

Peace River Water Use Plan

Peace River Baseline TGP/Temperature

GMSWorks-2

Year 3 Monitoring Program - Interim Report

January 2011 to December 2011

**Diversified Environmental Services
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PEACE RIVER WATER USE PLAN
IMPLEMENTATION PROGRAM

PEACE RIVER BASELINE TGP/TEMP
YEAR 3 MONITORING PROGRAM - INTERIM REPORT
APRIL 2012

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EXECUTIVE SUMMARY

Long-term monitoring of baseline water temperature and total dissolved gas pressure (TDGP) in the vicinity of the WAC Bennett and Peace Canyon dams is an essential component of the Peace Spill Protocol and the Peace River Flood Pulse Plan as set out by the Peace Water Use Plan Committee and the Peace Water Use Plan (WUP; BC Hydro 2010). Data collected through the monitoring of these parameters will be used to help assess and quantify the environmental effects of spills, as well as to provide information on the temperature regime of the Peace River under normal operating conditions and the influence of reservoir operations on downstream temperature. Long-term baseline temperature data will also be available for use in other projects and monitoring programs within and outside of the Peace WUP. This report summarizes data collection and maintenance activities conducted at 18 monitoring sites located between the WAC Bennett Dam forebay (Williston Reservoir) and a point approximately 6.5 km downstream of the confluence of the Pine and Peace rivers during Year 3 (Jan 01, 2011 to Dec 31, 2011).

In situ reference temperatures were recorded at the time of each field download event using a certified laboratory-grade mercury thermometer calibrated in increments of 0.1°C, for comparison to the corresponding hourly logger readings. With the exception of 1 site (halfUP2), mean calibration errors for all temperature loggers were $\leq 0.3^{\circ}\text{C}$.

Results of Year 3 water temperature monitoring over the 132 km length of the study area indicate a moderating effect of hypolimnetic withdrawal from Williston Reservoir and seasonal impacts associated with ambient air temperature. Minimum winter temperatures decrease and maximum summer temperatures increase with distance downstream from the facilities.

Long term sampling protocols were further refined in Year 3. Minor adjustments in station placement and tether lengths were made in response to changing riverbank conditions. This resulted in a reduction in data gaps in Year 3 due to dislodged or stranded loggers. In addition, extreme low flow conditions experienced in Year 2 were not prevalent in Year 3. Data losses were also reduced by more frequent replacement of tether cables showing signs of corrosion.

During Year 3, logger pcnDN1, halfDN1, mobDN2, and pineDN2 were relocated to their respective opposite riverbanks to provide better redundancy, as recommended in the Year 2 interim report.

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1.0 INTRODUCTION

Long-term monitoring of baseline water temperature and total dissolved gas pressure (TDGP) in the vicinity of the WAC Bennett and Peace Canyon dams has been identified as an essential component of the Peace Spill Protocol and the Peace River Flood Pulse Plan as set out by the Peace Water Use Plan Committee and the Peace Water Use Plan (WUP; BC Hydro 2010).

Data collected through the monitoring of these parameters will be used to help assess and quantify the environmental effects of spills, as well as to provide information on the temperature regime of the Peace River under normal operating conditions and the influence of reservoir operations on downstream temperature. Long-term baseline temperature data will also be available for use by other projects and monitoring programs within and outside the Peace WUP.

The objectives of this program are to collect data on spatial and temporal variations in water temperature between the WAC Bennett Dam forebay (Williston Reservoir) and a point 6.5 km downstream of the Pine River confluence for up to 10 years, and to maintain TDGP data loggers and related equipment for immediate deployment in the event of a spill event at either the GMS or PCN generating stations. This report summarizes data collection activities completed during Year 3 of the monitoring program (Jan 01, 2011 to Dec 31, 2011).

2.0 METHODS

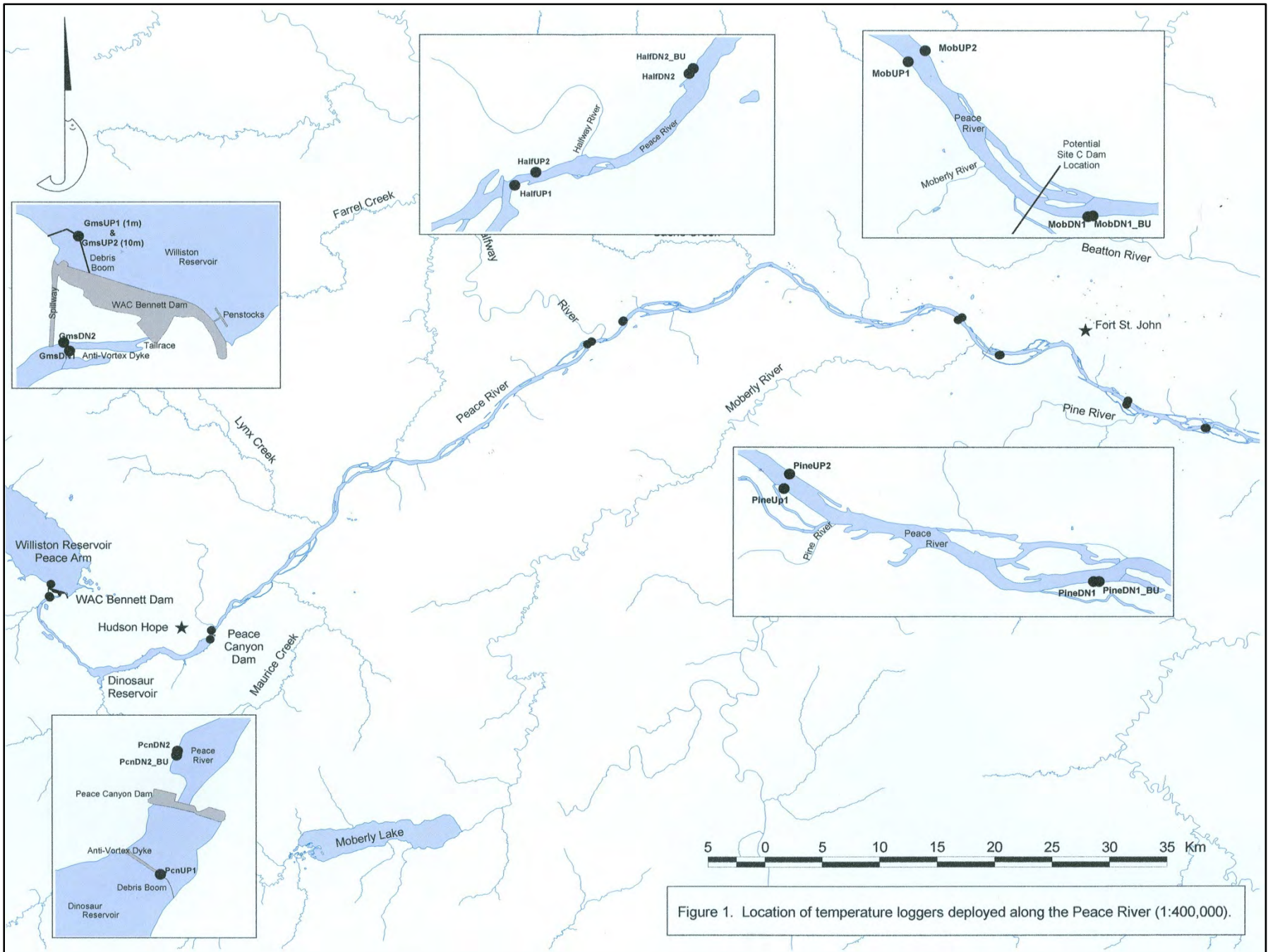
Temperature logger data presented in this summary were recorded between January 1, 2011 and December 31, 2011. The previous annual interim report (Year 2) encompassed 13 months of data collection in order to standardize the annual monitoring period to a calendar year beginning in Year 3.

2.1 Temperature Monitoring

Upon commencement of the Peace River baseline temperature monitoring program in September 2008 (Year 1), 20 Tidbit v2 Model #UTBI-001 temperature sensor/logger units (Onset Corp., Bourne, MA) were deployed at 18 locations between the WAC Bennett Dam forebay and a site approximately 6.5 km downstream of the confluence of the Pine and Peace rivers (Fig. 1). These 18 monitoring stations were maintained throughout Year 3. Further minor revisions were made due to changing bank conditions at some logger locations in order to reduce potential for stranding of the units during extreme low water events and to improve accessibility during high flow stage. A summary of temperature monitoring station information as of the end of Year 3 appears in Appendix I.

As in Year 2, temperature loggers were programmed to record water temperature (°C) at 1 hour intervals throughout Year 3. Loggers continued to be housed in 38 mm x 100 mm steel nipples with threaded steel end caps, weighted with 5 kg steel anchors, and tethered to rooted trees or large bedrock fragments using 6.35 mm galvanized steel cable.

Monitoring stations were typically maintained in pairs at each general location in order to provide redundancy and minimize the risk of data gaps in the event of logger stranding, failure, or loss. At Peace River locations upstream of major tributaries (Halfway, Moberly, and Pine), monitoring stations were maintained on opposing banks of the river in order to provide



redundancy and confirm temperature consistency across the channel. At Peace River locations downstream of major tributaries, paired station configuration was revised from opposing banks to common banks in Year 3 in order to provide better redundancy in tributary outflow paths prone to debris issues (*see* section 2.1.2).

Temperature data recorded and stored on each logger during 2011 were downloaded at approximately 3 month intervals (May, July, October, and early January 2012) by field transfer to a Model U-DTW-1 Hobo® waterproof shuttle (Onset Corp., Bourne, MA). Data from the shuttle were then downloaded to a desktop computer after each field session. Logger sites at the WAC Bennett Dam and Peace Canyon Dam forebay and tailrace locations were accessed by vehicle, while all Peace River mainstem sites were accessed by riverboat. Conditions and observations at the time of each download event were documented in the field on hardcopy Download Information Forms and subsequently entered into digital format. In situ reference temperatures were recorded at the time of each field download event using a certified laboratory-grade mercury thermometer calibrated in increments of 0.1°C for comparison to the corresponding hourly logger readings (within 30 minutes of reference temperature).

Data files were exported as MS Office Excel and Access compatible text files using Onset® Hoboware Pro software (Ver. 2.3.0), amalgamated into single Excel worksheets for each data logger, and plotted relative to time.

2.1.2 Year 3 Site Logistics

Few logistical problems were encountered during Year 3, partially due to ongoing refinements in station location and arrangement. Problems of logger stranding associated with extreme low flows during the summer and fall of Year 2 were not experienced during Year 3. Occasional stranding of loggers above the waterline during Year 3 were largely associated with the accumulation of debris on cables during flood events, and was confined to station halfDN2, located directly downstream of the confluence with the Halfway River. In order to reduce the risk of data gaps due to stranding at this station, redundant logger halfDN1, originally located on the opposing bank, was moved to same bank as halfDN2 and re-named halfDN2BU (back-up) to provide better redundancy, as per recommendations made in the Year 2 interim report. Logger halfDn1 formerly provided double redundancy for the 2 Halfway upstream stations.

As per recommendations of the Year 2 interim report, corresponding shifts in logger location were also made during Year 3 at the Moberly River and Pine River confluence downstream configurations (i.e., mobDN2 and pineDN2 loggers were moved to opposite banks and re-named mobDN1BU and pineDN1BU, respectively). The logger at station mobDN2 had been vandalized and dislodged early in Year 3 and could not be recovered until a low water event in October, at which time it was moved to the opposite riverbank (mobDN1BU). The unrecoverable logger apparently remained submerged during the intervening months between April and October and all data was retrieved.

In addition, logger pcnDN1, originally located on the south bank of the Peace Canyon tailrace, was moved to the north bank in Year 3 to provide redundancy for pcnDN2 and avoid chronic stranding and winter access problems. Year 1 and 2 data had indicated no difference in temperature patterns between the north and south banks of the Peace Canyon tailrace.

Weather conditions periodically prevented safe access and downloading of the PCN and GMS forebay loggers, which are suspended in the water column from a log boom and log boom buoy, respectively. No loss in data resulted from downloading delays.

2.2 Total Dissolved Gas Pressure (TDGP)

Six Model TBO-DL6(F) TDGP monitors (Common Sensing Inc., Clark Fork, ID) were purchased by BC Hydro in Year 1, and stored at the office of Diversified Environmental Services (DES) in Fort St. John, BC. Appendix II contains an inventory of dissolved gas pressure meters and probes. Throughout Year 3, the meters and probes were checked for functionality on a quarterly basis and batteries were re-charged. In addition, the calibration check routine was repeated and the condition of each probe oxygen sensor membrane was examined for evidence of ZnO precipitate build-up. This maintenance regime is conducted to ensure the equipment is ready for implementation in the event of a spill. No spill events occurred during Year 3.

3.0 RESULTS AND DISCUSSION

Download Information Forms completed during each download are provided in Appendix III. In addition to scheduled download events, loggers at some Peace River mainstem locations were visually checked and re-positioned by DES staff during the course of activities unrelated to the temperature monitoring program.

Reference temperatures recorded during download events are presented in Appendix IV along with corresponding logger temperatures and indicated error values. With the exception of logger halfUP2 (serial# 20385720), which exhibits a consistent correctable zero error of 1 degree C, calibration errors for all temperature loggers were typically within the range of 0.3°C. Corrected values for logger halfUP2 are provided in the accompanying 2011 data set.

In contrast to the low flow conditions prevalent in Year 2, Year 3 was characterized by moderate flow patterns punctuated by significant high flow events in June and July resulting from extreme storm events in tributary watersheds.

A summary of temperature data collection results and related conditions and limitations are discussed in the following 5 sections, which correspond to the 5 major generating station and tributary features.

3.1 WAC Bennett Dam Forebay and Tailrace

The WAC Bennett Dam forebay temperature monitoring station is located at the GMS spillway log boom and consists of a vertical cable suspended from the northernmost log boom steel buoy. Temperature is recorded with 2 loggers, one located at 1 metre depth and the second suspended at a depth of 10 metres. Continuous hourly data were recovered from both units for Year 3 and is presented in Figure 2. Although seasonal thermal stratification of Williston Reservoir is evident, the low degree of temperature differential suggests the primary thermocline lies deeper than 10 metres. Reservoir turn-over appeared to occur in late March and late October.

The GMS tailrace monitoring sites are located on opposite banks, approximately 700 m downstream of the outflow manifolds. Logger gmsDN1 records the temperature of water flowing from the south tailrace manifold, which originates from the shallowest penstock depth. Logger gmsDN2 measures water from the north tailrace manifold, which originates from a deeper withdrawal point. The tethered steel capsule at both stations contains a back-up logger in addition

to the primary unit (gmsDN1BU and gmsDN2BU). All 4 loggers collected seamless data through Year 3.

As in previous years, water temperatures at gmsDN2 showed the lowest annual variation and are consistently cooler in the summer and warmer in the winter than gmsDN1 flow, which originates closer to the surface of Williston Reservoir. Temperatures recorded at gmsUP1 (forebay surface) exhibit greater annual variation than tailrace values (Fig. 3).

3.2 Peace Canyon Dam Forebay and Tailrace

The data logger recording temperature in the Peace Canyon Dam forebay (pcnUP1) is attached to the anti-vortex dam log boom, approximately 450 m upstream of the dam face. Two loggers were originally deployed at this station, one at 1 m depth and one at 10 m depth. A comparison of temperatures recorded at 1 m and 10 m depths during Year 1 and part of Year 2 showed little evidence of thermal stratification within the upper 10 m of the forebay, although daytime surface warming in the range of 3-5°C was documented on the warmest days of July and August 2009. For this reason the 10 m depth logger was not replaced when it was lost due to a parted cable in Year 2. Forebay water temperature at 1 m depth was recorded seamlessly through Year 3.

The two Peace Canyon Dam tailrace loggers were originally located on opposite river banks, approximately 200 m downstream of the dam face. During Years 1 and 2, the south bank location (pcnDN1) frequently experienced stranding due to the lack of a suitable monitoring site. Winter access for downloading was also poor. A comparison of temperatures recorded on the north and south banks between September 2008 and May 2010 indicated a differential of less than 0.2°C. As recommended in the Year 2 interim report, the south bank logger (pcnDN1) was moved to the north bank next to pcnDN2 and re-named pcnDN2BU on July 29, 2011. PcnDN2 provided continuous data throughout Year 3 with the exception of a period of extremely low discharge in late June and early July when the logger appeared to be near the water line (Fig. 4). The back-up logger (pcnDN2BU) recorded seamless data after its relocation in July.

A comparison of PCN tailrace temperature (pcnDN2) and GMS tailrace temperature (mean of GMSDN1 and GMSDN2) indicates a relatively low degree of overall cooling in the winter and warming in the summer through Dinosaur Reservoir (Fig. 4).

Although not as distinct as in Year 2, Figure 4 indicates some thermal stratification of the Peace Canyon forebay below 10 m during August; i.e., water exiting the Peace Canyon powerhouse (pcnDN2) was cooler than forebay temperatures at 1 m depth (pcnUP1).

3.3 Halfway River Confluence

As in previous years, Peace River water temperature was monitored at points approximately 1 km upstream and 2.5 km downstream of the Halfway River confluence. Upstream stations were maintained on opposing banks through Year 3 (halfUP1 and halfUP2). The north bank upstream station (halfUP2) recorded seamless data throughout Year 3, while data from January 9 to May 30 at the redundant station on the opposing bank (halfUP1) was lost due to a cable parted by debris. As in Years 1 and 2, no cross-channel differential was recorded between the opposing upstream stations during the period when both loggers were operational.

As per recommendations from Year 2, the south bank downstream logger (halfDN1) was moved to the north bank on May 30 to provide redundancy for the halfDN2 logger, which lies within the direct influence of inputs from the Halfway River.

As in previous years, temperature values recorded at the downstream stations (halfDN2 and halfDN2BU) varied markedly from those collected upstream of the Halfway confluence and exhibited a higher degree of daily and annual variability (Fig. 5). Halfway River inputs typically have a cooling effect during the winter period (October through April) and a warming effect during the summer (May through September).

3.4 Moberly River Confluence

As in previous years, Peace River water temperature was monitored at points approximately 2.6 km upstream and 2.5 km downstream of the Moberly River confluence. Upstream stations were maintained on opposing banks throughout Year 3 (mobUP1 and mobUP2) and both recorded seamless hourly data throughout Year 3. As in Years 1 and 2, no cross-channel differential was recorded between the opposing upstream stations, indicating complete cross-channel mixing of tributary inputs from Cache Creek and the Halfway River, located 20 km and 36 km upstream, respectively.

For reasons previously discussed, the north bank downstream station was re-positioned to the south bank during Year 3 to provide redundancy for the south bank station (mobDN1), which lies within the direct influence of inputs from the Moberly River. The primary south bank logger recorded seamless data throughout Year 3. The second downstream unit recorded seamless hourly data both before (mobDN2) and after its re-location (mobDN1BU) on October 26.

As in previous years, temperatures recorded downstream, within the influence of the Moberly River, were warmer than upstream stations from May through July and cooler than upstream stations from October through December (Fig. 6). The influence of the Moberly River is significantly less than that of the Halfway River and appears to correspond to the difference in relative contributed volumes.

3.5 Pine River Confluence

Peace River water temperature was monitored at points approximately 2.0 km upstream and 6.5 km downstream of the Pine River confluence. As in previous years, upstream stations were maintained on opposing banks (pineUP1 and pineUP2). The redundant north bank logger (pineUP2) failed prior to the May 2011 download, resulting in a loss of data from January 6 to May 31; the replacement unit recorded continuous data for the remainder of the year. The south bank upstream logger (pineUP1) recorded continuous hourly data throughout Year 3. As in Years 1 and 2, little cross-channel differential was recorded between the opposing upstream stations during the period when both loggers were operational (Year 3 mean differential 0.2°C).

The south bank downstream logger (pineDN1) lies within the direct influence of inputs from the Pine River and recorded seamless hourly data throughout Year 3. The second downstream unit (pineDN2), originally located on the opposing bank, was lost during a

flood event in June. For reasons previously discussed, its replacement was repositioned to the south bank on July 18 (pineDN1BU) to provide redundancy for the south bank station (pineDN1).

Temperature values recorded within the downstream influence of the Pine River (pineDN1) were typically cooler than the Pine River upstream stations from late September through December and slightly warmer from July through mid September (Fig. 7).

Figure 8 represents comparative seasonal temperature change over the 132 km length of the study area between the WAC Bennett Dam Tailrace (gmsDN2) and the Pine River confluence (pineUP1). Data appearing in this figure includes Halfway and Pine confluence stations not directly influenced by their respective tributary inputs. The graph illustrates the moderating effect of hypolimnetic withdrawal from Williston Reservoir on downstream temperatures in the Peace River and the seasonal impact of ambient air temperature on downstream water temperatures, i.e., winter temperatures decrease and summer temperatures increase with distance downstream. Brief periods of homogeneity occurred in early April and early October with gradients inverting on either side of these dates to form the typical annual pattern.

4.0 RECOMMENDATIONS

Data quality and continuity during Year 3 were much improved as a result of refinements in station configuration and data collection protocols recommended during Years 1 and 2. These included:

- more frequent replacement of galvanized tether cables,
- re-positioning of downstream opposing stations at each tributary confluence to the same bank as the downstream-influenced station, in order to provide greater redundancy in the event of tampering, stranding, or logger failure, and
- re-positioning of the PCN tailrace south bank logger to the north bank, to provide more reliable redundancy.

No additional measures or configuration changes are recommended for Year 4.

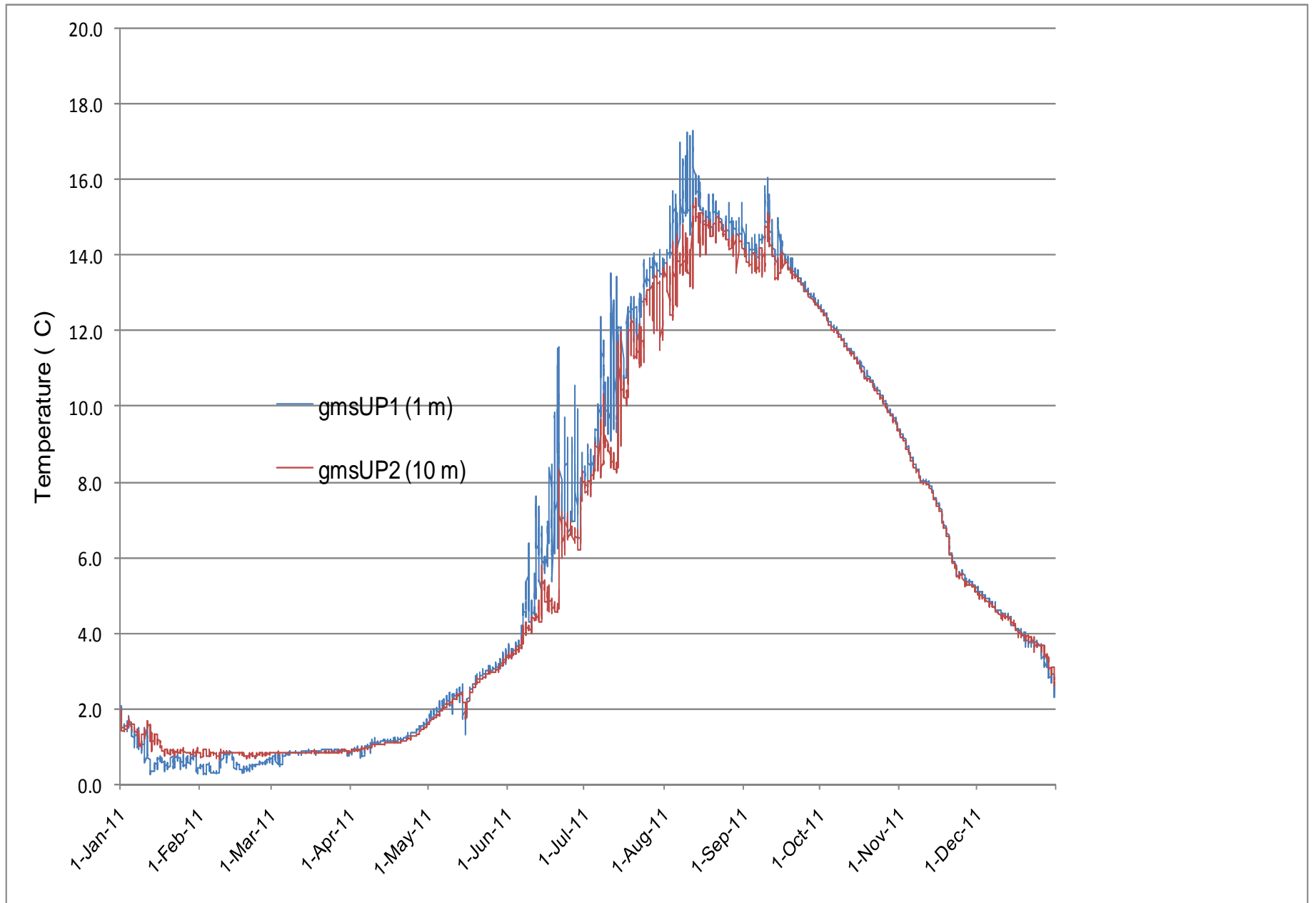


Figure 2. Comparison of water temperature at WAC Bennett Dam forebay station from 1 m depth (gmsUP1) and 10 m depth (gmsUP2) during Year 3.

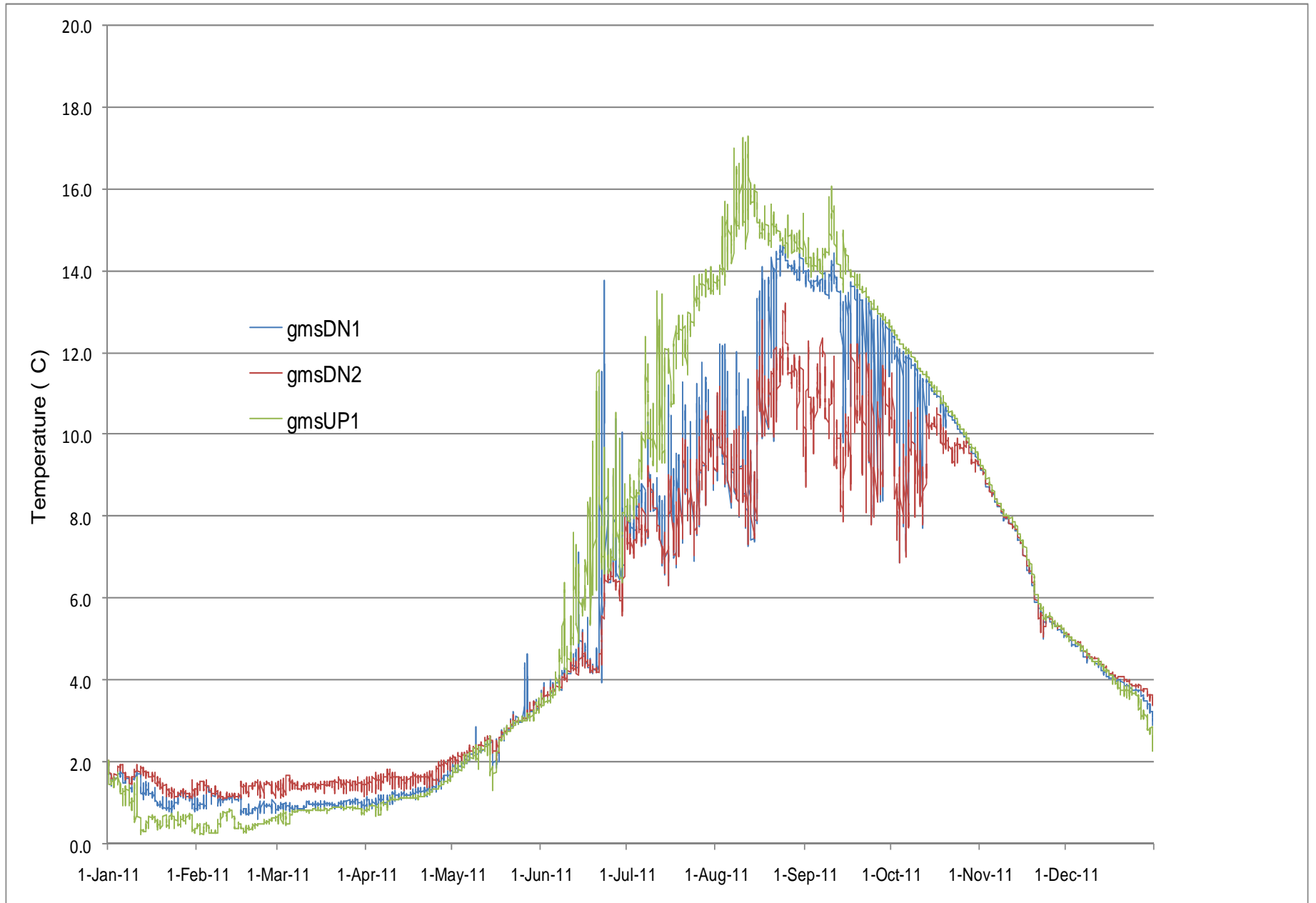


Figure 3. Comparison of water temperature at WAC Bennett Dam forebay surface (gmsUP1), and WAC Bennett Dam tailrace (gmsDN1 and gmsDN2) during Year 3.

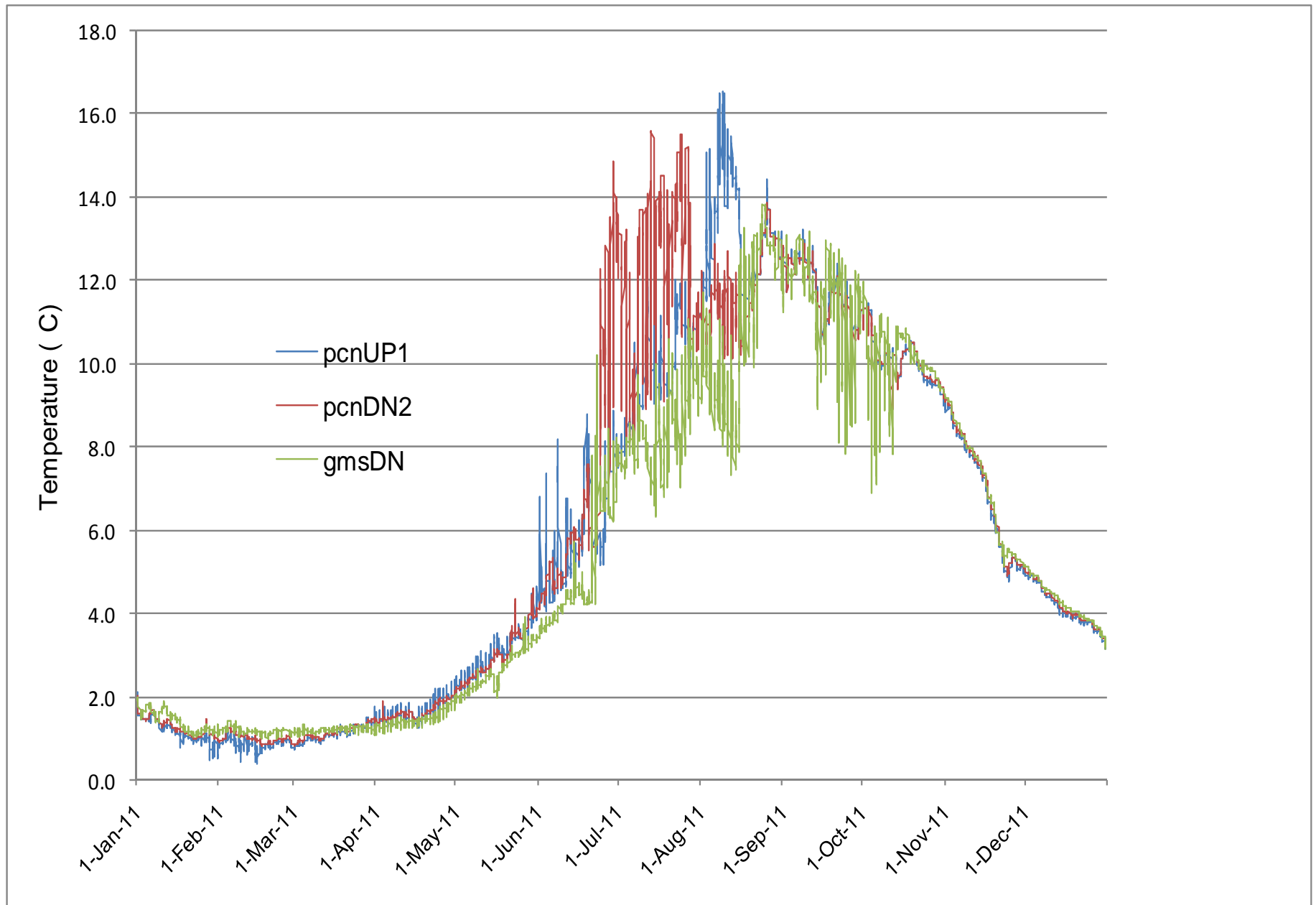


Figure 4. Comparison of water temperature at Peace Canyon forebay surface (pcnUP1), Peace Canyon tailrace (pcnDN2), and WAC Bennett Dam tailrace (gmsDN) during Year 3.

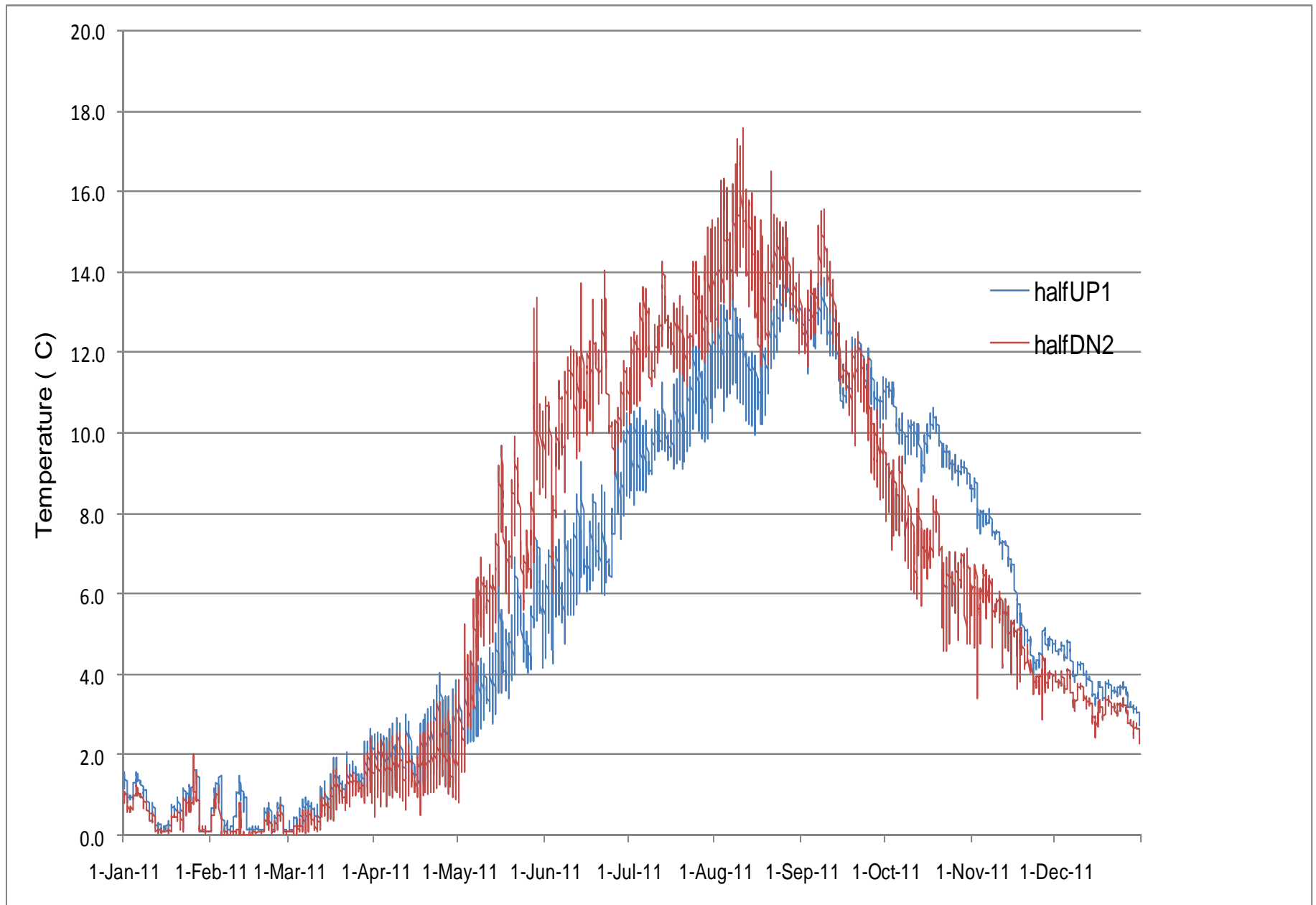


Figure 5. Comparison of Peace River water temperature upstream of Halfway River confluence (halfUP1) and downstream of Halfway River confluence (halfDN2) during Year 3.

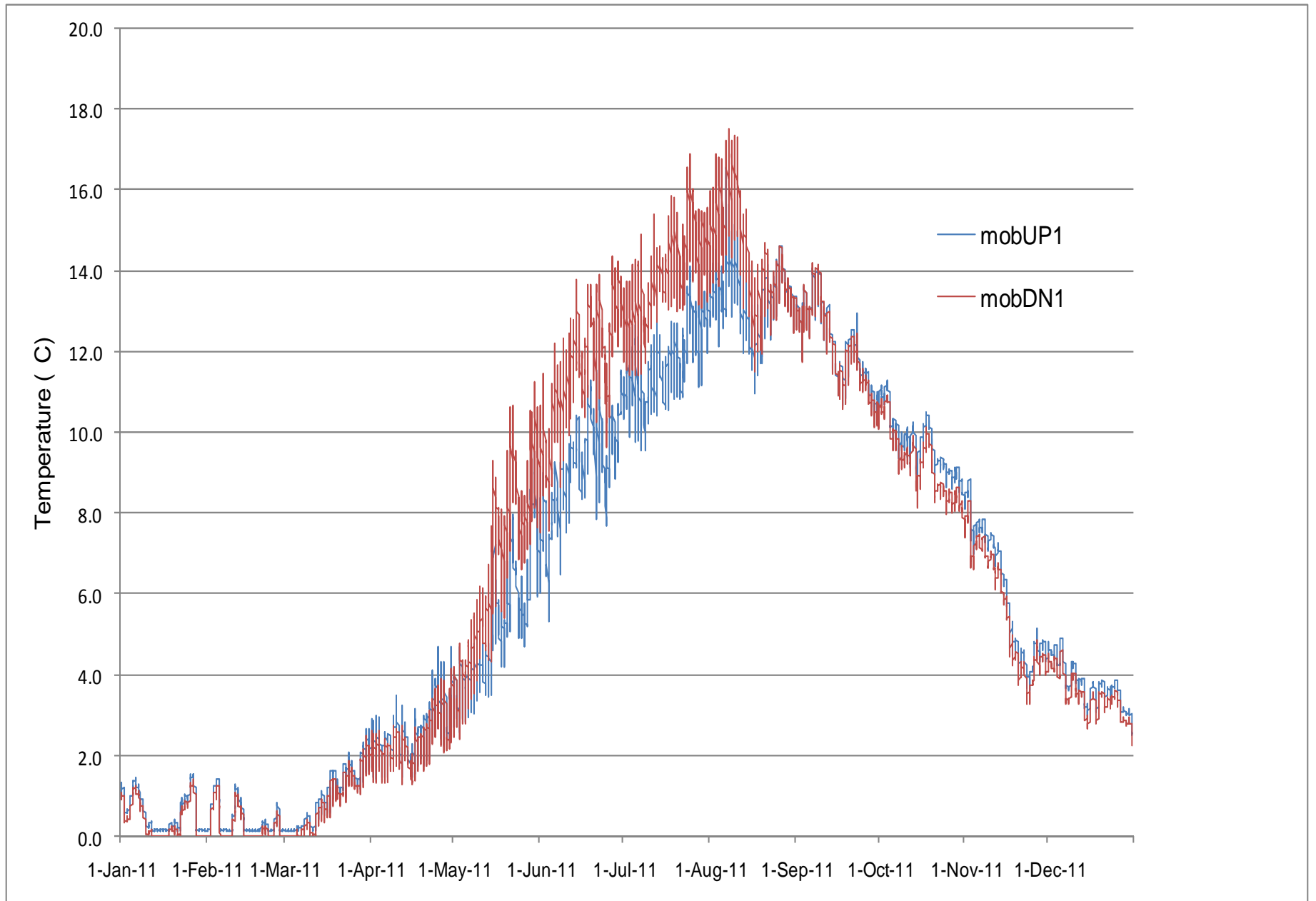


Figure 6. Comparison of Peace River water temperature upstream of Moberly River confluence (mobUP1) and downstream of Moberly River confluence (mobDN1) during Year 3.

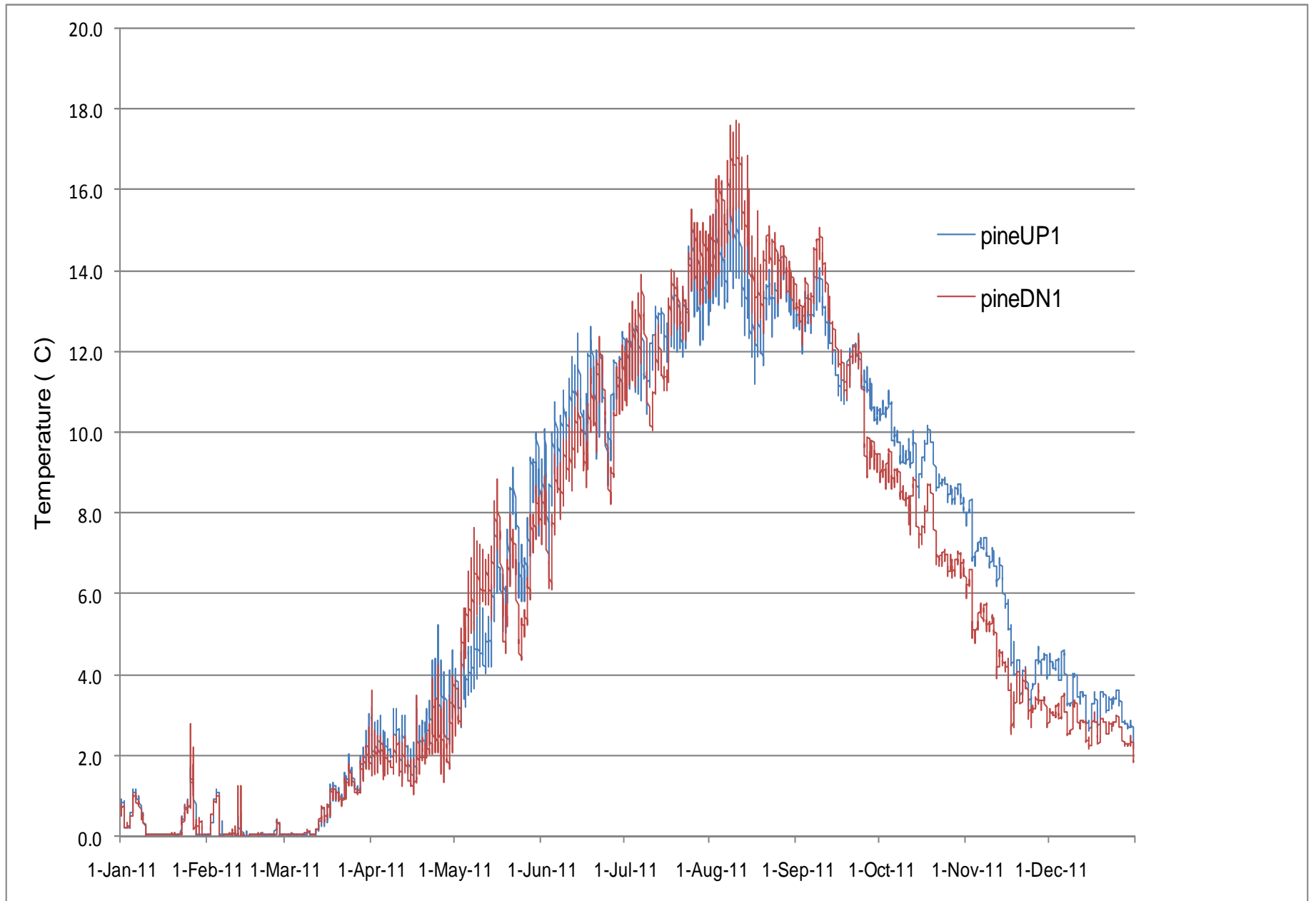


Figure 7. Comparison of Peace River water temperature upstream of Pine River confluence (pineUP1) and downstream of Pine River confluence (pineDN1) during Year 3.

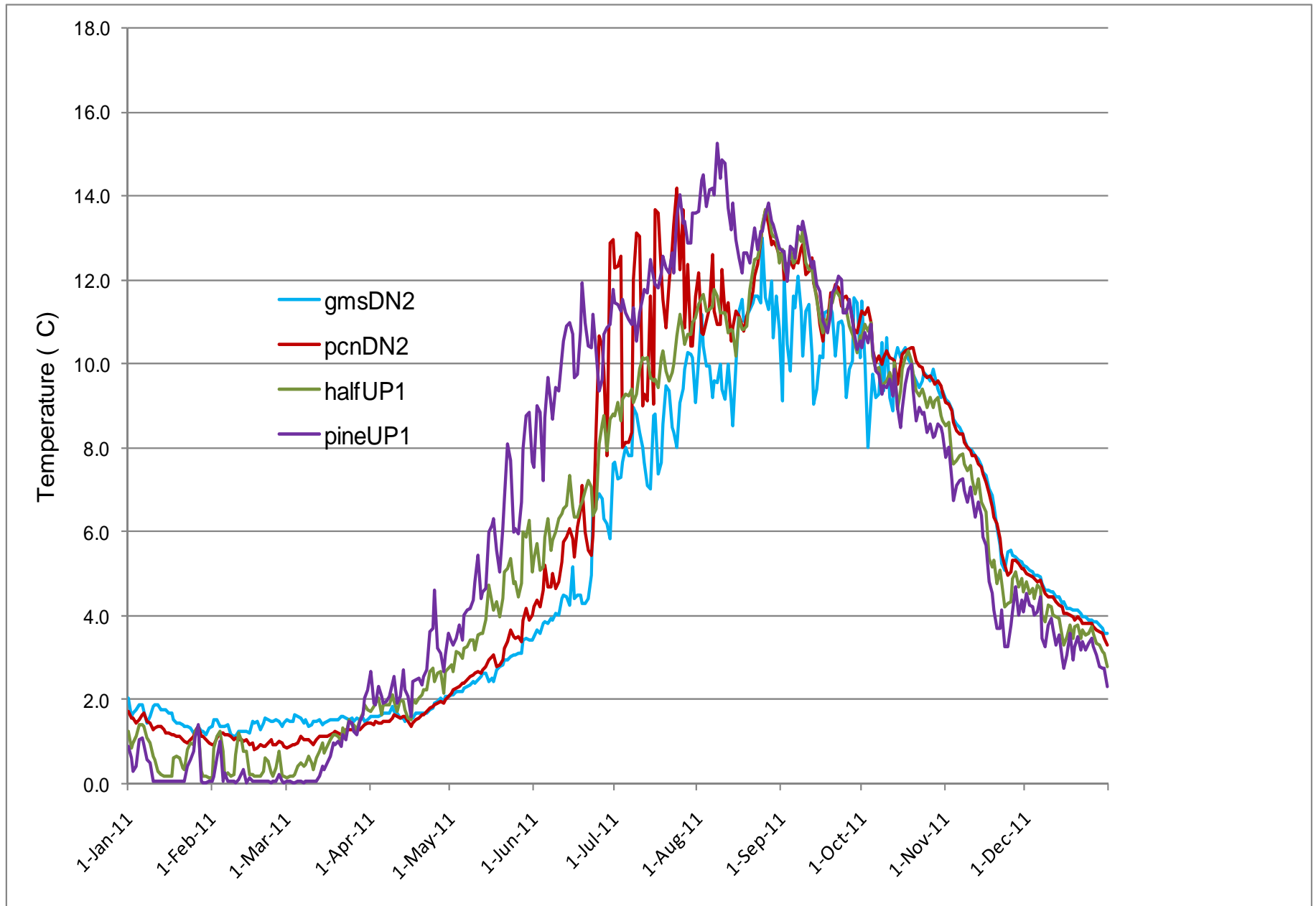


Figure 8. Peace River water temperature gradient from WAC Bennett Dam tailrace, downstream to Pine River confluence, during Year 3.

REFERENCES

BC Hydro. 2010. Peace River Water Use Plan; monitoring program terms of reference – Peace River Baseline TGP/Temp. BC Hydro, Vancouver, BC. 7pp.

Point Four Systems Inc. No date. Dissolved gas pressure and oxygen meter/logger Model TBO-DL6(F) Instruction Manual. Revision 3. Prepared by Point Four Systems Inc., Coquitlam, BC.

Appendix I: Data logger locations at end of Year 3.

| Site ID | Serial # | Location | East | North | Comment |
|--------------|----------|---------------------------------|--------|---------|---|
| gmsUP1 | 2038617 | WAC Bennett Forebay | 548841 | 6209022 | steel buoy; 1 m depth |
| gmsUP2 | 2038574 | WAC Bennett Forebay | 548841 | 6209022 | steel buoy; 10 m depth |
| gmsDN1 | 2038619 | GMS Tailrace | 548881 | 6207761 | southbank; deflection wier riprap |
| gmsDN1backup | 2038619 | GMS Tailrace | 548881 | 6207761 | southbank; deflection wier riprap |
| gmsDN2 | 2038620 | GMS Tailrace | 548828 | 6207836 | north bank; riprap below Tunnel portal #3 |
| gmsDN2backup | 2038614 | GMS Tailrace | 548828 | 6207836 | north bank; riprap below Tunnel portal #3 |
| pcnUP1 | 2225325 | Peace Canyon Forebay | 562684 | 6204075 | anti-vortex log boom; 1 m depth |
| pcnDN2 | 2038621 | Peace Canyon Tailrace | 562803 | 6204854 | north bank; rock slab |
| pcnDN2BU | 2038568 | Peace Canyon Tailrace | 562803 | 6204854 | north bank; rock slab |
| HalfUP1 | 9767573 | Halfway Confluence - upstream | 595165 | 6230094 | south bank; spruce tree |
| HalfUP2 | 2038572 | Halfway Confluence - upstream | 595578 | 6230542 | north bank; aspen stump |
| HalfDN2 | 2038574 | Halfway Confluence - downstream | 598198 | 6232169 | north bank; balsam poplar |
| HalfDN2BU | 2038623 | Halfway Confluence - downstream | 598179 | 6232144 | north bank; balsam poplar |
| MobUP1 | 2038612 | Moberly Confluence - upstream | 627158 | 6232349 | south bank; alder |
| MobUP2 | 2038616 | Moberly Confluence - upstream | 627501 | 6232563 | north bank; birch tree |
| MobDN1 | 2038622 | Moberly Confluence - downstream | 630583 | 6229281 | south bank; alder |
| MobDN1BU | 2038576 | Moberly Confluence - downstream | 630402 | 6229275 | south bank; alder |
| PineUP1 | 2038624 | Pine Confluence - upstream | 641034 | 6225375 | south bank; alder |
| PineUP2 | 9767572 | Pine Confluence - upstream | 641653 | 6225304 | north bank; balsam poplar |
| PineDN1 | 2225322 | Pine Confluence - downstream | 648427 | 6222837 | south bank; alder |
| PineDN1BU | 9762095 | Pine Confluence - downstream | 648362 | 6222823 | south bank; alder |

Appendix II. Inventory of dissolved gas pressure meters and probes.

| Meter Number | Serial Number | Probe Number | Cable Length (ft) |
|---------------------|----------------------|---------------------|--------------------------|
| 1 | 00231 | 1 | 50 |
| 2 | 00228 | 2 | 100 |
| 3 | 00230 | 3 | 100 |
| 4 | 00227 | 4 | 100 |
| 5 | 00226 | 5 | 100 |
| 6 | 00229 | 6 | 100 |

Appendix III. Year 3 Download Information Forms

| BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM | | | | | | | | | | | |
|--|----------|------------------------|----------------------|-----------------------------------|---------------|-----------------------|--------------------|-------------|-------|--|--|
| SITE ID | half UP2 | LOCATION | u/s of Halfway River | | | BANK | north | | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038572 | | | UTM | 595578 | 6230542 | | | |
| DOWNLOAD DATE | 30 | May | 2011 | DOWNLOAD TIME | 12:05 | | | CREW | BC RB | | |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.2 | AIR TEMP | 12 | ICE CONDITIONS | free | | | | |
| LOGGER CONDITIONS | | | | | | | | | | | |
| WATER DEPTH | 120 | cm | DISLODGED | no | REASON | | | | | | |
| BURIED | no | FUNCTIONAL | wet | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | willow | | | | |
| COMMENTS | | | | | | | | | | | |
| download OK | | | | | | | | | | | |
| Low water | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| SITE ID | half UP1 | LOCATION | u/s of Halfway River | | | BANK | south | | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767573 | | | UTM | 595165 | 6230094 | | | |
| DOWNLOAD DATE | 30 | May | 2011 | DOWNLOAD TIME | 12:30 | | | CREW | BC RB | | |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.2 | AIR TEMP | 12 | ICE CONDITIONS | free | | | | |
| LOGGER CONDITIONS | | | | | | | | | | | |
| WATER DEPTH | 160 | cm | DISLODGED | yes | REASON | ice | | | | | |
| BURIED | n/a | FUNCTIONAL | no | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | spruce | | | | |
| COMMENTS | | | | | | | | | | | |
| cable parted; logger gone | | | | | | | | | | | |
| replaced with 9767573 | | | | | | | | | | | |
| moved slightly upstream to new coordinates - deep water | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| SITE ID | half DN2 | LOCATION | d/s of Halfway River | | | BANK | north | | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038574 | | | UTM | 598198 | 6232169 | | | |
| DOWNLOAD DATE | 30 | May | 2011 | DOWNLOAD TIME | 13:05 | | | CREW | BC RW | | |
| TEST RECORDER TYPE | merc | WATER TEMP | 0.9 | AIR TEMP | -13 | ICE CONDITIONS | free | | | | |
| LOGGER CONDITIONS | | | | | | | | | | | |
| WATER DEPTH | 0 | cm | DISLODGED | yes | REASON | debris | | | | | |
| BURIED | no | FUNCTIONAL | dry | IF DRY, HEIGHT ABOVE WATER | 20 | cm | TETHER TYPE | balsam pop | | | |
| COMMENTS | | | | | | | | | | | |
| recently drug ashore by debris | | | | | | | | | | | |
| repositioned in 180 cm of water | | | | | | | | | | | |
| cable OK | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |
| SITE ID | half DN1 | LOCATION | d/s of Halfway River | | | BANK | south | | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038623 | | | UTM | 598364 | 6231605 | | | |
| DOWNLOAD DATE | 30 | May | 2011 | DOWNLOAD TIME | 13:15 | | | CREW | BC RW | | |
| TEST RECORDER TYPE | merc | WATER TEMP | 5.7 | AIR TEMP | 12 | ICE CONDITIONS | free | | | | |
| LOGGER CONDITIONS | | | | | | | | | | | |
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | | | | | |
| BURIED | no | FUNCTIONAL | wet | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | spruce | | | | |
| COMMENTS | | | | | | | | | | | |
| moved across river to new location half DN2_BU; UTM 10.598179.6232144 upstream of half DN2 | | | | | | | | | | | |
| replaced corroded cable | | | | | | | | | | | |
| anchored from balsam poplar in 200 cm of water | | | | | | | | | | | |
| New site Ref temp 9.8 @ 1335 hrs | | | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | mobUP1 | LOCATION | u/s of Moberly River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038612 | | UTM | 627158 | 6232349 |
| DOWNLOAD DATE | 31 May 2011 | DOWNLOAD TIME | 11:06 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.0 | AIR TEMP | 15 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK
cable OK
w ater high

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | mobUP2 | LOCATION | u/s of Moberly River | | BANK | | north |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038616 | | UTM | 627501 | 6232563 |
| DOWNLOAD DATE | 31 May 2011 | DOWNLOAD TIME | 11:15 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 7.2 | AIR TEMP | 15 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|--------|
| WATER DEPTH | 120 | cm | DISLODGED | yes | REASON | ice | debris |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | birch |

COMMENTS

logger shifted dow nstream
dow nload OK

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | mobDN1 | LOCATION | d/s of Moberly River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038622 | | UTM | 630583 | 6229281 |
| DOWNLOAD DATE | 31 May 2011 | DOWNLOAD TIME | 16:29 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 9.8 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | mobDN2 | LOCATION | d/s of Moberly River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038576 | | UTM | 631187 | 6229623 |
| DOWNLOAD DATE | 31 May 2011 | DOWNLOAD TIME | | | CREW | BC TE | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|--|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | | cm | DISLODGED | | REASON | | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

couldn't locate cable or logger due to high w ater

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|-------------|------------------------|------------------------|-----------------|--------|-----------------------|------|
| SITE ID | pineUP1 | LOCATION | upstream of Pine River | BANK | south | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038624 | UTM | 641034 | 6225372 | |
| DOWNLOAD DATE | 31 May 2011 | DOWNLOAD TIME | 17:17 | CREW | BC TE | | |
| TEST RECORDER TYPE | merc | WATER TEMP | 8.9 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK
 Removed corroded cable end
 replace cable next dow nload

| | | | | | | | |
|---------------------------|-------------|------------------------|------------------------|-----------------|--------|-----------------------|------|
| SITE ID | pineUP2 | LOCATION | upstream of Pine River | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038567 | UTM | 641653 | 6225304 | |
| DOWNLOAD DATE | 31 May 2011 | DOWNLOAD TIME | 17:40 | CREW | BC TE | | |
| TEST RECORDER TYPE | merc | WATER TEMP | 8 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 180 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

logger failed; no dow nload
 replaced failed logger 2038567 with "spare" 9767572
 repositioned in 200 cm of w ater
 replace cable next dow nload

| | | | | | | |
|---------------------------|--|------------------------|--|-----------------|--|-----------------------|
| SITE ID | | LOCATION | | BANK | | |
| LOGGER TYPE | | LOGGER SERIAL # | | UTM | | |
| DOWNLOAD DATE | | DOWNLOAD TIME | | CREW | | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS |

| LOGGER CONDITIONS | | | | | | |
|--------------------|--|-------------------|------------------|-----------------------------------|---------------|--------------------|
| WATER DEPTH | | cm | DISLODGED | | REASON | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE |

COMMENTS

| | | | | | | |
|---------------------------|--|------------------------|--|-----------------|--|-----------------------|
| SITE ID | | LOCATION | | BANK | | |
| LOGGER TYPE | | LOGGER SERIAL # | | UTM | | |
| DOWNLOAD DATE | | DOWNLOAD TIME | | CREW | | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS |

| LOGGER CONDITIONS | | | | | | |
|--------------------|----|-------------------|------------------|-----------------------------------|---------------|--------------------|
| WATER DEPTH | | cm | DISLODGED | | REASON | |
| BURIED | no | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE |

COMMENTS

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | gmsUP1 | LOCATION | GMS Forebay | | | BANK | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038617 | | | UTM | 548841 | 6209022 |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 12:19 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 14 | AIR TEMP | 18 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|------------|
| WATER DEPTH | 100 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | steel buoy |

COMMENTS

dow nload OK
cable OK

| | | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | gmsUP2 | LOCATION | GMS Forebay | | | BANK | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767574 | | | UTM | 548841 | 6209022 |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 12:21 | | CREW | BC TE |
| TEST RECORDER TYPE | n/a | WATER TEMP | n/a | AIR TEMP | 18 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|------|-------------------|------|-----------------------------------|--|----|--------------------|------------|
| WATER DEPTH | 10 m | DISLODGED | no | REASON | | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | steel buoy |

COMMENTS

dow nload OK
cable OK

| | | | | | | | | |
|---------------------------|--------|------------------------|------------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | gmsDN2 | LOCATION | GMS Tailrace RDB | | | BANK | | north |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038620 | | | UTM | 548828 | 6207836 |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 13:35 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 10.3 | AIR TEMP | 19 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|------|
| WATER DEPTH | 170 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK
Back-up logger 2038614 also dow nloaded
replace corroded section of cable next dow nload

| | | | | | | | | |
|---------------------------|--------|------------------------|------------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | gmsDN1 | LOCATION | GMS Tailrace LDB | | | BANK | | south |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038619 | | | UTM | 548881 | 6207761 |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 13:48 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 10.2 | AIR TEMP | 19 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK
Back-up logger 2038613 also dow nloaded
corroded cable replaced

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|--------|------------------------|--------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnDN2 | LOCATION | PCN Tailrace | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038621 | | UTM | 562803 | 6204854 | |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 10:21 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 10.3 | AIR TEMP | 17 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|------|
| WATER DEPTH | 100 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK
replaced corroded cable

| | | | | | | | | |
|---------------------------|--------|------------------------|--------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnDN1 | LOCATION | PCN Tailrace | | BANK | south | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038568 | | UTM | 563128 | 6204822 | |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 10:00 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | n/a | AIR TEMP | 14 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|----------|
| WATER DEPTH | 0 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | dry | IF DRY, HEIGHT ABOVE WATER | 50 | cm | TETHER TYPE | concrete |

COMMENTS

PCN discharge very low ; logger dry
removed and relocated to north side of tailrace - pcnDN2_BU - same anchor as pcnDN2 (UTM 10.562803.6204854)
installed new .125 stainless cable
re-deployed @ 1040 hrs - ref temp 10.3

| | | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnUP1 | LOCATION | PCN Forebay | | BANK | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2225325 | | UTM | 562684 | 6204075 | |
| DOWNLOAD DATE | 29 | Jul | 2011 | DOWNLOAD TIME | 11:02 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 11.3 | AIR TEMP | 17 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|----------|
| WATER DEPTH | 100 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | log boom |

COMMENTS

dow nload OK
ref temp at surface

| | | | | | | | | |
|---------------------------|--|------------------------|--|----------------------|-------------|-----------------------|-------------|--|
| SITE ID | | LOCATION | | | BANK | | | |
| LOGGER TYPE | | LOGGER SERIAL # | | | UTM | | | |
| DOWNLOAD DATE | | | | DOWNLOAD TIME | | | CREW | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS | | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|--|-------------------|------------------|-----------------------------------|---------------|----|--------------------|--|
| WATER DEPTH | | cm | DISLODGED | | REASON | | | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | |

COMMENTS

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfUP2 | LOCATION | u/s of Halfway River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038572 | | UTM | 595578 | 6230542 |
| DOWNLOAD DATE | 24 Jul 2011 | DOWNLOAD TIME | 11:10 | | CREW | BC DC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 10.9 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|--------|
| WATER DEPTH | 110 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | willow |

COMMENTS

dow nload Ok
 replaced low er section of cable
 cable lengthened; re-positioned to >200 cm of w ater

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfUP1 | LOCATION | u/s of Halfway River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767573 | | UTM | 595165 | 6230094 |
| DOWNLOAD DATE | 24 Jul 2011 | DOWNLOAD TIME | 11:40 | | CREW | BC DC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 10.6 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------------|
| WATER DEPTH | 220 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | spruce tree |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfDN2_BU | LOCATION | d/s of Halfway River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038623 | | UTM | 598179 | 6263144 |
| DOWNLOAD DATE | 24 Jul 2011 | DOWNLOAD TIME | 13:15 | | CREW | BC DC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 12.8 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|----|-------------------|------------------|-----|-----------------------------------|--------|-------------------------------|
| WATER DEPTH | 0 | cm | DISLODGED | yes | REASON | debris | |
| BURIED | no | FUNCTIONAL | | dry | IF DRY, HEIGHT ABOVE WATER | 60 cm | TETHER TYPE balsam pop |

COMMENTS

dow nload OK
 logger/anchor drug ahore by debris
 re-deployed in 160 cm of w ater

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfDN2 | LOCATION | d/s of Halfway River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038574 | | UTM | 598198 | 6232169 |
| DOWNLOAD DATE | 24 Jul 2011 | DOWNLOAD TIME | 12:05 | | CREW | BC DC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 12.8 | AIR TEMP | 18 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 50 | cm | DISLODGED | yes | REASON | debris | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK
 dislodged by debris but still functional
 re-positioned in 150 cm of w ater

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|----------------------------|---------|
| SITE ID | mobUP2 | LOCATION | u/s of Moberly River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038616 | | UTM | 627501 | 6232563 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | 15:50 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 12.7 | AIR TEMP | 22 | ICE CONDITIONS free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|----|-------------------|------|-----------------------------------|----|--------------------------|
| WATER DEPTH | 120 | cm | DISLODGED | no | REASON | | |
| BURIED | no | | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE birch |

COMMENTS

dow nload Ok
cable embedded on shore but logger OK

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|----------------------------|---------|
| SITE ID | mobUP1 | LOCATION | u/s of Moberly River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038612 | | UTM | 627158 | 6232349 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | 15:57 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 12.4 | AIR TEMP | 22 | ICE CONDITIONS free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|----|----|-------------------|------|-----------------------------------|----|--------------------------|
| WATER DEPTH | 70 | cm | DISLODGED | no | REASON | | |
| BURIED | no | | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE alder |

COMMENTS

dow nload OK
logger dragged part w ay to shore - OK
re-positioned to 120 cm of w ater

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | mobDN2 | LOCATION | d/s of Moberly River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038576 | | UTM | 631187 | 6229623 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | | | CREW | BC TE | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|--|----|-------------------|--|-----------------------------------|----|-------------------------|
| WATER DEPTH | | cm | DISLODGED | | REASON | | |
| BURIED | | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE rock |

COMMENTS

Water very high - couldn't locate anchor, cable or logger

| | | | | | | | |
|---------------------------|-------------|------------------------|----------------------|-----------------|-------------|----------------------------|---------|
| SITE ID | mobDN1 | LOCATION | d/s of Moberly River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038622 | | UTM | 630583 | 6229281 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | 16:10 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 15.4 | AIR TEMP | 22 | ICE CONDITIONS free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|----|-------------------|------|-----------------------------------|----|--------------------------|
| WATER DEPTH | 140 | cm | DISLODGED | no | REASON | | |
| BURIED | no | | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE alder |

COMMENTS

dow nload OK

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|-------------|------------------------|-------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | pineUP1 | LOCATION | u/s of Pine River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038624 | | UTM | 641034 | 6225375 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | 18:01 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 13.6 | AIR TEMP | 21 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK
cable buried at shore end
replaced low er half of cable

| | | | | | | | |
|---------------------------|-------------|------------------------|-------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | pine UP2 | LOCATION | u/s of Pine River | | BANK | | north |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767572 | | UTM | 641653 | 6225304 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | 18:22 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 12.7 | AIR TEMP | 20 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 120 | cm | DISLODGED | no | REASON | | |
| BURIED | yes | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK
logger/anchor embedded in silt
replace corroded cable next dow nload

| | | | | | | | |
|---------------------------|-------------|------------------------|-------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | pineDN1_BU | LOCATION | d/s of Pine River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9762095 | | UTM | 648362 | 6222823 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | n/a | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 14.0 | AIR TEMP | 22 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 200 | cm | DISLODGED | | REASON | | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

new logger deployed 62 m upstream of pineDN1; 1741 hrs (new UTM 10.648362.6222823)
replaces pineDN2 (cable parted by ice/debris, logger gone)

| | | | | | | | |
|---------------------------|-------------|------------------------|-------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | pineDN1 | LOCATION | d/s of Pine River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2225322 | | UTM | 648408 | 6222831 |
| DOWNLOAD DATE | 18 Jul 2011 | DOWNLOAD TIME | 1709 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 14.0 | AIR TEMP | 22 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 100 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK
moved 23 m dow nstream to new alder due to uprooting of anchor tree during flood; new UTM 10.648427.6222837
original cable buried but logger Ok
re-deployed to 200 cm of w ater

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|-------------|------------------------|-------------|-----------------|-------------|-----------------------|---------|
| SITE ID | gmsUP1 | LOCATION | GMS Forebay | | BANK | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038617 | | UTM | 548841 | 6209022 |
| DOWNLOAD DATE | 17 Nov 2011 | DOWNLOAD TIME | 14:04 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | -12 | ICE CONDITIONS | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|--|----|-------------------|--|-----------------------------------|----|-------------------------------|
| WATER DEPTH | | cm | DISLODGED | | REASON | | |
| BURIED | | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE steel buoy |

COMMENTS

couldn't access due to rough w ater

| | | | | | | | |
|---------------------------|-------------|------------------------|------------------|-----------------|-------------|----------------------------|---------|
| SITE ID | gmsDN2 | LOCATION | GMS Tailrace RDB | | BANK | | north |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038620 | | UTM | 548828 | 6207836 |
| DOWNLOAD DATE | 17 Nov 2011 | DOWNLOAD TIME | 13:37 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.7 | AIR TEMP | -12 | ICE CONDITIONS free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|----|-------------------|------|-----------------------------------|----|-------------------------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | |
| BURIED | no | | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE rock |

COMMENTS

Back-up logger 2038614 in same capsule
both dow nloads OK

| | | | | | | | |
|---------------------------|-------------|------------------------|------------------|-----------------|-------------|----------------------------|---------|
| SITE ID | gmsDN1 | LOCATION | GMS Tailrace LDB | | BANK | | south |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038619 | | UTM | 548881 | 6207761 |
| DOWNLOAD DATE | 17 Nov 2011 | DOWNLOAD TIME | 14:04 | | CREW | BC TE | |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.7 | AIR TEMP | -12 | ICE CONDITIONS free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|----|-------------------|------|-----------------------------------|----|-------------------------|
| WATER DEPTH | 160 | cm | DISLODGED | no | REASON | | |
| BURIED | no | | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE rock |

COMMENTS

Back-up logger 2038613 in same capsule
both dow nloads OK

| | | | | | | | |
|---------------------------|--|------------------------|--|-----------------|-------------|-----------------------|--|
| SITE ID | | LOCATION | | | BANK | | |
| LOGGER TYPE | | LOGGER SERIAL # | | | UTM | | |
| DOWNLOAD DATE | | DOWNLOAD TIME | | | CREW | | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|--|----|-------------------|--|-----------------------------------|----|--------------------|
| WATER DEPTH | | cm | DISLODGED | | REASON | | |
| BURIED | | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE |

COMMENTS

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|--------|------------------------|--------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnDN2 | LOCATION | PCN Tailrace | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038621 | | UTM | 562803 | 6204854 | |
| DOWNLOAD DATE | 17 | Nov | 2011 | DOWNLOAD TIME | 15:08 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.5 | AIR TEMP | -12 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK

| | | | | | | | | |
|---------------------------|-----------|------------------------|--------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnDN2_BU | LOCATION | PCN Tailrace | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038568 | | UTM | 562803 | 6204854 | |
| DOWNLOAD DATE | 17 | Nov | 2011 | DOWNLOAD TIME | 15:12 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.5 | AIR TEMP | -12 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK
same rock as pcnDN2

| | | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnUP1 | LOCATION | PCN Forebay | | BANK | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2225325 | | UTM | 562684 | 6204075 | |
| DOWNLOAD DATE | 17 | Nov | 2011 | DOWNLOAD TIME | | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | -12 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|----------|
| WATER DEPTH | 100 | cm | DISLODGED | | REASON | | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | log boom |

COMMENTS

couldn't access due to wind and ice coating on boom logs

| | | | | | | | | |
|---------------------------|--|------------------------|--|----------------------|-------------|-----------------------|-------------|--|
| SITE ID | | LOCATION | | | BANK | | | |
| LOGGER TYPE | | LOGGER SERIAL # | | | UTM | | | |
| DOWNLOAD DATE | | | | DOWNLOAD TIME | | | CREW | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS | | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|--|-------------------|------------------|-----------------------------------|---------------|--------------------|--|
| WATER DEPTH | | cm | DISLODGED | | REASON | | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | |

COMMENTS

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|---------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | halfUP2 | LOCATION | u/s of Halfway River | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038572 | | UTM | 595578 | 6230542 | |
| DOWNLOAD DATE | 27 | Oct | 2011 | DOWNLOAD TIME | 13:42 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 9.1 | AIR TEMP | 8 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|--------------------|----------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | w willow |

COMMENTS

dow nload Ok
Partially dragged in but OK

| | | | | | | | | |
|---------------------------|---------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | halfUP1 | LOCATION | u/s of Halfway River | | BANK | south | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767573 | | UTM | 595165 | 6230094 | |
| DOWNLOAD DATE | 27 | Oct | 2011 | DOWNLOAD TIME | 13:50 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 9.0 | AIR TEMP | 8 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------------|
| WATER DEPTH | 90 | cm | DISLODGED | yes | REASON | unk | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | spruce tree |

COMMENTS

dow nload OK
re-positioned to >200 cm depth

| | | | | | | | | |
|---------------------------|------------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | halfDN2_BU | LOCATION | d/s of Halfway River | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038623 | | UTM | 598179 | 6263144 | |
| DOWNLOAD DATE | 27 | Oct | 2011 | DOWNLOAD TIME | 14:05 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.6 | AIR TEMP | 8 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 250 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK
replaced low er section of corroded cable

| | | | | | | | | |
|---------------------------|---------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | halfDN2 | LOCATION | d/s of Halfway River | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038574 | | UTM | 598198 | 6232169 | |
| DOWNLOAD DATE | 27 | Oct | 2011 | DOWNLOAD TIME | 14:08 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 6.6 | AIR TEMP | 8 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 220 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | mobUP2 | LOCATION | u/s of Moberly River | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038616 | | UTM | 627501 | 6232563 | |
| DOWNLOAD DATE | 26 | Oct | 2011 | DOWNLOAD TIME | 12:10 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 8.5 | AIR TEMP | 6 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 140 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | birch |

COMMENTS

dow nload Ok

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | mobUP1 | LOCATION | u/s of Moberly River | | BANK | south | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038612 | | UTM | 627158 | 6232349 | |
| DOWNLOAD DATE | 26 | Oct | 2011 | DOWNLOAD TIME | 12:21 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 8.9 | AIR TEMP | 6 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 80 | cm | DISLODGED | yes | REASON | unk | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK
 logger dragged part way to shore - OK
 re-positioned to 140 cm of water

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | mobDN2 | LOCATION | d/s of Moberly River | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038576 | | UTM | 631187 | 6229623 | |
| DOWNLOAD DATE | 26 | Oct | 2011 | DOWNLOAD TIME | 12:30 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 8.6 | AIR TEMP | 6 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 150 | cm | DISLODGED | yes | REASON | tampered | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK
 moved logger across river to new site mobDN1_BU, 175 m upstream of mobDN1.
 tether to alder in 160 cm of water
 new UTM 10.630402.6229275
 ref temp 8.2 @ 1230 hrs

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | mobDN1 | LOCATION | d/s of Moberly River | | BANK | south | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038622 | | UTM | 630583 | 6229281 | |
| DOWNLOAD DATE | 26 | Oct | 2011 | DOWNLOAD TIME | 13:30 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 8.3 | AIR TEMP | 6 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | 140 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------------|-----------------------|---------|
| SITE ID | gmsUP1 | LOCATION | GMS Forebay | | BANK | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038617 | | UTM | 548841 | 6209022 |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 13:56 | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 0.2 | AIR TEMP | 0 | ICE CONDITIONS | 20 cm |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 100 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | steel buoy |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------------|-----------------------|---------|
| SITE ID | gmsUP2 | LOCATION | GMS Forebay | | BANK | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767574 | | UTM | 548841 | 6209022 |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 13:55 | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 0 | ICE CONDITIONS | 20 cm |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|------|-------------------|------|-----------------------------------|----|--------------------|------------|
| WATER DEPTH | 10 m | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | steel buoy |

COMMENTS

dow nload OK
no ref temperature taken at 10 m depth

| | | | | | | | |
|---------------------------|--------|------------------------|------------------|----------------------|-------------|-----------------------|---------|
| SITE ID | gmsDN1 | LOCATION | GMS Tailrace LDB | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038619 | | UTM | 548881 | 6207761 |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 13:18 | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 1.5 | AIR TEMP | 0 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

Back-up logger 2038613 in same capsule
both dow nloads OK

| | | | | | | | |
|---------------------------|--------|------------------------|------------------|----------------------|-------------|-----------------------|---------|
| SITE ID | gmsDN2 | LOCATION | GMS Tailrace RDB | | BANK | | north |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038620 | | UTM | 548828 | 6207836 |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 13:05 | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 1.8 | AIR TEMP | 0 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 150 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

Back-up logger 2038614 in same capsule
both dow nloads OK

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|--------|------------------------|--------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnDN2 | LOCATION | PCN Tailrace | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038621 | | UTM | 562803 | 6204854 | |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 11:16 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 1.6 | AIR TEMP | 0 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 140 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK

| | | | | | | | | |
|---------------------------|-----------|------------------------|--------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnDN2_BU | LOCATION | PCN Tailrace | | BANK | north | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038568 | | UTM | 562803 | 6204854 | |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 11:18 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 1.6 | AIR TEMP | 0 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------|
| WATER DEPTH | 140 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | rock |

COMMENTS

dow nload OK
same rock as pcnDN2

| | | | | | | | | |
|---------------------------|--------|------------------------|-------------|----------------------|-------------|-----------------------|-------------|-------|
| SITE ID | pcnUP1 | LOCATION | PCN Forebay | | BANK | | | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2225325 | | UTM | 562684 | 6204075 | |
| DOWNLOAD DATE | 25 | Jan | 2012 | DOWNLOAD TIME | 11:43 | | CREW | BC TE |
| TEST RECORDER TYPE | merc | WATER TEMP | 1.0 | AIR TEMP | 0 | ICE CONDITIONS | | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|----------|
| WATER DEPTH | 100 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | log boom |

COMMENTS

dow nload OK
reference temperature taken at surface

| | | | | | | | | |
|---------------------------|--|------------------------|--|----------------------|-------------|-----------------------|-------------|--|
| SITE ID | | LOCATION | | | BANK | | | |
| LOGGER TYPE | | LOGGER SERIAL # | | | UTM | | | |
| DOWNLOAD DATE | | | | DOWNLOAD TIME | | | CREW | |
| TEST RECORDER TYPE | | WATER TEMP | | AIR TEMP | | ICE CONDITIONS | | |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|--|-------------------|------------------|-----------------------------------|---------------|--------------------|--|
| WATER DEPTH | | cm | DISLODGED | | REASON | | |
| BURIED | | FUNCTIONAL | | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | |

COMMENTS

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfUP2 | LOCATION | u/s of Halfway River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038572 | | UTM | 595578 | 6230542 |
| DOWNLOAD DATE | 6 Jan 2012 | DOWNLOAD TIME | 15:05 | | CREW | BC MC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 2.4 | AIR TEMP | -1 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|--------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | spruce |

COMMENTS

dow nload Ok

| | | | | | | | |
|---------------------------|------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfUP1 | LOCATION | u/s of Halfway River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767573 | | UTM | 595165 | 6230094 |
| DOWNLOAD DATE | 6 Jan 2012 | DOWNLOAD TIME | 15:15 | | CREW | BC MC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 2.3 | AIR TEMP | -1 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|-------------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | unk | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | spruce tree |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfDN2_BU | LOCATION | d/s of Halfway River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038623 | | UTM | 598179 | 6263144 |
| DOWNLOAD DATE | 6 Jan 2012 | DOWNLOAD TIME | 15:57 | | CREW | BC MC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 2.0 | AIR TEMP | -2 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 180 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|------------|------------------------|----------------------|-----------------|-------------|-----------------------|---------|
| SITE ID | halfDN2 | LOCATION | d/s of Halfway River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038574 | | UTM | 598198 | 6232169 |
| DOWNLOAD DATE | 6 Jan 2012 | DOWNLOAD TIME | 15:45 | | CREW | BC MC | |
| TEST RECORDER TYPE | merc | WATER TEMP | 2.0 | AIR TEMP | -1 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 180 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | mobUP2 | LOCATION | u/s of Moberly River | | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038616 | | | UTM | 627501 | 6232563 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 16:05 | | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 6 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|----|--------------------|-------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | birch |

COMMENTS

dow nload Ok

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | mobUP1 | LOCATION | u/s of Moberly River | | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038612 | | | UTM | 627158 | 6232349 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 16:16 | | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 6 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|----|--------------------|-------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

| | | | | | | | | |
|---------------------------|-----------|------------------------|----------------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | mobDN1_BU | LOCATION | d/s of Moberly River | | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038576 | | | UTM | 630403 | 6229275 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 15:40 | | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 6 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----------|--------------------|-------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | tampered | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

| | | | | | | | | |
|---------------------------|--------|------------------------|----------------------|----------------------|-------|-----------------------|-------------|---------|
| SITE ID | mobDN1 | LOCATION | d/s of Moberly River | | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038622 | | | UTM | 630583 | 6229281 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 15:50 | | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 6 | ICE CONDITIONS | free | |

| LOGGER CONDITIONS | | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|----|--------------------|-------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM

| | | | | | | | |
|---------------------------|---------|------------------------|-------------------|----------------------|-------------|-----------------------|---------|
| SITE ID | pineUP1 | LOCATION | u/s of Pine River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2038624 | | UTM | 641034 | 6225375 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 15:12 | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 7 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|---------|------------------------|-------------------|----------------------|-------------|-----------------------|---------|
| SITE ID | pineUP2 | LOCATION | u/s of Pine River | | BANK | north | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9767572 | | UTM | 641653 | 6225304 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 15:05 | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 7 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|-----|-------------------|------------------|-----------------------------------|---------------|--------------------|------------|
| WATER DEPTH | 200 | cm | DISLODGED | no | REASON | | |
| BURIED | yes | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | balsam pop |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|------------|------------------------|-------------------|----------------------|-------------|-----------------------|---------|
| SITE ID | pineDN1_BU | LOCATION | d/s of Pine River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 9762095 | | UTM | 648362 | 6222823 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 14:38 | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 7 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK

| | | | | | | | |
|---------------------------|---------|------------------------|-------------------|----------------------|-------------|-----------------------|---------|
| SITE ID | pineDN1 | LOCATION | d/s of Pine River | | BANK | south | |
| LOGGER TYPE | Tidbit | LOGGER SERIAL # | 2225322 | | UTM | 648427 | 6222837 |
| DOWNLOAD DATE | 8 | Jan | 2012 | DOWNLOAD TIME | 14:18 | CREW | BC DC |
| TEST RECORDER TYPE | merc | WATER TEMP | | AIR TEMP | 7 | ICE CONDITIONS | free |

| LOGGER CONDITIONS | | | | | | | |
|--------------------|------|-------------------|------------------|-----------------------------------|---------------|--------------------|-------|
| WATER DEPTH | >200 | cm | DISLODGED | no | REASON | | |
| BURIED | no | FUNCTIONAL | w et | IF DRY, HEIGHT ABOVE WATER | cm | TETHER TYPE | alder |

COMMENTS

dow nload OK
replaced corroded cable

Appendix IV: Reference temperature values and corresponding logger fix values recorded during download events in Year 3.

| Logger ID | Date | Logger Temp | Reference Temp | Error |
|------------------|-------------|--------------------|-----------------------|--------------|
| gmsUP1 | 7-Jan-11 | 1.1 | 0.7 | 0.4 |
| | 29-Jul-11 | 13.7 | 14.0 | -0.3 |
| gmsUP2 | 29-Jul-11 | - | - | - |
| gmsDN1 | 7-Jan-11 | 1.6 | 1.5 | 0.1 |
| | 29-Jul-11 | 10.2 | 10.2 | 0.0 |
| | 17-Nov-11 | 6.9 | 6.8 | 0.1 |
| gmsDN1BU | 7-Jan-11 | 1.6 | 1.5 | 0.1 |
| | 29-Jul-11 | 10.2 | 10.2 | 0.0 |
| | 17-Nov-11 | 6.9 | 6.8 | 0.1 |
| gmsDN2 | 7-Jan-11 | 1.7 | 1.5 | 0.2 |
| | 29-Jul-11 | 10.1 | 10.3 | -0.2 |
| | 17-Nov-11 | 7.0 | 6.8 | 0.2 |
| gmsDN2BU | 7-Jan-11 | 1.8 | 1.5 | 0.3 |
| | 29-Jul-11 | 10.1 | 10.3 | -0.2 |
| | 17-Nov-11 | 7.0 | 6.8 | 0.2 |
| pcnUP1 | 7-Jan-11 | 1.6 | 1.3 | 0.3 |
| | 29-Jul-11 | 10.3 | 10.5 | -0.2 |
| pcnDN2 | 7-Jan-11 | 1.7 | 1.4 | 0.3 |
| | 29-Jul-11 | 10.6 | 10.3 | 0.3 |
| | 17-Nov-11 | 6.9 | 6.5 | 0.4 |
| pcnDN2BU | 7-Jan-11 | 1.7 | 1.5 | 0.2 |
| | 29-Jul-11 | - | - | - |
| | 17-Nov-11 | 6.9 | 6.5 | 0.4 |
| halfUP1 | 9-Jan-11 | 0.9 | 1.0 | -0.1 |
| | 30-May-11 | 6.3 | 6.2 | 0.1 |
| | 24-Jul-11 | 10.4 | 10.6 | -0.2 |
| | 27-Oct-11 | 9.0 | 9.0 | 0.0 |
| halfUP2 | 9-Jan-11 | -0.1 | 1.0 | -1.1 |
| | 30-May-11 | 5.3 | 6.2 | -0.9 |
| | 24-Jul-11 | 9.9 | 10.9 | -1.0 |
| | 27-Oct-11 | 8.2 | 9.1 | -0.9 |
| halfDN2 | 9-Jan-11 | 0.6 | 0.5 | 0.1 |
| | 30-May-11 | - | - | - |
| | 24-Jul-11 | 13.1 | 12.8 | 0.3 |
| | 27-Oct-11 | 6.6 | 6.6 | 0.0 |
| halfDN2BU | 9-Jan-11 | 0.9 | 0.9 | 0.0 |
| | 30-May-11 | 5.7 | 5.7 | 0.0 |
| | 30-May-11 | 9.8 | 9.8 | 0.0 |
| | 24-Jul-11 | - | - | - |
| | 27-Oct-11 | 6.7 | 6.6 | 0.1 |

Appendix IV Con't: Reference temperature values and corresponding logger fix values recorded during download events in Year 3.

| Logger ID | Date | Logger Temp | Reference Temp | Error |
|------------------|-------------|--------------------|-----------------------|--------------|
| mobUP1 | 6-Jan-11 | 1.3 | 1.0 | 0.3 |
| | 31-May-11 | 6.3 | 6.0 | 0.3 |
| | 18-Jul-11 | 12.4 | 12.4 | 0.0 |
| | 26-Oct-11 | 9.1 | 8.9 | 0.2 |
| mobUP2 | 6-Jan-11 | 1.2 | 1.0 | 0.2 |
| | 31-May-11 | 7.2 | 7.2 | 0.0 |
| | 18-Jul-11 | 12.5 | 12.7 | -0.2 |
| | 26-Oct-11 | 8.5 | 8.5 | 0.0 |
| mobDN1 | 6-Jan-11 | 1.2 | 1.0 | 0.2 |
| | 31-May-11 | 9.9 | 9.8 | 0.1 |
| | 18-Jul-11 | 15.4 | 15.4 | 0.0 |
| | 26-Oct-11 | 8.4 | 8.3 | 0.1 |
| mobDN1BU | 6-Jan-11 | 1.2 | 1.0 | 0.2 |
| | 26-Oct-11 | 8.5 | 8.6 | -0.1 |
| | 26-Oct-11 | 8.3 | 8.3 | 0.0 |
| pineUP1 | 6-Jan-11 | 1.1 | 0.9 | 0.2 |
| | 31-May-11 | 8.8 | 8.9 | -0.1 |
| | 18-Jul-11 | 13.5 | 13.6 | -0.1 |
| | 26-Oct-11 | 8.7 | 8.6 | 0.1 |
| pineUP2 | 6-Jan-11 | 1.1 | 1.0 | 0.1 |
| | 31-May-11 | 8.3 | 8.0 | 0.3 |
| | 18-Jul-11 | 12.8 | 12.7 | 0.1 |
| | 26-Oct-11 | 8.8 | 8.6 | 0.2 |
| pineDN1 | 6-Jan-11 | 1.0 | 0.6 | 0.4 |
| | 18-Jul-11 | 14.0 | 14.0 | 0.0 |
| | 26-Oct-11 | 6.8 | 6.6 | 0.2 |
| pineDN2 | 6-Jan-11 | 1.5 | 1.2 | 0.3 |
| | 18-Jul-11 | 14.0 | 14.0 | 0.0 |
| | 26-Oct-11 | 6.8 | 6.7 | 0.1 |