



Peace Project Water Use Plan

Peace River Baseline TDGP/Temperature

Implementation Year 7

Reference: GMSWORKS-2

Study Period: January 2015 to December 2015

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May 2016

PEACE RIVER WATER USE PLAN
IMPLEMENTATION PROGRAM

PEACE RIVER BASELINE TDGP/TEMPERATURE
GMSWorks-2
YEAR 7 MONITORING PROGRAM - ANNUAL REPORT
January 2015 to December 2015

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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 7 (Jan 01, 2015 to Dec 31, 2015).

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. Mean calibration errors for all temperature loggers were $\leq 0.4^\circ\text{C}$.

Results of Year 7 water temperature monitoring over the 132 km length of the study area indicate a moderating effect of hypolimnetic withdrawal from Williston Reservoir and seasonal effects associated with ambient air temperature. Minimum winter temperatures decrease and maximum summer temperatures increase with distance downstream from the facilities.

No significant logistical problems were encountered in Year 7. Short-term data gaps were observed at some stations immediately downstream of tributary mouths due to loggers becoming temporarily stranded near the waterline due to out-flowing ice, large woody debris, and tampering by curious persons. Data gaps were generally covered by functioning back-up loggers at these locations. Loggers located in the GMS forebay (gmsUP1 and gmsUP2) and downstream of the Moberly River (mobDN1 and mobDN1BU) were lost between the October 2015 and January 2016 download events; all four loggers were replaced.

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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 (PSP) 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 at either the Gordon M. Shrum (GMS) or Peace Canyon (PCN) generating stations that is likely to meet the PSP criteria (2 days at 1,500cms spill, or 500cms for 7+ days at PCN; 205cms for 2 days or more at GMS). This report summarizes data collection activities completed during Year 7 of the monitoring program (January 01, 2015 to December 31, 2015).

2.0 METHODS

Temperature data presented in this summary were recorded between January 01, 2015 and December 31, 2015.

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 (0.2°C accuracy over 0°C to 50°C; 0.02°C resolution @ 25°C; 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). During Years 2 and 3, revisions were made to monitoring site positioning and configuration to account for changes in bank conditions, to reduce the potential for

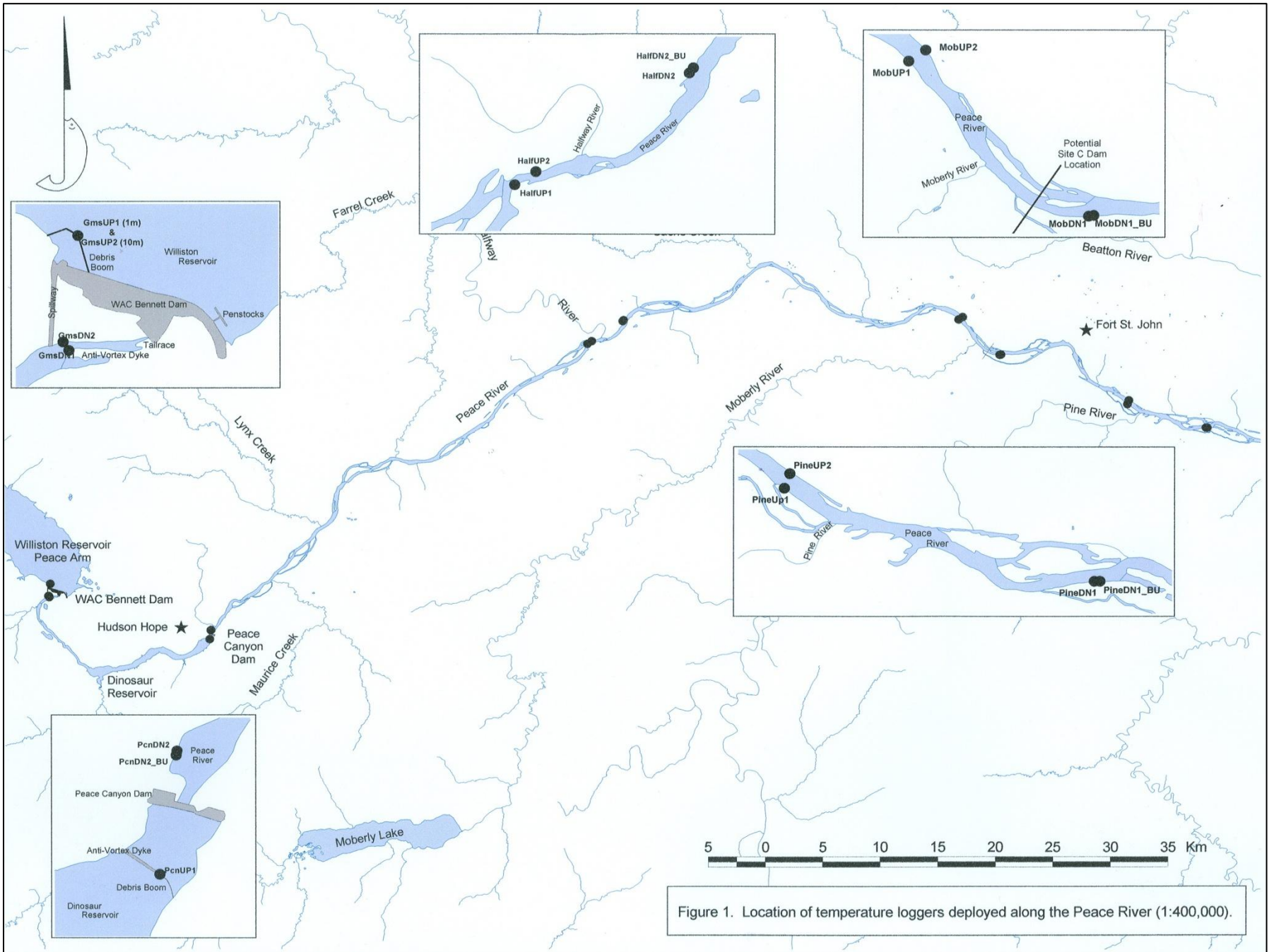


Figure 1. Location of temperature loggers deployed along the Peace River (1:400,000).

logger stranding due to debris and flow level extremes, to increase redundancy in case of logger failure or loss, and to improve accessibility during high flow stage.

Monitoring stations are typically maintained in pairs at each general location in order to 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 rivers), monitoring stations are 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 in 2011 (Year 3) from opposing banks to common banks in order to provide better redundancy in tributary outflow paths prone to stranding by passing ice and debris.

By late in Year 3, monitoring site configuration had been revised to include 21 data loggers at 18 monitoring sites. This configuration was maintained throughout Years 4 to 7. A summary of temperature monitoring station location information as of the end of Year 7 appears in Appendix I. A description of site configuration changes prior to Year 3 can be found in DES 2013.

Temperature loggers were programmed to record water temperature (°C) at 1 hour intervals throughout Year 7. 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 either 6.35 mm galvanized steel cable or 3.18 mm stainless steel cable.

Temperature data recorded and stored on each logger during 2015 were downloaded at approximately 3 month intervals 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 YSI® Professional Plus handheld multi-parameter instrument (Model No. E-528-ProPlus) or 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).

In addition to scheduled download events, temperature 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.

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.

2.1.1 Year 7 Site Logistics

Few logistical problems were encountered during Year 7, partially due to refinements in station location and configuration made in Years 2 and 3. Occasional stranding of loggers above the waterline during Year 7 was largely associated with extremely low water levels in late March. Stranding also occurred due to the accumulation of debris on tether cables during tributary freshet and flood events. Loggers located downstream of the Pine and Moberly river confluences along the right downstream bank were also stranded in late June to early July by debris originating from upstream. The loggers located upstream of the Halfway River (halfUP2) and Moberly River (mobUP2) were pulled ashore and left near or above the high water mark by persons unknown. The tampering of the primary logger downstream of the Pine River (pineDN1) was alleviated by moving the logger 75 m downstream away from a pathway from the cultivated field adjacent to the Peace River.

With the exception of a few sections of 6.35 mm galvanized cable originally deployed in Years 1 to 3 laying well above the high water mark, all tether cables were replaced with 3.18 mm stainless steel cable during Year 7 which appears to have a longer lifespan.

Temperature data logged during Year 7 (2015) was successfully downloaded from all loggers with the exception of the following 4 units which could not be recovered during the January 2016 download event. Neither logger at the GMS forebay station (gmsUP1 and gmsUP2) could not be located in January 2016, due to a parted cable, resulting in the loss of data recorded after the October 16, 2015 download. Both loggers located immediately downstream of the mouth of the Moberly River were lost due to BC Hydro Site C dam site clearing activities prior to the January 2016 download event resulting in the loss of data recorded after the October 17, 2015 download. All 4 loggers were replaced in January 2016.

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. Meters and probes were checked for functionality on a quarterly basis when not in use and battery charge was maintained. Initialization check routines were repeated and the condition of each probe oxygen sensor membrane was examined for evidence of ZnO precipitate build-up. In addition to routine quarterly maintenance records, calibration statements were obtained for meters that were returned to the manufacturer for repair or factory re-calibration.

No spill events or TDGP meter deployments occurred during Year 7.

3.0 RESULTS AND DISCUSSION

Figures 2 to 11 are presented following Section 4.0.

3.1 Temperature Monitoring

Reference temperatures recorded during download events are presented in Appendix III along with corresponding logger temperatures and indicated error values. None of the loggers in use in 2015 exhibited a correctable zero error greater than 0.4°C; most calibration errors are typically within the range of 0.2°C.

In Year 7, several loggers were replaced as they were approaching the end of their useful lifespan of six years and were exhibiting low voltage. Logger serial numbers listed in Appendix I correspond to the units presently in use following the January 2016 data downloads.

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. Download Information Forms completed during each download are provided in Appendix IV.

3.1.1 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, the first located at 1 m depth and the second suspended at a depth of 10 m. Due to the loss of both loggers sometime after the October 16, 2015 download event,

only temperature data spanning the January 1 to October 16, 2015 period is presented in Figure 2. Although seasonal thermal stratification of Williston Reservoir is evident, the relatively small temperature differential (mean=0.4°C) suggests the primary thermocline may lie deeper than 10 m. Maximum temperature differentials up to 7°C were recorded during a period of significant daytime surface warming during the first two weeks of July 2015, when annual ambient temperatures peaked. Temperature profiles recorded further up the Peace Reach during unrelated work in August 2012 indicated a thermocline at approximately 26 m depth (B. Culling, pers. obs.).

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 samples 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 7.

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). Temperatures recorded at gmsDN1 and gmsDN2 exhibit a wide range of hourly and daily fluctuations during the summer period compared to gmsUP1, due the operational changes in water intake for power generation and maintenance activities.

3.1.2 Peace Canyon Dam Forebay and Tailrace

The data logger recording temperature at the Peace Canyon Dam forebay (pcnUP1) is attached to the anti-vortex dam log boom, approximately 450 m upstream of the dam face. Forebay water temperature at 1 m depth was recorded seamlessly through Year 7.

Both Peace Canyon Tailrace loggers (pcnDN2 and pcnDN2BU) recorded continuous data throughout Year 7. A comparison of PCN tailrace temperature (pcnDN2) and GMS tailrace temperature (mean of gmsDN1 and gmsDN2) indicates a relatively small temperature change through Dinosaur Reservoir during all seasons (Fig. 4). For example, mean differentials of 0.1°C were recorded in winter (December through February) and 0.5°C in summer (June through August). Figure 4 also illustrates slight thermal stratification of the Peace Canyon forebay during peak ambient temperatures during the first two weeks of August 2015 (i.e., forebay temperatures at 1 m depth (pcnUP1) were an average of 3.4 °C and as much as 8.1 °C warmer than water exiting the Peace Canyon powerhouse (pcnDN2) in July 2015).

3.1.3 Halfway River Confluence

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 throughout Year 7 (halfUP1 and halfUP2). Logger halfUP1 recorded continuous data while logger halfUP2 became intermittently stranded between the January 25 and April 18, 2015 download events and between the July 24 and the October 17, 2015 download events. In both case, halfUP2 had been pulled to shore by persons unknown and left in shallow water where it was occasionally submerged at moderate to high flow stage. Excluding the periods when halfUP2 was lying in shallow water near shore, no cross-channel differential was recorded between the opposing upstream stations.

Of the two loggers located downstream of the Halfway confluence (halfDN2 and halfDN2BU), halfDN2BU recorded continuous data throughout Year 7, while halfDN2 was swung to shore by ice and debris where it was intermittently exposed for short periods from February 17 to 19 and March 28 to 31, 2015. After the April 18, 2015 download, both loggers recorded continuous data. Data from halfDN2BU are presented in Figure 5.

As in previous years, Peace River temperature values recorded at stations upstream and downstream of the Halfway River confluence differed markedly. Temperatures collected downstream of the confluence exhibited a greater 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). Temperatures within the Halfway River upstream of its confluence with the Peace are not recorded as part of this project.

3.1.4 Moberly River Confluence

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 7 (mobUP1 and mobUP2). Logger mobUP1 recorded continuous data throughout Year 7 while mobUP2 became intermittently stranded between September 25 and the October 17, 2015 download event after being pulled to shore by persons unknown. No cross-channel differential was recorded during July and August, with the mean temperature differing by only 0.1 °C.

The Moberly downstream logger and downstream back-up logger were both located on the south river bank, within the influence of outfall from the Moberly River. Both loggers also lie within the footprint of the proposed Site C dam. Continuous data was recovered from both mobDN1 and mobDN1BU between January 1 and October 17, 2015. No temperature data is available for either logger after October 17, 2015 as both units were destroyed during river bank clearing operations associated with Site C construction. Both units were replaced on January 27, 2016.

As in previous years, Peace River temperatures recorded within the influence of the Moberly River (downstream of confluence), were cooler than the upstream stations from January through March and warmer than the upstream stations from May through July (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. Temperatures within the Moberly River upstream of its confluence with the Peace are not recorded as part of this project.

3.1.5 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. During Year 7, upstream stations were maintained on opposing banks (pineUP1 and pineUP2) and both downstream loggers (pineDN1 and pineDN1BU) were located on the south river bank, within the influence of inputs from the Pine River.

Both pineUP1 and pineUP2 recorded continuous hourly data throughout Year 7. No cross-channel differential was noted.

Both downstream loggers (pineDN1 and pineDN1BU) became stranded periodically due to debris accumulations on the tether cables. Both loggers were exposed briefly on February 1, 2015 and March 28 to 31, 2015 and more frequently between June 3 and the July 12, 2015 download event.

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 presents comparative seasonal temperature changes over the 132 km length of the study area between the WAC Bennett Dam tailrace (gmsDN2) and the Pine River confluence (pineUP1) during 2015 and Figure 9 compares ambient air temperature at the Fort St. John airport with Peace

River water temperature at the Pine river confluence (pineUP1). Data appearing in these figures includes Halfway and Pine confluence stations not directly influenced by their respective tributary inputs. The graphs 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 mid-October, with gradients inverting on either side of these dates to form the typical annual pattern.

Figures 10 and 11 represent temporal comparisons of water temperatures over the 7 calendar years encompassed by the current monitoring program for WAC Bennett Dam tailrace and Pine River confluence sites, respectively. Year to year temperature differences in output from the north manifold of the GMS tailrace suggest corresponding inter-annual variation in Williston Reservoir hypolimnion temperature, with 2014 being the coolest year recorded and 2015 being the warmest, particularly during the fall cool down period (Fig. 10). Temperatures during 2015 lie within the ranges established over the previous 6 years. Possible factors for this variation may include the proportion of reservoir input contributed by snow melt versus precipitation and annual variations in storage level and drawdown rate and timing. Year to year variations in Peace River water temperature immediately above the Pine River confluence (pineUP1) appear to follow a pattern similar to that observed at the GMS tailrace, with 2012 being the coolest and 2015 among the warmest (Fig. 11). Temperatures recorded in 2015 generally appear to be warmer within the established range. Lower than average snow pack in winter 2014-2015, drought conditions throughout summer and fall 2015 and a late onset of winter in 2015 likely contribute to the warming trend.

4.0 RECOMMENDATIONS

The 6.35 mm galvanized cable used during the initial years of the program has proven to have low resistance to corrosion. With the exception of a few locations where segments of galvanized cable are in use above the waterline, all the tether cables have been replaced with stainless steel cable. The remaining galvanized cable sections should be monitored for corrosion.

The battery life of the Tidbit v2 Model #UTBI-001 temperature sensors is estimated at approximately 5-6 years and a number of loggers were replaced in 2015. Scheduled replacement of units should continue in 2016 as per the table presented in Appendix V.

During 2015, aluminum information tags reading “DATA RECORDER, PLEASE DO NOT DISTURB” were attached to the tether cables of loggers previously subject to tampering or potentially accessible to the public. These tags should be monitored and maintained through Year 8.

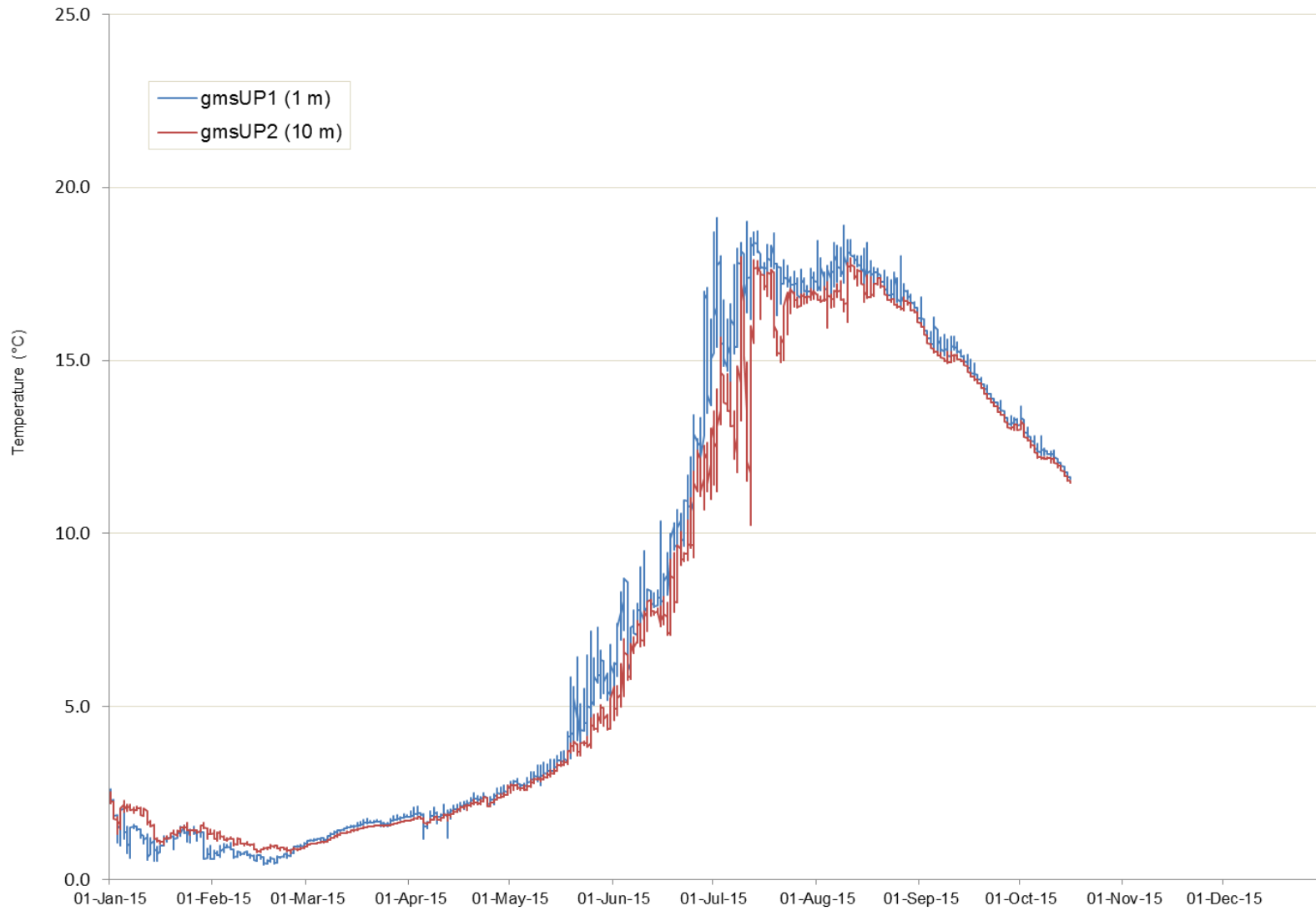


Figure 2. Comparison of water temperature at WAC Bennett Dam forebay station from 1 m depth (gmsUP1) and 10 m depth (gmsUP2) during Year 7, January 01, 2015 – December 31, 2015.

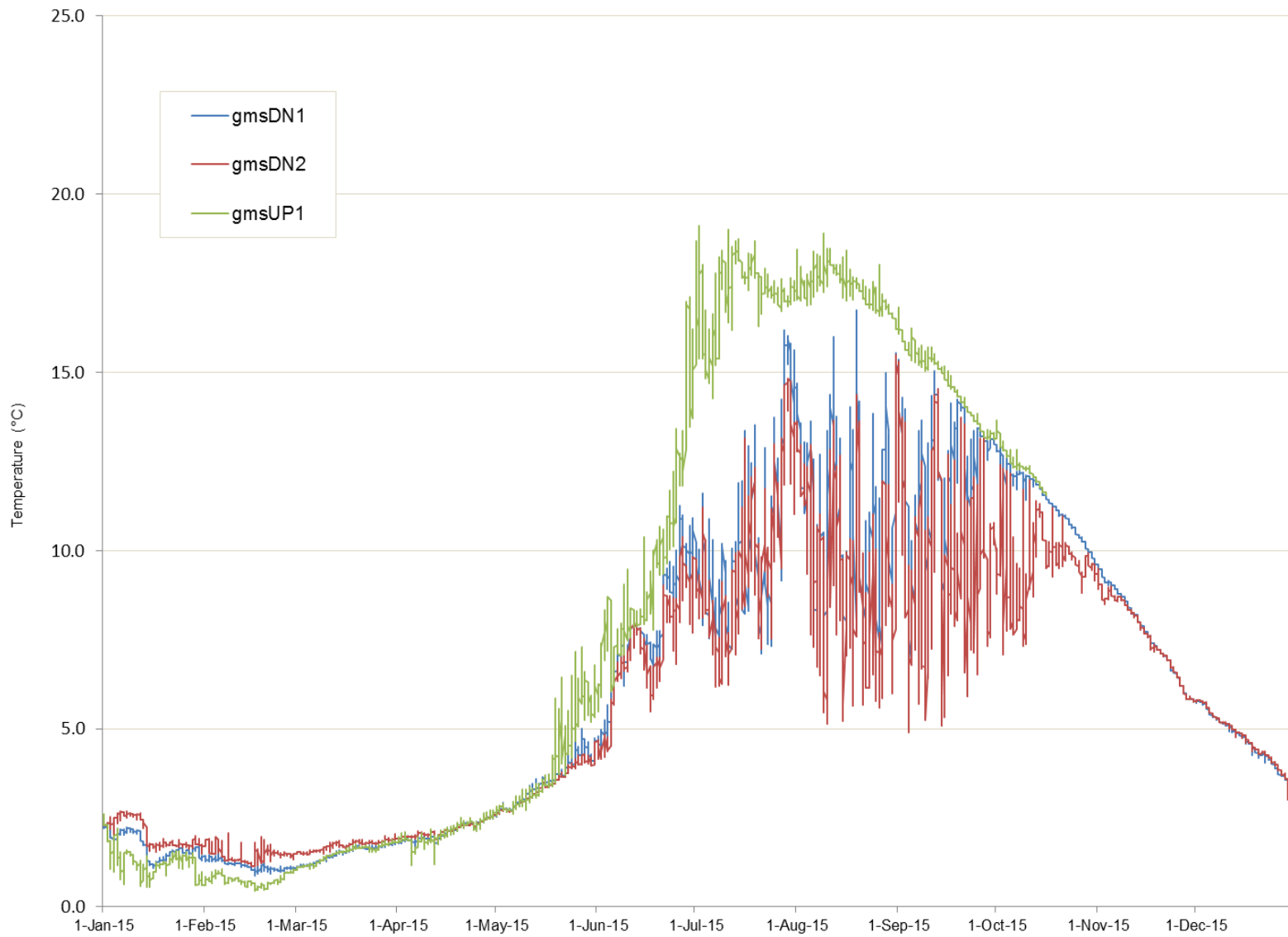


Figure 3. Comparison of water temperature at WAC Bennett Dam forebay surface (gmsUP1), and WAC Bennett Dam tailrace (gmsDN1 and gmsDN2) during Year 7, January 01, 2015 – December 31, 2015.

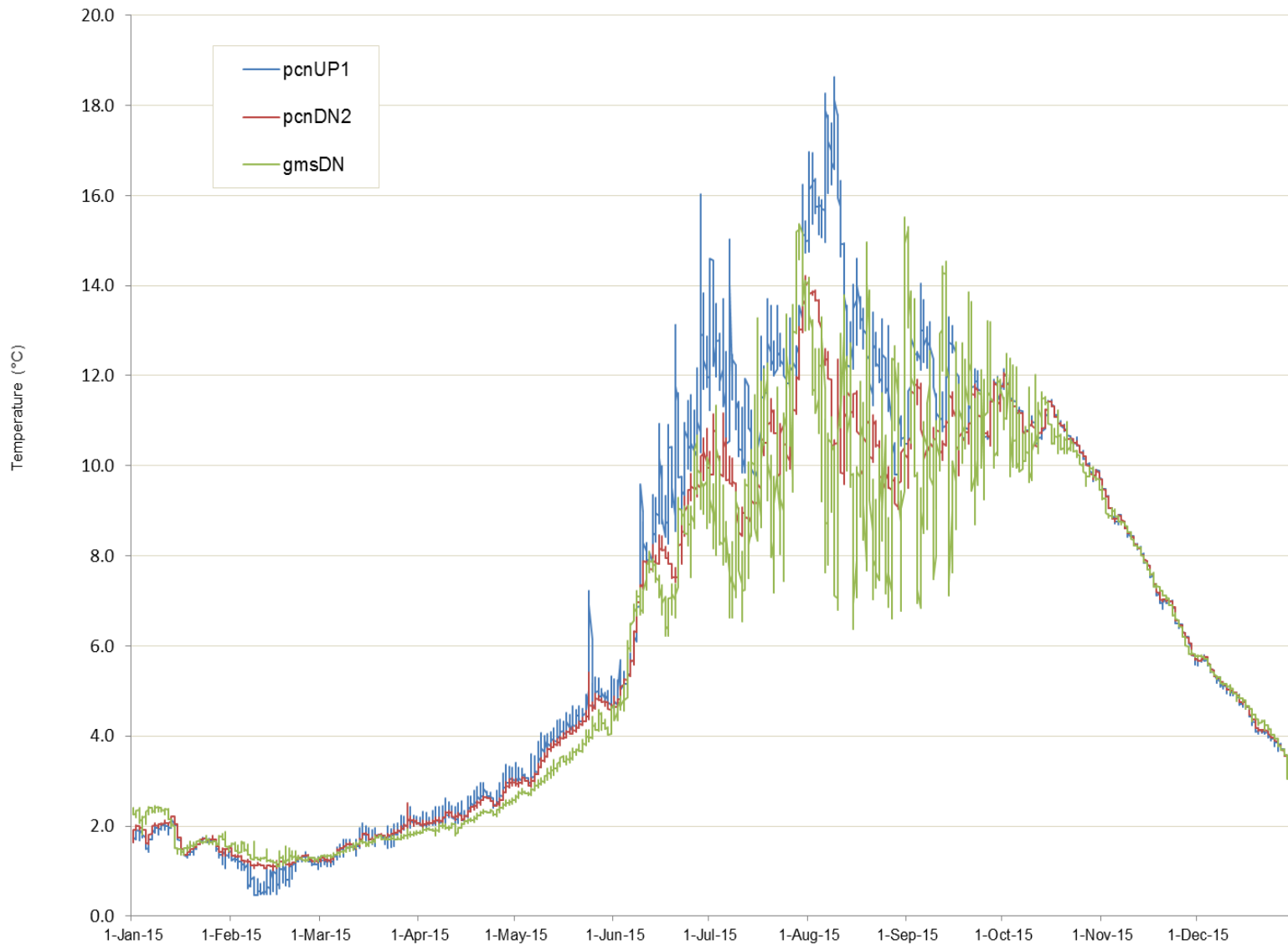


Figure 4. Comparison of water temperature at Peace Canyon forebay surface (pcnUP1), Peace Canyon tailrace (pcnDN2), and WAC Bennett Dam tailrace (gmsDN) during Year 7, January 01, 2015 – December 31, 2015.

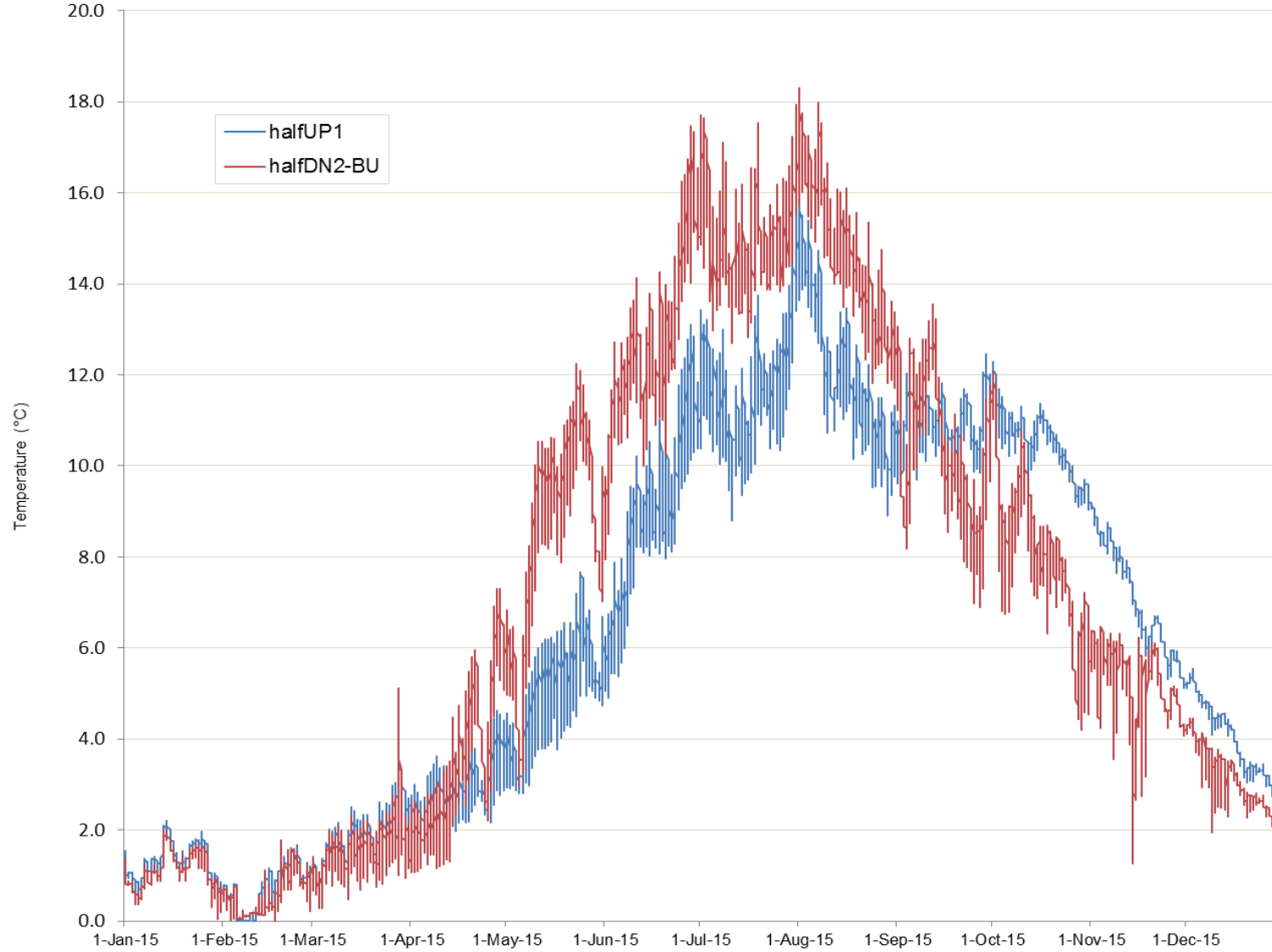


Figure 5. Comparison of Peace River water temperature upstream of Halfway River confluence (halfUP1) and downstream of Halfway River confluence (halfDN2BU) during Year 7, January 01, 2015 – December 31, 2015.

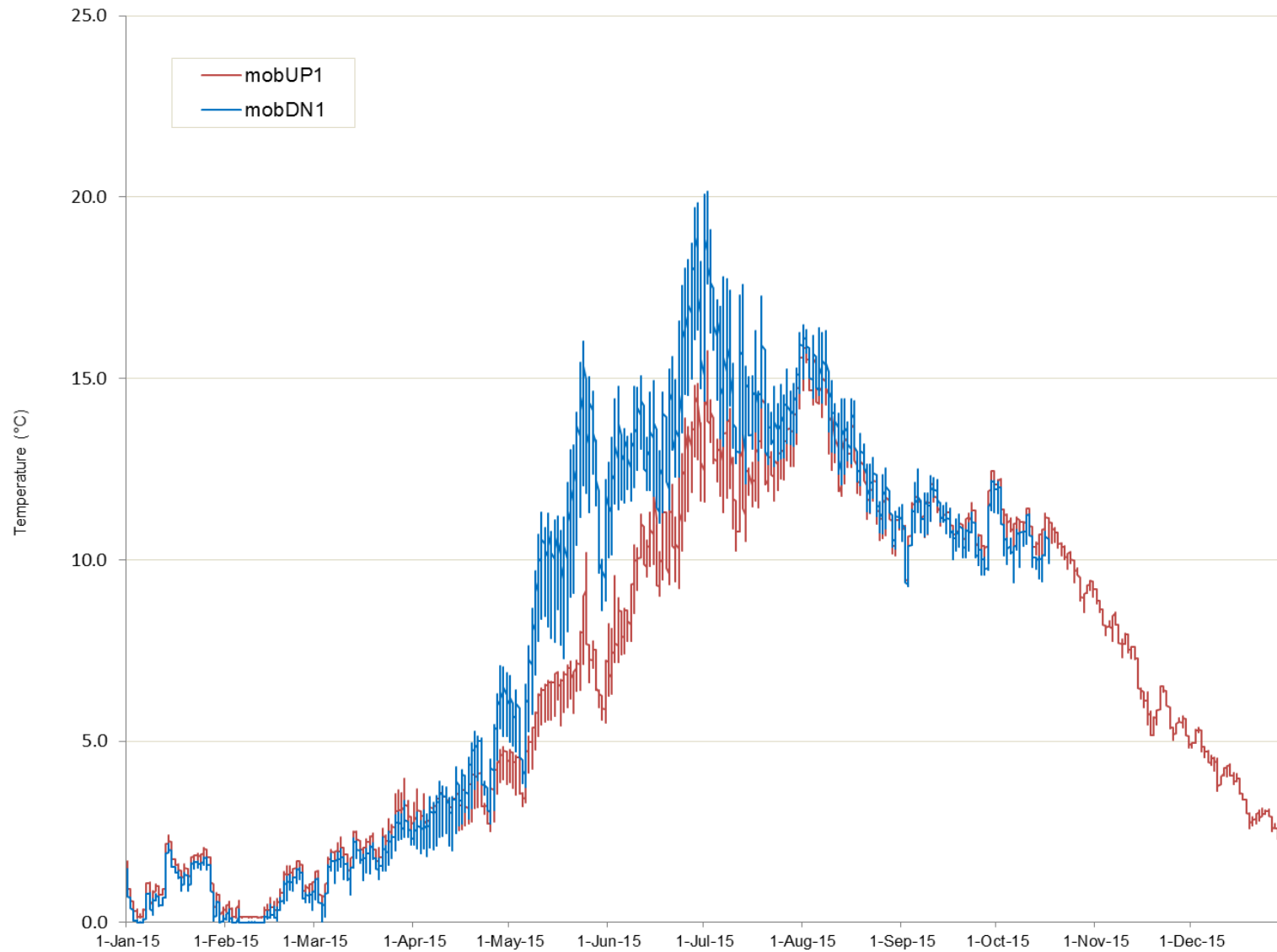


Figure 6. Comparison of Peace River water temperature upstream of Moberly River confluence (mobUP1) and downstream of Moberly River confluence (mobDN1) during Year 7, January 01, 2015 – December 31, 2015.

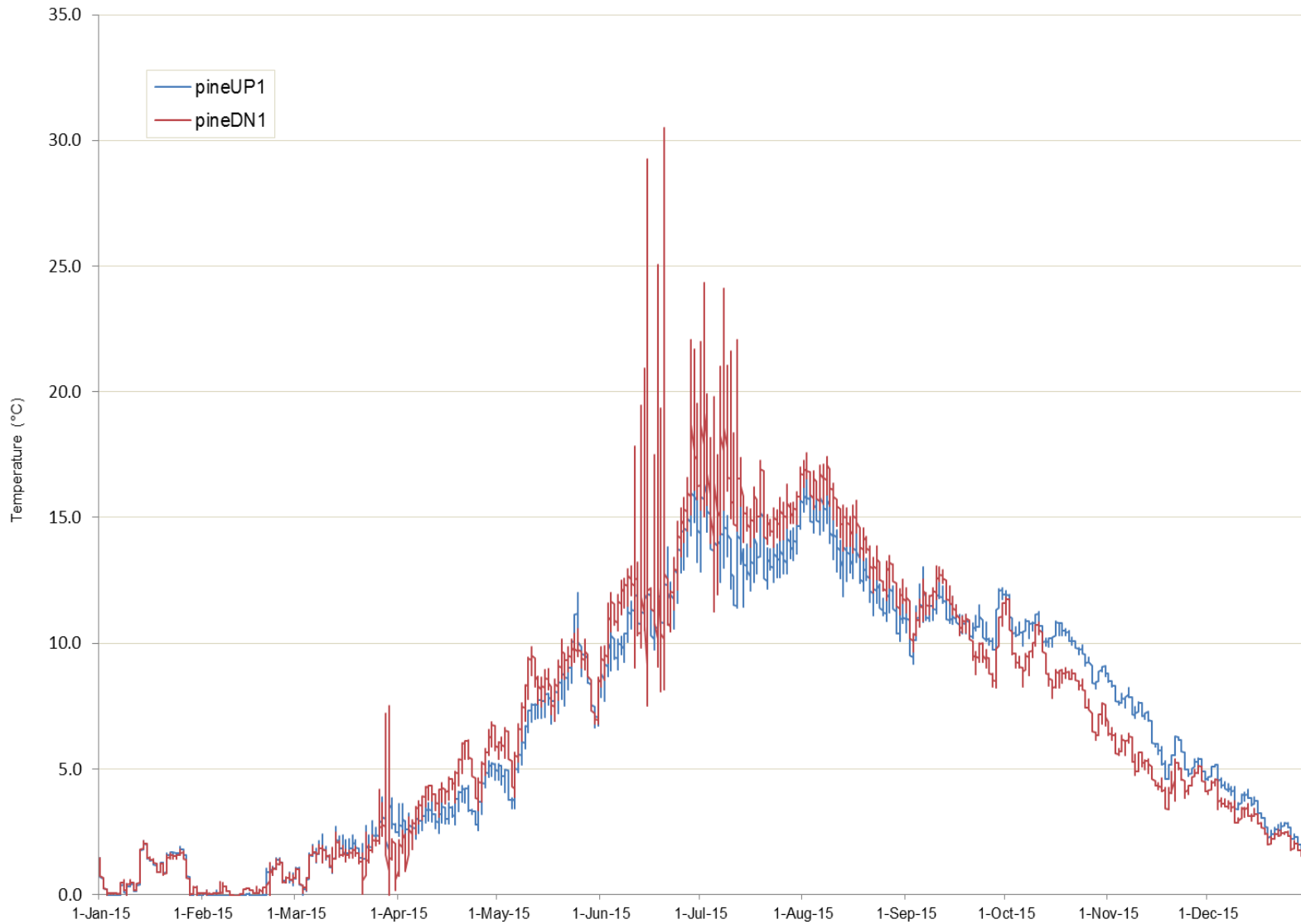


Figure 7. Comparison of Peace River water temperature upstream of Pine River confluence (pineUP1) and downstream of Pine River confluence (pineDN1) during Year 7, January 01, 2015 – December 31, 2015.

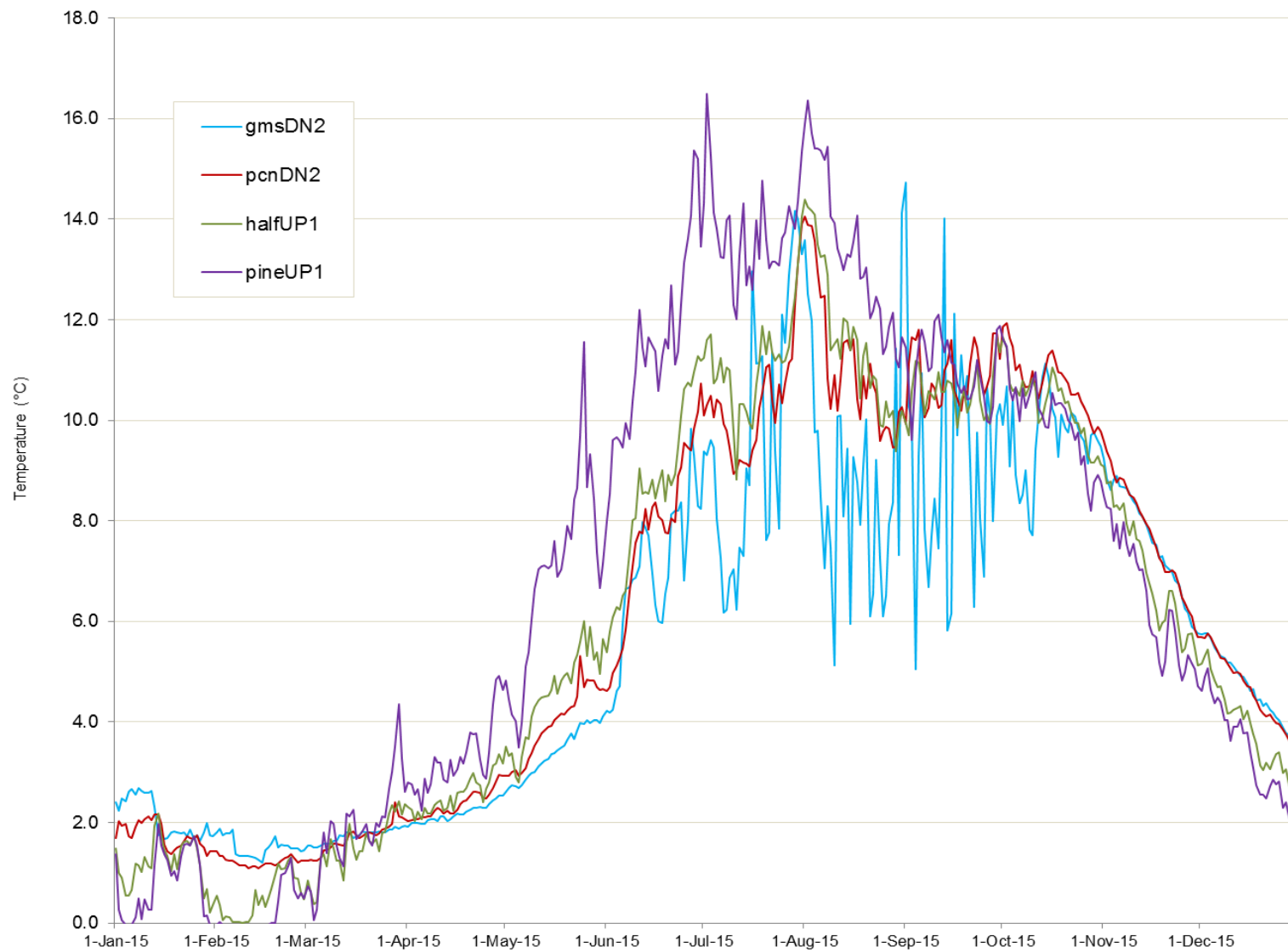


Figure 8. Peace River water temperature gradient from WAC Bennett Dam tailrace, downstream to Pine River confluence, during Year 7, January 01, 2015 – December 31, 2015.

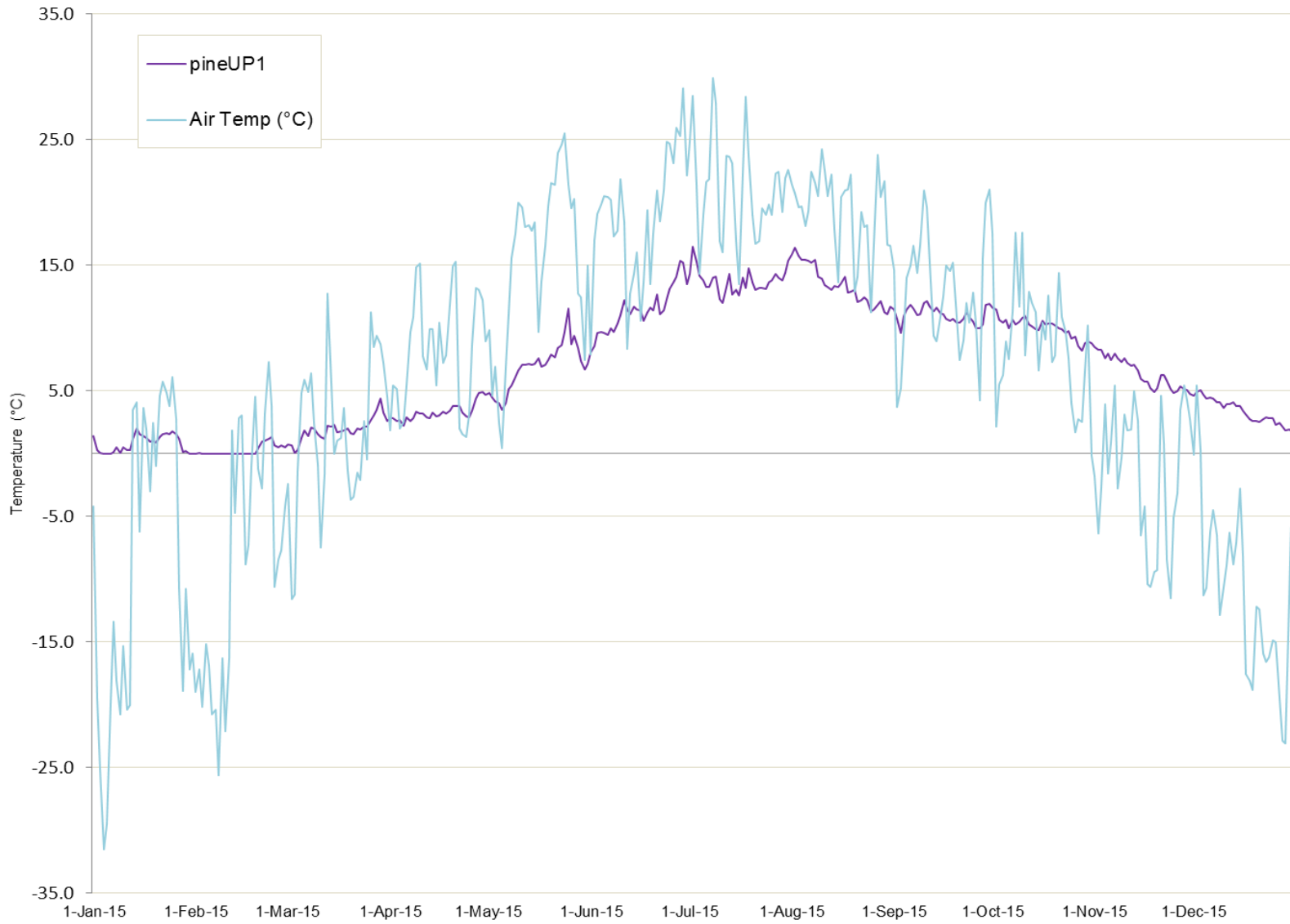


Figure 9. Comparison of Peace River water temperature upstream of the Pine River confluence (pineUP1) and ambient air temperature at the Fort St. John airport during Year 7, January 01, 2015 to December 31, 2015.

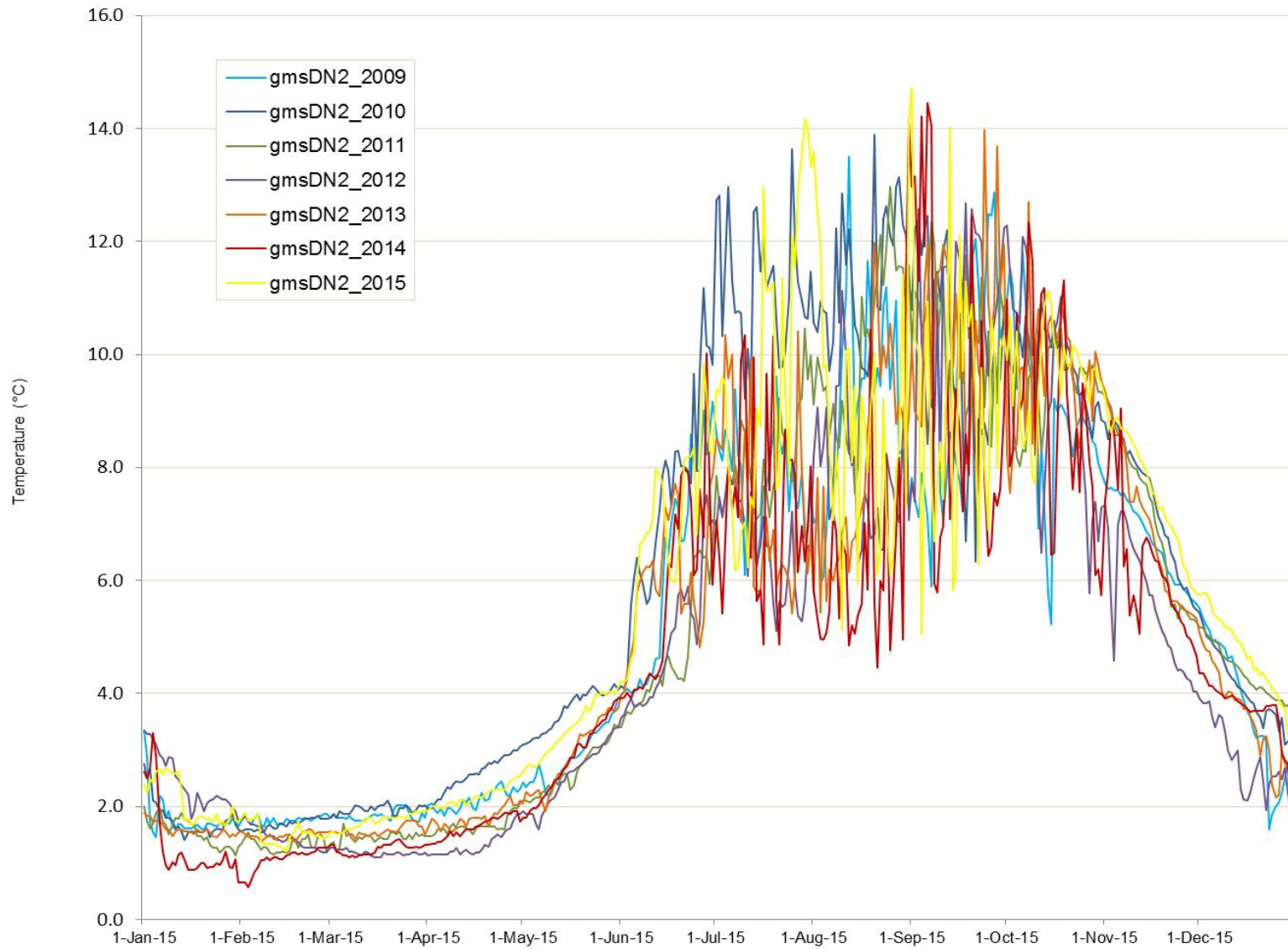


Figure 10. Comparison of water temperature at WAC Bennett Dam tailrace north manifold (gmsDN2) from January 2009 to December 2015.

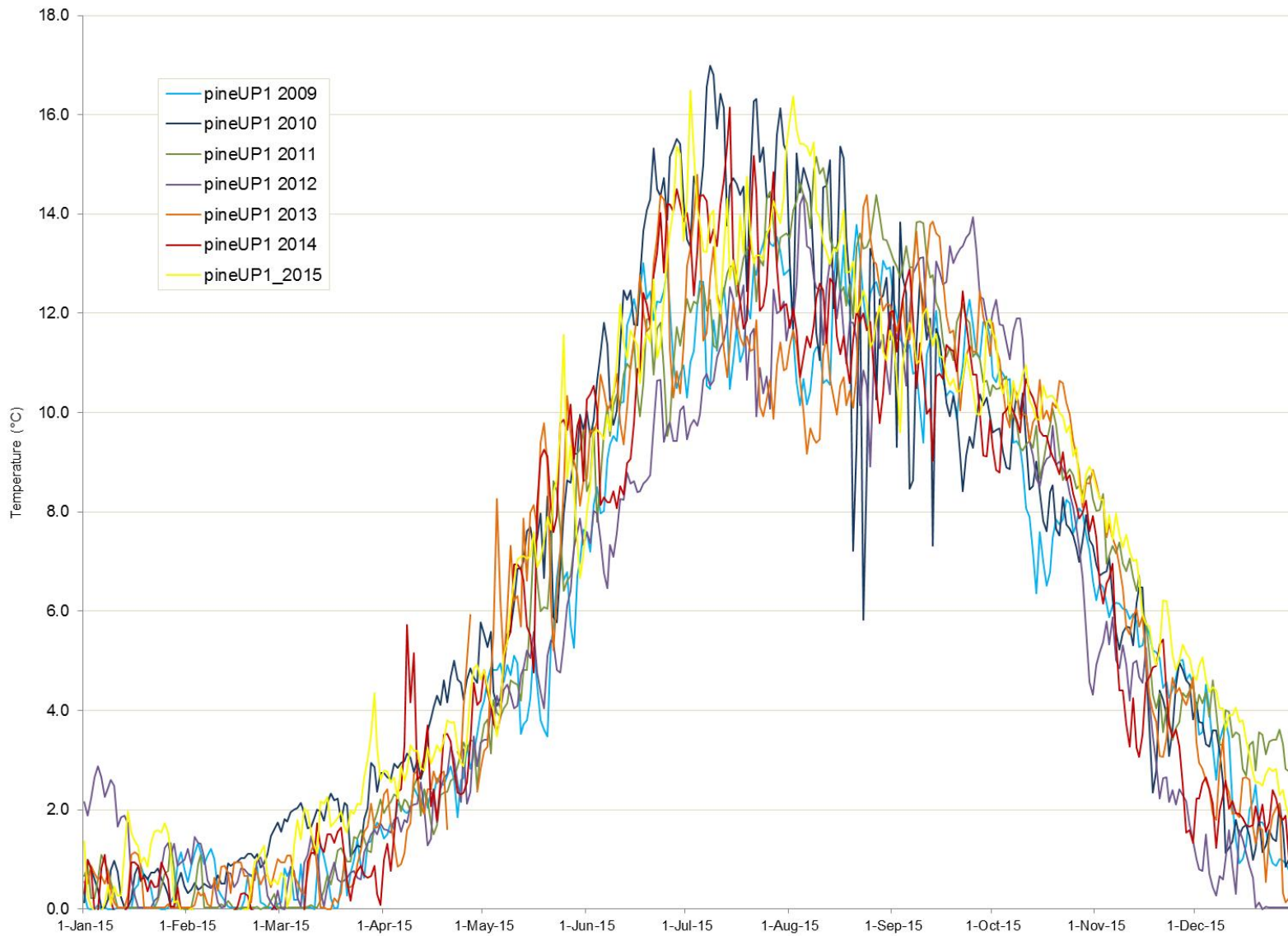


Figure 11. Comparison of water temperature upstream of the Pine River confluence (pineUP1) from January 2009 to December 2015.

REFERENCES

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

DES (Diversified Environmental Services). 2013. Peace River Water Use Plan Peace River Baseline TDGP/Temperature GMSWorks-2 - Year 4 Monitoring Program - Interim Report January 2012 to December 2012. Prepare for BC Hydro, Vancouver, BC. 24pp + appendices.

Appendix I. Temperature monitoring station location information for Year 7, January 01, 2015 to December 31, 2015.

gmsUP1	10676155	WAC Bennett Forebay	548841	6209022	steel buoy; 1 m depth
gmsUP2	10676160	WAC Bennett Forebay	548841	6209022	steel buoy; 10 m depth
gmsDN1	10635063	GMS Tailrace	548881	6207761	southbank; deflection wier riprap
gmsDN1BU	2038613	GMS Tailrace	548881	6207761	southbank; deflection wier riprap
gmsDN2	10669739	GMS Tailrace	548828	6207836	north bank; riprap below Tunnel portal #3
gmsDN2BU	2038614	GMS Tailrace	548828	6207836	north bank; riprap below Tunnel portal #3
pcnUP1	10635067	Peace Canyon Forebay	562710	6204068	anti-vortex log boom; 1 m depth
pcnDN2	10156317	Peace Canyon Tailrace	562803	6204854	north bank; rock slab
pcnDN2BU	10635061	Peace Canyon Tailrace	562803	6204854	north bank; rock slab
halfUP1	9767573	Halfway Confluence - upstream	595204	6230148	south bank; spruce tree
halfUP2	10156319	Halfway Confluence - upstream	595578	6230542	north bank; spruce tree
halfDN2	10669748	Halfway Confluence - downstream	598198	6232169	north bank; balsam poplar
halfDN2BU	10156314	Halfway Confluence - downstream	598179	6232144	north bank; balsam poplar
mobUP1	10669754	Moberly Confluence - upstream	627158	6232349	south bank; alder
mobUP2	10669741	Moberly Confluence - upstream	627501	6232563	north bank; spruce tree
mobDN1	10676146	Moberly Confluence - downstream	630583	6229281	south bank; alder
mobDN1BU	10676147	Moberly Confluence - downstream	630403	6229275	south bank; alder
pineUP1	10669747	Pine Confluence - upstream	641034	6225375	south bank; alder
pineUP2	10635062	Pine Confluence - upstream	641653	6225304	north bank; balsam poplar
pineDN1	2225322	Pine Confluence - downstream	648101	6222802	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	231	1	50
2	228	2	100
3	230	3	100
4	227	4	100
5	226	5	100
6	229	6	100

Appendix III. Reference temperature values and corresponding logger fix values recorded during download events in Year 7, January 01, 2015 to December 31, 2015.

Logger ID	Date	Fix Temp	Ref Temp	Error
gmsUP1 (SN 2038617)	6-Feb-15	1.1	1.3	-0.2
	16-Apr-15	2.2	2.0	0.2
	13-Jul-15	18.2	18.2	0.0
	16-Oct-15	11.6	11.5	0.1
gmsUP2 (SN 10156318)	6-Feb-15	1.2	1.2	0.0
	16-Apr-15	2.0	2.0	0.0
	13-Jul-15	17.8	17.8	0.0
	16-Oct-15	11.5	11.4	0.1
gmsDN1 (SN 2038619)	26-Jan-15	1.6	1.4	0.2
gmsDN1 (SN 10635063)	16-Apr-15	2.1	2.0	0.1
	13-Jul-15	9.7	9.6	0.1
	16-Oct-15	11.5	11.4	0.1
	28-Jan-16	0.8	0.8	0.0
gmsDN1_BU (SN 2038613)	26-Jan-15	1.6	1.4	0.2
	16-Apr-15	2.2	2.0	0.2
	13-Jul-15	9.8	9.6	0.2
	16-Oct-15	11.6	11.4	0.2
	28-Jan-16	0.9	0.8	0.1
gmsDN2 (SN 2038620)	26-Jan-15	1.8	1.6	0.2
	16-Apr-15	2.2	2.1	0.1
gmsDN2 (SN 10669739)	13-Jul-15	7.6	7.5	0.1
	16-Oct-15	10.2	10.1	0.1
	28-Jan-16	0.9	0.9	0.0
gmsDN2_BU (SN 2038614)	26-Jan-15	1.8	1.6	0.2
	16-Apr-15	2.2	2.1	0.1
	13-Jul-15	7.7	7.5	0.2
	16-Oct-15	10.3	10.1	0.2
	28-Jan-16	1.0	0.9	0.1
pcnUP1 (SN 2225325)	26-Jan-15	1.7	1.6	0.1
	16-Apr-15	2.3	2.4	-0.1
pcnUP1 (SN 10635067)	13-Jul-15	11.1	11.3	-0.2
	16-Oct-15	11.3	11.0	0.3
	28-Jan-16	0.9	0.6	0.3
pcnDN2 (SN 10156317)	26-Jan-15	1.8	1.6	0.2
	16-Apr-15	2.2	2.1	0.1
	13-Jul-15	9.3	9.2	0.1
	16-Oct-15	11.4	11.3	0.1
	28-Jan-16	0.9	0.7	0.2

Appendix III. Reference temperature values and corresponding logger fix values recorded during download events in Year 7, January 01, 2015 to December 31, 2015, cont.

Logger ID	Date	Logger Temp	Reference Temp	Error
pcnDN2_BU (SN 2038568)	26-Jan-15	1.8	1.6	0.2
	16-Apr-15	2.2	2.1	0.1
pcnDN2_BU (SN 10635061)	13-Jul-15	9.2	9.2	0.0
	16-Oct-15	11.4	11.3	0.1
	28-Jan-16	0.9	0.7	0.2
halfUP1 (SN 9767573)	23-Jan-15	1.6	1.5	0.1
	18-Apr-15	2.9	2.9	0.0
	11-Jul-15	10.2	10.3	-0.1
	17-Oct-15	10.9	10.8	0.1
	27-Jan-16	0.8	0.8	0.0
halfUP2 (SN 10156319)	23-Jan-15	1.7	1.5	0.2
	18-Apr-15	3.1	3.0	0.1
	11-Jul-15	10.7	10.5	0.2
	17-Oct-15	10.9	10.7	0.2
	27-Jan-16	0.8	0.8	0.0
halfDN2 (SN 2038574)	23-Jan-15	1.5	1.2	0.3
	18-Apr-15	3.6	3.8	-0.2
halfDN2 (SN 10669748)	11-Jul-15	13.7	13.9	-0.2
	17-Oct-15	8	7.9	0.1
	27-Jan-16	0.7	0.7	0.0
halfDN2_BU (SN 10156314)	23-Jan-15	1.5	1.2	0.3
	18-Apr-15	3.6	3.8	-0.2
	11-Jul-15	13.7	13.9	-0.2
	17-Oct-15	8.2	7.9	0.3
	27-Jan-16	0.7	0.7	0.0
mobUP1 (SN 2038612)	22-Jan-15	1.8	1.4	0.4
	18-Apr-15	2.7	2.5	0.2
	12-Jul-15	13.1	13.0	0.1
	17-Oct-15	10.6	10.3	0.3
mobUP1 (SN 10339754)	27-Jan-16	0.9	0.9	0.0
mobUP2 (SN 2038616)	22-Jan-15	1.5	1.4	0.1
	18-Apr-15	2.5	2.5	0.0
mobUP2 (SN 10669741)	12-Jul-15	12.7	12.9	-0.2
	17-Oct-15	10.1	9.9	0.2
	27-Jan-16	0.7	0.9	-0.2

Appendix III. Reference temperature values and corresponding logger fix values recorded during download events in Year 7, January 01, 2015 to December 31, 2015, cont.

Logger ID	Date	Logger Temp	Reference Temp	Error
mobDN1 (SN 2038622)	22-Jan-15	1.6	1.3	0.3
	18-Apr-15	2.9	2.8	0.1
mobDN1 (SN 10669746)	12-Jul-15	16.5	16.8	-0.3
	17-Oct-15	9.9	9.6	0.3
mobDN1_BU (SN 2038576)	22-Jan-15	1.5	1.3	0.2
mobDN1_BU (SN 10635065)	18-Apr-15	3	2.8	0.2
	12-Jul-15	16.8	16.8	0.0
	17-Oct-15	9.8	9.6	0.2
pineUP1 (SN 2038624)	22-Jan-15	1.6	1.4	0.2
	18-Apr-15	2.9	3.0	-0.1
pineUP1 (SN10669747)	12-Jul-15	14.9	15.1	-0.2
	17-Oct-15	10.3	10.1	0.2
	27-Jan-16	0.9	0.8	0.1
pineUP2 (SN 9762095)	22-Jan-15	1.6	1.5	0.1
pineUP2 (SN10635062)	18-Apr-15	2.9	2.7	0.2
	12-Jul-15	13.2	13.0	0.2
	17-Oct-15	10.3	10.1	0.2
	27-Jan-16	0.9	0.8	0.1
pineDN1 (SN 2225322)	22-Jan-15	1.5	1.5	0.2
	18-Apr-15	3.8	3.7	0.1
	17-Oct-15	8.3	8.1	0.2
	27-Jan-16	0.9	0.9	0.0
pineDN1_BU (SN 9762095)	22-Jan-15	1.5	1.3	0.2
	18-Apr-15	3.7	3.7	0.0
	17-Oct-15	8.2	8.1	0.1
	27-Jan-16	0.8	0.8	0.0

Appendix IV. Year 7 download information forms, January 01, 2015 to December 31, 2015.

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	gmsUP1		LOCATION	GMS Forebay			BANK			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635066			UTM	548841	6209022	
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	11:42			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	2	AIR TEMP	7	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	100	cm	DISLODGED	no	REASON					
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	steel buoy
COMMENTS										
Dow nload OK										
Stainless steel cable OK										
SITE ID	gmsUP2		LOCATION	GMS Forebay			BANK			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156318			UTM	548841	6209022	
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	11:44			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	2	AIR TEMP	7	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	10 m		DISLODGED	no	REASON					
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	steel buoy
COMMENTS										
Dow nload OK										
Stainless steel cable OK										
SITE ID	gmsDN2		LOCATION	GMS Tailrace RDB			BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	2038620			UTM	548828	6207836	
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	12:40			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	8	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock
COMMENTS										
Back-up logger gmsDN2-BU 2038614 in same capsule 12:40										
both dow nloads OK										
cable ok (stainless steel cable section attached to galvanized cable around rock)										
Logger replaced w ith Rpl #11, SN 10669739										
SITE ID	gmsDN1		LOCATION	GMS Tailrace LDB			BANK			south
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635063			UTM	548881	6207761	
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	12:21			CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	8	ICE CONDITIONS	none		
LOGGER CONDITIONS										
WATER DEPTH	250	cm	DISLODGED	no	REASON					
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock
COMMENTS										
Back-up logger gmsDN1-BU 2038613 in same capsule 12:22										
both dow nloads OK										
cable ok (stainless steel cable section attached to galvanized cable around rock)										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pcnUP1	LOCATION	PCN Forebay			BANK			north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	2225325		UTM	562684	6204075			
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	10:42		CREW	BC TE			
TEST RECORDER TYPE	YSI		WATER TEMP	2.4	AIR TEMP	7.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	log boom				
COMMENTS											
dow nload OK all stainless steel cable ok replaced w ith Rpl #10, SN 10635067											
SITE ID	pcnDN2	LOCATION	PCN Tailrace			BANK			north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156317		UTM	562803	6204854			
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	10:14		CREW	BC TE			
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	7.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock				
COMMENTS											
dow nload OK all stainless steel cable ok											
SITE ID	pcnDN2_BU	LOCATION	PCN Tailrace			BANK			north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	2038568		UTM	562803	6204854			
DOWNLOAD DATE	16	Apr	2015	DOWNLOAD TIME	10:17		CREW	BC TE			
TEST RECORDER TYPE	YSI		WATER TEMP	2.1	AIR TEMP	7.0	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock				
COMMENTS											
dow nload OK all stainless steel cable ok Anchored to same rock as pcnDN2 Replaced w ith Rpl #9, SN10635061											
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 #	10156319			UTM	595569	6230541				
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	13:12			CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	3.0	AIR TEMP	10	ICE CONDITIONS	none					
LOGGER CONDITIONS												
WATER DEPTH	20	cm	DISLODGED	yes	REASON	tampered						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce					
COMMENTS												
download OK												
cable OK												
pulled to shore by persons unknown												
SITE ID	halfUP1	LOCATION	u/s of Halfway River			BANK	south					
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9767573			UTM	595165	6230094				
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	13:22			CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	2.9	AIR TEMP	10	ICE CONDITIONS	none					
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED	no	REASON							
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce tree					
COMMENTS												
download OK												
cable OK												
SITE ID	halfDN2	LOCATION	d/s of Halfway River			BANK			north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	2038574			UTM	598198	6232169				
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	13:37			CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	3.3	AIR TEMP	10	ICE CONDITIONS	none					
LOGGER CONDITIONS												
WATER DEPTH	180	cm	DISLODGED	no	REASON							
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop					
COMMENTS												
download OK												
stainless steel cable OK												
replaced with Rpl #15, SN 10669748												
SITE ID	halfDN2_BU	LOCATION	d/s of Halfway River			BANK			north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598179	6263144				
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	13:34			CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	3.8	AIR TEMP	10	ICE CONDITIONS	none					
LOGGER CONDITIONS												
WATER DEPTH	160	cm	DISLODGED	no	REASON							
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop					
COMMENTS												
download OK												
stainless steel cable 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	18	Apr	2015	DOWNLOAD TIME			9:22			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	2.5	AIR TEMP	5.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no		REASON					
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce			
COMMENTS											
dow nload Ok											
stainless steel cable OK											
Replaced w ith Rpl #12, SN 10669741											
SITE ID	mobUP1		LOCATION			u/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			2038612			UTM	627158	6232349
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME			9:32			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	2.5	AIR TEMP	5.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no		REASON					
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS											
dow nload OK											
replace cable w ith stainless steel cable next time											
SITE ID	mobDN1_BU		LOCATION			d/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635065			UTM	630403	6229275
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME			9:48			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	2.8	AIR TEMP	5.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED		yes	REASON			ice	debris	
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS											
dow nload OK											
partially sw ung to shore											
replace cable w ith stainless steel cable next time											
SITE ID	mobDN1		LOCATION			d/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			2038622			UTM	630583	6229281
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME			9:57			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	2.8	AIR TEMP	5.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	180	cm	DISLODGED	no		REASON					
BURIED	no	FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS											
dow nload OK											
Replaced w ith Rpl # 13, SN 10669746											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pineUP2	LOCATION			u/s of Pine River	BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635062	UTM	641653	6225304			
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	10:28	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	2.7	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
down load OK											
Stainless steel cable OK											
SITE ID	pineUP1	LOCATION			u/s of Pine River	BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #			2038624	UTM	641034	6225372			
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	10:19	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	3.0	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED	yes	REASON	ice	debris				
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
down load OK											
partially submerged in to shore but still submerged											
Replaced with Rpl # 14, SN 10669747											
Stainless steel cable OK											
SITE ID	pineDN1_BU	LOCATION			d/s of Pine River	BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #			9762095	UTM	648362	6222823			
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	10:44	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	3.7	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED	yes	REASON	ice					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
down load OK											
partially submerged in to shore but still submerged											
Stainless steel cable OK											
SITE ID	pineDN1	LOCATION			d/s of Pine River	BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #			2225322	UTM	648427	6222837			
DOWNLOAD DATE	18	Apr	2015	DOWNLOAD TIME	10:52	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP	3.7	AIR TEMP	5.0	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED	yes	REASON	ice					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
down load OK											
partially submerged to shore but submerged											
Stainless steel cable OK											
Logger repositioned 75m downstream to avoid tampering. New position UTM 10.648500.6222839.											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	gmsUP1		LOCATION	GMS Forebay			BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635066			UTM	548841	6209022		
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME	11:05			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	18.2	AIR TEMP	22	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	steel buoy				
COMMENTS											
Dow nload OK											
Stainless steel cable OK											
SITE ID	gmsUP2		LOCATION	GMS Forebay			BANK				
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156318			UTM	548841	6209022		
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME	11:07			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	17.8	AIR TEMP	7	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	10	m	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	steel buoy				
COMMENTS											
Dow nload OK											
Stainless steel cable OK											
SITE ID	gmsDN2		LOCATION	GMS Tailrace RDB			BANK			north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669739			UTM	548828	6207836		
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME	10:15			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	7.5	AIR TEMP	22	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock				
COMMENTS											
Back-up logger gmsDN2-BU 2038614 in same capsule 10:16											
both dow nloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											
gmsDN2 = Rpl #11, SN 10669739											
SITE ID	gmsDN1		LOCATION	GMS Tailrace LDB			BANK	south			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635063			UTM	548881	6207761		
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME	10:30			CREW	BC TE		
TEST RECORDER TYPE	YSI		WATER TEMP	9.6	AIR TEMP	22	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	250	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	rock				
COMMENTS											
gmsDN1 = Rpl #7											
Back-up logger gmsDN1-BU 2038613 in same capsule 10:31											
both dow nloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pcnUP1	LOCATION			PCN Forebay			BANK	north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635067			UTM	562710	6204068
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME			9:20			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	11.3	AIR TEMP	22.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	log boom		
COMMENTS											
download OK											
all stainless steel cable ok											
Rpl #10, SN 10635067											
SITE ID	pcnDN2	LOCATION			PCN Tailrace			BANK	north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10156317			UTM	562803	6204854
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME			8:56			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	9.2	AIR TEMP	22.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock		
COMMENTS											
download OK											
all stainless steel cable ok											
SITE ID	pcnDN2_BU	LOCATION			PCN Tailrace			BANK	north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635061			UTM	562803	6204854
DOWNLOAD DATE	13	July	2015	DOWNLOAD TIME			8:57			CREW	BC TE
TEST RECORDER TYPE	YSI		WATER TEMP	9.2	AIR TEMP	22.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock		
COMMENTS											
download OK											
all stainless steel cable ok											
Anchored to same rock as pcnDN2											
Rpl #9, SN10635061											
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 #			10156319			UTM	595569	6230541	
DOWNLOAD DATE	11	July	2015	DOWNLOAD TIME	17:55			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	10.5	AIR TEMP	25		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	spruce			
COMMENTS											
down load OK											
cable OK											
SITE ID	halfUP1	LOCATION			u/s of Halfway River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			9767573			UTM	595165	6230094	
DOWNLOAD DATE	11	July	2015	DOWNLOAD TIME	18:01			CREW	BC TE		
TEST RECORDER TYPE	Merc	WATER TEMP	10.3	AIR TEMP	25		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	spruce tree			
COMMENTS											
down load OK											
cable OK											
SITE ID	halfDN2	LOCATION			d/s of Halfway River			BANK			north
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669748			UTM	598198	6232169	
DOWNLOAD DATE	11	July	2015	DOWNLOAD TIME	17:40			CREW	BC TE		
TEST RECORDER TYPE	Merc	WATER TEMP	13.9	AIR TEMP	25		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	balsam pop			
COMMENTS											
down load OK											
stainless steel cable OK											
Rpl #15, SN 10669748											
SITE ID	halfDN2_BU	LOCATION			d/s of Halfway River			BANK			north
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10156314			UTM	598179	6263144	
DOWNLOAD DATE	11	July	2015	DOWNLOAD TIME	17:39			CREW	BC TE		
TEST RECORDER TYPE	Merc	WATER TEMP	13.9	AIR TEMP	25		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	160	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	balsam pop			
COMMENTS											
down load OK											
stainless steel cable 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 #			10669741			UTM	627501	6232563
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME			13:52			CREW	BC MC
TEST RECORDER TYPE	Merc		WATER TEMP	12.9	AIR TEMP	26.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce				
COMMENTS											
dow nload Ok											
stainless steel cable OK											
Rpl #12, SN 10669741											
SITE ID	mobUP1		LOCATION			u/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			2038612			UTM	627158	6232349
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME			14:03			CREW	BC MC
TEST RECORDER TYPE	Merc		WATER TEMP	13.0	AIR TEMP	26.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	70	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
dow nload OK											
replaced cable w ith 1/8" stainless steel cable											
SITE ID	mobDN1_BU		LOCATION			d/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635065			UTM	630403	6229275
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME			14:39			CREW	BC MC
TEST RECORDER TYPE	Merc		WATER TEMP	16.8	AIR TEMP	26.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	80	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
dow nload OK											
Rpl # 5, SN 10635065											
replace cable w ith stainless steel cable next time											
SITE ID	mobDN1		LOCATION			d/s of Moberly River			BANK	south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10669746			UTM	630583	6229281
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME			14:46			CREW	BC MC
TEST RECORDER TYPE	Merc		WATER TEMP	16.8	AIR TEMP	26.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	90	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder				
COMMENTS											
dow nload OK											
Rpl # 13, SN 10669746											
cable replaced w ith 1/8" stainless steel cable											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pineUP2	LOCATION			u/s of Pine River			BANK		north	
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635062			UTM	641653	6225304	
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME	15:29			CREW	BC MC		
TEST RECORDER TYPE	Merc	WATER TEMP	13.0	AIR TEMP	26.0		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	balsam pop			
COMMENTS											
dow nload OK											
Stainless steel cable OK											
Rpl # 6, SN 10635062											
SITE ID	pineUP1	LOCATION			u/s of Pine River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669747			UTM	641034	6225372	
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME	15:21			CREW	BC MC		
TEST RECORDER TYPE	Merc	WATER TEMP	15.1	AIR TEMP	26.0		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder			
COMMENTS											
dow nload OK											
Rpl # 14, SN 10669747											
Stainless steel cable OK											
SITE ID	pineDN1_BU	LOCATION			d/s of Pine River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			9762095			UTM	648362	6222823	
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME	15:47			CREW	BC MC		
TEST RECORDER TYPE	Merc	WATER TEMP	17.9	AIR TEMP	5.0		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	0	cm	DISLODGED		yes	REASON				debris	
BURIED	no	FUNCTIONAL		dry	IF DRY, HEIGHT ABOVE WATER	100	cm	TETHER TYPE	alder		
COMMENTS											
dow nload OK											
sw ung in to shore by debris and stranded, redeployed in 60 cm of w ater											
Stainless steel cable OK											
SITE ID	pineDN1	LOCATION			d/s of Pine River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			2225322			UTM	648500	6222839	
DOWNLOAD DATE	12	July	2015	DOWNLOAD TIME	16:07			CREW	BC MC		
TEST RECORDER TYPE	Merc	WATER TEMP	16.8	AIR TEMP	26.0		ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	0	cm	DISLODGED		yes	REASON				debris	
BURIED	no	FUNCTIONAL		dry	IF DRY, HEIGHT ABOVE WATER	60	cm	TETHER TYPE	alder		
COMMENTS											
dow nload OK											
cable parted by debris and logger recovered in stranded debris pile on shore dow nstream											
Logger repositioned to new location, 60m upstream to 10.648101.6222802 on mature balsam poplar											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM												
SITE ID	gmsUP1		LOCATION			GMS Forebay			BANK			
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635066			UTM		548841 6209022	
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			12:06			CREW		BC TE MM
TEST RECORDER TYPE	YSI		WATER TEMP		11.5	AIR TEMP		10	ICE CONDITIONS			none
LOGGER CONDITIONS												
WATER DEPTH	100	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE		steel buoy	
COMMENTS												
Down load OK												
Stainless steel cable OK												
Rpl # 8, SN 10635066												
SITE ID	gmsUP2		LOCATION			GMS Forebay			BANK			
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10156318			UTM		548841 6209022	
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			12:08			CREW		BC TE MM
TEST RECORDER TYPE	YSI		WATER TEMP		11.4	AIR TEMP		10	ICE CONDITIONS			none
LOGGER CONDITIONS												
WATER DEPTH	10	m	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE		steel buoy	
COMMENTS												
Down load OK												
Stainless steel cable OK												
SITE ID	gmsDN2		LOCATION			GMS Tailrace RDB			BANK		north	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10669739			UTM		548828 6207836	
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			10:33			CREW		BC TE
TEST RECORDER TYPE	Merc		WATER TEMP		10.1	AIR TEMP		8	ICE CONDITIONS			none
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE		rock	
COMMENTS												
Back-up logger gmsDN2-BU 2038614 in same capsule 10:34												
both down loads OK												
cable ok (stainless steel cable section attached to galvanized cable around rock)												
gmsDN2 = Rpl #11, SN 10669739												
SITE ID	gmsDN1		LOCATION			GMS Tailrace LDB			BANK		south	
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635063			UTM		548881 6207761	
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			10:53			CREW		BC TE
TEST RECORDER TYPE	YSI		WATER TEMP		11.4	AIR TEMP		8	ICE CONDITIONS			none
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE		rock	
COMMENTS												
gmsDN1 = Rpl #7												
Back-up logger gmsDN1-BU 2038613 in same capsule 10:54												
both down loads OK												
cable ok (stainless steel cable section attached to galvanized cable around rock)												

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	pcnUP1	LOCATION			PCN Forebay			BANK	north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635067			UTM	562710	6204068
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			9:17			CREW	BC TE MM
TEST RECORDER TYPE	YSI		WATER TEMP	10.8	AIR TEMP	2.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED	no	REASON						
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	log boom	
COMMENTS											
download OK											
all stainless steel cable ok											
Rpl #10, SN 10635067											
SITE ID	pcnDN2	LOCATION			PCN Tailrace			BANK	north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10156317			UTM	562803	6204854
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			8:41			CREW	BC TE MM
TEST RECORDER TYPE	YSI		WATER TEMP	11.3	AIR TEMP	2.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock	
COMMENTS											
download OK											
all stainless steel cable ok											
Rpl # 2, SN 10156317											
SITE ID	pcnDN2_BU	LOCATION			PCN Tailrace			BANK	north		
LOGGER TYPE	Tidbit		LOGGER SERIAL #			10635061			UTM	562803	6204854
DOWNLOAD DATE	16	Oct	2015	DOWNLOAD TIME			8:42			CREW	BC TE MM
TEST RECORDER TYPE	YSI		WATER TEMP	11.3	AIR TEMP	2.0	ICE CONDITIONS			none	
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no		FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	rock	
COMMENTS											
download OK											
all stainless steel cable ok											
Anchored to same rock as pcnDN2											
Rpl #9, SN10635061											
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 #	10156319			UTM	595569	6230541			
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	12:32			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	10.7	AIR TEMP	8	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	40	cm	DISLODGED	yes	REASON	tampered					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce				
COMMENTS											
pulled to shore by persons unknown, redeployed in 2m of water											
download OK											
cable OK											
Rpl # 1, 10156319											
SITE ID	halfUP1	LOCATION	u/s of Halfway River			BANK	south		6230094		
LOGGER TYPE	Tidbit	LOGGER SERIAL #	9767573			UTM	595165	6230094			
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	12:41			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	10.8	AIR TEMP	8	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	250	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	spruce tree				
COMMENTS											
download OK											
stainless steel cable OK											
no ID tag installed											
SITE ID	halfDN2	LOCATION	d/s of Halfway River			BANK	north		6232169		
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10669748			UTM	598198	6232169			
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	12:55			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	7.9	AIR TEMP	8	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download OK											
stainless steel cable OK											
Rpl #15, SN 10669748											
SITE ID	halfDN2_BU	LOCATION	d/s of Halfway River			BANK	north		6263144		
LOGGER TYPE	Tidbit	LOGGER SERIAL #	10156314			UTM	598179	6263144			
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	13:01			CREW	BC TE		
TEST RECORDER TYPE	YSI	WATER TEMP	7.9	AIR TEMP	8	ICE CONDITIONS	none				
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop				
COMMENTS											
download OK											
stainless steel cable 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 #			10669741	UTM	627501	6232563		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	9:58	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	9.9	AIR TEMP	2.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	30	cm	DISLODGED		yes	REASON	tampered			
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	spruce		
COMMENTS										
down load Ok										
Stainless steel cable OK										
Rpl #12, SN 10669741										
pulled to shore a laying in 0.3m of water										
ID tag attached to cable										
SITE ID	mobUP1	LOCATION			u/s of Moberly River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			2038612	UTM	627158	6232349		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	10:06	CREW	BC TE			
TEST RECORDER TYPE	Merc	WATER TEMP	13.0	AIR TEMP	26.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	120	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder		
COMMENTS										
down load OK										
Stainless steel cable OK										
ID tag attached to cable										
Logger replaced w ith RPL # 16, SN 10669754										
SITE ID	mobDN1_BU	LOCATION			d/s of Moberly River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635065	UTM	630403	6229275		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	9:41	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	9.6	AIR TEMP	1.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	150	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder		
COMMENTS										
down load OK										
Rpl # 5, SN 10635065										
replace cable w ith stainless steel cable next time										
ID tag attached to cable										
SITE ID	mobDN1	LOCATION			d/s of Moberly River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669746	UTM	630583	6229281		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	9:32	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	9.6	AIR TEMP	1.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	alder		
COMMENTS										
down load OK										
Rpl # 13, SN 10669746										
Stainless steel cable OK										
ID tag attached to cable										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	pineUP2	LOCATION			u/s of Pine River	BANK		north		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635062	UTM	641653	6225304		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	10:42	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	10.1	AIR TEMP	3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop			
COMMENTS										
dow nload OK										
Stainless steel cable OK										
Rpl # 6, SN 10635062										
No ID tag on cable										
SITE ID	pineUP1	LOCATION			u/s of Pine River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669747	UTM	641034	6225372		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	10:35	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	10.1	AIR TEMP	3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	150	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
dow nload OK										
Rpl # 14, SN 10669747										
Stainless steel cable OK										
No ID tag on cable										
SITE ID	pineDN1_BU	LOCATION			d/s of Pine River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			9762095	UTM	648362	6222823		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	11:05	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	8.1	AIR TEMP	3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	150	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
dow nload OK										
ID tag attached to cable										
Stainless steel cable OK										
SITE ID	pineDN1	LOCATION			d/s of Pine River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			2225322	UTM	648101	6222802		
DOWNLOAD DATE	17	Oct	2015	DOWNLOAD TIME	10:56	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	8.1	AIR TEMP	3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	120	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
dow nload OK										
ID tag attached to cable										
Stainless steel cable OK										

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM											
SITE ID	gmsUP1		LOCATION	GMS Forebay				BANK			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635066				UTM	548841	6209022	
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME					CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	0.7	AIR TEMP	2	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	100	cm	DISLODGED		yes	REASON	tampered				
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy	
COMMENTS											
logger missing, removed by BC Hydro employees conducting fall maintenance on log boom											
logger replaced with Rpl # 19, SN 10676155, launched at 13:11											
Stainless steel cable OK replaced											
SITE ID	gmsUP2		LOCATION	GMS Forebay				BANK			
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10156318				UTM	548841	6209022	
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME					CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	0.7	AIR TEMP	2	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	10	m	DISLODGED		yes	REASON	tampered				
BURIED			FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	steel buoy	
COMMENTS											
logger missing, removed by BC Hydro employees conducting fall maintenance on log boom											
logger replaced with Rpl # 20, SN 10676160, launched at 13:12											
Stainless steel cable OK replaced											
SITE ID	gmsDN2		LOCATION	GMS Tailrace RDB				BANK			north
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10669739				UTM	548828	6207836	
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME	14:16				CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	0.9	AIR TEMP	7	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock	
COMMENTS											
Back-up logger gmsDN2-BU 2038614 in same capsule 14:17											
both downloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											
gmsDN2 = Rpl #11, SN 10669739											
SITE ID	gmsDN1		LOCATION	GMS Tailrace LDB				BANK	south		
LOGGER TYPE	Tidbit		LOGGER SERIAL #	10635063				UTM	548881	6207761	
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME	14:34				CREW	BC TE	
TEST RECORDER TYPE	YSI		WATER TEMP	0.8	AIR TEMP	7	ICE CONDITIONS	none			
LOGGER CONDITIONS											
WATER DEPTH	150	cm	DISLODGED	no		REASON					
BURIED	no		FUNCTIONAL	wet		IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock	
COMMENTS											
gmsDN1 = Rpl #7											
Back-up logger gmsDN1-BU 2038613 in same capsule 14:35											
both downloads OK											
cable ok (stainless steel cable section attached to galvanized cable around rock)											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	pcnUP1	LOCATION			PCN Forebay	BANK		north		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635067	UTM	562710	6204068		
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME	15:37	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.6	AIR TEMP	7.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	100	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	log boom		
COMMENTS										
dow nload OK										
all stainless steel cable ok										
Rpl #10, SN 10635067										
SITE ID	pcnDN2	LOCATION			PCN Tailrace	BANK		north		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10156317	UTM	562803	6204854		
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME	15:16	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.7	AIR TEMP	7.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	150	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock		
COMMENTS										
dow nload OK										
all stainless steel cable ok										
Rpl # 2, SN 10156317										
SITE ID	pcnDN2_BU	LOCATION			PCN Tailrace	BANK		north		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635061	UTM	562803	6204854		
DOWNLOAD DATE	28	Jan	2016	DOWNLOAD TIME	15:11	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.7	AIR TEMP	7.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	150	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER		cm	TETHER TYPE	rock		
COMMENTS										
dow nload OK										
all stainless steel cable ok										
Anchored to same rock as pcnDN2										
Rpl #9, SN10635061										
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 #				10156319	UTM	595569	6230541			
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME		13:56	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP		0.8	AIR TEMP		2	ICE CONDITIONS				none
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	spruce		
COMMENTS												
download OK												
Stainless steel cable OK												
Rpl # 1, SN 10156319												
SITE ID	halfUP1	LOCATION				u/s of Halfway River	BANK	south				
LOGGER TYPE	Tidbit	LOGGER SERIAL #				9767573	UTM	595165	6230094			
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME		14:03	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP		0.8	AIR TEMP		2	ICE CONDITIONS				none
LOGGER CONDITIONS												
WATER DEPTH	250	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	spruce tree		
COMMENTS												
download OK												
stainless steel cable OK												
no ID tag installed												
labelled HalfUPRPL												
SITE ID	halfDN2	LOCATION				d/s of Halfway River	BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #				10669748	UTM	598198	6232169			
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME		13:36	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP		0.7	AIR TEMP		2	ICE CONDITIONS				none
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	balsam pop		
COMMENTS												
download OK												
stainless steel cable OK												
Rpl #15, SN 10669748												
SITE ID	halfDN2_BU	LOCATION				d/s of Halfway River	BANK		north			
LOGGER TYPE	Tidbit	LOGGER SERIAL #				10156314	UTM	598179	6263144			
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME		13:37	CREW	BC TE				
TEST RECORDER TYPE	YSI	WATER TEMP		0.7	AIR TEMP		2	ICE CONDITIONS				none
LOGGER CONDITIONS												
WATER DEPTH	200	cm	DISLODGED		no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	balsam pop		
COMMENTS												
download OK												
stainless steel cable 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 #			10669741			UTM	627501	6232563	
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME			12:29			CREW	BC TE
TEST RECORDER TYPE	YSI	WATER TEMP		0.7	AIR TEMP		2.0	ICE CONDITIONS			none
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	spruce	
COMMENTS											
download Ok											
Stainless steel cable OK											
Rpl #12, SN 10669741											
SITE ID	mobUP1	LOCATION			u/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669754			UTM	627158	6232349	
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME			12:37			CREW	BC TE
TEST RECORDER TYPE	YSI	WATER TEMP		0.9	AIR TEMP		2.0	ICE CONDITIONS			none
LOGGER CONDITIONS											
WATER DEPTH	200	cm	DISLODGED	no	REASON						
BURIED	no	FUNCTIONAL		wet	IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	alder	
COMMENTS											
download OK											
Stainless steel cable OK											
RPL # 16, SN 10669754											
SITE ID	mobDN1_BU	LOCATION			d/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10676147			UTM	630403	6229275	
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME						CREW	BC TE
TEST RECORDER TYPE	YSI	WATER TEMP		0.5	AIR TEMP		2.0	ICE CONDITIONS			none
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED		yes	REASON			tapered		
BURIED		FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE	alder	
COMMENTS											
logger missing, removed by Site C clearing equipment											
Logger replaced with Rpl # 14, SN 10669747 @ UTM 10.630875.6229303											
Stainless steel cable replaced											
No ID tag attached to cable											
SITE ID	mobDN1	LOCATION			d/s of Moberly River			BANK	south		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669746			UTM	630583	6229281	
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME						CREW	BC TE
TEST RECORDER TYPE	YSI	WATER TEMP		0.5	AIR TEMP		2.0	ICE CONDITIONS			none
LOGGER CONDITIONS											
WATER DEPTH		cm	DISLODGED		yes	REASON			tapered		
BURIED		FUNCTIONAL			IF DRY, HEIGHT ABOVE WATER			cm	TETHER TYPE		
COMMENTS											
logger missing, removed by Site C clearing equipment											
Logger replaced with Rpl # 17, SN 10676146 @ UTM 10.630776.6229287											
Stainless steel cable replaced											
No ID tag attached to cable											

BC HYDRO PEACE RIVER TEMPERATURE MONITORING - DOWNLOAD INFORMATION FORM										
SITE ID	pineUP2	LOCATION			u/s of Pine River	BANK		north		
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10635062	UTM	641653	6225304		
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME	15:39	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.8	AIR TEMP	3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	balsam pop			
COMMENTS										
dow nload OK Stainless steel cable OK Rpl # 6, SN 10635062 No ID tag on cable										
SITE ID	pineUP1	LOCATION			u/s of Pine River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			10669747	UTM	641034	6225372		
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME	15:29	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.8	AIR TEMP	2.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
dow nload OK Rpl # 14, SN 10669747 Stainless steel cable OK No ID tag on cable										
SITE ID	pineDN1_BU	LOCATION			d/s of Pine River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			9762095	UTM	648362	6222823		
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME	16:09	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.8	AIR TEMP	3.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
dow nload OK ID tag attached to cable Stainless steel cable OK										
SITE ID	pineDN1	LOCATION			d/s of Pine River	BANK	south			
LOGGER TYPE	Tidbit	LOGGER SERIAL #			2225322	UTM	648101	6222802		
DOWNLOAD DATE	27	Jan	2016	DOWNLOAD TIME	15:59	CREW	BC TE			
TEST RECORDER TYPE	YSI	WATER TEMP	0.9	AIR TEMP	2.0	ICE CONDITIONS	none			
LOGGER CONDITIONS										
WATER DEPTH	200	cm	DISLODGED	no	REASON					
BURIED	no	FUNCTIONAL	wet	IF DRY, HEIGHT ABOVE WATER	cm	TETHER TYPE	alder			
COMMENTS										
dow nload OK ID tag attached to cable Stainless steel cable OK										

Appendix V. Summary of temperature logger deployment dates and anticipated replacement dates.

Site ID	Serial #	Location	Date Deployed	Replace Date
gmsUP1	10676155	WAC Bennett Forebay	Jan 2016	2022
gmsUP2	10676160	WAC Bennett Forebay	Jan 2016	2022
gmsDN1	10635063	GMS Tailrace	Jan 2015	2021
gmsDN1BU	2038613	GMS Tailrace	Nov 2009	2015
gmsDN2	10669739	GMS Tailrace	Apr 2015	2021
gmsDN2BU	2038614	GMS Tailrace	Nov 2009	2015
pcnUP1	10635067	Peace Canyon Forebay	Apr 2015	2021
pcnDN2	10156317	Peace Canyon Tailrace	July 2014	2020
pcnDN2BU	10635061	Peace Canyon Tailrace	Apr 2015	2021
HalfUP1	9767573	Halfway Confluence - upstream	May 2011	2017
HalfUP2	10156319	Halfway Confluence - upstream	May 2014	2020
HalfDN2	10669748	Halfway Confluence - downstream	Apr 2015	2021
HalfDN2BU	10156314	Halfway Confluence - downstream	Jul 2013	2018
MobUP1	10339754	Moberly Confluence - upstream	Oct 2015	2021
MobUP2	10669741	Moberly Confluence - upstream	Apr 2015	2021
MobDN1	10669746	Moberly Confluence - downstream	Apr 2015	2021
MobDN1BU	10676147	Moberly Confluence - downstream	Jan 2015	2021
PineUP1	10669747	Pine Confluence - upstream	Apr 2015	2021
PineUP2	10635062	Pine Confluence - upstream	Jan 2015	2021
PineDN1	2225322	Pine Confluence - downstream	Sep 2008	2015
PineDN1BU	9762095	Pine Confluence - downstream	July 2011	2017