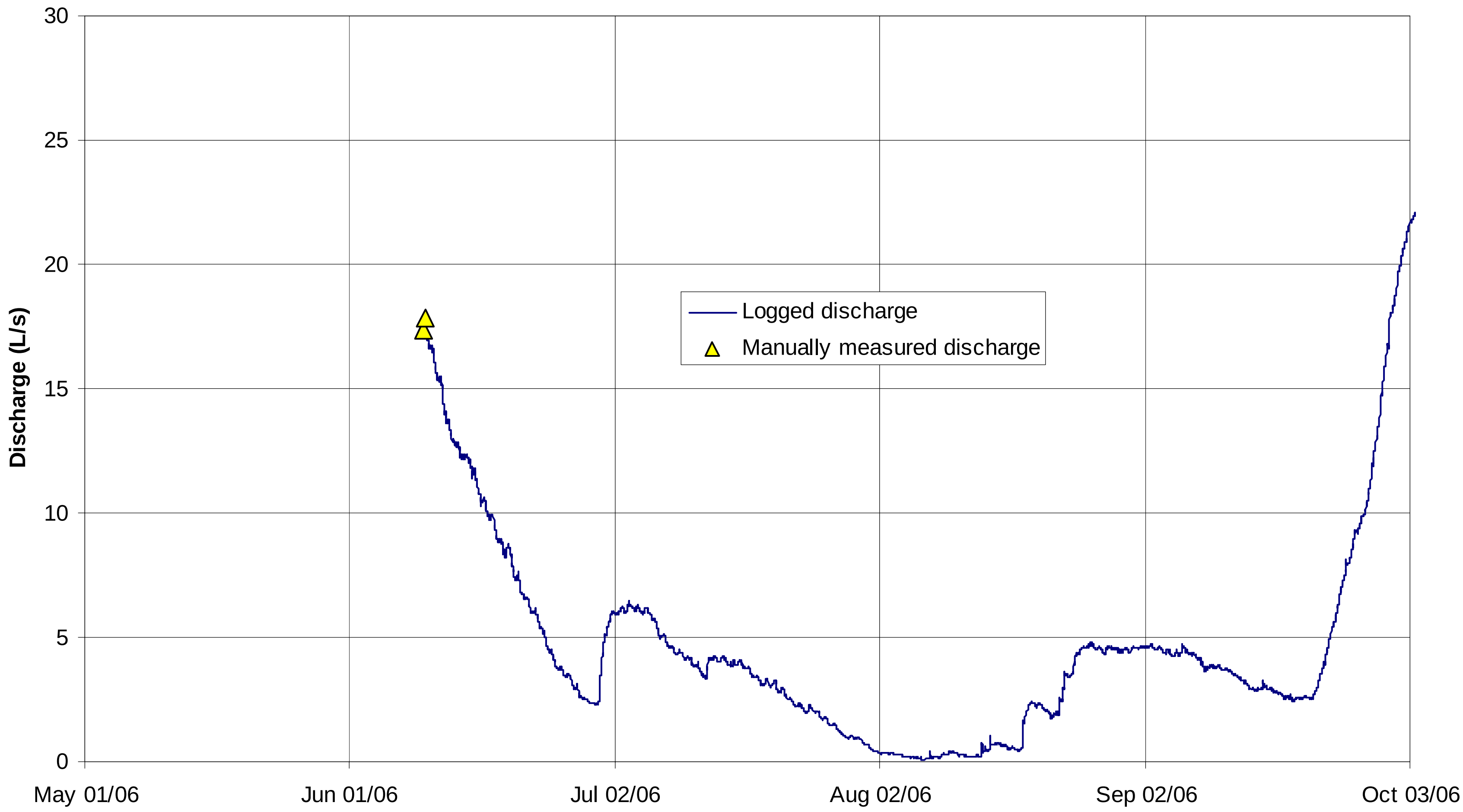
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

6" PARSHALL FLUME CALIBRATION
SITE #4 - ROUND LAKE OUTLET

FIG. 2.13

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_4-Round\2006



HAY & COMPANY CONSULTANTS

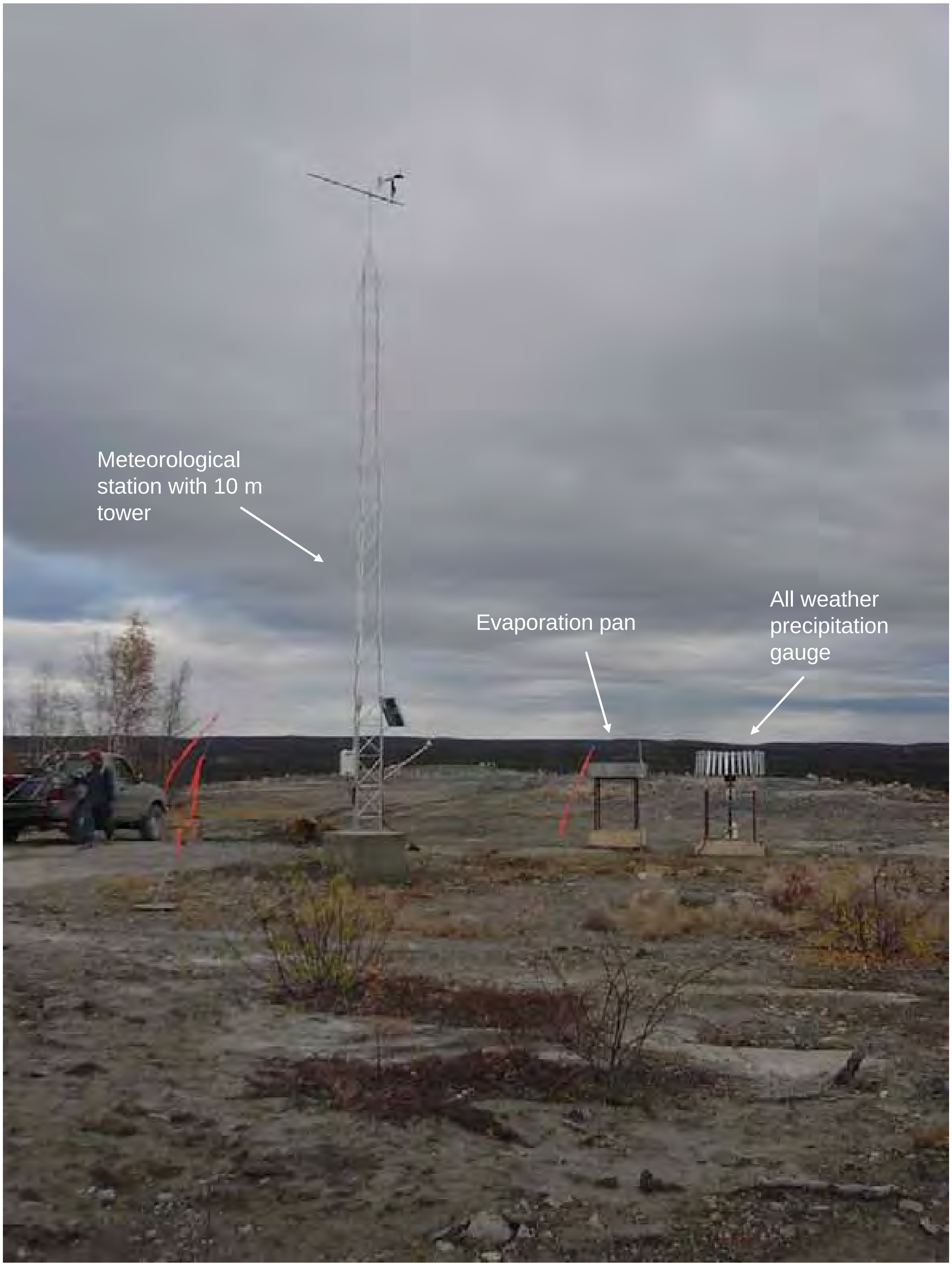
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TIME HISTORY OF DISCHARGE
SITE #4 - ROUND LAKE OUTLET

FIG. 2.14

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Hydrology\Site_4-Round\2006



HAY & COMPANY CONSULTANTS

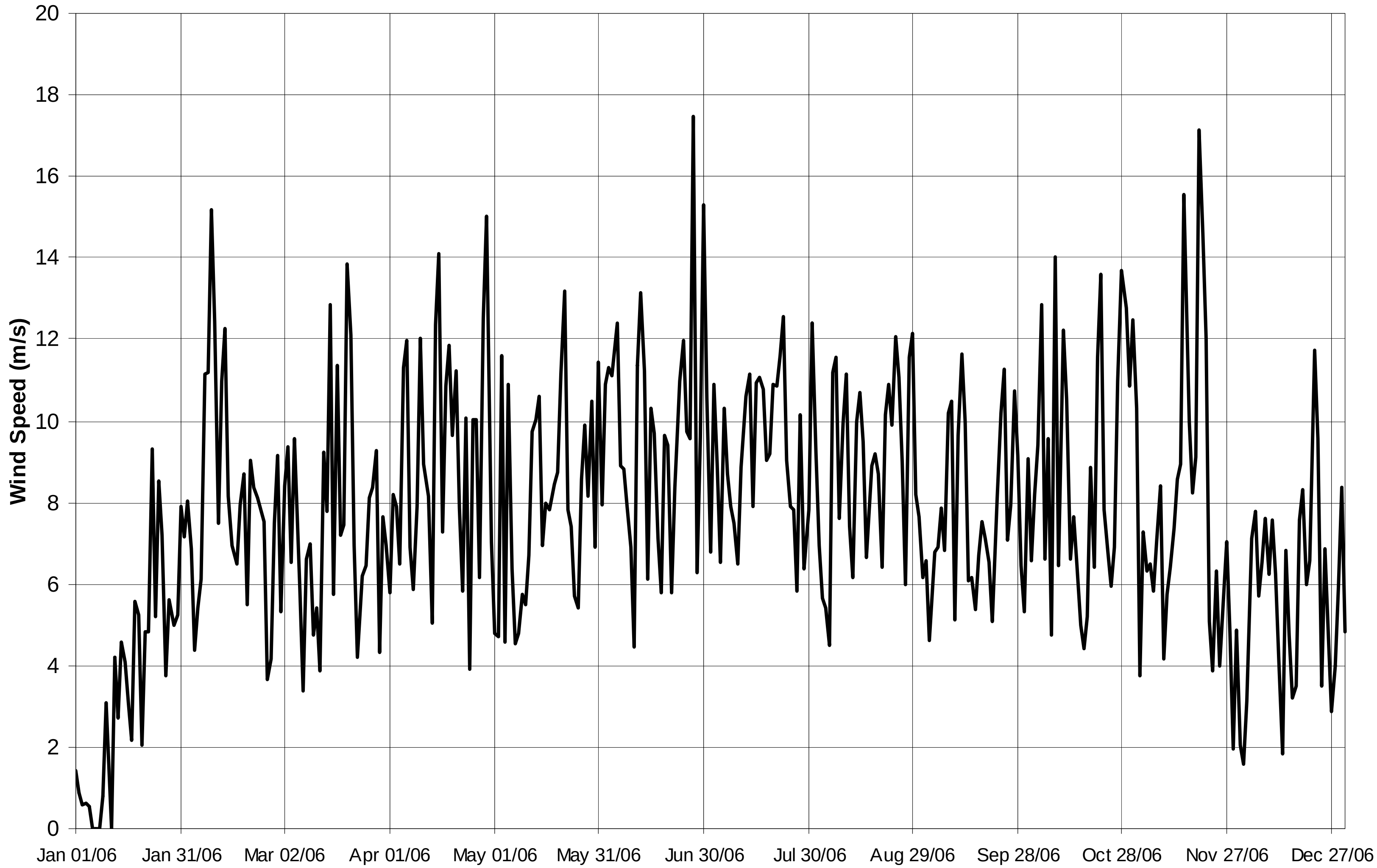
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

VIEW OF SITE # 7 - TYHEE METEOROLOGICAL STATION

FIG. 3.0

FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Apr07_Report_portrait_figures.ppt



HAY & COMPANY CONSULTANTS

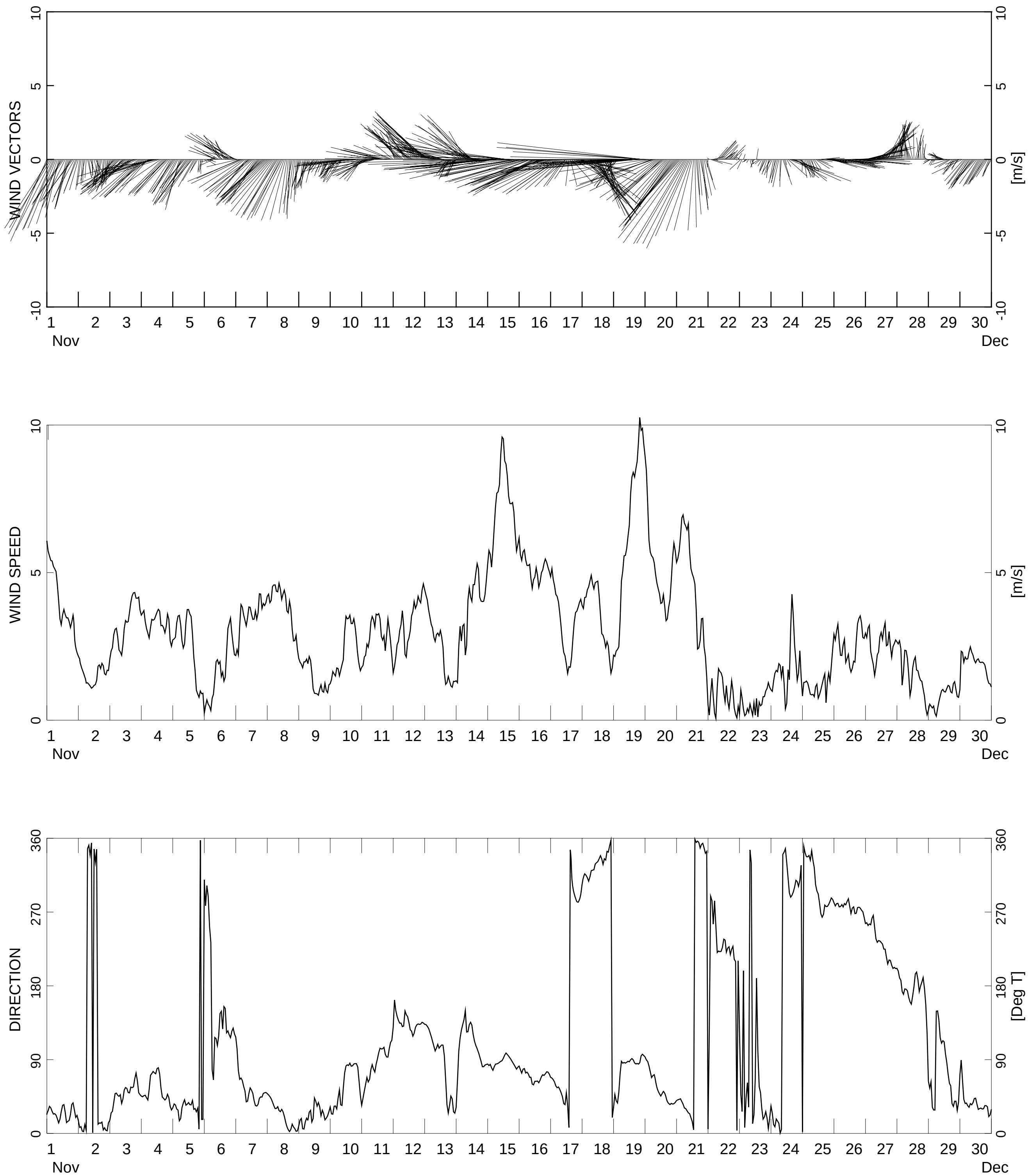
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 DAILY MAXIMUM RECORDED WIND SPEED
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG.
3.1

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology



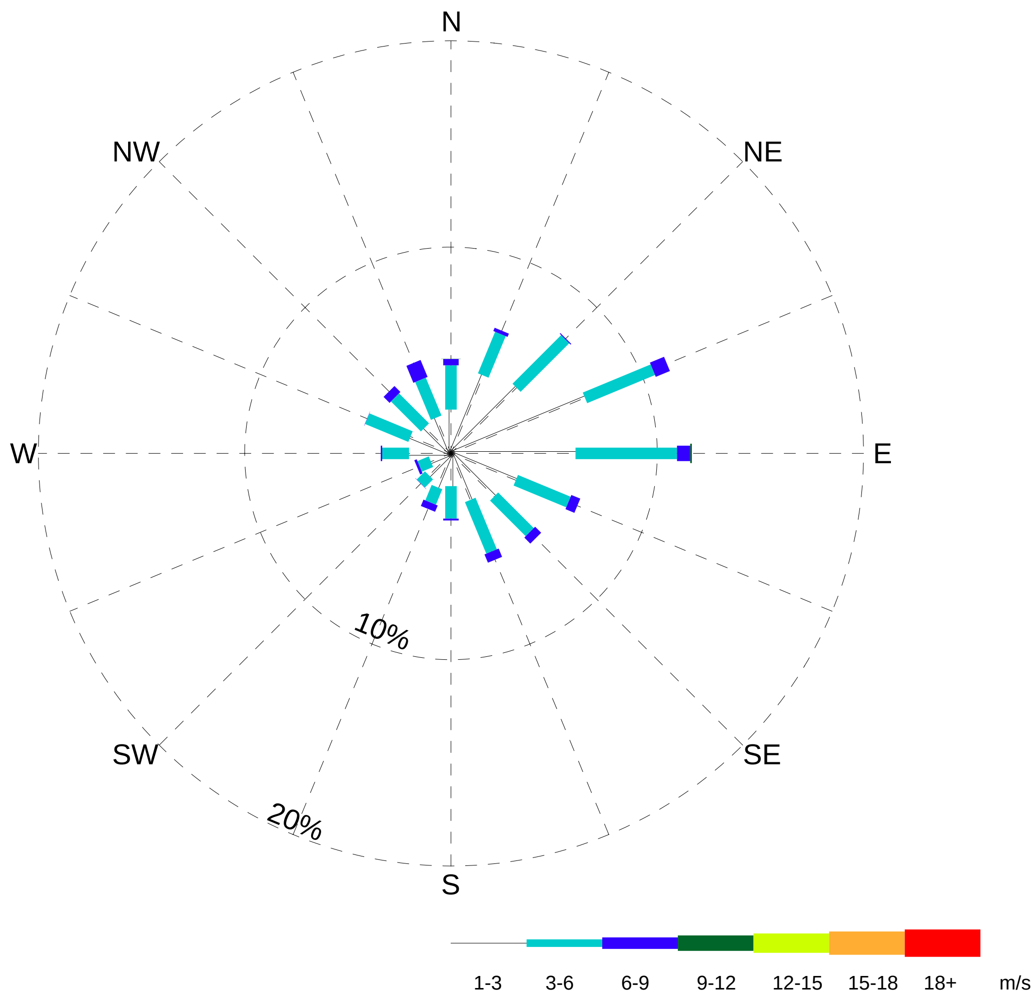
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

NOV. 2006 WINDS
SITE #7 TYHEE STATION

FIG. 3.2



Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 365 days

Start Date: Jan. 1, 2006

End Date: Dec. 31, 2006

Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	7.03	3.56	0.74	-	-	-	-	11.34
NE	-	4.50	3.33	0.05	-	-	-	-	7.88
NNE	-	4.09	2.18	0.17	-	-	-	-	6.44
N	-	2.12	2.15	0.31	0.01	-	-	-	4.59
NNW	-	1.87	1.99	0.89	-	-	-	-	4.75
NW	-	1.78	2.06	0.41	-	-	-	-	4.25
WNW	-	2.12	2.27	0.01	-	-	-	-	4.41
W	-	2.03	1.30	0.07	-	-	-	-	3.40
WSW	-	1.05	0.59	0.13	-	-	-	-	1.77
SW	-	1.51	0.56	0.01	-	-	-	-	2.08
SSW	-	1.77	0.81	0.33	-	-	-	-	2.91
S	-	1.59	1.58	0.09	-	-	-	-	3.25
SSE	-	2.44	2.70	0.43	-	-	-	-	5.58
SE	-	2.96	2.44	0.41	-	-	-	-	5.81
ESE	-	3.40	2.76	0.47	-	-	-	-	6.63
E	-	6.04	4.92	0.64	0.08	-	-	-	11.68
Calm	13.24	-	-	-	-	-	-	-	13.24
Total (%)	13.24	46.30	35.21	5.16	0.09	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

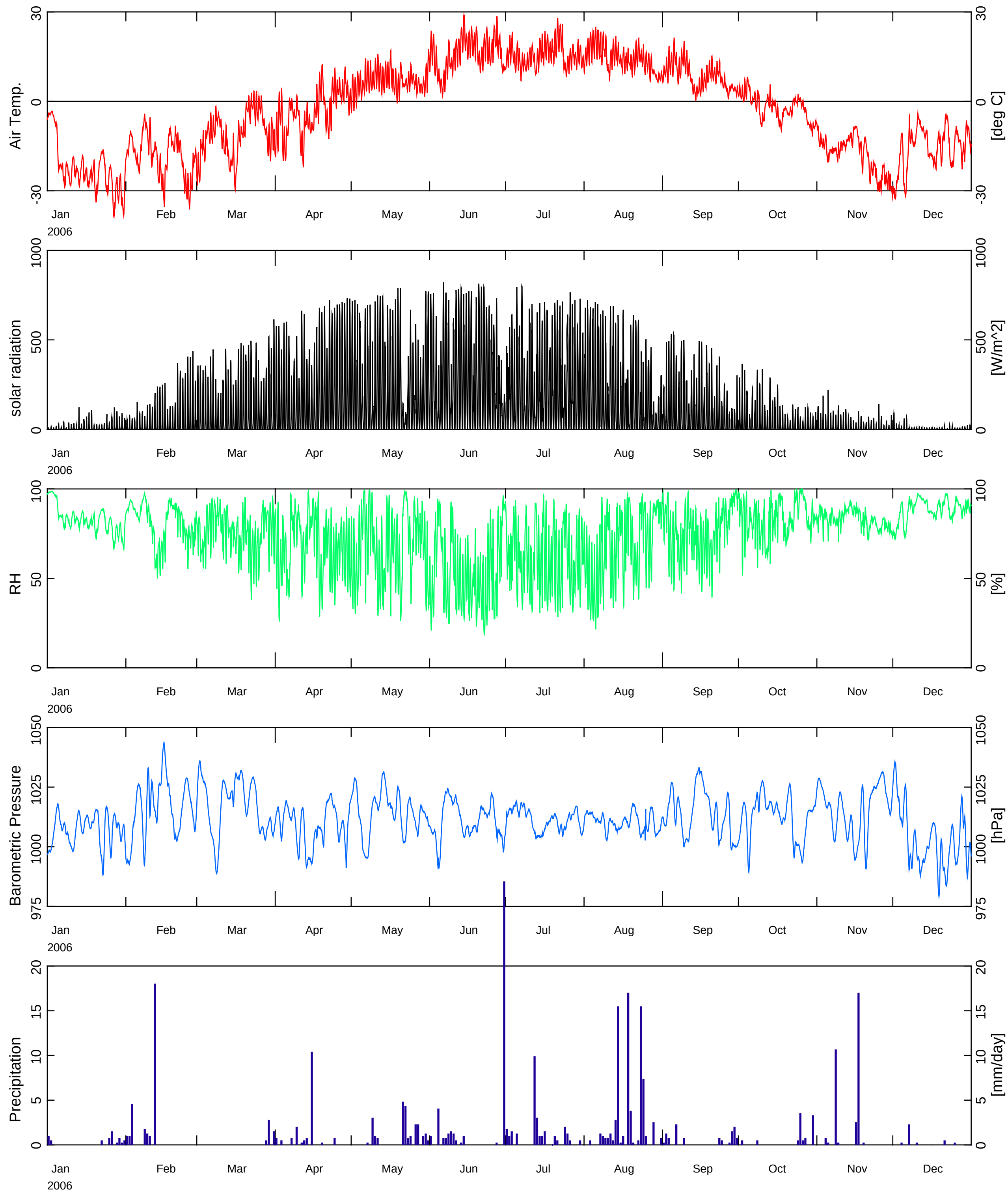
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. 3.3

Thu Apr 12 09:01:36 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\Wind_roses



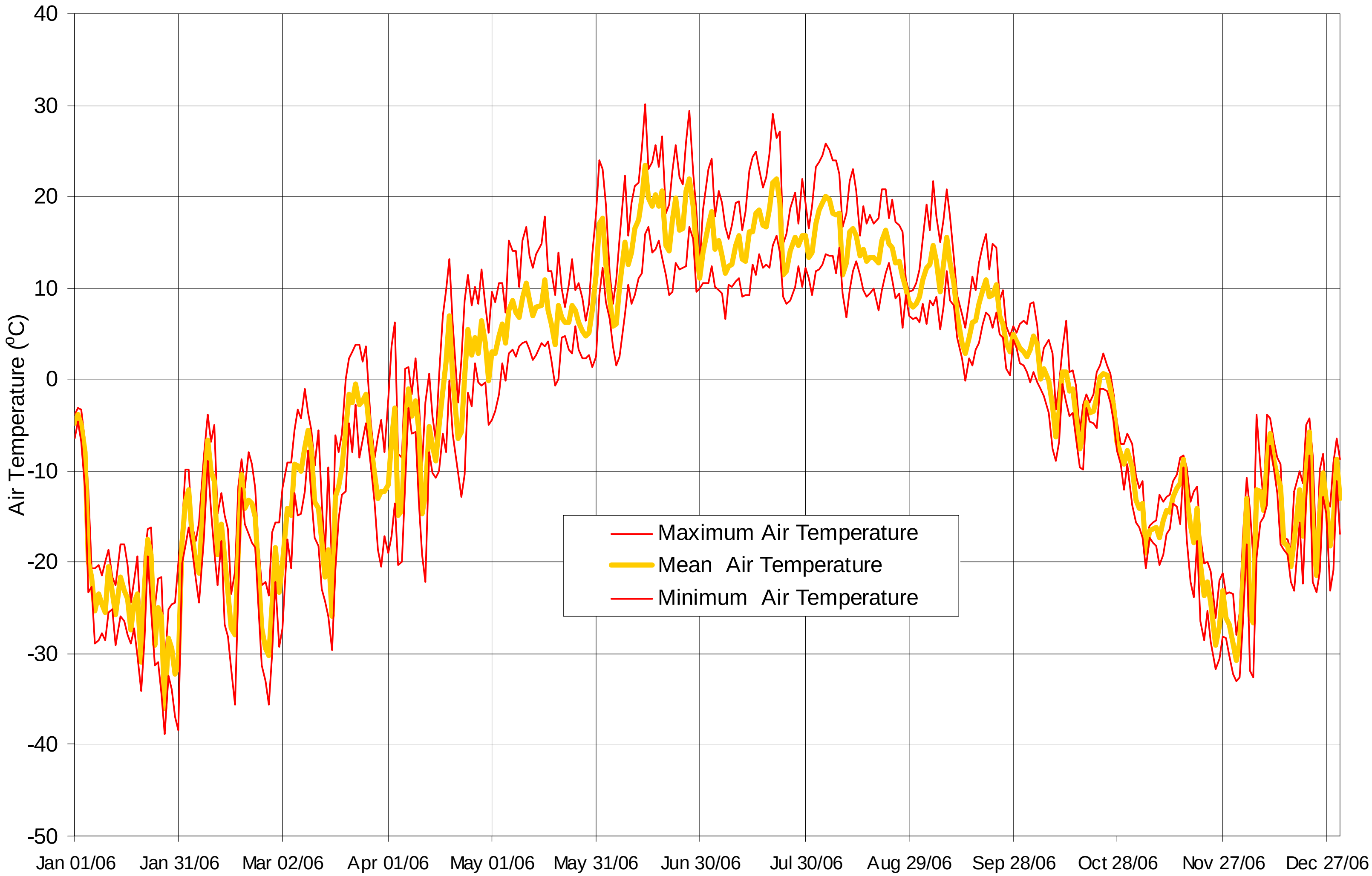
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 WEATHER SUMMARY
SITE #7 TYHEE STATION

FIG. 3.4



HAY & COMPANY CONSULTANTS

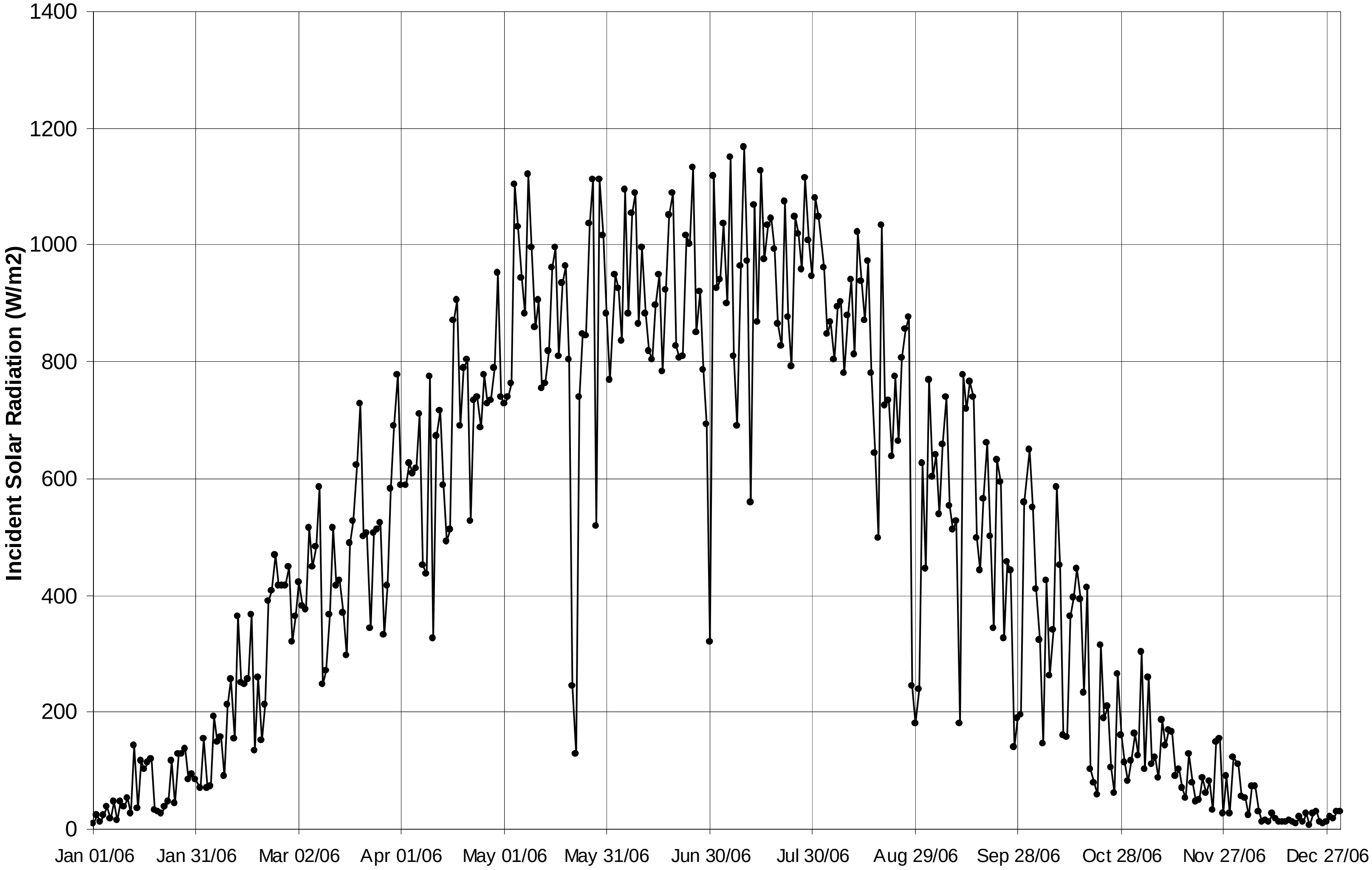
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 DAILY MAX, MIN AND MEAN AIR TEMPERATURE
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG. 3.5

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology



HAY & COMPANY CONSULTANTS

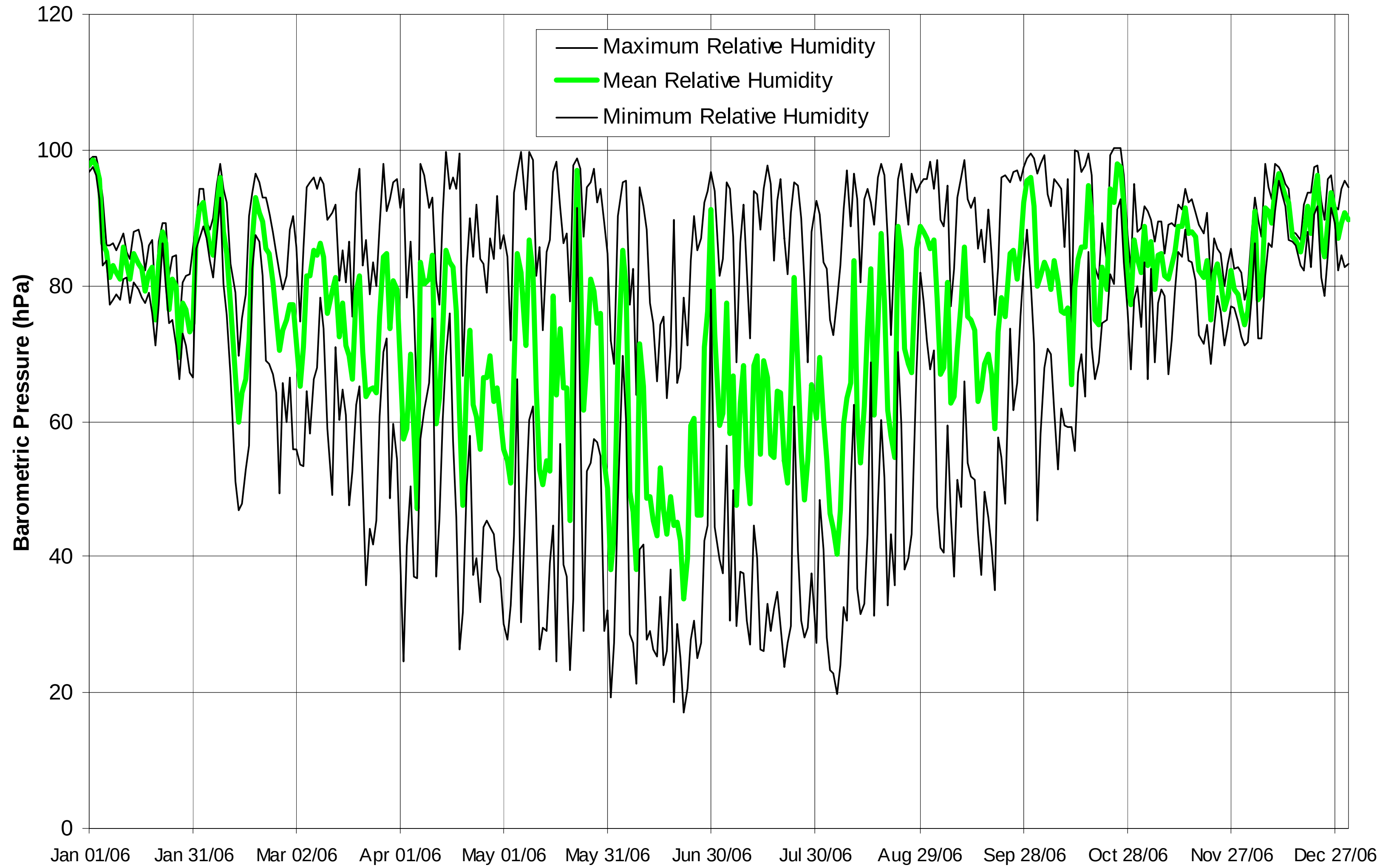
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 MAXIMUM DAILY INCIDENT SOLAR RADIATION
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG. 3.6

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology



HAY & COMPANY CONSULTANTS

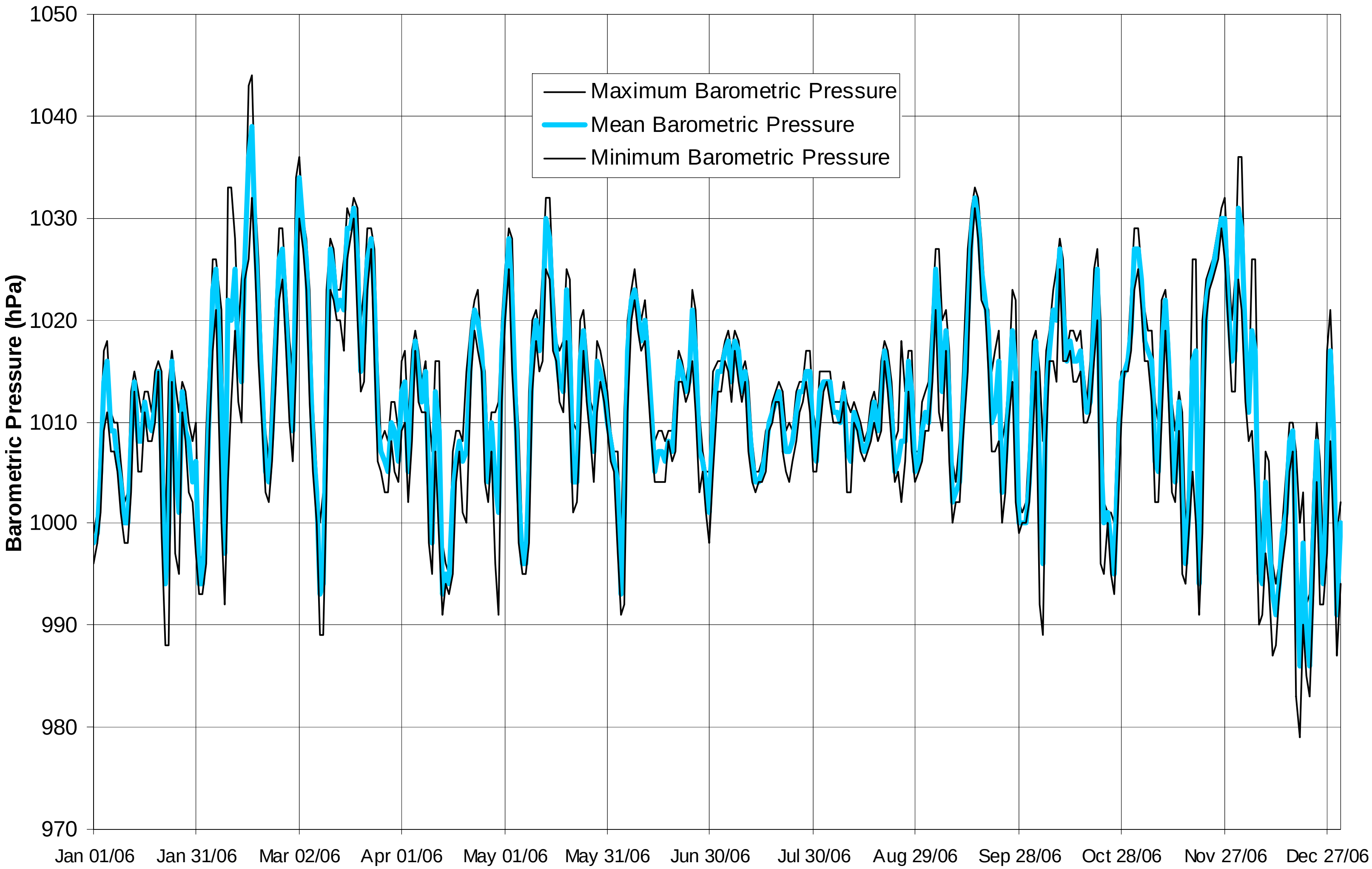
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 DAILY MAX, MIN AND MEAN RELATIVE HUMIDITY
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG.
3.7

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology



HAY & COMPANY CONSULTANTS

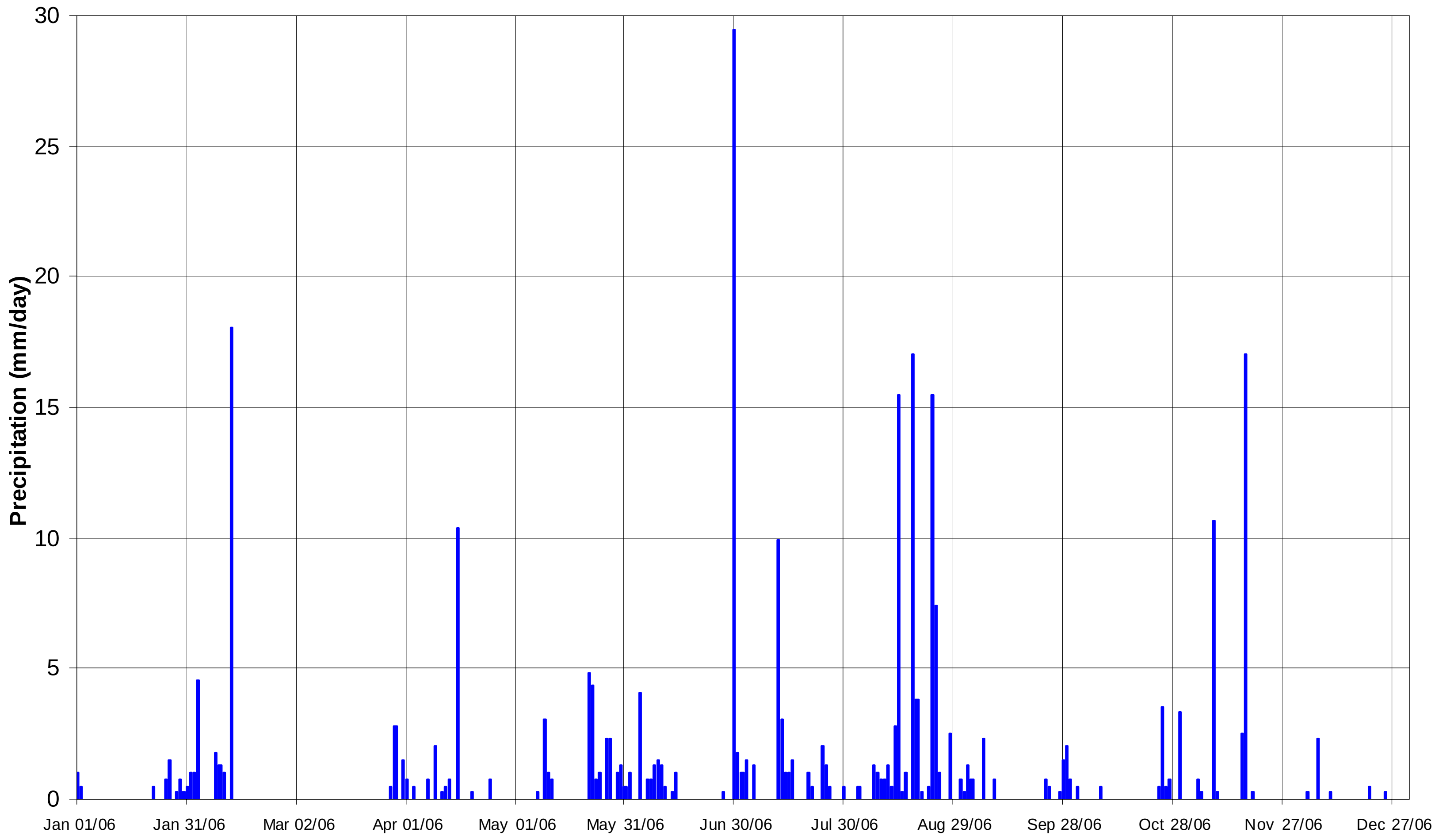
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 DAILY MAX, MIN AND MEAN BAROMETRIC PRESSURE
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG.
3.8

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology



HAY & COMPANY CONSULTANTS

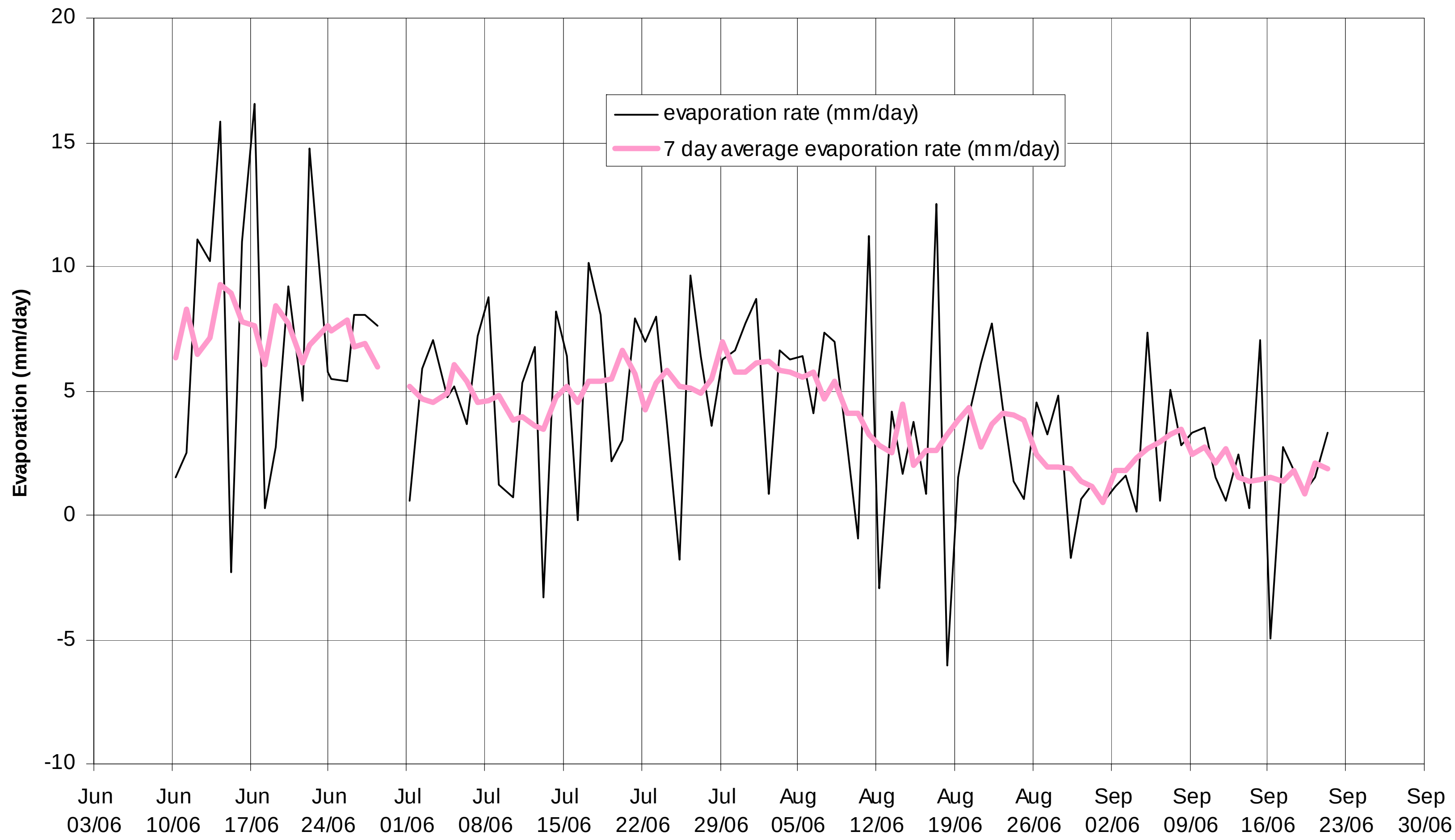
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 TOTAL DAILY WATER EQUIVALENT PRECIPITATION
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG. 3.9

EXCEL FILE: Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

2006 DAILY PAN EVAPORATION RATES
SITE #7 - TYHEE METEOROLOGICAL STATION

FIG. 3.10

EXCEL FILE: Q:\Vancouver\Data\0804-water\Projects\1740180_Yellowknife_Gold\working\RED\Evaporation\Pan_Evaportation\Pan_Evap_summary.xls

APPENDIX

APPENDIX A SITE DESCRIPTIONS

Site Identification: **Site: #1** **Name: Narrow Lake Outlet**

Site GPS NAD27 Coordinates: 113° 57' 18.4" West Longitude 63° 9' 15.0" North Latitude

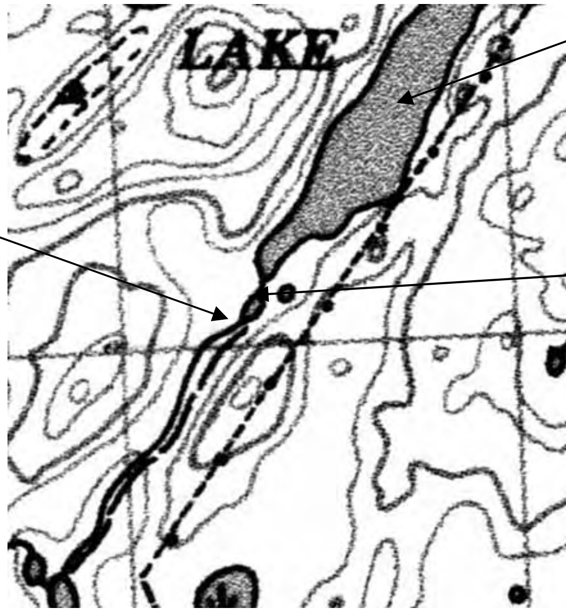
Site Location:
The station is located on the southwest end of Narrow Lake. It is about 10 m north of the winter road at the junction of the creek with the road. There are two small creeks, which flow out of Narrow Lake. Both creeks enter a small pond. A single creek flows out of this pond and for the first 50 m the flow is along a well-defined channel. The Narrow Lake outlet hydrometric Site #1 is located in this channel about 10 m downstream of the pond.

Description:
Two creeks flow southwest from Narrow Lake and merge again into a small pond. A single creek flows out of the southwest side of the pond. The creek bed is about 0.5 m below the typical bank elevation and is typically about 1 to 3 m in width. After approximately 100 m of defined creek channel, the channel disappear and the creek flow is diffuse in nature and in general meanders through stunted growth of birch, pine trees, willow shrubs and long grass.

Instrumentation:
A hydrometric station is installed at this site. The station includes a Parshall Flume and a continuous recording river stage logger and water level sensor. A staff gauge and creek discharge gauging station are located just upstream of the Parshall Flume.

Specifics on Measurements:

2434006	Pressure transducer / data logger serial number
12.00	(inches) Parshall Flume throat diameter
0.046	(psi) Parshall Flume transducer well offset
0.100	(psi) Transducer zero offset
690.917	Flume calibration algorithm multiplier
1.522	Flume calibration algorithm exponent



Site #1: Map

Site #1: Aerial view looking upstream to the northeast to Narrow Lake

Site #1: Hydrometric gauging station with installed Parshall flume

Site Identification: **Site: #3** **Name: Winter Lake Outlet**

Site GPS NAD27 Coordinates: 113° 55’ 51.2” West Longitude 63° 10’ 3.8” North Latitude

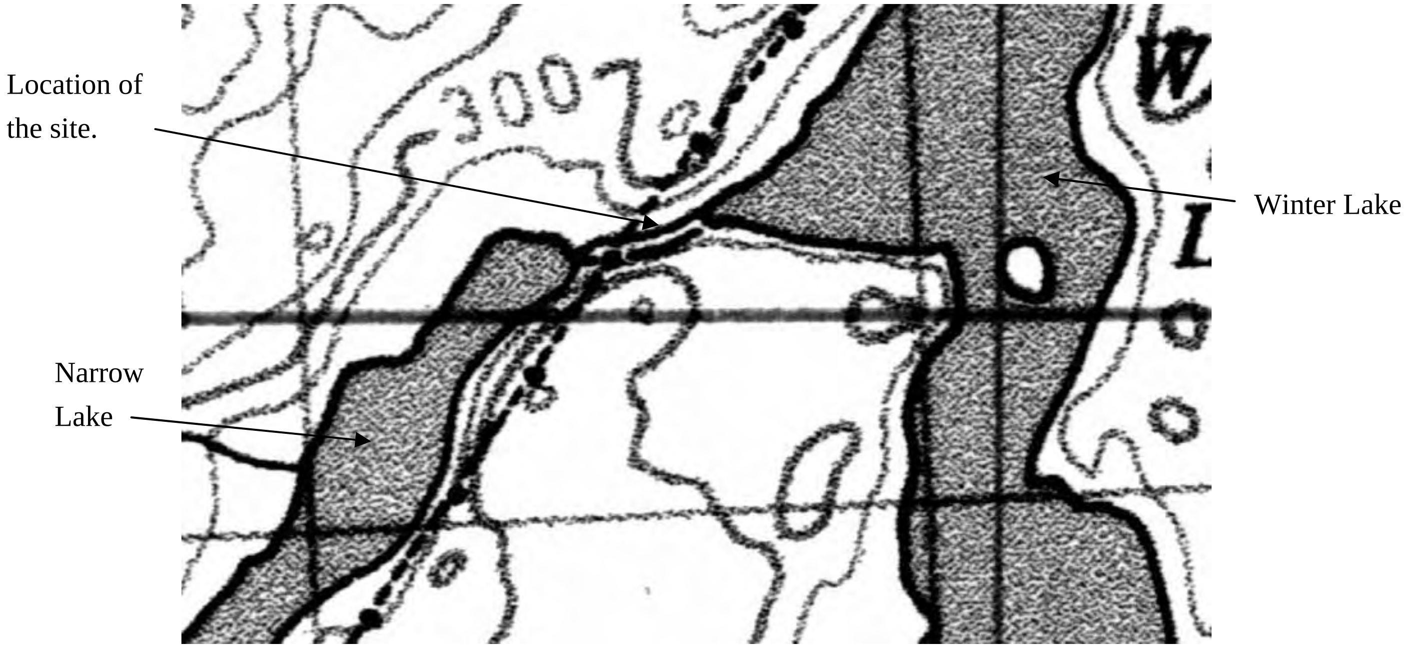
Site Location:
The site is located between Narrow Lake to the southwest and Winter Lake to the northeast. The Winter Lake outlet is located on the northwest portion of Winter Lake about 10 m to the south of the winter road. The hydrometric station is located 60 m downstream from the outlet.

Description:
The creek flows along the south side of the winter road to midway between Winter and Narrow Lakes. For this reach of the creek the channel is typically 30 to 60 cm wide by 15 to 20 cm deep. For the rest of the distance to Narrow Lake the creek flows along a poorly defined diffuse route down the winter road and discharges to Narrow Lake.

Instrumentation:
A hydrometric station is installed at this site. The station includes a Parshall flume and a continuous recording river stage logger and water level sensor. A creek discharge gauging station is located just downstream of the Parshall flume.

Specifics on Measurements:

2434007	pressure transducer / data logger serial number
9.00	(inches) Parshall Flume throat diameter
0.048	(psi) Parshall Flume transducer well offset
0.007	(psi) Transducer zero offset
535.343	Flume calibration algorithm multiplier
1.530	Flume calibration algorithm exponent



Site #3: Map

Site #3: Aerial view from Winter Lake looking southwest across site to Narrow Lake

Site #3: Hydrometric gauging station with installed Parshall flume

Site Identification: **Site: #4** **Name: Round Lake Outlet**

Site GPS Coordinates: 113° 54’ 49.7” West Longitude 63° 10’ 22.4” North Latitude

Site Location:

The site is located between Winter Lake to the southwest and Round Lake to the east. The station is located on the north side of the winter road, 75 m northeast from the point the winter road intersects Round Lake. The flow outlet is situated on the northwest side of the Round Lake.

Description:

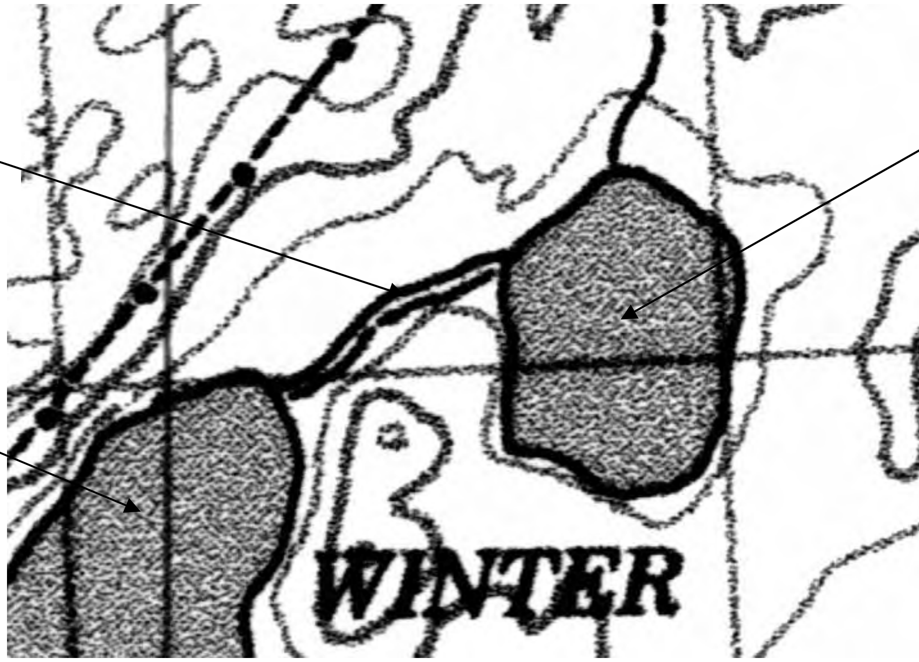
There is no distinct flow channel out of Round Lake but rather a diffuse flow through the muskeg into a small marsh approximately 5 m downstream from the lake. The outlet from this marsh flows southwest into Winter Lake, typically as a vadose flow, through the muskeg and willow shrubs. At one point, about 25 m southwest of the Round Lake outlet, the flow is contained in a single channel. The hydrometric station was installed here.

Instrumentation:

A hydrometric station is installed at this site. The station includes a Parshall flume and a continuous recording river stage logger and water level sensor. A staff gauge and creek discharge gauging station are located just upstream of the Parshall flume.

Specifics on Measurements:

2516008	Pressure transducer / data logger serial number
6.00	(inches) Parshall Flume throat diameter
0.0494	(psi) Parshall Flume transducer well offset
0.069	(psi)Transducer zero offset
381.206	Flume calibration algorithm multiplier
1.580	Flume calibration algorithm exponent



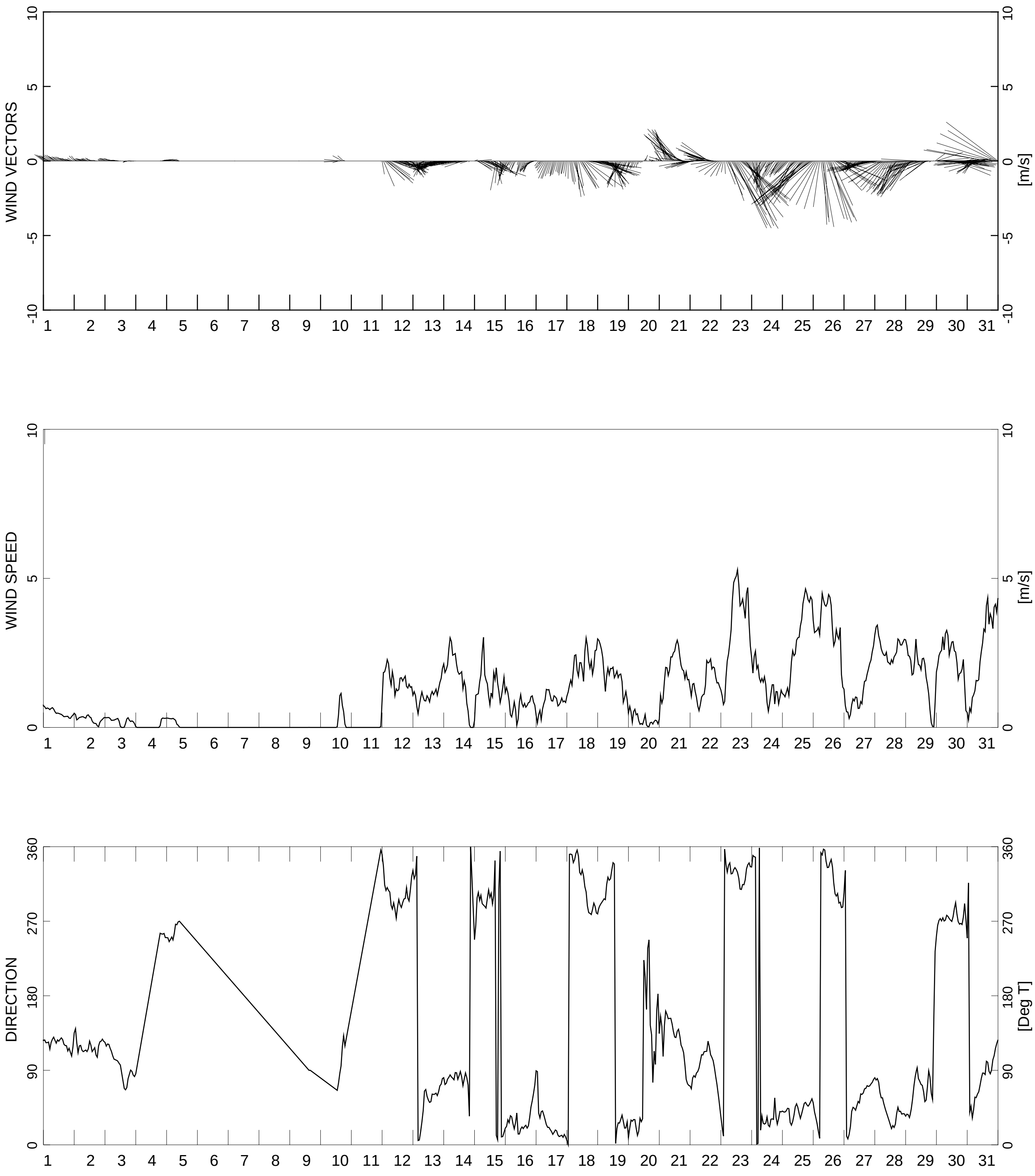
Site #4: Map

Site #4: Aerial view from Round Lake southwest across site to Winter Lake.

Site #4: Hydrometric Gauging Station With installed Parshall flume

APPENDIX

APPENDIX B MONTHLY WIND SUMMARIES – JANUARY 2006 TO DECEMBER 2006



HAY & COMPANY CONSULTANTS

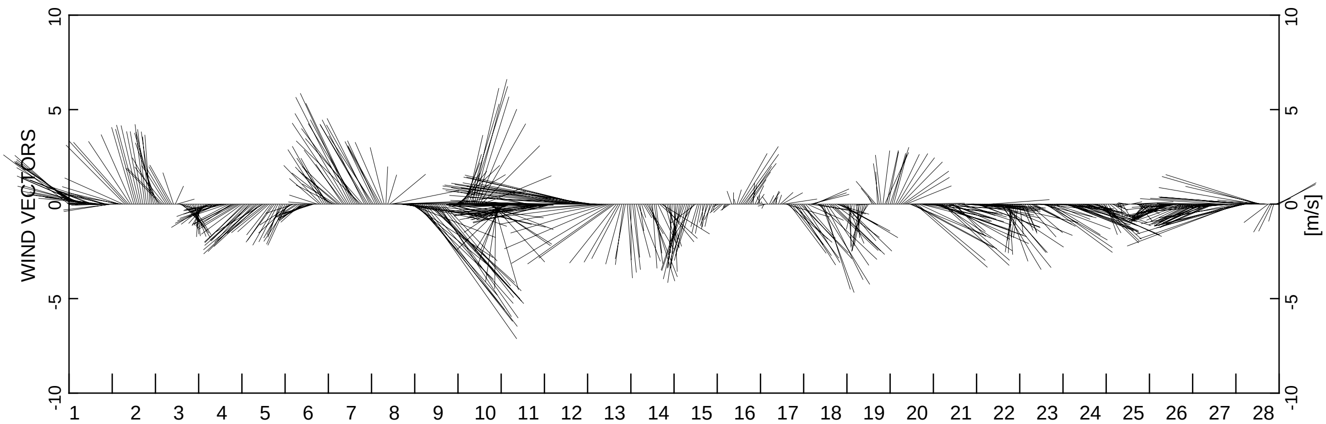
TYHEE NWT CORP.

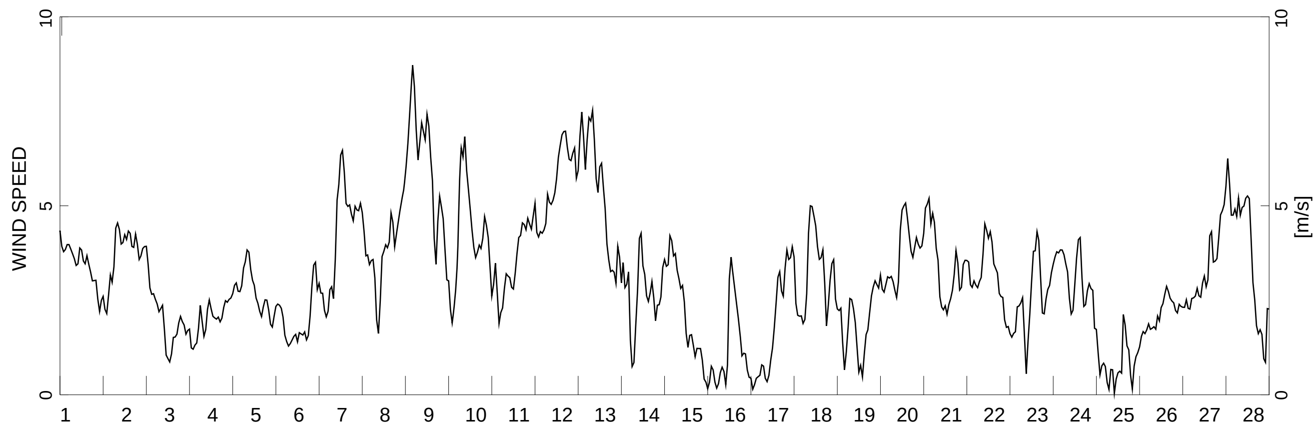
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

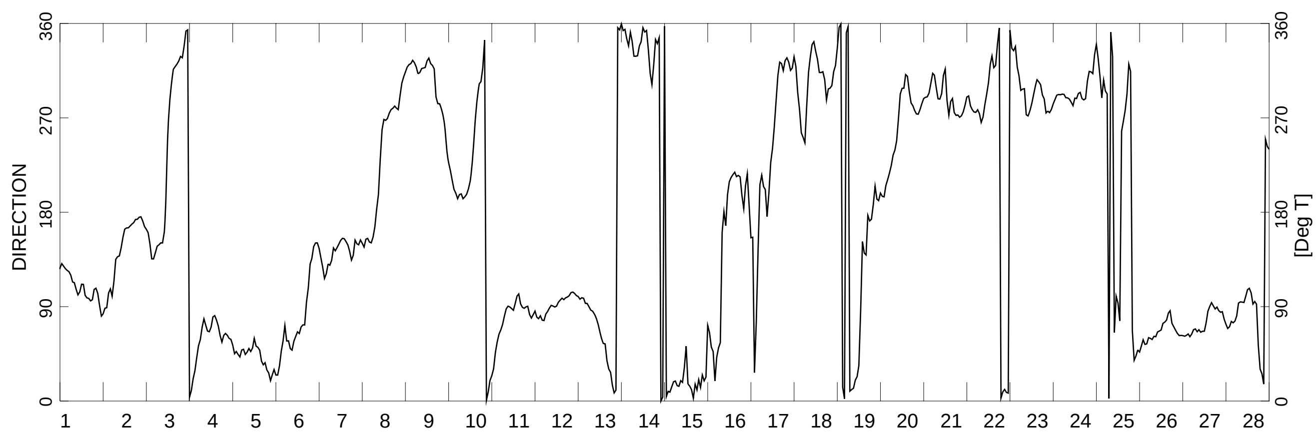
JAN. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-1

Thu Apr 12 08:49:37 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs







HAYCO HAY & COMPANY CONSULTANTS

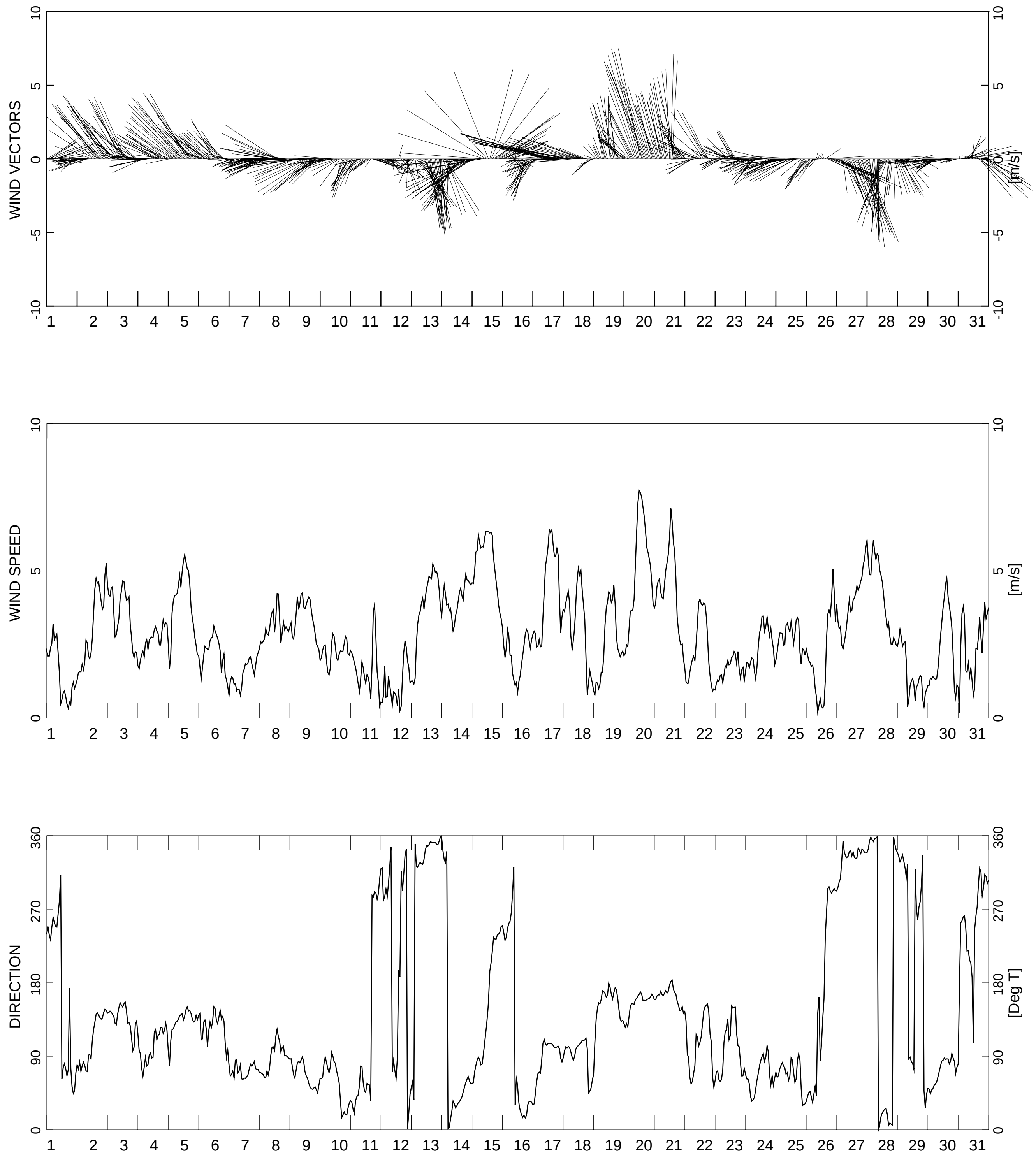
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

FEB. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-2

Thu Apr 12 08:49:39 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



HAY & COMPANY CONSULTANTS

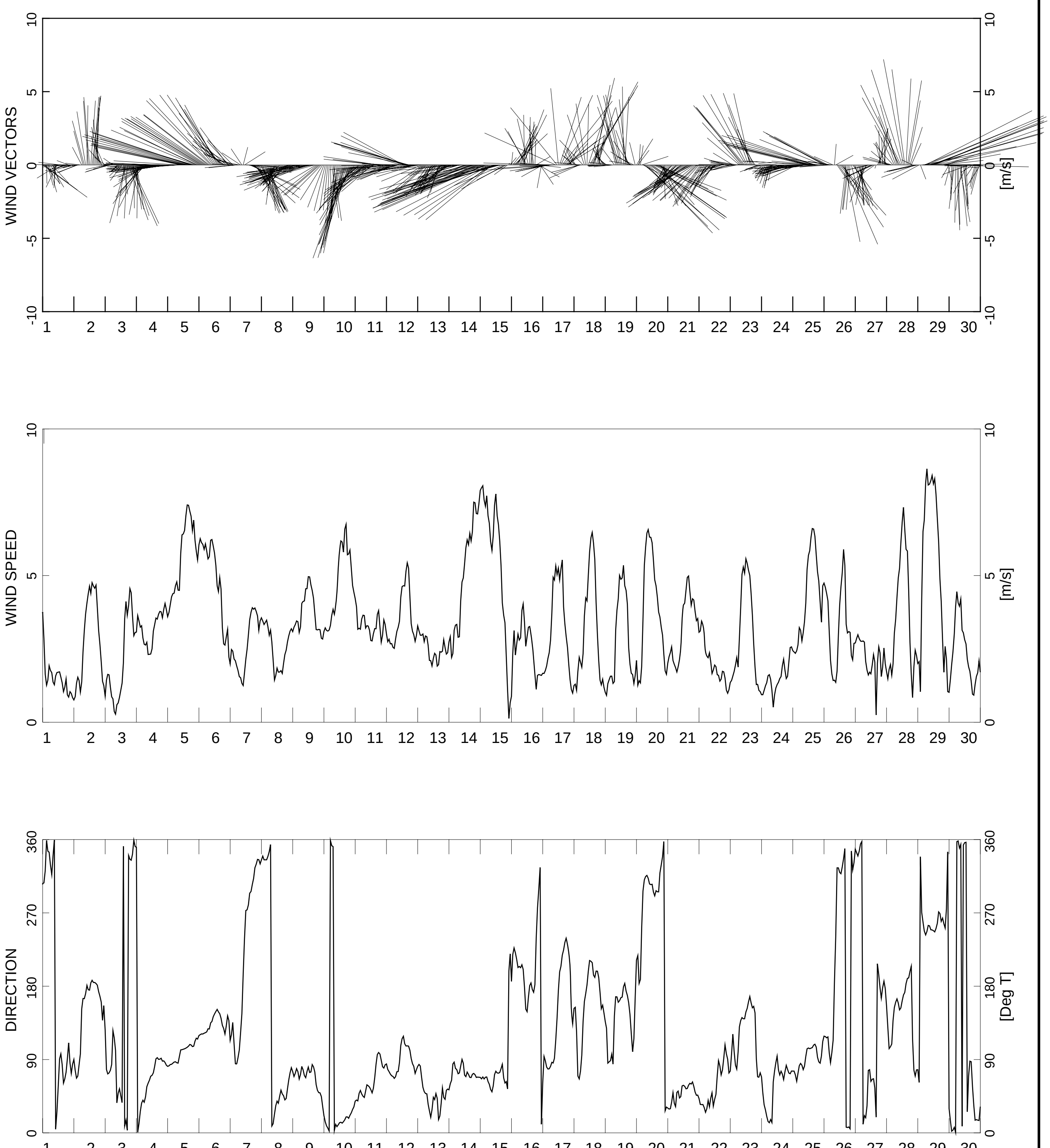
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

MAR. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-3

Thu Apr 12 08:49:41 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



HAY & COMPANY CONSULTANTS

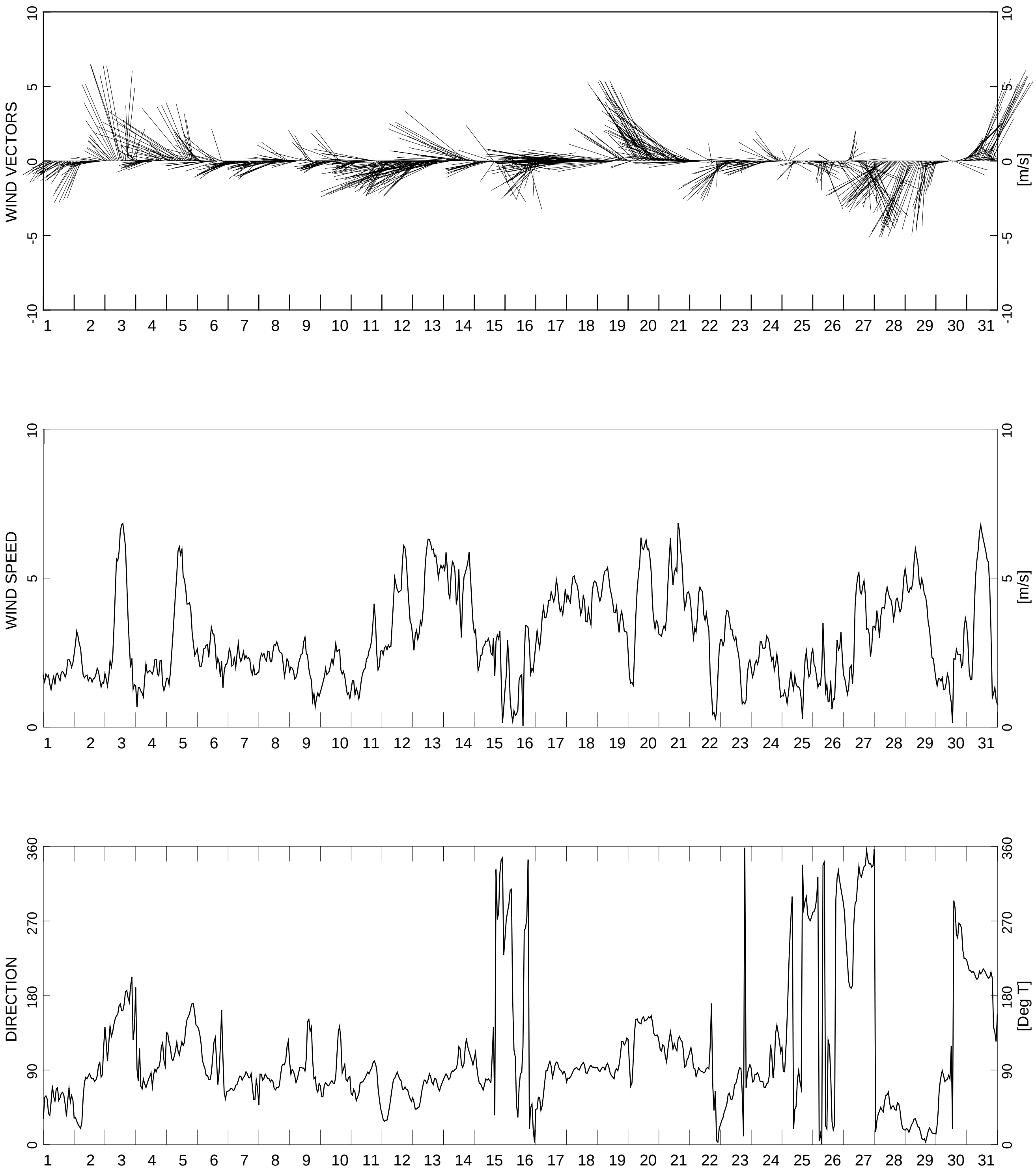
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

APR. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-4

Thu Apr 12 08:49:43 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



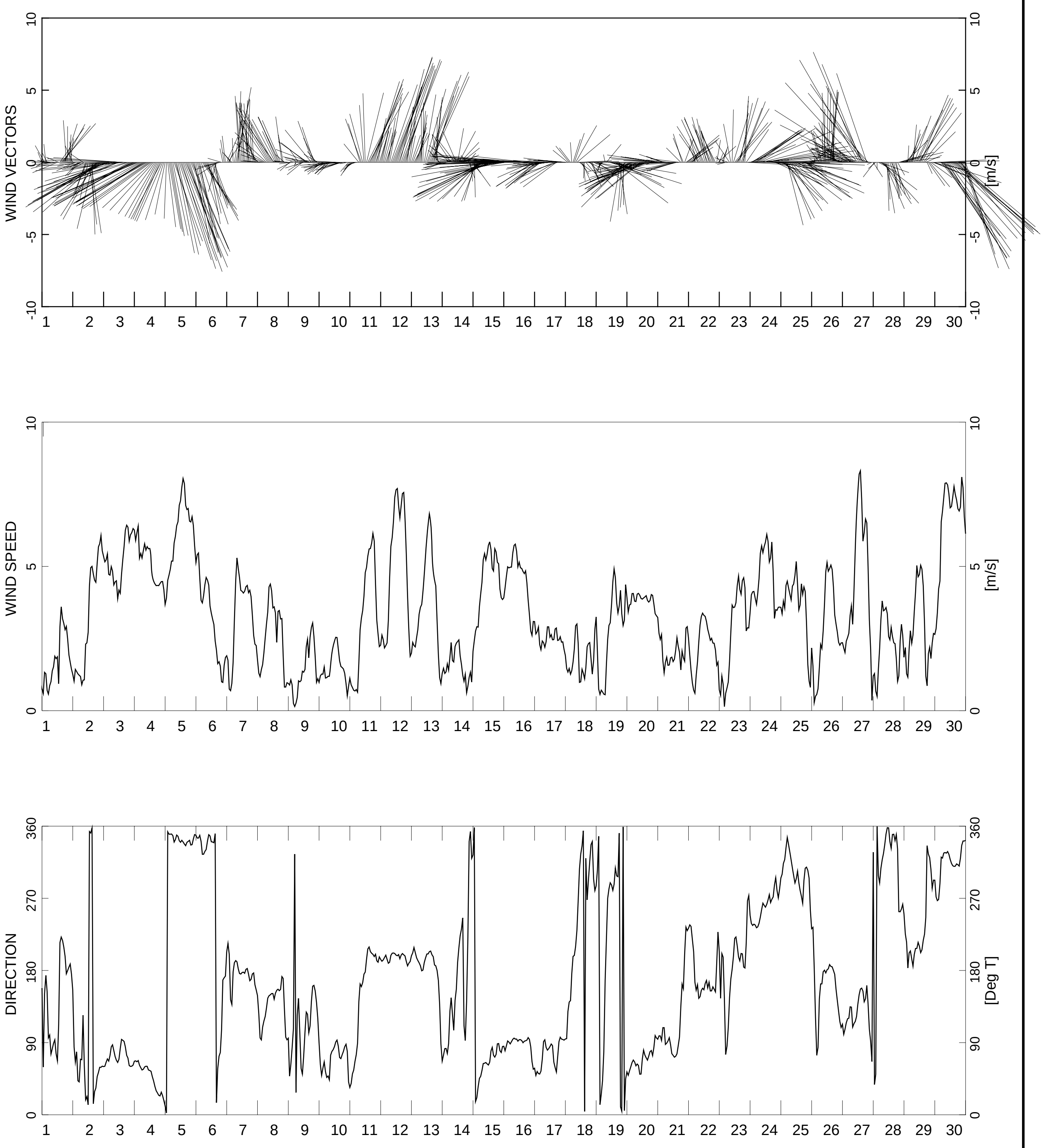
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

MAY 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-5



HAYCO HAY & COMPANY CONSULTANTS

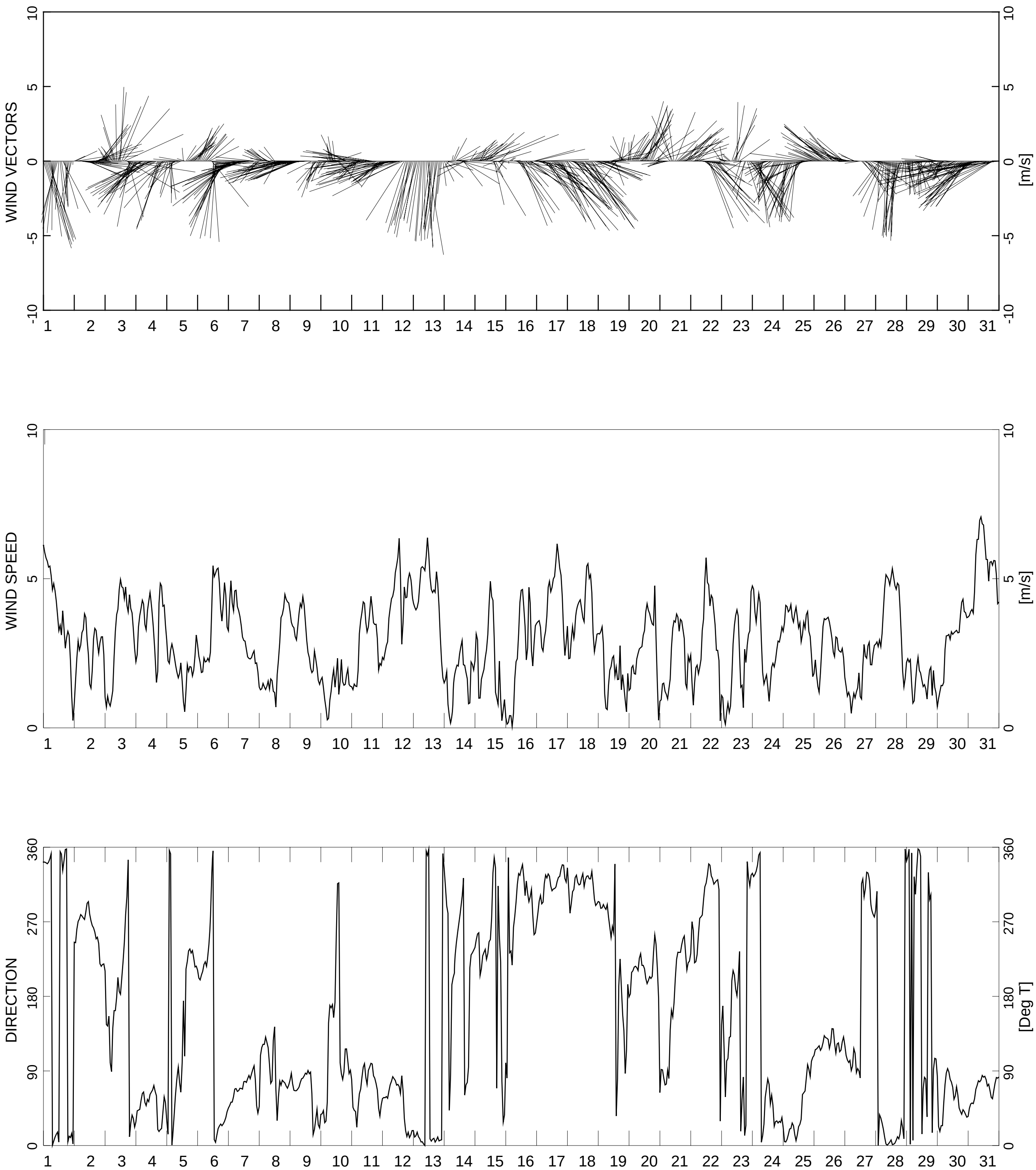
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

JUN. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-6

Thu Apr 12 08:49:46 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



HAYCO
HAY & COMPANY CONSULTANTS

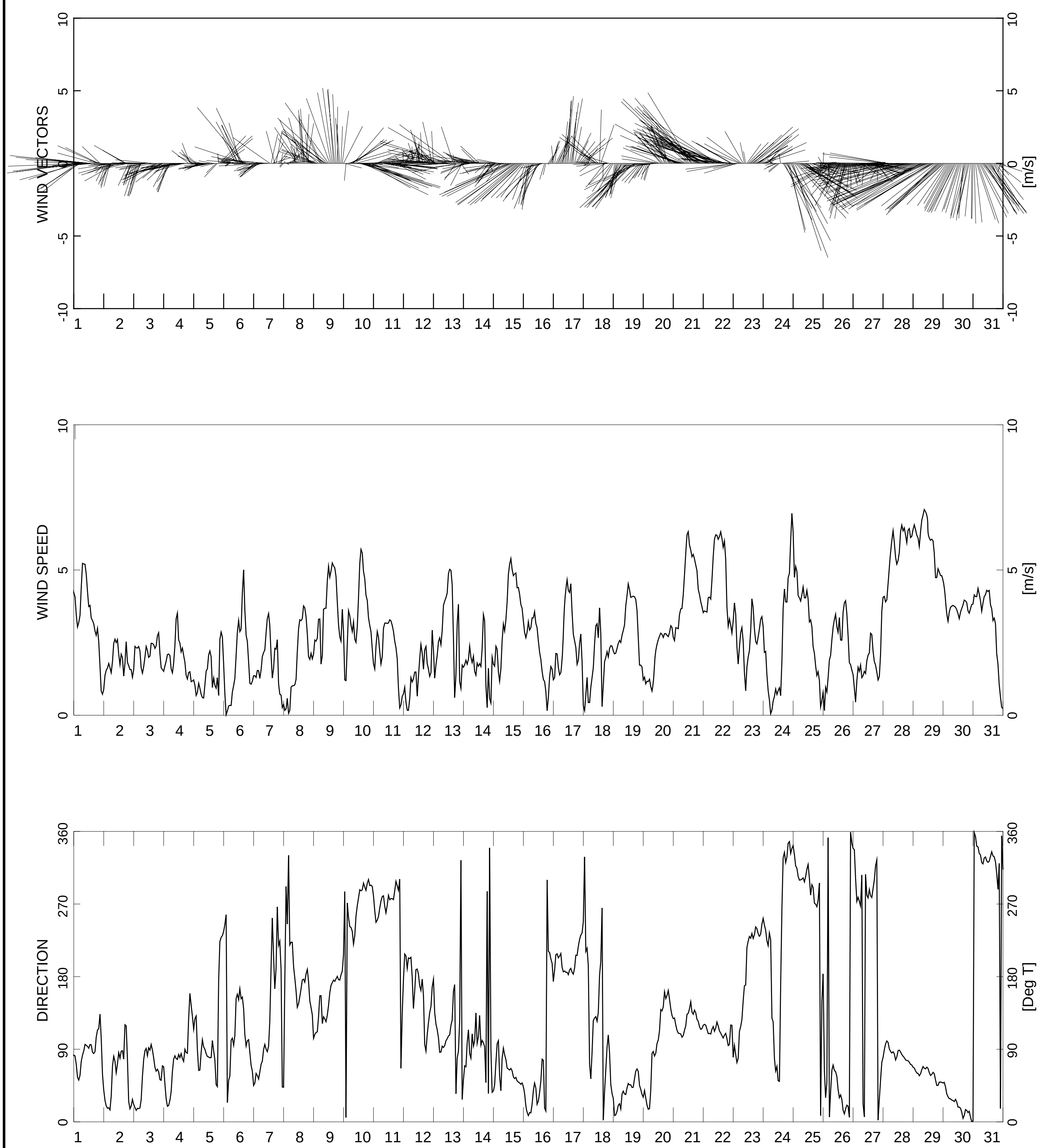
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

JUL. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-7

Thu Apr 12 08:49:47 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



HAY & COMPANY CONSULTANTS

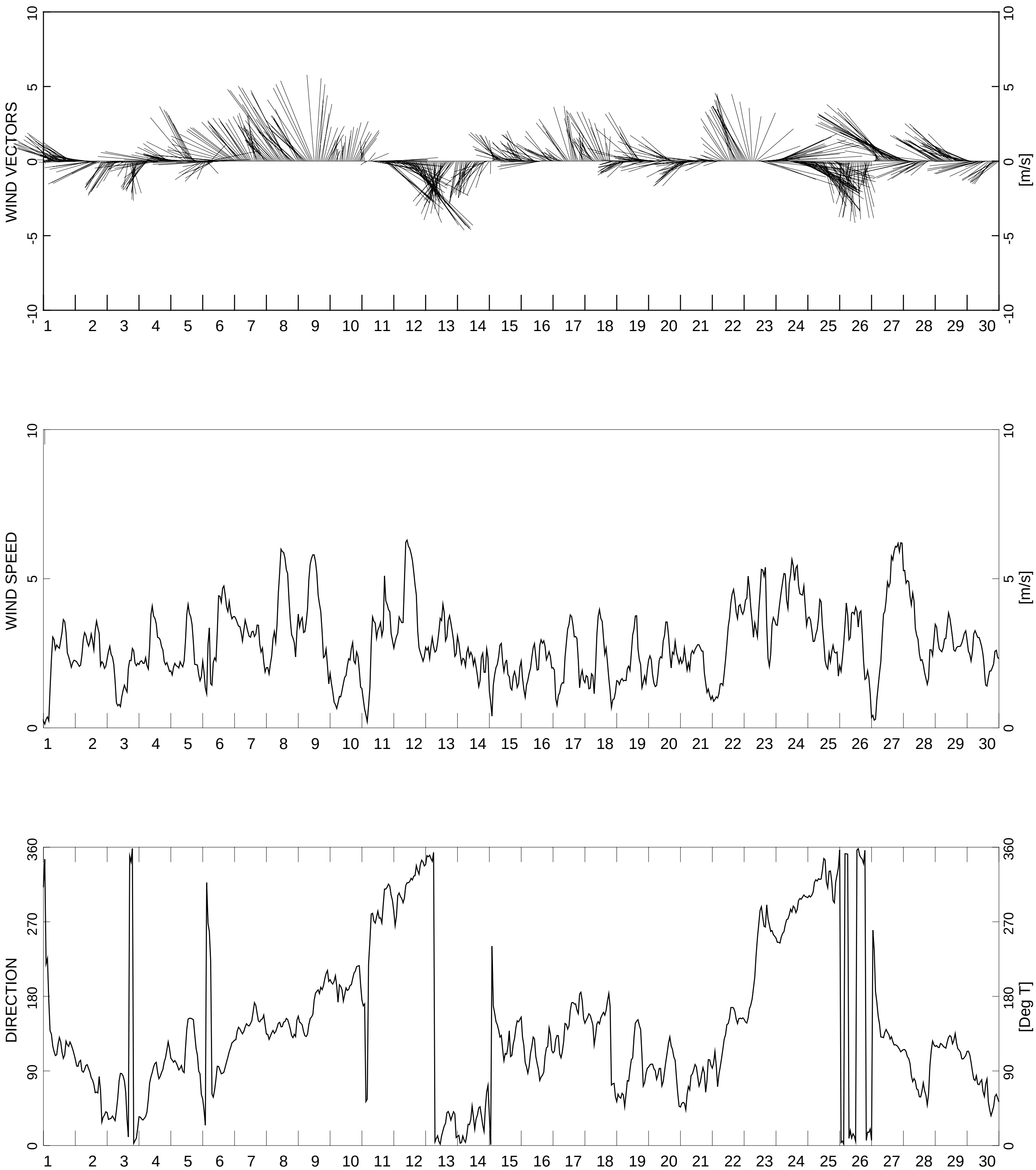
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AUG. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-8

Thu Apr 12 08:49:49 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



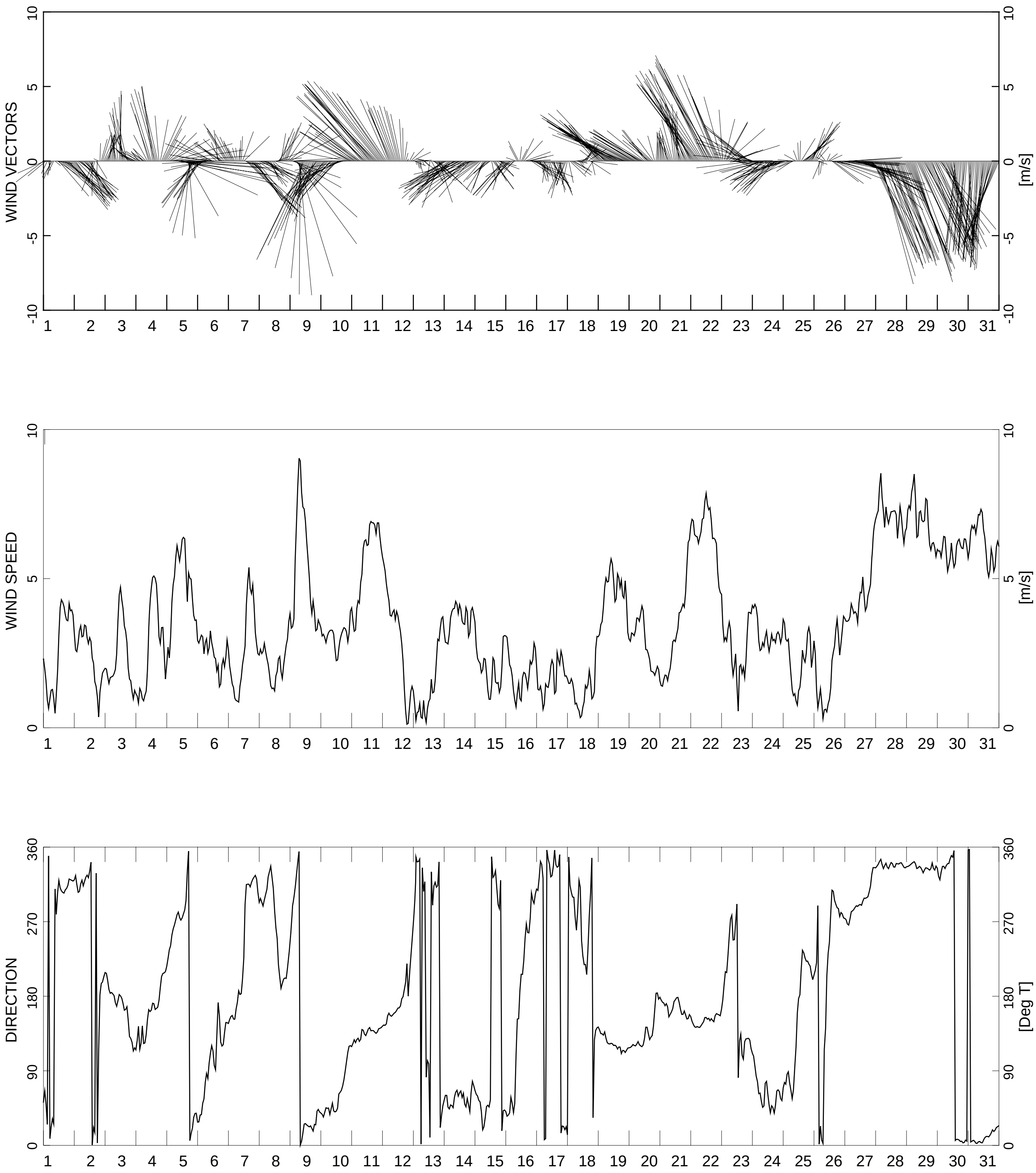
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

SEP. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-9



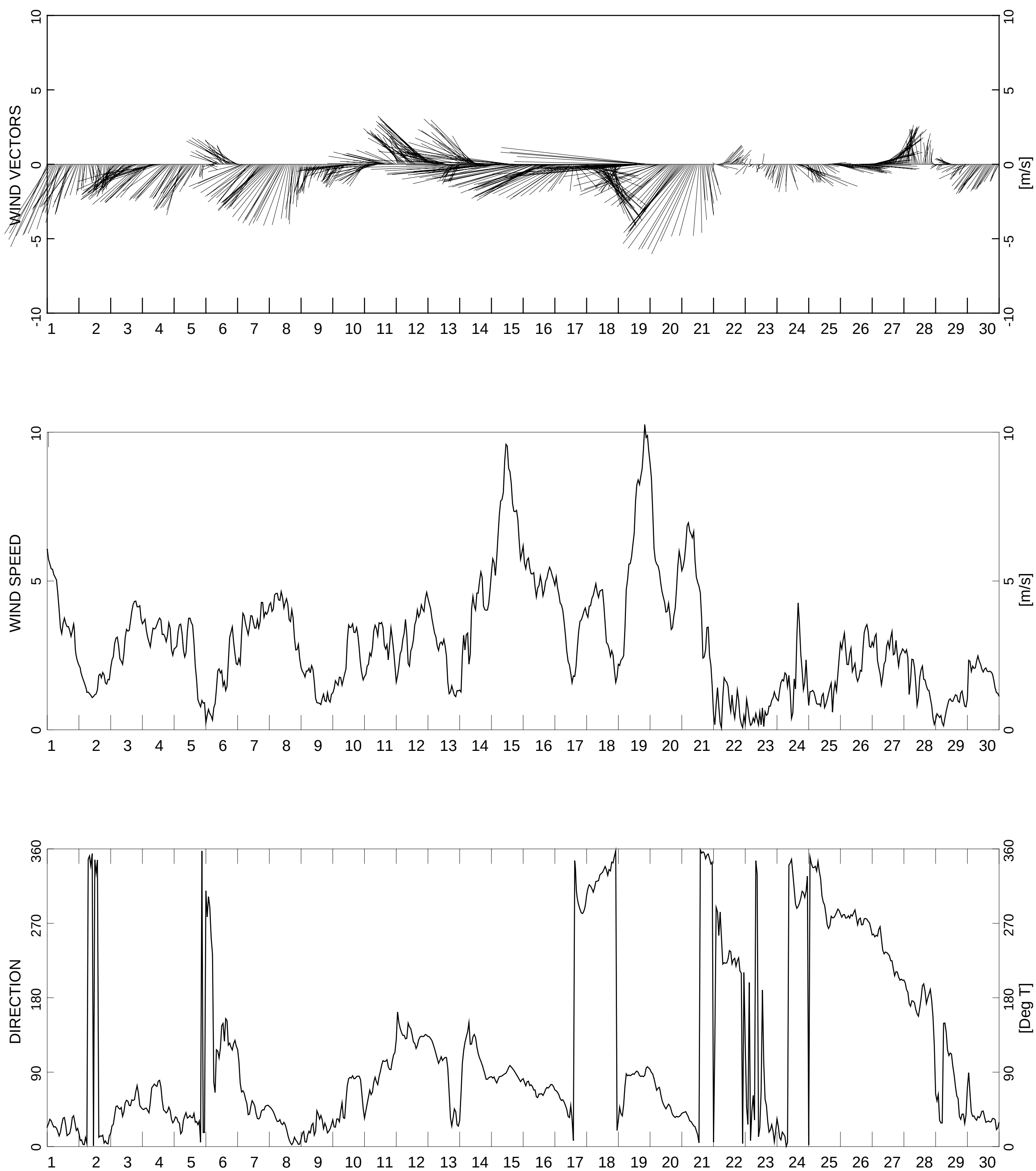
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

OCT. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-10



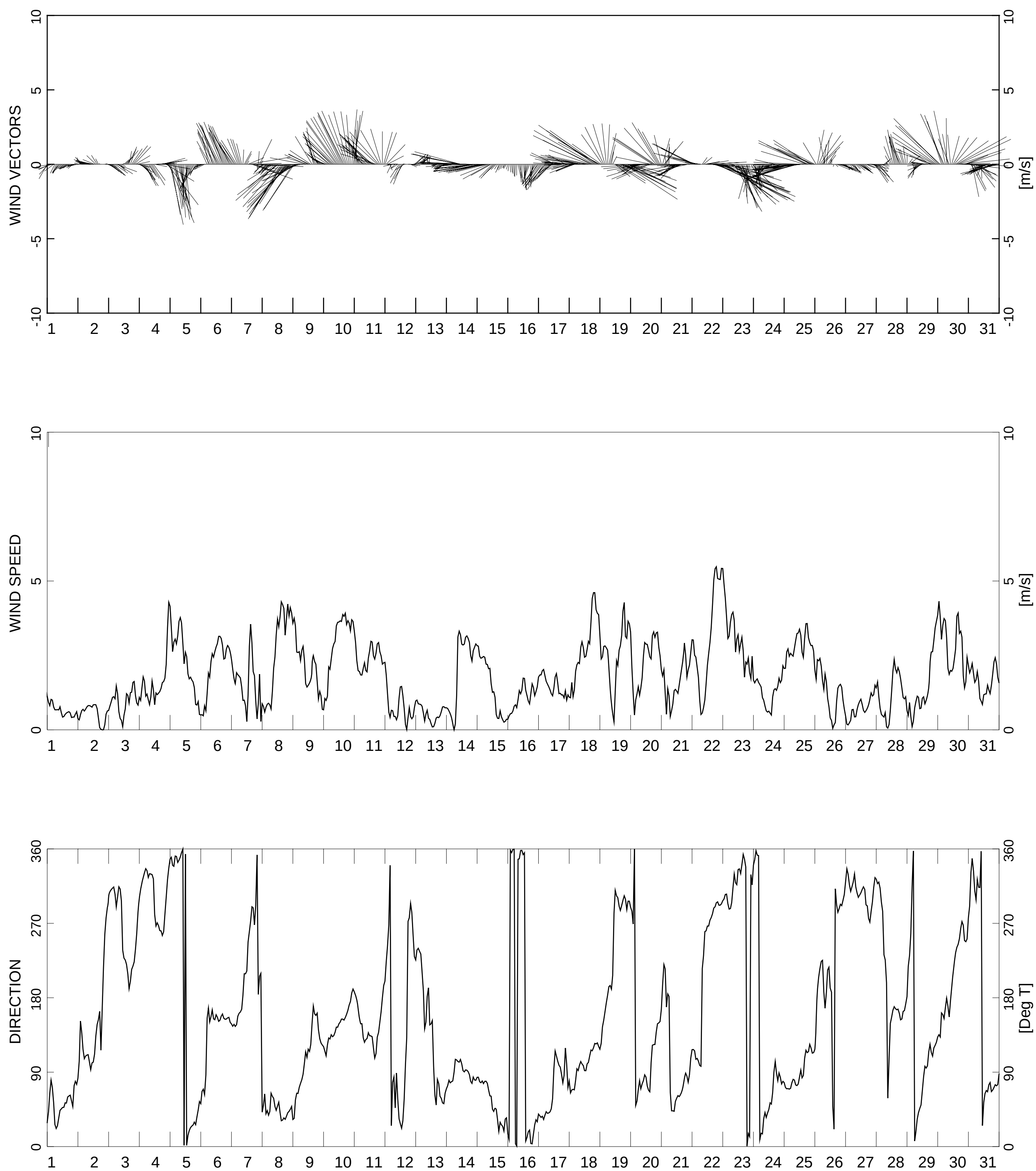
HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

NOV. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-11



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

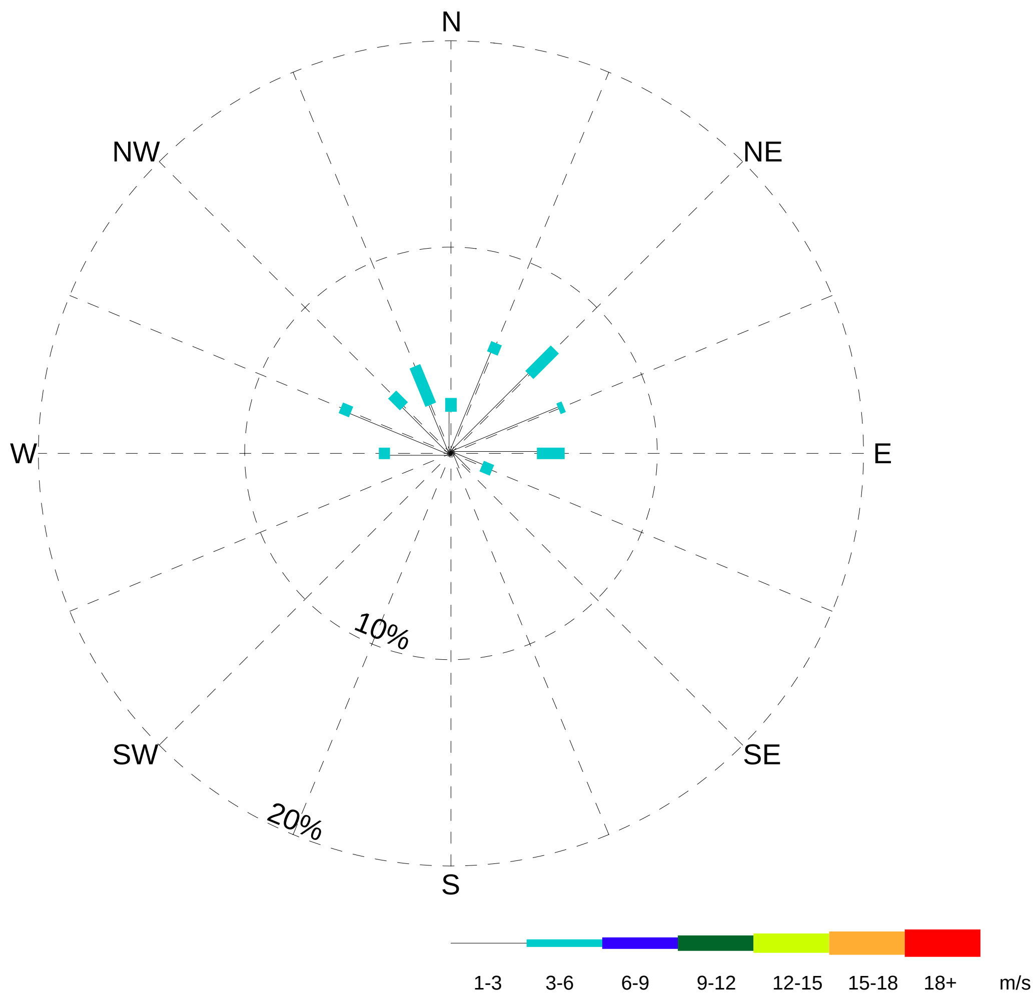
DEC. 2006 WINDS
SITE #7 TYHEE STATION

FIG.
B-12

Thu Apr 12 08:49:55 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs

APPENDIX

APPENDIX C SUMMARY OF MONTHLY WIND ROSES – JANUARY 2006 TO DECEMBER 2006



Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Jan. 1, 2006

End Date: Jan. 31, 2006

Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	5.64	0.27	-	-	-	-	-	5.91
NE	-	5.38	1.75	-	-	-	-	-	7.12
NNE	-	5.24	0.54	-	-	-	-	-	5.78
N	-	2.02	0.67	-	-	-	-	-	2.69
NNW	-	2.55	2.02	-	-	-	-	-	4.57
NW	-	3.23	0.81	-	-	-	-	-	4.03
WNW	-	5.24	0.54	-	-	-	-	-	5.78
W	-	2.96	0.54	-	-	-	-	-	3.49
WSW	-	0.13	-	-	-	-	-	-	0.13
SW	-	-	-	-	-	-	-	-	-
SSW	-	-	-	-	-	-	-	-	-
S	-	-	-	-	-	-	-	-	-
SSE	-	0.81	-	-	-	-	-	-	0.81
SE	-	1.21	-	-	-	-	-	-	1.21
ESE	-	1.61	0.54	-	-	-	-	-	2.15
E	-	4.17	1.34	-	-	-	-	-	5.51
Calm	50.81	-	-	-	-	-	-	-	50.81
Total (%)	50.81	40.19	9.01	-	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

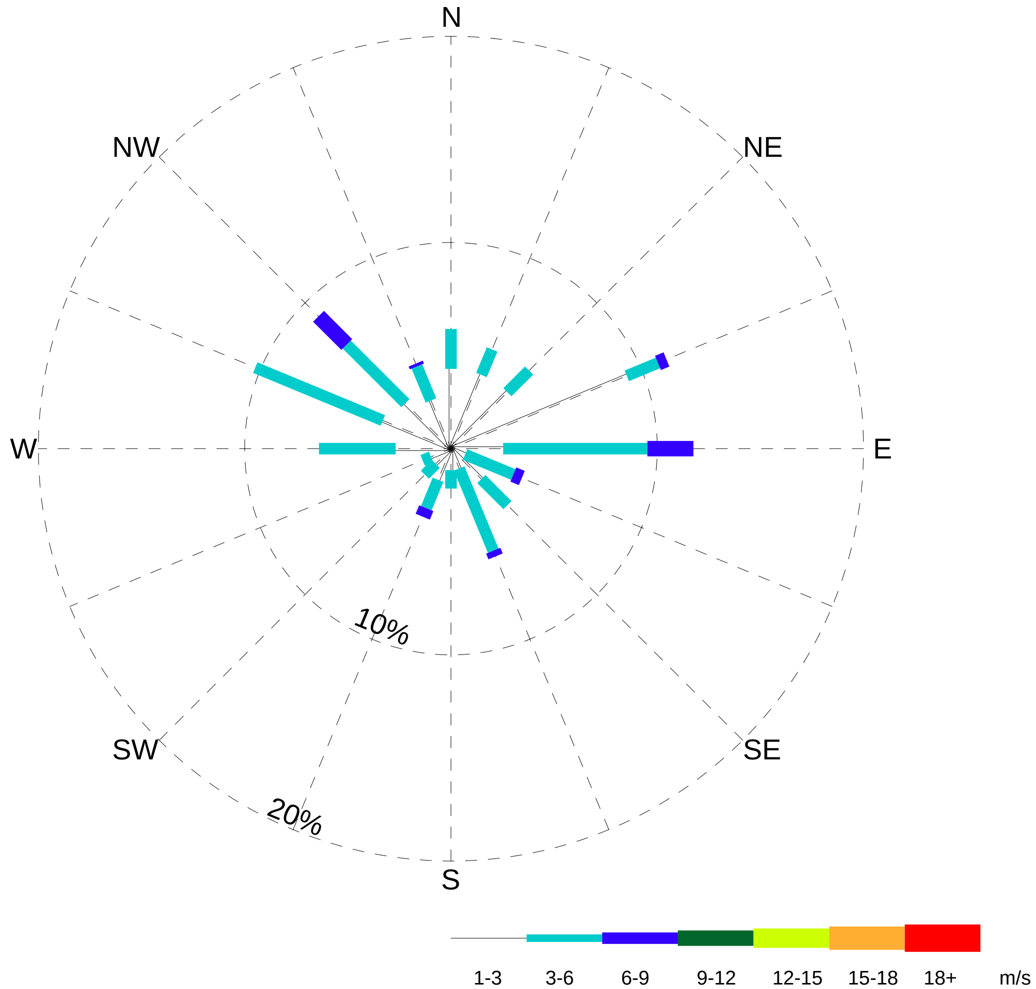
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

JAN. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG.
C-1

Thu Apr 12 09:01:37 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\Wind_roses



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	9.23	1.64	0.45	-	-	-	-	11.31
NE	-	3.87	1.49	-	-	-	-	-	5.36
NNE	-	3.87	1.34	-	-	-	-	-	5.21
N	-	3.87	1.93	-	-	-	-	-	5.80
NNW	-	2.53	1.79	0.15	-	-	-	-	4.46
NW	-	3.12	4.02	1.93	-	-	-	-	9.08
WNW	-	3.57	6.70	-	-	-	-	-	10.27
W	-	2.68	3.72	-	-	-	-	-	6.40
WSW	-	1.04	0.45	-	-	-	-	-	1.49
SW	-	1.04	0.74	-	-	-	-	-	1.79
SSW	-	1.64	1.49	0.45	-	-	-	-	3.57
S	-	1.04	0.89	-	-	-	-	-	1.93
SSE	-	1.04	4.32	0.30	-	-	-	-	5.66
SE	-	2.08	1.79	-	-	-	-	-	3.87
ESE	-	0.74	2.53	0.45	-	-	-	-	3.72
E	-	2.53	6.99	2.23	-	-	-	-	11.76
Calm	8.33	-	-	-	-	-	-	-	8.33
Total (%)	8.33	43.90	41.81	5.95	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11’ 6.2" W113° 53’ 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 28 days
Start Date: Feb. 1, 2006
End Date: Feb. 28, 2006
Comment:

HAYCO HAY & COMPANY CONSULTANTS

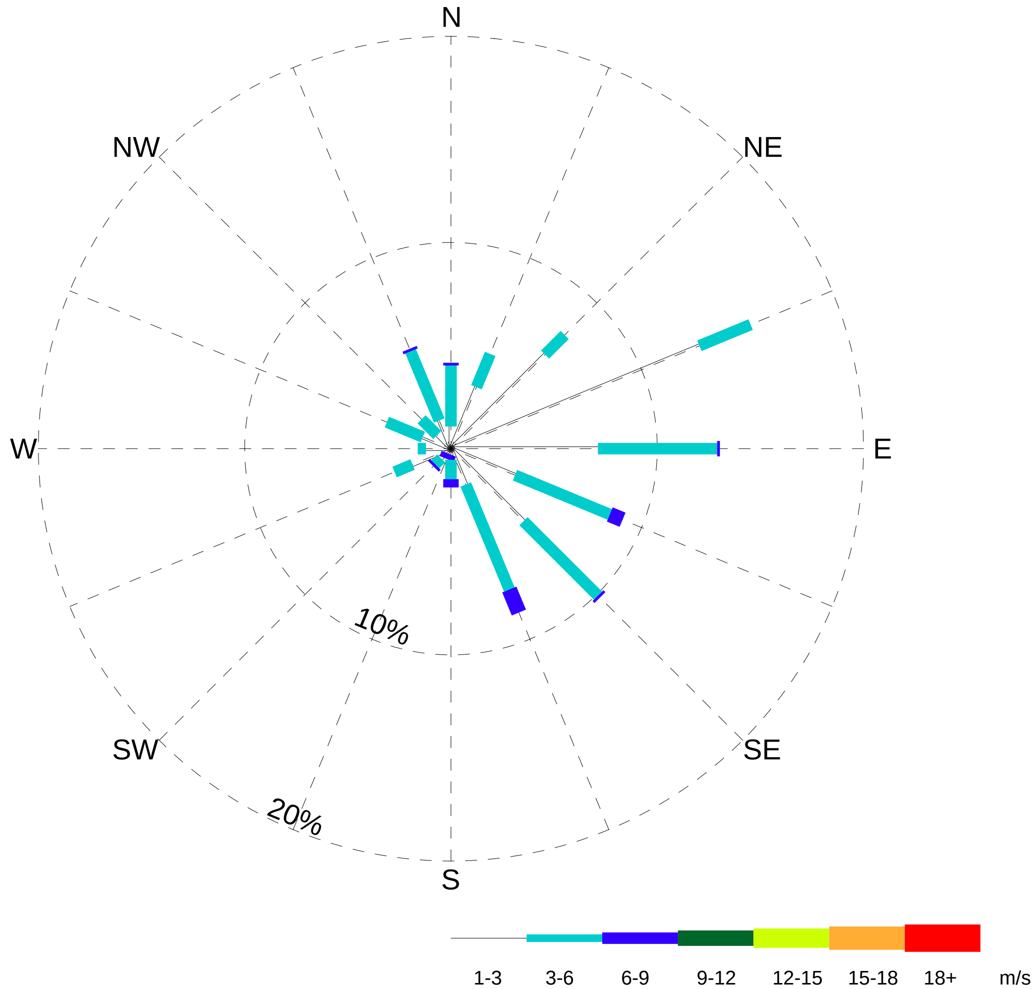
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

FEB. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-2

Thu Apr 12 09:01:38 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\Wind_roses



Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Mar. 1, 2006
End Date: Mar. 31, 2006
Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	13.04	2.69	-	-	-	-	-	15.73
NE	-	6.45	1.34	-	-	-	-	-	7.80
NNE	-	3.23	1.75	-	-	-	-	-	4.97
N	-	1.08	2.96	0.13	-	-	-	-	4.17
NNW	-	1.48	3.63	0.13	-	-	-	-	5.24
NW	-	0.94	1.08	-	-	-	-	-	2.02
WNW	-	1.48	1.88	-	-	-	-	-	3.36
W	-	1.21	0.40	-	-	-	-	-	1.61
WSW	-	2.02	0.94	-	-	-	-	-	2.96
SW	-	0.67	0.40	0.13	-	-	-	-	1.21
SSW	-	0.27	-	0.27	-	-	-	-	0.54
S	-	0.54	0.94	0.40	-	-	-	-	1.88
SSE	-	1.88	5.51	1.21	-	-	-	-	8.60
SE	-	4.97	5.11	0.13	-	-	-	-	10.22
ESE	-	3.36	4.97	0.67	-	-	-	-	9.01
E	-	7.12	5.78	0.13	-	-	-	-	13.04
Calm	7.66	-	-	-	-	-	-	-	7.66
Total (%)	7.66	49.73	39.38	3.23	-	-	-	-	100.00

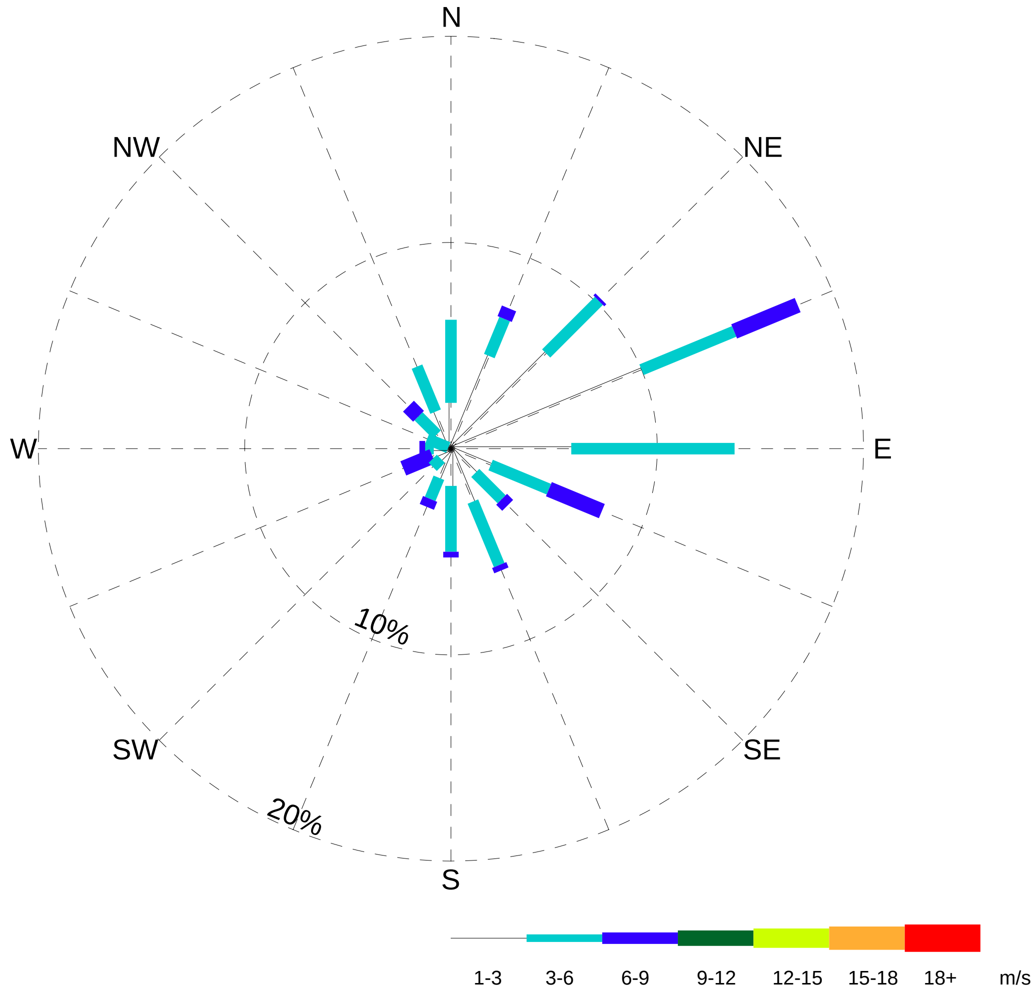
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

MAR. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG.
C-3

Thu Apr 12 09:01:38 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\Wind_roses



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	10.00	4.86	3.33	-	-	-	-	18.19
NE	-	6.53	3.61	0.14	-	-	-	-	10.28
NNE	-	4.86	1.94	0.56	-	-	-	-	7.36
N	-	2.22	4.03	-	-	-	-	-	6.25
NNW	-	1.94	2.36	-	-	-	-	-	4.31
NW	-	0.97	1.25	0.69	-	-	-	-	2.92
WNW	-	0.14	1.11	-	-	-	-	-	1.25
W	-	0.83	0.42	0.28	-	-	-	-	1.53
WSW	-	0.97	-	1.53	-	-	-	-	2.50
SW	-	0.69	0.56	-	-	-	-	-	1.25
SSW	-	1.53	1.11	0.42	-	-	-	-	3.06
S	-	1.81	3.19	0.28	-	-	-	-	5.28
SSE	-	2.78	3.33	0.28	-	-	-	-	6.39
SE	-	1.67	1.81	0.42	-	-	-	-	3.89
ESE	-	2.08	3.06	2.78	-	-	-	-	7.92
E	-	5.83	7.92	-	-	-	-	-	13.75
Calm	3.89	-	-	-	-	-	-	-	3.89
Total (%)	3.89	44.86	40.56	10.69	-	-	-	-	100.00

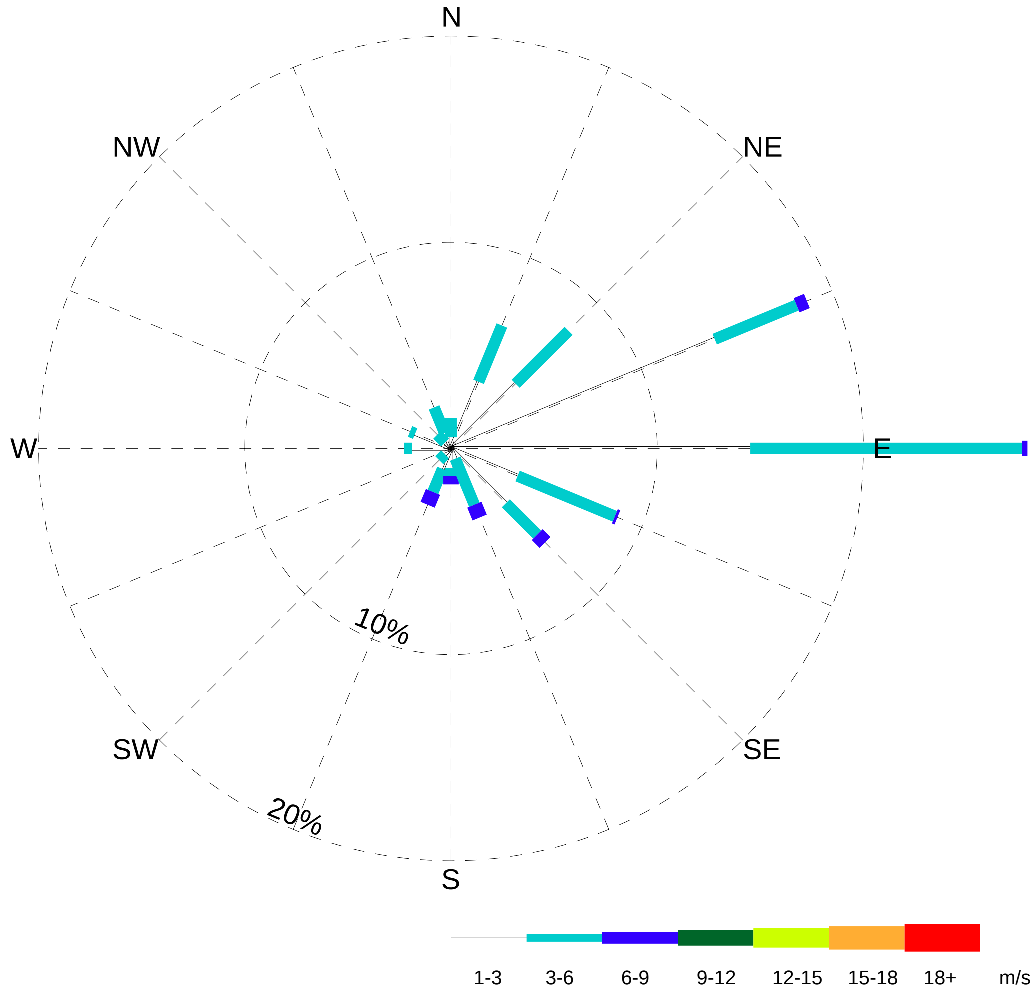
Station Name: Tyhee
NAD 27 Location:
N63° 11’ 6.2" W113° 53’ 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 30 days
Start Date: Apr. 1, 2006
End Date: Apr. 30, 2006
Comment:

HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

APR. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG.
C-4



Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: May. 1, 2006
End Date: May. 31, 2006
Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	13.84	4.30	0.54	-	-	-	-	18.68
NE	-	4.43	3.63	-	-	-	-	-	8.06
NNE	-	3.49	2.96	-	-	-	-	-	6.45
N	-	0.54	0.94	-	-	-	-	-	1.48
NNW	-	0.81	1.34	-	-	-	-	-	2.15
NW	-	0.40	0.54	-	-	-	-	-	0.94
WNW	-	1.88	0.27	-	-	-	-	-	2.15
W	-	1.88	0.40	-	-	-	-	-	2.29
WSW	-	0.67	-	-	-	-	-	-	0.67
SW	-	0.40	0.40	-	-	-	-	-	0.81
SSW	-	1.08	1.21	0.67	-	-	-	-	2.96
S	-	0.94	0.40	0.40	-	-	-	-	1.75
SSE	-	0.54	2.42	0.67	-	-	-	-	3.63
SE	-	3.76	2.15	0.54	-	-	-	-	6.45
ESE	-	3.49	5.11	0.13	-	-	-	-	8.74
E	-	14.52	13.17	0.27	-	-	-	-	27.96
Calm	4.84	-	-	-	-	-	-	-	4.84
Total (%)	4.84	52.69	39.25	3.23	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

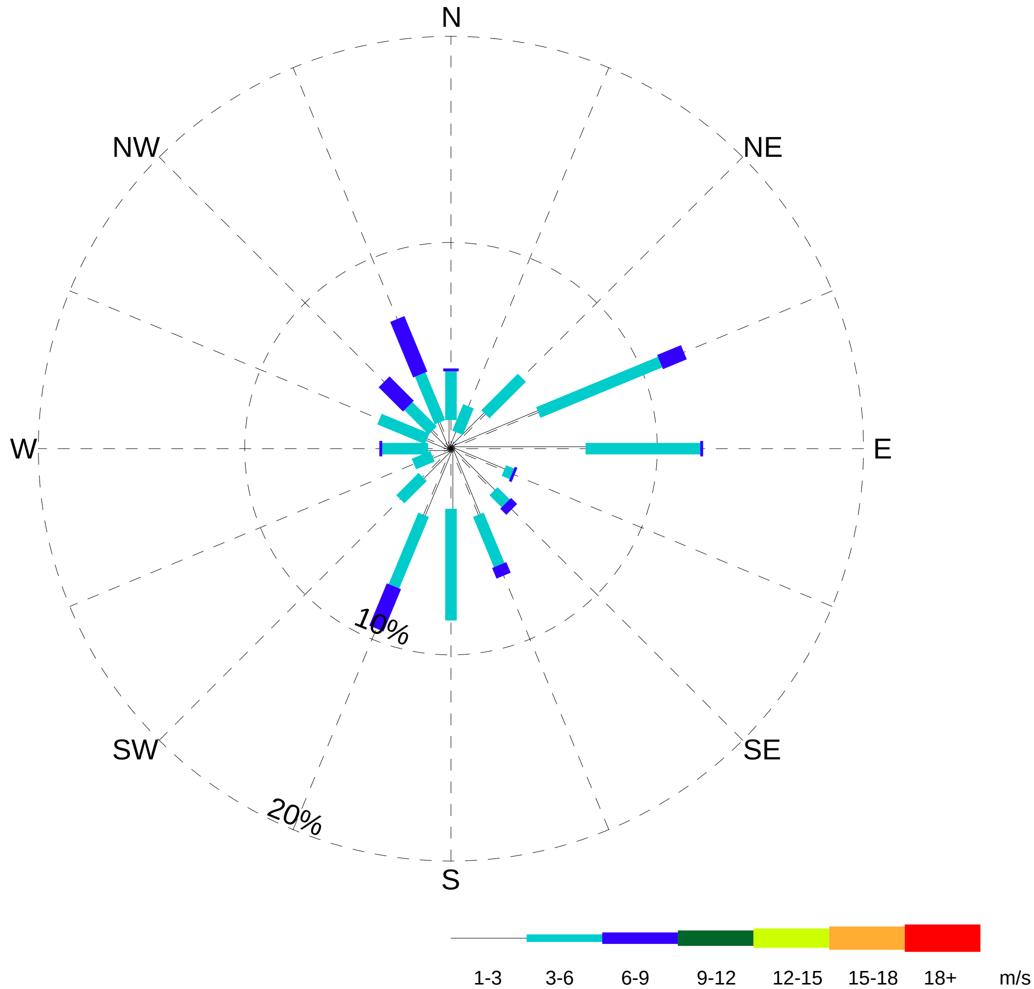
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

MAY 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-5

Thu Apr 12 09:01:40 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\Wind_roses



Wind Speed & Direction Frequency Distribution Table

Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
	Percent Occurrence (%)								
ENE	-	4.58	6.39	1.25	-	-	-	-	12.22
NE	-	2.36	2.50	-	-	-	-	-	4.86
NNE	-	0.83	1.39	-	-	-	-	-	2.22
N	-	1.39	2.36	0.14	-	-	-	-	3.89
NNW	-	1.39	2.50	2.92	-	-	-	-	6.81
NW	-	1.25	1.67	1.67	-	-	-	-	4.58
WNW	-	1.25	2.50	-	-	-	-	-	3.75
W	-	1.11	2.22	0.14	-	-	-	-	3.47
WSW	-	0.97	0.97	-	-	-	-	-	1.94
SW	-	1.94	1.53	-	-	-	-	-	3.47
SSW	-	3.47	3.75	2.22	-	-	-	-	9.44
S	-	2.92	5.42	-	-	-	-	-	8.33
SSE	-	3.47	2.64	0.56	-	-	-	-	6.67
SE	-	2.92	0.83	0.42	-	-	-	-	4.17
ESE	-	2.78	0.42	0.14	-	-	-	-	3.33
E	-	6.53	5.56	0.14	-	-	-	-	12.22
Calm	8.61	-	-	-	-	-	-	-	8.61
Total (%)	8.61	39.17	42.64	9.58	-	-	-	-	100.00

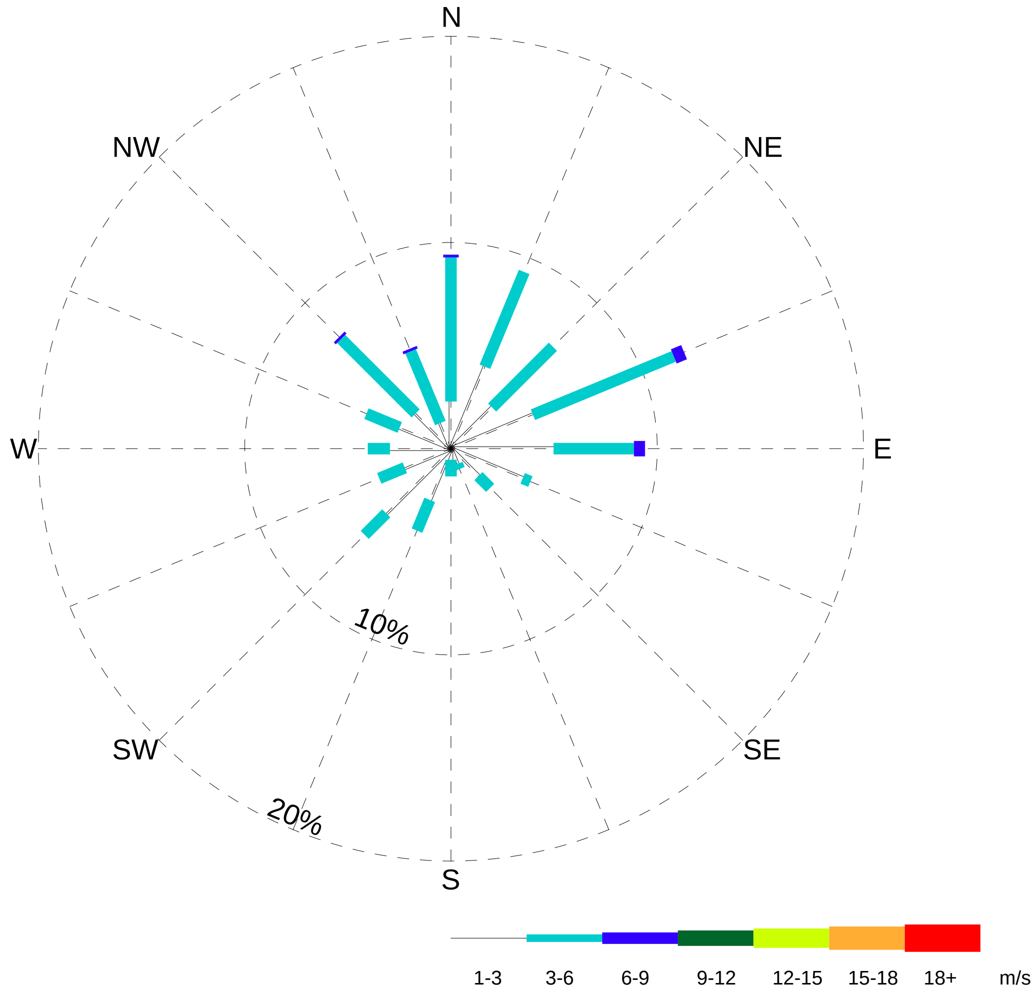
Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 30 days
Start Date: Jun. 1, 2006
End Date: Jun. 30, 2006
Comment:

HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

JUN. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-6



Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Jul. 1, 2006
End Date: Jul. 31, 2006
Comment:

Wind Speed & Direction Frequency Distribution Table

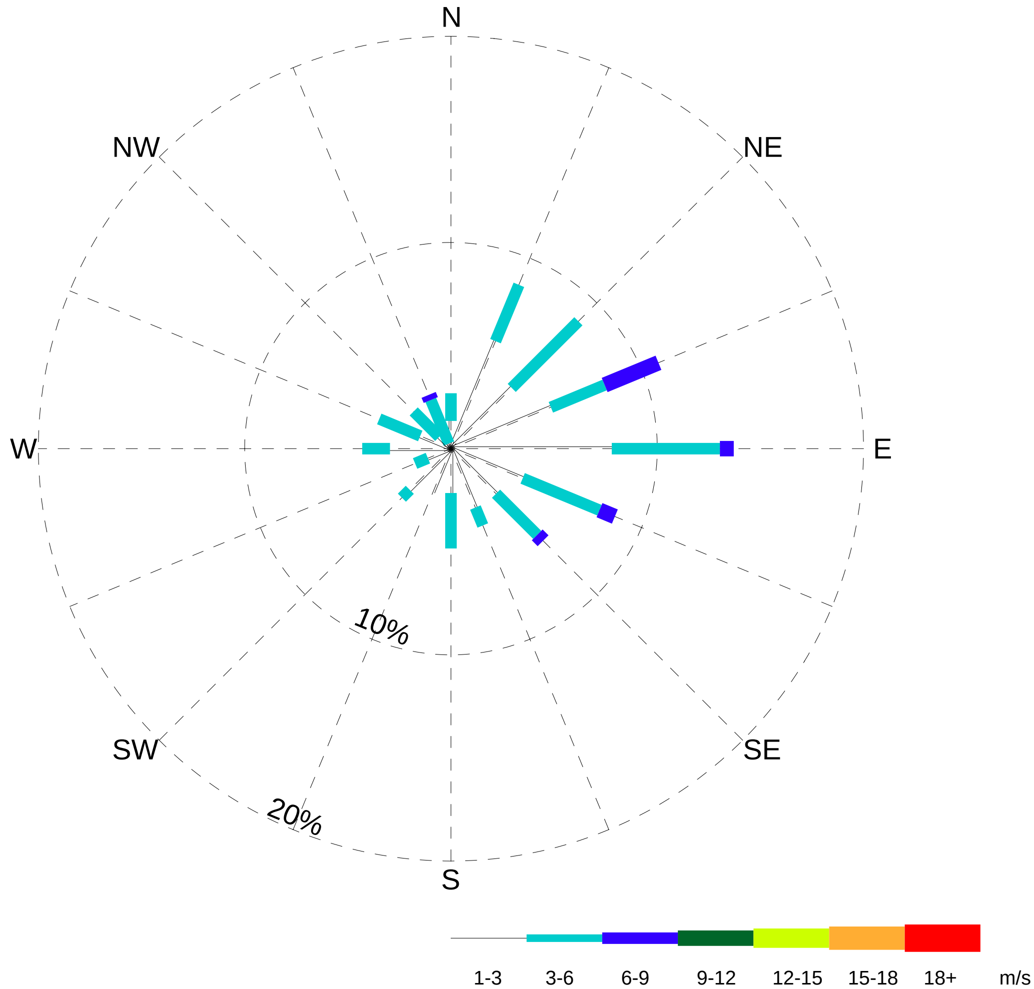
	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	4.30	7.39	0.54	-	-	-	-	12.23
NE	-	2.82	4.17	-	-	-	-	-	6.99
NNE	-	4.30	4.97	-	-	-	-	-	9.27
N	-	2.29	6.99	0.13	-	-	-	-	9.41
NNW	-	1.34	3.76	0.13	-	-	-	-	5.24
NW	-	2.42	5.11	0.13	-	-	-	-	7.66
WNW	-	2.69	1.75	-	-	-	-	-	4.43
W	-	2.96	1.08	-	-	-	-	-	4.03
WSW	-	2.42	1.34	-	-	-	-	-	3.76
SW	-	4.43	1.48	-	-	-	-	-	5.91
SSW	-	2.69	1.61	-	-	-	-	-	4.30
S	-	0.54	0.81	-	-	-	-	-	1.34
SSE	-	0.81	0.27	-	-	-	-	-	1.08
SE	-	1.88	0.81	-	-	-	-	-	2.69
ESE	-	3.76	0.40	-	-	-	-	-	4.17
E	-	4.97	3.90	0.54	-	-	-	-	9.41
Calm	8.06	-	-	-	-	-	-	-	8.06
Total (%)	8.06	44.62	45.83	1.48	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

JUL. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-7



Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 31 days

Start Date: Aug. 1, 2006

End Date: Aug. 31, 2006

Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	5.24	2.82	2.82	-	-	-	-	10.89
NE	-	4.17	4.57	-	-	-	-	-	8.74
NNE	-	5.64	2.96	-	-	-	-	-	8.60
N	-	1.34	1.34	-	-	-	-	-	2.69
NNW	-	0.27	2.29	0.27	-	-	-	-	2.82
NW	-	0.81	1.75	-	-	-	-	-	2.55
WNW	-	1.61	2.15	-	-	-	-	-	3.76
W	-	2.96	1.34	-	-	-	-	-	4.30
WSW	-	1.21	0.67	-	-	-	-	-	1.88
SW	-	2.82	0.54	-	-	-	-	-	3.36
SSW	-	2.29	-	-	-	-	-	-	2.29
S	-	2.15	2.69	-	-	-	-	-	4.84
SSE	-	3.09	0.94	-	-	-	-	-	4.03
SE	-	3.09	2.82	0.40	-	-	-	-	6.32
ESE	-	3.76	4.03	0.81	-	-	-	-	8.60
E	-	7.80	5.24	0.67	-	-	-	-	13.71
Calm	10.62	-	-	-	-	-	-	-	10.62
Total (%)	10.62	48.25	36.16	4.97	-	-	-	-	100.00

HAYCO HAY & COMPANY CONSULTANTS

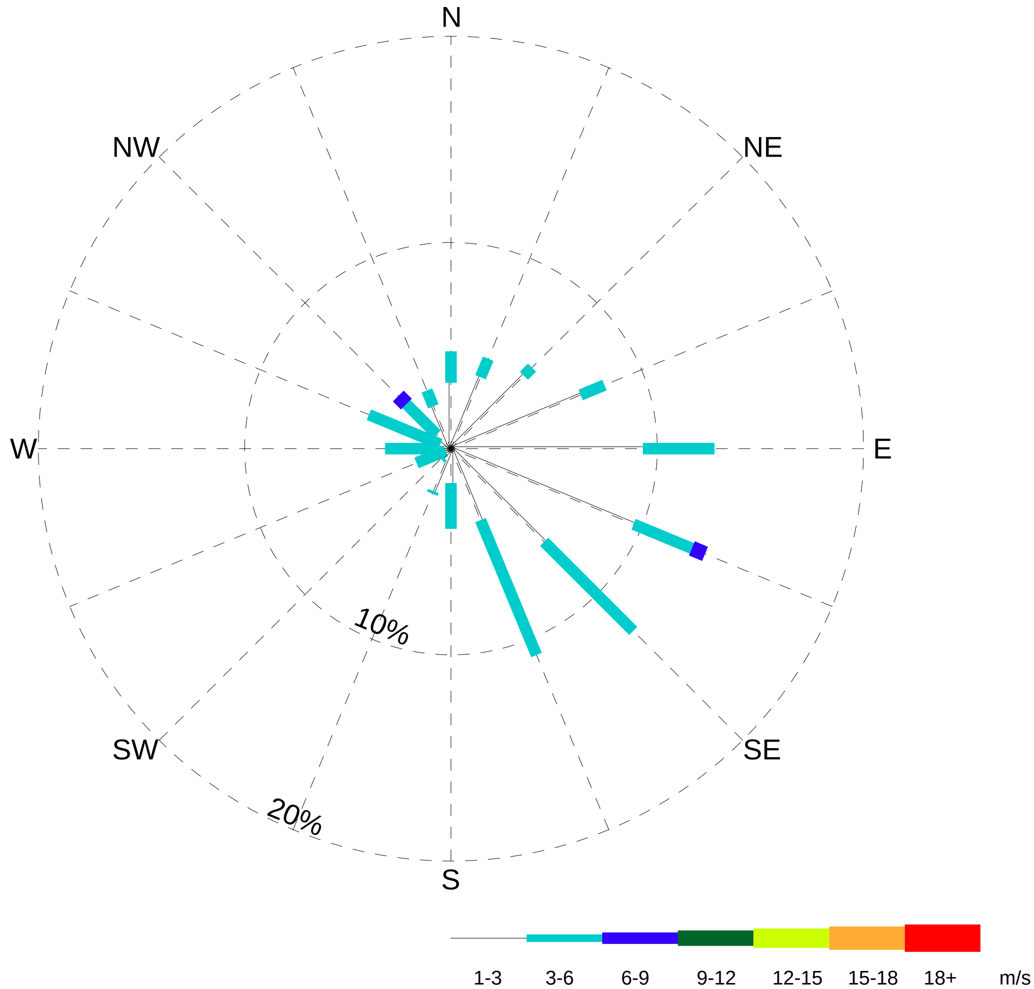
TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

AUG. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-8

Thu Apr 12 09:01:42 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\Wind_roses



Station Name: Tyhee

NAD 27 Location:

N63° 11' 6.2" W113° 53' 40.2"

Elev. above SL: 300m

Tower height: 10 m

Record length: 30 days

Start Date: Sep. 1, 2006

End Date: Sep. 30, 2006

Comment:

Wind Speed & Direction Frequency Distribution Table

Direction	Percent Occurrence (%) 0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	6.81	1.25	-	-	-	-	-	8.06
NE	-	5.00	0.56	-	-	-	-	-	5.56
NNE	-	3.75	0.97	-	-	-	-	-	4.72
N	-	3.19	1.53	-	-	-	-	-	4.72
NNW	-	2.22	0.83	-	-	-	-	-	3.06
NW	-	0.97	2.08	0.56	-	-	-	-	3.61
WNW	-	0.56	3.75	-	-	-	-	-	4.31
W	-	0.69	2.50	-	-	-	-	-	3.19
WSW	-	0.28	1.53	-	-	-	-	-	1.81
SW	-	0.56	0.14	-	-	-	-	-	0.69
SSW	-	2.22	0.14	-	-	-	-	-	2.36
S	-	1.67	2.22	-	-	-	-	-	3.89
SSE	-	3.75	7.08	-	-	-	-	-	10.83
SE	-	6.39	6.11	-	-	-	-	-	12.50
ESE	-	9.58	3.06	0.69	-	-	-	-	13.33
E	-	9.31	3.47	-	-	-	-	-	12.78
Calm	4.58	-	-	-	-	-	-	-	4.58
Total (%)	4.58	56.94	37.22	1.25	-	-	-	-	100.00

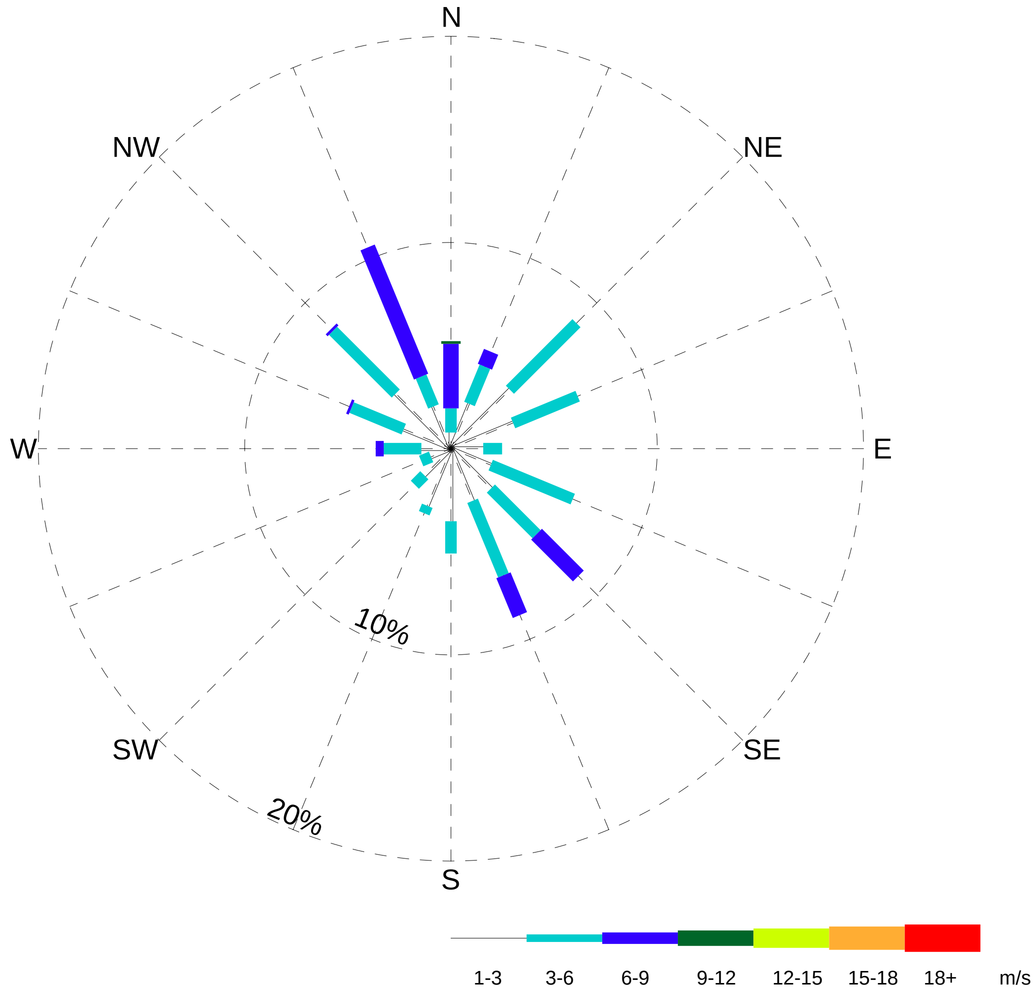
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

SEP. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-9



Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
ENE	-	3.26	3.39	-	-	-	-	-	6.65
NE	-	4.04	4.56	-	-	-	-	-	8.60
NNE	-	2.35	1.96	0.78	-	-	-	-	5.09
N	-	0.78	1.17	3.13	0.13	-	-	-	5.22
NNW	-	2.22	1.57	6.78	-	-	-	-	10.56
NW	-	3.78	4.30	0.13	-	-	-	-	8.21
WNW	-	2.48	2.74	0.13	-	-	-	-	5.35
W	-	1.43	1.83	0.39	-	-	-	-	3.65
WSW	-	1.04	0.52	-	-	-	-	-	1.57
SW	-	1.83	0.65	-	-	-	-	-	2.48
SSW	-	3.00	0.39	-	-	-	-	-	3.39
S	-	3.52	1.57	-	-	-	-	-	5.09
SSE	-	2.74	3.91	2.09	-	-	-	-	8.73
SE	-	2.74	3.13	2.87	-	-	-	-	8.73
ESE	-	2.09	4.30	-	-	-	-	-	6.39
E	-	1.57	0.91	-	-	-	-	-	2.48
Calm	7.82	-	-	-	-	-	-	-	7.82
Total (%)	7.82	38.85	36.90	16.30	0.13	-	-	-	100.00

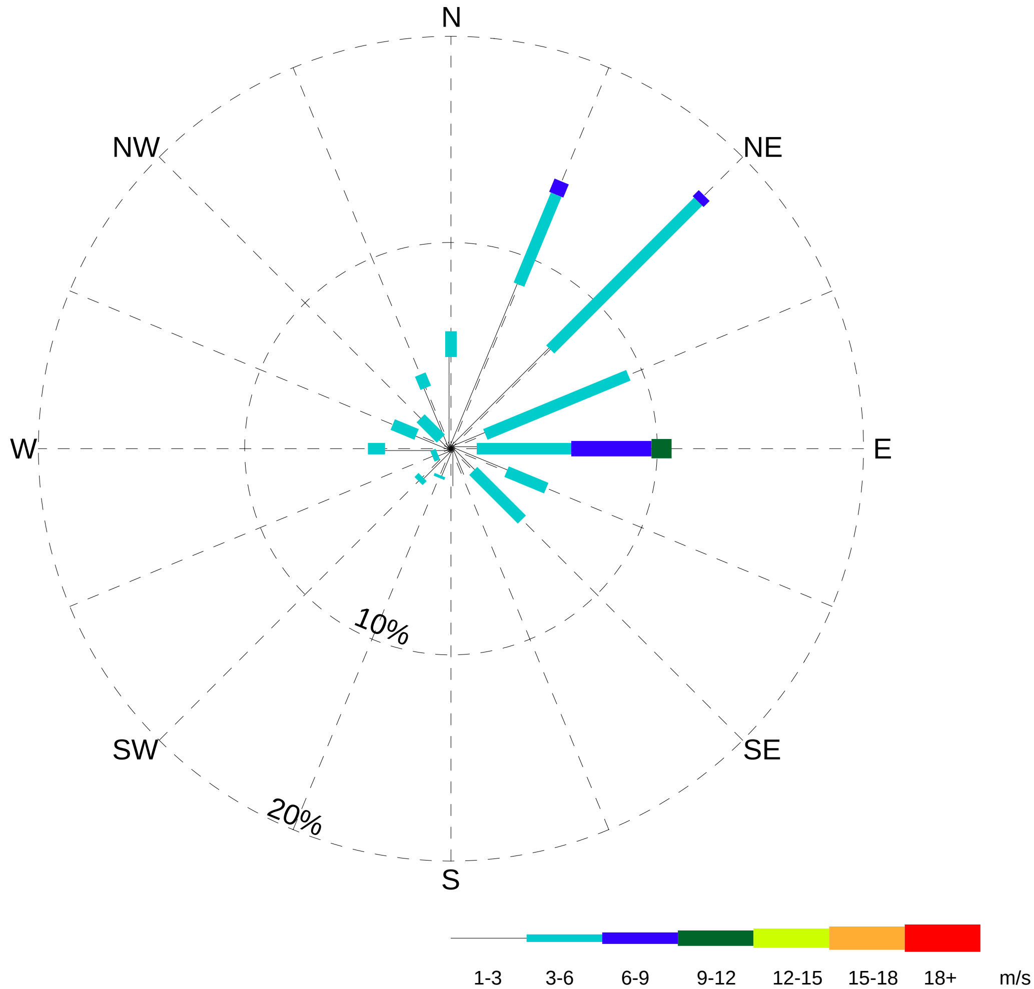
Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Oct. 1, 2006
End Date: Oct. 31, 2006
Comment:

HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

OCT. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-10



Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 30 days
Start Date: Nov. 1, 2006
End Date: Nov. 30, 2006
Comment:

Wind Speed & Direction Frequency Distribution Table

	Percent Occurrence (%)								
Direction	**0-1 m/s**	**1-3 m/s**	**3-6 m/s**	**6-9 m/s**	**9-12 m/s**	**12-15 m/s**	**15-18 m/s**	**18+ m/s**	**Total (%)**
ENE	-	1.81	7.50	-	-	-	-	-	9.31
NE	-	6.81	10.14	0.42	-	-	-	-	17.36
NNE	-	8.61	4.72	0.69	-	-	-	-	14.03
N	-	4.44	1.25	-	-	-	-	-	5.69
NNW	-	3.19	0.69	-	-	-	-	-	3.89
NW	-	0.69	1.39	-	-	-	-	-	2.08
WNW	-	1.81	1.25	-	-	-	-	-	3.06
W	-	3.19	0.83	-	-	-	-	-	4.03
WSW	-	0.69	0.28	-	-	-	-	-	0.97
SW	-	1.94	0.28	-	-	-	-	-	2.22
SSW	-	1.39	0.14	-	-	-	-	-	1.53
S	-	1.81	-	-	-	-	-	-	1.81
SSE	-	1.39	-	-	-	-	-	-	1.39
SE	-	1.53	3.33	-	-	-	-	-	4.86
ESE	-	2.92	2.08	-	-	-	-	-	5.00
E	-	1.25	4.58	3.89	0.97	-	-	-	10.69
Calm	12.08	-	-	-	-	-	-	-	12.08
Total (%)	12.08	43.47	38.47	5.00	0.97	-	-	-	100.00

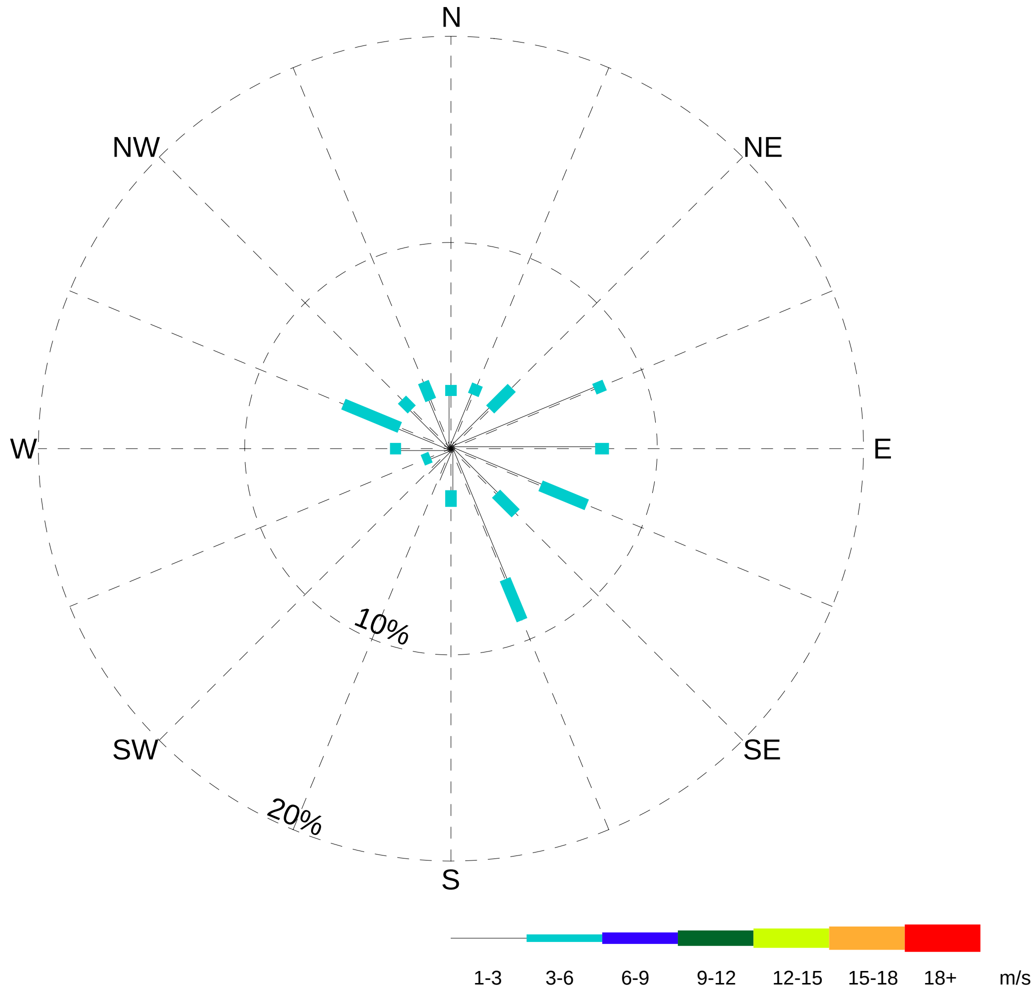
HAYCO HAY & COMPANY CONSULTANTS

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

NOV. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG. C-11



Wind Speed & Direction Frequency Distribution Table

Direction	0-1 m/s	1-3 m/s	3-6 m/s	6-9 m/s	9-12 m/s	12-15 m/s	15-18 m/s	18+ m/s	Total (%)
	Percent Occurrence (%)								
ENE	-	7.53	0.54	-	-	-	-	-	8.06
NE	-	2.69	1.48	-	-	-	-	-	4.17
NNE	-	2.82	0.54	-	-	-	-	-	3.36
N	-	2.55	0.54	-	-	-	-	-	3.09
NNW	-	2.55	0.94	-	-	-	-	-	3.49
NW	-	2.69	0.67	-	-	-	-	-	3.36
WNW	-	2.69	2.96	-	-	-	-	-	5.64
W	-	2.42	0.54	-	-	-	-	-	2.96
WSW	-	1.08	0.40	-	-	-	-	-	1.48
SW	-	1.61	-	-	-	-	-	-	1.61
SSW	-	1.61	-	-	-	-	-	-	1.61
S	-	2.02	0.81	-	-	-	-	-	2.82
SSE	-	6.86	2.15	-	-	-	-	-	9.01
SE	-	3.09	1.34	-	-	-	-	-	4.43
ESE	-	4.70	2.42	-	-	-	-	-	7.12
E	-	6.99	0.67	-	-	-	-	-	7.66
Calm	30.11	-	-	-	-	-	-	-	30.11
Total (%)	30.11	53.90	15.99	-	-	-	-	-	100.00

Station Name: Tyhee
NAD 27 Location:
N63° 11' 6.2" W113° 53' 40.2"
Elev. above SL: 300m
Tower height: 10 m
Record length: 31 days
Start Date: Dec. 1, 2006
End Date: Dec. 31, 2006
Comment:

HAYCO HAY & COMPANY CONSULTANTS

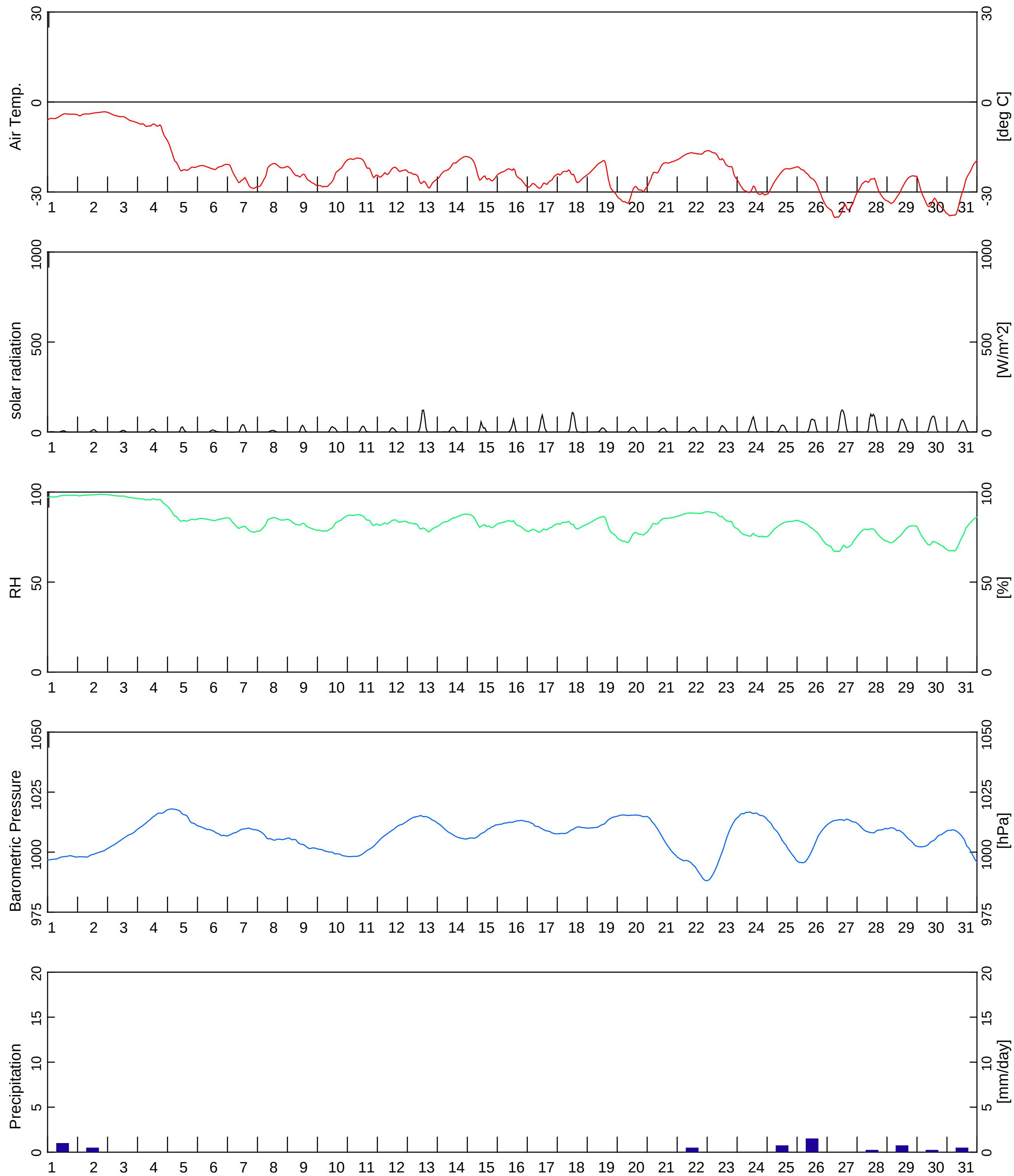
TYHEE NWT CORP
YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

DEC. 2006 WIND ROSE
SITE #7 TYHEE STATION

FIG.
C-12

APPENDIX

APPENDIX D SUMMARY OF WEATHER PARAMTERS – JANUARY 2006 TO DECEMBER 2006



HAY & COMPANY CONSULTANTS

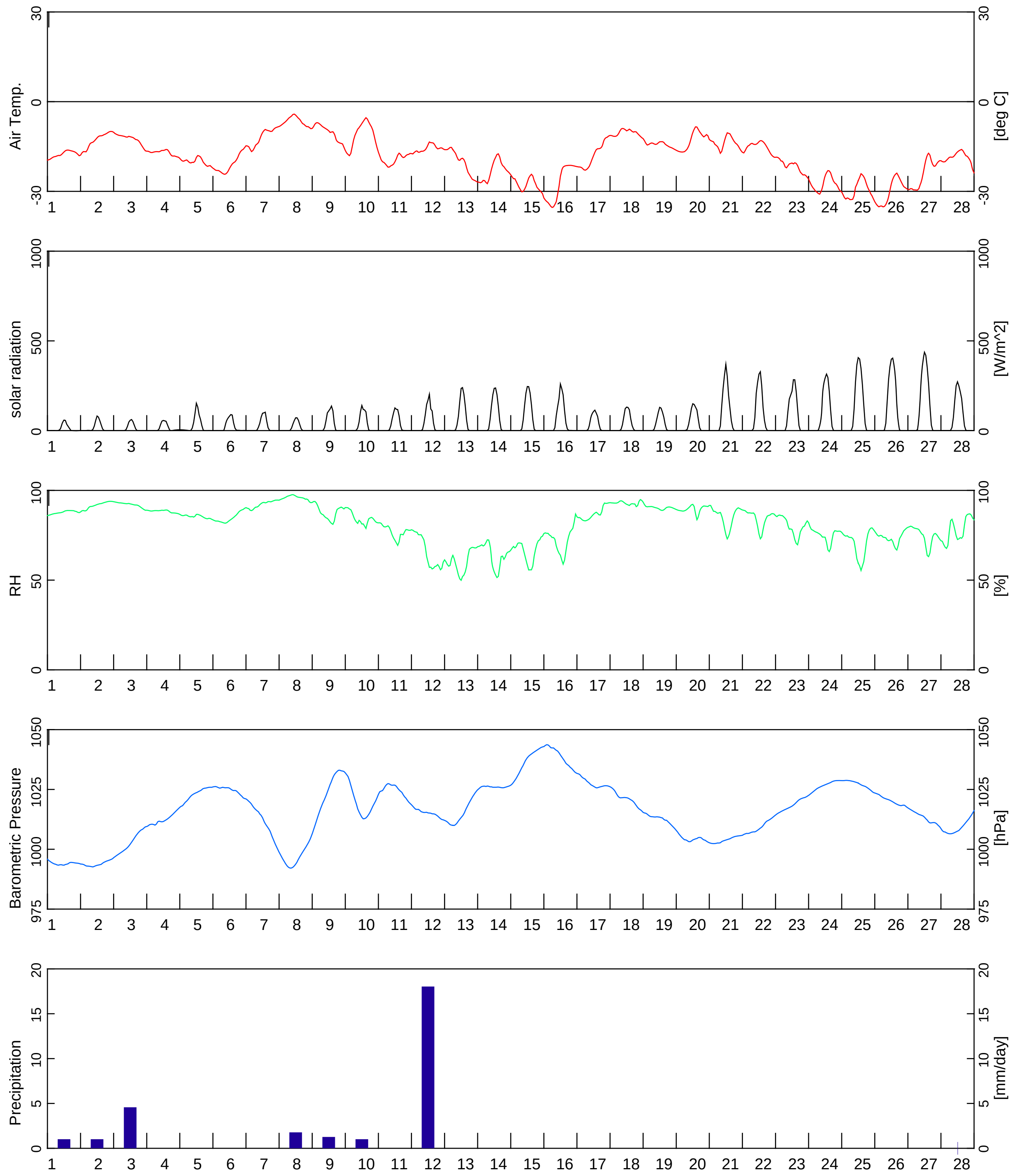
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

JAN. 2006 WEATHER
SITE #7 TYHEE STATION

FIG.
D-1

Thu Apr 12 08:49:38 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



HAY & COMPANY CONSULTANTS

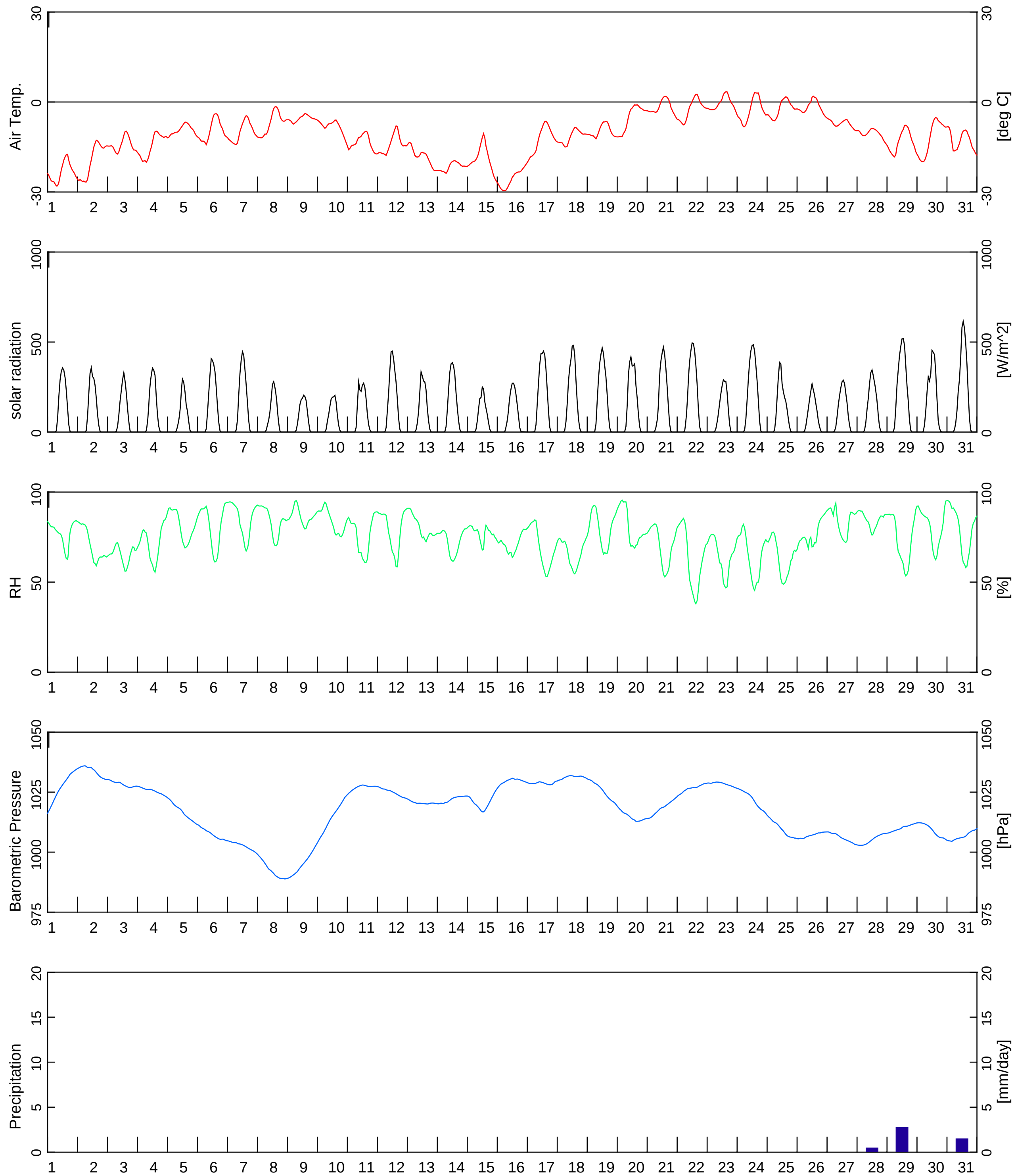
TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

FEB. 2006 WEATHER
SITE #7 TYHEE STATION

FIG.
D-2

Thu Apr 12 08:49:40 2007:Q:\Vancouver\Environmental\Y221\Projects\Y22101001_Tyhee_2006\RED\Meteorology\2006_data\data_reduction_programs



HAY & COMPANY CONSULTANTS

TYHEE NWT CORP.

YELLOWKNIFE GOLD PROJECT
HYDROLOGY AND METEOROLOGY

MAR. 2006 WEATHER
SITE #7 TYHEE STATION

FIG.
D-3