DUNTROON EXPANSION QUARRY

ADAPTIVE MANAGEMENT PLAN 2018

WALKER AGGREGATES INC.

PART LOT 24 AND LOT 25 CONCESSION XII TOWNSHIP OF CLEARVIEW, COUNTY OF SIMCOE

APRIL 30, 2019

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1 EXECUTIVE SUMMARY

The Adaptive Management Plan (AMP) annual summary report is a requirement of the Aggregate Resources Act licensing of the expansion quarry. The licensed property of the existing quarry operates in accordance with Aggregate Resource Act (ARA) license number 3514. The expansion quarry is licenced to WAI under ARA licence number 607841, issued August 6, 2014.

Walker Aggregates environmental commitment is to manage its lands so that in the long term, the ecology is not only maintained but also enhanced beyond its current condition. This will be accomplished through environmental initiatives detailed on the ARA Site Plans and the AMP to ensure that protection, mitigation, and enhancement measures sustain local environmental resource features and functions for future generations.

Aggregate extraction in Phase 1 of the expansion quarry began in late June 2016 and was the first year of reporting for the adaptive management plan. The potential impacts for each phase of Quarry operations are outlined in the AMP with details on specific protection and monitoring measures. This annual summary report will focus on quarry operations in Phase 1 and the associated monitoring measures that were completed in support of the AMP in 2018.

Given the extraction that has occurred in the existing quarry, extraction in Phase 1 of the expansion quarry is not expected to result in any negative impacts to off-site water resources and/or ecological features and functions. Therefore, the monitoring and mitigation requirements during this phase of extraction are such that the response of the natural environment system will be monitored by means of the groundwater, surface water and wetland monitoring network, and results compared to predictions.

The AMP consists of four monitoring programs: the Performance Indicator Trigger Monitoring program (PITM), the Long Term Trend Groundwater and Surface Water Monitoring program (LTT), the Long Term Trend Ecological Monitoring program (LTTEM) and the Ecological Enhancement and Mitigation Monitoring program (EEMM). The AMP annual summary report is a consolidated summary report documenting the observations from each of the monitoring programs.

Key findings of the PITM and LTT indicate atypical climate conditions in 2018 (below average precipitation, early spring melt in February and an extended winter period), resulted in some surface water flows and/or temperatures that fell below the assigned monthly interim PITM trigger levels at specific locations. However, since the PITM trigger periods do not come into effect until after Phase 1 (Table 3.2 in the AMP), mitigation action was not required. Based on the findings found from PITM program it is recommended that the trigger levels are adjusted to include the monitoring results found in Phase 1.

Key findings from the LTT found that the monitoring wells closest to the expansion quarry have experienced increasing drawdown effects as the quarry continues to expand within the Phase 1 extraction footprint. As monitoring has progressed certain wells have become no longer accessible (BH02-3 CLF1, OW1-6, OW3-1 and NW2). It is recommended that these wells be removed from the monitoring.

Key findings from the LTTEM found that the habitat at each survey Station was suitable for amphibians and, when comparing 2018 data to previous years' surveys, amphibian communities were similar in diversity and abundance at each Station.

Key findings from the EEMM found that the cumulative mortality incurred up to July 2018 has been 4.6%, which translates to a survival rate of 95.4%. Adding in the replacements, which outnumber the mortality, survivability is currently greater than 100% surpassing the project target. The final warranty inspection of the 2017 plantings will be conducted in the spring of 2019 and will conclude the warranty period for the project.

2 INTRODUCTION

The Duntroon Expansion Quarry is located on County Road 91, west of the village of Duntroon on Lot 25, Concession XII in the Township of Clearview, County of Simcoe. The existing quarry property is located south of County Road 91 and the expansion quarry is located north of County Road 91. The expansion quarry property is located adjacent to the approved (August 24, 2012) MAQ Aggregates Inc. (MAQ) Highland Quarry, an independent third party. The locations of these quarry properties and of other lands owned by Walker Aggregates are shown on ***Figure 1***.

The Duntroon Quarry has been in operation since the early 1960s on the south side of County Road 91 (existing quarry). Since 1995 the quarry has been operated by Walker Aggregates Inc. (WAI), a wholly owned subsidiary of Walker Industries Holdings Ltd. The licensed property of the existing quarry operates in accordance with Aggregate Resource Act (ARA) license number 3514. The expansion quarry is licenced to WAI under ARA licence number 607841, issued August 6, 2014.

The Adaptive Management Plan (AMP) annual summary report is a requirement of the Aggregate Resources Act licensing of the expansion quarry. Throughout this report the original AMP, created in December 2013, will be referenced for specific details on AMP requirements. Please refer to the original AMP for an in-depth review of the monitoring that will occur during each Phase until after final rehabilitation. For additional background information pertaining to the site, contact information and monitoring requirements please refer to ***Appendix A***. The phasing is also detailed on the Site Plan 2B of 4 Operational Plan. Phase 1, Phase 2a and Phase 2b are identified on ***Figure 2a – Site Sketch.*** The site sketch is based on conditions on October 2018.

This report will provide a summary of the monitoring completed in 2018 for the AMP. The monitoring components are broken down into 4 main categories:

- Performance Indicator Trigger Monitoring (PITM): Focuses on the quarry's impact on an annual basis comparing monitoring to historical values to ensure the mine is not having an adverse impact on surrounding ecological features.
- Long Term Groundwater and Surface Water Monitoring Program (LTT): Reviews monitoring results as well as past data and analyzes to see if the data matches forecasted trends. This monitoring also makes note if any unexpected trends begin to occur.
- Long Term Ecological Monitoring: Compares current data collected on surrounding ecological features with historic observations to see if the quarry's activity is having any negative impact on plants or wildlife.
- Ecological Enhancement and Mitigation Monitoring: Designed so that throughout the quarry's life steps are taken to ensure that upon rehabilitation the property is left in better ecological condition than prior to quarrying.

Extraction during Phase 1 of quarry operations is not expected to result in any negative impacts to off-site water resources or ecological features due to the proximity of the existing quarry. As a result, the monitoring that occurs during this Phase will help compare predicted to actual results found. This Phase will help set a baseline for ecological features that will be compared to in later phases as the quarry expands.

Trigger monitoring criteria for water flows, water temperature and wetland water levels will apply during their respective trigger periods as soon as extraction proceeds beyond Phase 1. Groundwater and surface water monitoring data will be used to further update interim triggers as well as build statistically valid relationships between monitoring locations and control points.

In June of 2018 monitoring responsibilities were transferred from WSP to Walker Industries. For the remainder of the year monitoring was completed by Walker Industries with the help of WSP to provide

guidance when required. In addition, this was the first year that the report was written internally and then reviewed by both WSP and Stantec.

3 CLIMATE DATA

Climate data that is used as part of hydrogeological studies is generally obtained from an operational climate station with at least 30 years of data located in close proximity to the subject area. Environment Canada routinely publishes 30 Year Normals (or averages) for active climate stations with at least 30 years of climate data. The 30 Year Normal data is used as a historical baseline against which recent climate data are compared to determine if a particular year or month is wetter or drier than normal. The information is also used in the assessment of future conditions and impacts that may occur as a result of changes in land use.

Prior to the creation of the AMP, Duntroon Quarry's Permit To Take Water (PTTW) required a 30 Year Normal to review the annual water budget. The 30 Year Normal from Thornbury Slama Station was used as the baseline to compare annual weather data. In 2005 the Thornbury Slama weather station was discontinued. As a result, the Shanty bay climate station is now used to create a correlation between itself and the Duntroon Quarry climate station. Justification for the use of climate data from these stations was provided in the PTTW annual summary reports.

The combination of historical climate data and annual weather station data can be used to analyze the impact of deviation from climate norms and their corresponding impact on the surrounding local hydrology and ecosystems.

In 2008, WAI established, an automatic weather station (the WAI station) in the vicinity of Duntroon quarry

- which provides the following local climate data: Wind speed and direction;
- Average hourly air temperature (°C); and
- Total hourly precipitation (mm)

Historically, there have been some operational issues with the weather station which have been resolved since July 2015 and the station has been operating without any major issues since then. Any major issues that occur over the course of the monitoring year will be noted in this section.

In October 2018, the connection was lost between the weather station and its' online database. After repairs were made all data in October was recovered.

For the purpose of this annual report, both the Shanty Bay and the WAI climate station data have been evaluated. Once a more consistent record of local climate conditions has been established, the local and regional climate data will be used exclusively to prepare seasonal and annual water budget assessments based on the Thornthwaite-Mather method, as used by Environment Canada. The information from the WAI climate station can be used to compile seasonal and annual water surplus/deficit amounts for consideration in surface water runoff and groundwater recharge evaluations and for comparison against quarry discharge volumes.

The 30-Year Climate Normal data and a calculated water budget for the Thornbury Slama Station are provided in ***Appendix A***, on Table A-1. The Shanty Bay climate data and the calculated water budget for 2015, 2016, 2017 and 2018 are provided in Tables A-2, A-3, A-5 and A-7, respectively. The WAI climate station data and the calculated water budgets for 2016, 2017 and 2018 are provided in Table A-4, A-6 and A-8. ***Figures A-1*** through ***A-7*** provide a graphical plot of the monthly precipitation and water surplus for each calculated water budget with the data for the 30-Year Climate Normal provided for comparison.

The 2018 climate data at the Shanty Bay station reports a higher amount of precipitation than the WAI station (991 mm vs. 756 mm), although, the WAI station has often recorded lower precipitation levels. In 2018 the WAI climate station reported roughly 20 mm less precipitation than the Shanty Bay station on a per month basis. The mean monthly temperature at the Shanty Bay station is also warmer than the mean monthly temperature reported at the WAI station (7.4°C vs. 5.8°C). The mean monthly temperature for the Shanty Bay and WAI climate stations are plotted with the 30-Year normal mean monthly temperature in

Figure A-8. The total monthly precipitation for the Shanty Bay and WAI climate stations are plotted with the 30-Year normal total monthly precipitation in ***Figure A-9***.

3.1 AIR TEMPERATURE

At the Shanty Bay climate station, the monthly mean temperature in 2018 was 7.4°C, 0.6°C higher than the 30-Year Climate Normal value of 6.8°C. The monthly average temperatures in January, April, October, and November were between 1.1°C to 3.7°C lower than normal. The months of February, May, June, July, August, and September were within 1.5°C to 4.4 °C warmer than normal. The months of March and December were within +/-1°C of the normal.

At the WAI climate station, the mean monthly temperature in 2018 was 5.8°C, 1.0°C cooler than the 30-Year Climate Normal value of 6.8°C. The average monthly temperature in May was 3.4°C warmer than normal. The months of January, March, April, October and November were within 1.8°C to 5.7°C colder than normal. February, June, July, August, September and December were within +/- 1°C of the normal monthly temperature for their respective month. An early spring melt occurred in February, in which for 3 days the temperatures were above 0 with a high of over 12°C. It should also be noted that six out of the twelve months recorded below zero monthly averages.

The irregular below average temperatures contributed to an extended winter resulting in flows that deviated from the historical values at both the beginning and end of the year.

3.2 PRECIPITATION

At the Shanty Bay climate station in 2018, the total amount of precipitation received was 991 mm, or 25 mm (2.6 %) more than the calculated 30-Year Climate Normal (1971-2000) of 966 mm. The months of February, April, August and October received between 23% and 100% more precipitation than normal, while the months of January, March, June, July, September and November received between 19% and 90% less precipitation than normal. The months of May and December received a normal amount of precipitation (within 10% of the Normal). Shanty Bay's climate station reported to be within the 30 year normal for both the first half and second half of the year.

At the WAI climate station in 2018, the total amount of precipitation received was 756 mm, or 210 mm (22%) less than the calculated 30-Year Climate Normal (1971-2000) of 966 mm. The months of April and October received 73% and 29% more precipitation than normal respectively. The months of January, March, June, July, September, November and December received between 32% and 76% less precipitation than normal. The months of February, May and August received within 10% of the normal amount of precipitation. The second half of the year (July through December) received only 388 mm of precipitation, compared to a normal amount of 536 mm, a difference of 148 mm and a reduction of 28%.

The abnormal distribution of precipitation over the late summer months and through the end of the year contributed to drier than normal conditions and resulted in lower than normal measured flow rates at several surface water monitoring stations.

3.3 ANNUAL WATER BUDGET

The climate data from the Shanty Bay and WAI stations (temperature and precipitation) are used to calculate a general water budget for the area that provides a measure of losses to evaporation of the precipitation. The difference between the monthly precipitation and the monthly evaporation (adjusted for daylight hours) yields the estimated water surplus or deficit for that month, and similarly for the annual totals. The estimated evaporation is based on the method originally developed by Thornthwaite, and

incorporates a water holding capacity for the soil, which is taken into account in the calculation of the actual water surplus. The annual water surplus is a measure of the amount of water that is available for surface runoff and groundwater recharge. Results of the water balance are summarized in Table 3-1. Shanty Bay and the WAI stations are both included in the analysis for 2018.

Table 3-1 2018 Water Balance

PARAMETER	THORNBURY SLAMA (30-Year Normal)	SHANTY BAY	WAI
		2018	2018
Annual Precipitation (mm)	966	991	756
Potential Water Surplus (mm)	368	388	196
Actual Water Surplus (mm)	395	503	308

In 2018, it was found that the actual budget surplus based on the data obtained from the Shanty Bay climate station was 503 mm, which is 108 mm (27%) greater than the 30-year average. When the water surplus calculated using WAI's weather station data (308 mm) is compared to the 30-year average it is found to be 87 mm (22%) less than the historical average. These values represent the amount of water that is available for infiltration into the ground surface to recharge the groundwater flow system and for surface runoff to the creeks. The amount of water that is divided into these two components based on site specific conditions such as topography and various ground infiltration variables. The Ministry of the Environment has provided estimates of infiltration factors for various types of slope, soil and vegetation cover in their land development guidelines (MOE, 1996). For the general conditions present across the Duntroon Quarry and the surrounding area, the infiltration factor is estimated and presented on Table 3-2.

Table 3-2 Duntroon Quarry and Surrounding Area Infiltration Factor

FEATURE (RANGE OF INFILTRATION FACTORS)	SITE CHARACTERISTICS	CORRESPONDING INFILTRATION FACTOR
Slope (0.1-0.4)	Hilly land to rolling land	0.1 to 0.2
Soil Type (0.1-0.4)	Medium combinations of clay and loam to exposed fractured bedrock	0.2 to 0.4
Vegetation Cover (0.1-0.2)	Cultivated lands to woodland	0.1 to 0.2
OVERALL INFILTRATION FACTOR RANGE		**0.4 to 0.8**

Based on the overall infiltration factor range, an estimated range of groundwater recharge and surface runoff components can be separated as seen in Table 3-3.

Table 3-3 Groundwater Recharge and Surface Water Runoff

ANNUAL SURPLUS	GROUNDWATER RECHARGE	SURFACE WATER RUNOFF
30 Year Normals (395 mm)	158 to 316 mm per year 0.050 to 0.100 L/s/ha	237 to 79 mm per year 0.075 to 0.025 L/s/ha
2018 Shanty Bay Data (503 mm)	201 to 402 mm/year	303 to 101 mm/year
2018 WAI Data (308 mm)	123 to 246 mm/year	185 to 62 mm/year

It should be noted that the infiltration values used for this site are based on average characteristic of the site and actual values will vary based on location. For example the low-lying wetlands would allow for more groundwater recharge and areas with karst features, such as near SW9 or DP10, would also differ greatly from these estimated values. In addition, any groundwater recharge near the Escarpment would be

transitioned to the springs that drain below the Escarpment, like the SW11 series. A similar effect occurs near the quarry face and causes the groundwater recharge to flow onto the quarry floor and results in the water table drawdown-distance effect that will be discussed in the Long Term Trend section of the report. It should be noted that the calculated water surplus at the WAI climate station is zero for the months of May, June, July, August, September, October and November.

4 PERFORMANCE INDICATOR TRIGGER MONITORING PROGRAM

4.1 METHODS

The Performance Indicator Trigger Monitoring (PITM) program is the regulatory compliance component of the AMP with respect to water-related issues.

The Performance Indicator Trigger Monitoring (PITM) program's purpose is to monitor the effects of quarry operations on water resources with respect to levels, flows and temperature, and to initiate any actions necessary to adapt quarry operations so that the values of each of these parameters remain within their normal monthly patterns of seasonal variation. Any long term changes in prevailing climatic conditions will be incorporated into the AMP by developing statistical relationships between key AMP monitoring stations and two surface water flow and temperature control stations that are located in the Pretty River and Batteaux Creek drainage basins. These two control stations are situated beyond any possible influence of quarry operations or significant water users.

The PITM program provides for the monitoring of water resources that support natural heritage features. These are the features outside of the limit of extraction that potentially are sensitive to fluctuations in water regimes, such as provincially significant wetlands and fisheries.

These locations are monitored so that appropriate actions may be taken to modify routine quarry operations and/or implement contingency mitigation measures, to ensure that quarry operations do not negatively impact water resources which directly support natural heritage features, namely:

- Springs that discharge at the Niagara Escarpment east of the expansion quarry. These springs help to sustain surface water flow and fish habitat below the brow of the Niagara Escarpment in tributary streams of the Pretty River and Batteaux Creek;
- Surface water flows that support fish habitat in the Beaver River west of the expansion quarry; and
- Surface water levels and flows and groundwater levels that support wetland features and functions.

It is recognized that, in some instances, there may be factors, such as atypical climate conditions, which have no connection to quarry operations that could affect flow and/or temperature conditions at some monitoring locations. The monitoring programs in the AMP are designed to assist in identifying cause and effect relationships. In order to incorporate any effects that long term trends in regional climatic conditions (i.e. climate change) have on local groundwater springs and/or surface water level and flow conditions that are monitored as part of the PITM, monitoring will be conducted at the surface water control sites in the Pretty River and the Batteaux Creek subwatersheds.

For Phase 1 quarry operations, the potential for off-site water-related effects to any of the provincially significant wetlands and/or Escarpment springs is very low.

During Phase 1, interim trigger values are based on historic monthly measurements at each monitoring location, and will be updated annually and as part of the 5-year review of the AMP. Data collected in 2018 as part of the PITM monitoring program will be used to update the interim trigger values and to help incorporate the long term trends in regional climate on the groundwater springs and/or surface water level and flow conditions monitored as part of the PITM. It is noted that PITM trigger periods do not come into effect until Phase 1 is completed.

A description of the PITM regulatory monitoring stations is included in Table 3.3 of the AMP document. Please see ***Figure 4*** for monitoring station locations.

During the months of July and August bi-weekly monitoring must be completed at the surface water Escarpment springs (SW10, SW11, SW11A-E, SW21C, SW24A and SW77) and monthly during other times of the year. Monitoring is to include as a minimum, temperature and an assessment of flow conditions through either the use of an electromagnetic flow meter or at least a visual assessment.

Water pumped into and out of the dewatering sumps and the water moving off-site as quarry discharge is monitored under the Permit to Take Water and the Environmental Compliance Approval. The quarry discharges into the RR6 wetland, west of the existing quarry. There is no specified monitoring requirement for the quarry discharge under the AMP. Pumping rates and the metered flow of the quarry discharge are not specified as part of the AMP and are not reported on in this AMP Summary Report.

Aside from surface water flows and groundwater levels outside of the quarry, field chemistry parameters (temperature, pH, dissolved oxygen and conductivity) are to be recorded quarterly at the dewatering sumps (Sump 1 and Sump 2 in the existing quarry and future Sump 3 on the expansion floor).

Temperature and surface water channel flow are to be monitored hourly at selected PITM surface water stations. PITM surface water monitoring stations include locations in three separate watersheds:

- The Pretty River tributary system: SW16, SW17, SW17A, SW18 and PR Control,
- The Batteaux Creek tributary system: SW9, SW14, SW15 and BC Control, and
- The Beaver River tributary system: SW1, SW2, SW0-2, SW3, SW6A and SW3B ('RR3 Karst')

Pressure transducers and a staff gauge have been installed at stations: SW1, SW2, SW0-2, SW3, SW6A, SW9, SW15, SW16 and SW18. Staff gauges have been installed at stations: SW14, SW17, SW17A, RR3 Karst, PR Control and BC Control; these stations are real-time logger to web stations. Flow measurements are to be taken with a Valeport electromagnetic flow velocity meter or manually. Field chemistry parameters (temperature, pH, dissolved oxygen and conductivity) are to be recorded monthly.

During the months of May, June and July drivepoint monitors in the wetlands are to be to be monitored bi-weekly and monthly for the remainder of the year. Monitoring is to include measurements of groundwater level, ponded water depth and water temperature. The drivepoints are located in the following wetlands:

- ANSI A wetland: DP6 (vernal pool)
- ANSI B wetland: Bridson DP and DP9
- RR2 wetland: DP5 (vernal pool) and DP7 (vernal pool)
- RR3 wetland: DP10
- RR6 wetland: DP2, DP4 and DP8

During Phase 1 quarry operations, a reference wetland station will be established in either the Nottawasaga Lookout Provincial Park or the Pretty River Provincial Park with input from the Ministry of Natural Resources and Forestry (MNRF) and the Nottawasaga Valley Conservation Authority (NVCA). Additional information about the search for a reference wetland will be discussed in Section 4.2.36.

4.2 MONITORING RESULTS

The results of the AMP performance indicator trigger monitoring program in 2018 are presented in the following section.

As stated in Table 3.2 of the AMP, trigger monitoring criteria for water flows, water temperature and wetland water levels will apply during their respective trigger periods as soon as extraction proceeds beyond Phase 1. Interim trigger values have been developed for water flows and water temperature using historical monitoring data and will be updated as further monitoring data become available.

4.2.1 SURFACE WATER FLOW

For stream flow and/or flow at Escarpment springs, the interim red trigger value is set as the historic lowest monthly value recorded at a specific location. The interim yellow trigger value is calculated either by increasing the red value by 15%, or by using the third-lowest monthly flow value over the historic period of record, whichever is the higher value. Green interim trigger values are set above the yellow interim trigger value.

Interim flow trigger values are outlined in Table 3.5, ***Appendix B*** of the AMP document. Monitoring locations are outlined on ***Figure 3***. A brief description of the surface water locations are provided in Table 3.3 of the original AMP Report.

4.2.1.1 STREAM FLOW

Observations on the 2018 stream flow monitoring results are presented in Table 4-1, below:

Table 4-1 Surface Water Monitoring Stations - Results

Monitoring Station	Figure	Observations
Pretty River Tributary System		
SW16	B-28	Surface water flows generally within previously reported range.
SW17	B-29	Surface water flows generally within previously reported range.
SW17A	B-30	Surface water flows generally within previously reported range.
SW18	B-32	Surface water flows generally within previously reported range.
PR Control	B-56	Surface water flows generally within previously reported range.
Batteaux Creek Tributary System		
SW9	B-15	Surface water flows generally within previously reported range.
SW14	B-26	Surface water flows generally within previously reported range.
SW15	B-27	Surface water flows generally within previously reported range.
BC Control	B-57	Surface water flows generally within previously reported range.
Beaver River Tributary System		
SW1	B-1	Surface water flows generally within previously reported range.
SW2	B-2	Surface water flows generally within previously reported range.
SW0-2	B-4	Surface water flows generally within previously reported range.
SW3	B-7	Surface water flows generally within previously reported range.
SW6A	B-12	Surface water flows generally within previously reported range.
SW3B ('RR3 Karst')	B-55	Surface water flows generally within previously reported range.

4.2.1.2 ESCARPMENT SPRINGS

The results of the 2018 AMP monitoring program at the Escarpment spring monitoring stations are summarized in Table 4-2, below.

Table 4-2 Escarpment Springs Monitoring Stations - Results

Monitoring Station	Figure	Observations
SW10	B-16	Surface water flows generally within previously reported range.
SW11	B-17	Surface water flows generally within previously reported range.
SW11A	B-18	Surface water flows generally within previously reported range.
SW11B	B-19	Surface water flows generally within previously reported range.
SW11C	B-20	Surface water flows generally within previously reported range.
SW11D	B-21	Surface water flows generally within previously reported range.
SW11E	B-22	Surface water flows generally within previously reported range.
SW21C	B-38	Surface water flows generally within previously reported range.
SW24A	B-46	Surface water flows generally within previously reported range.
SW77	B-53	Surface water flows generally within previously reported range.

4.2.1.3 CONTROL STATIONS

During Phase 1 of quarry operations, the likelihood of quarry-related water effects off-site is extremely low. WAI is currently in the process of developing statistically valid relationships for flow and temperature conditions between specified key AMP monitoring locations and control stations in the Pretty River sub-catchment drainage basin and in the Batteaux Creek sub-catchment drainage basin. Larger sample sizes generally lead to increased precision when developing relationships. The statistical validity of the relationships between flow and temperature conditions between the specified AMP monitoring locations and the control stations is expected to increase as data collection progresses.

The key monitoring locations for the Pretty River sub-catchment drainage basin are SW17, SW17A and SW18 and in the Batteaux Creek sub-catchment drainage basin is SW14.

The control stations have been established at the following locations:

— Batteaux Creek Sub-watershed Station (“BC Control”) – surface water control station located at the north side of the road culvert on 21/22 Sideroad, Clearview Township, approximately 1350 m east of Concession 10.

— Pretty River Sub-watershed Station (“PR Control”) – surface water control station located at the north side of the road culvert on 30/31 Sideroad, Town of the Blue Mountains, approximately 390 m west of the boundary line between Clearview Township and Town of Blue Mountains.

Photo 1 - Batteaux Creek sub-watershed control station

Photo 2 – Pretty River sub-watershed control station

In addition to the two control locations, long term gauging stations selected for comparison are the Mad River station at Avening and the Pretty River station at Collingwood. Statistical relationships between key monitoring locations and the long term gauging stations will be created and used as a supplementary trigger to replace the initial triggers based on the data collected throughout Phase 1.

The long term regional flow data for the Mad River and the Pretty River stations are presented in ***Appendix A*** as ***Figures A-10*** and ***A-11***. The data for these figures was obtained from the Government of Canada real-time hydrometric data web-site (https://wateroffice.en.gc.ca). Historical data for the Mad River station (02ED015) is available from 1988 through 2017. Historical data for the Pretty River station (02ED031) is available from 2006 through 2017. The average daily surface water flow data for both stations in 2018 was obtained from the real-time data set.

4.2.1.4 TRIGGER EXCEEDANCES

As stated in Table 3.2 of the AMP, trigger monitoring criteria for water flows, water temperature and wetland water levels will apply during their respective trigger periods as soon as extraction proceeds beyond Phase 1. Interim trigger values have been developed for water flows and water temperature using historical monitoring data. These interim trigger values will be updated as further monitoring data becomes available during Phase 1.

Exceedances of the interim trigger values for stream flow are discussed below in chronological order. Monthly summary tables including measured stream flow and temperature values are included in ***Appendix B*** (Tables B7 - B 32).

JANUARY 2018

Surface water flow rates and temperatures at the Escarpment springs and the surface water monitoring stations were collected during the January monthly monitoring event (January 16-18, 2018).

- Green zone stream flow measured at: all surface water stations and Escarpment springs with the exception of SW24A and SW77.
- Yellow zone stream flow interim triggers measured at: SW77.
- Red zone stream flow interim triggers measured at: SW24A.

In addition, SW1, SW0-2, SW3 as well as SW16 were frozen over and unable to be measured. Prior to measuring surface water flows Duntroon had received less than 30 mm of precipitation. This precipitation is less than a third of the historical monthly average (94 mm). The lack of precipitation experienced prior to monitoring is most likely the cause of the trigger exceedances.

FEBRUARY 2018

Surface water flow and temperatures at the Escarpment springs and the surface water monitoring stations, including SW1, SW2 and SW0-2 were collected during the February monthly monitoring event (February 19-24, 2018).

- Green zone stream flow measured at: all surface water stations and Escarpment springs with the exception of SW24A.
- Yellow zone stream flow interim triggers measured at SW24A.

There was a melt event before and during the February monthly monitoring event, which resulted in higher than usual flow measurements at many of the surface water stations. SW24A is a surface water location that is primarily fed by a groundwater spring upstream of the measured location. The flow at SW24A is primarily groundwater and therefore shows less influence due to surface water runoff created by melt events. The yellow interim trigger level measured at SW24A during the February monthly monitoring event is not attributed to quarry activities.

MARCH 2018

Surface water flow and temperature data at the Escarpment springs and the surface water stations were collected during the March monthly monitoring event (March 19-21, 2018).

March 2018 was drier than normal (measured at the WAI climate station). March is typically the month when the majority of the snow pack melts, resulting in higher stream flows.

- Green zone stream flow measured at: SW11, SW21C, SW77, SW2, SW17 & SW17A.
- Yellow zone stream flow interim triggers measured at: SW10, SW24A, SW6A, SW14 & SW16.
- Red zone stream flow interim triggers measured at: SW15 & SW 18.

In addition, SW1, SW0-2, SW3, SW9, as well as BC Control were frozen and were unable to be measured.

The February melt contributed to lower than normal flows during the March 2018 monthly monitoring event, since there was little to no snow pack remaining. In addition, the cold weather had extended into April resulting in no melt occurring in the month of March. Lower than expected flows were recorded at SW10, SW24A, SW6A, SW14 and SW16 (yellow trigger zones) and also at SW15 and SW18 (red trigger zones).

The yellow and red zone interim stream flow trigger values that were exceeded in the month of March are attributed to the atypical climate conditions and are not attributed to the expansion quarry.

APRIL 2018

Surface water flow and temperature data at the Escarpment springs and the surface water stations were collected during the April monthly monitoring event (April 17-19, 2018).

- Green zone stream flow measured at: all surface water stations and Escarpment springs with the exception of SW24A.
- Yellow zone stream flow interim triggers measured at SW24A.

In addition, SW10, SW1, SW0-2, SW3, as well as SW9 were frozen and unable to be measured.

The yellow trigger at SW24A is may be due to ice blockage further up the stream as ice was observed in the vicinity of the surface water flow. This is due to the fact the surface water flow is recorded roughly 50 meters south of the escarpment spring outlet and is fairly shallow making it prone to freezing. The below average temperatures experienced in spring would help contribute to extended freezing.

MAY 2018

Surface water flows and water temperature data were collected at the Escarpment springs and the surface water monitoring stations during the May monthly monitoring event (May 14-16, 2018).

- Green zone stream flow measured at: all Escarpment springs stations, except SW2, and all surface water monitoring locations.
- Yellow zone stream flow interim triggers measured at SW2.

The yellow zone interim stream flow trigger value exceeded at SW2 is interpreted to be the result of the atypical climate conditions and are not attributed to the expansion quarry.

JUNE 2018

The surface water flow and temperature data were collected from the Escarpment springs and the surface water monitoring locations during the June monthly monitoring event (June 18 – 20, 2018).

- Green zone stream flow measured at: all Escarpment springs, with the exception of SW77, SW2, and SW17A all surface water monitoring locations.
- Yellow zone stream flow interim trigger measured at: SW2 and SW17A.
- Red zone stream flow interim trigger measured at: SW77.

The month of June received roughly 30 mm less precipitation than the 30 year average and only 15 mm prior to monitoring. This low level of precipitation is believed to be the cause of the trigger exceedances and the yellow and red zone stream flow measurements are not attributed to the expansion quarry.

JULY 2018

Surface water flow and temperature data were collected bi-weekly at the Escarpment springs in July 2018, as stipulated by the PITM. Monitoring events were completed on July 4th, 2018 and during the July monthly monitoring event on July 16-19, 2018. Surface water monitoring stations were measured during the monthly event only.

July 4th Event (Escarpment springs only)

- Green Zone: All Escarpment springs

July 18-20th Event

- Green zone stream flow measured at: all Escarpment spring stations, and all surface water monitoring stations, except for SW0-2, SW15, and SW 18.
- Yellow zone stream flow interim triggers measured at: SW 15 and SW 18.
- Red zone stream flow interim triggers measured at: SW0-2.

The precipitation received in July was 36 mm below the 30 year historical average, in addition Duntroon had only received 2.9mm prior to monitoring. This resulted in the three trigger exceedances. The surface flows were re-measured the following week after receiving 21mm of precipitation and both SW0-2 and SW18 were both above their trigger levels. The red and yellow zone stream flow interim triggers recorded in July 2018 are not attributed to the expansion quarry.

AUGUST 2018

Surface water flow and water temperature data were collected during the August monthly monitoring event (August 22-24, 2018). An additional site visit was completed on August 3rd, 2018 to make observations at the Escarpment springs, as stipulated in the AMP.

August 3rd Event (Escarpment springs only)

- Green zone stream flow measured at: All Escarpment Spring stations.

August 14-18th Event

- Green zone stream flow measured at: all Escarpment spring stations, all surface water monitoring stations, with the exception of SW 15.
- Yellow zone stream flow interim triggers measured at: SW15.

It is fairly common for SW15 to be recorded as dry during the summer season, in fact seven out of the past ten years the flow from SW15 has been 0.1L/s or less in the month of August. The yellow zone interim trigger value recorded in August 2018 is not attributed to the expansion quarry.

SEPTEMBER 2018

Surface water flow measurements and water temperature data were collected at the Escarpment springs and the surface water monitoring stations during the September monthly monitoring event (September 17-19, 2018).

- Green zone stream flow measured at: all Escarpment spring stations, with the exception of SW10, and all surface water monitoring stations, with the exception of SW 14 and SW15.
- Yellow zone stream flow interim triggers measured at: SW10, SW14 and SW15.

The precipitation recorded for the month of September was over 70 mm less than the 30 year average. Both SW10 and SW15 are commonly dry during the month of September. When reviewing the trigger criteria for SW14 it was found that the yellow trigger should be 0.54L/s instead of 0.8L/s. The error was caused due to the initial rounding of flows when the triggers were created. For the reasons listed, the exceedances of the yellow interim trigger value in September 2018 are not attributed to the expansion quarry.

OCTOBER 2018

Surface water flow measurements and water temperature at the Escarpment springs and the surface water monitoring stations were collected during the October monthly monitoring event (October 23-25, 2018).

- Green zone stream flow measured at: Escarpment spring stations and all surface water monitoring stations.

All green zone levels are most likely due to the 30 mm of precipitation above the 30 year average.

NOVEMBER 2018

Surface water flow measurements and air temperature data were recorded at the Escarpment springs and the surface water monitoring stations during the November monthly monitoring event (November 19-22, 2018).

- Green zone stream flow measured at: SW21C and all surface water stations.
- Yellow zone stream flow interim triggers measured at: SW10, SW 11 and SW24A.

The three yellow triggers were within 0.1 L/s from the threshold of their trigger limits. The below average temperatures experienced in November caused some surface water to freeze. The smallest amount of ice blockage upstream could have caused these flows to hit their yellow triggers. In addition, the month of November received 31 mm less precipitation than the historical average. For these reasons, the yellow interim trigger zone is not attributed to the aggregate extraction in Phase 1 of the expansion quarry

DECEMBER 2018

Surface water flow measurements and water temperature data were collected at the Escarpment springs and most of the surface water monitoring stations during the December monthly monitoring event (December 11-13, 2018).

- Green zone stream flow measured at: Escarpment springs stations and all surface water monitoring stations with the exception of SW6A and SW15.
- Yellow zone stream flow interim triggers measured at: SW6A & SW15.

Several of the surface water monitoring stations were frozen over during the monthly monitoring event in December 2018. Frozen conditions upstream of SW6A and SW15 may have affected flow patterns thereby contributing to the lower than average flow rate reported in December. These interim stream flow trigger values are not attributed to the aggregate extraction activities occurring in Phase 1 of the expansion quarry.

4.2.1.5 MITIGATION MEASURES UNDERTAKEN

There were no mitigation measures required for 2018. Mitigation measures are not anticipated to be required in Phase 1, since extraction during Phase 1 is not expected to result in negative impacts to off-site water resources and/or ecological features and functions, given the extraction that historically has occurred in the Existing Quarry.

An overview of the proposed future mitigation measures that may be implemented if necessary, is outlined in Section 2.3 of the AMP document.

4.2.1.5.1 ROUTINE WATER MANAGEMENT MEASURES

In addition to the Site Plans, and this AMP, routine water management and mitigation are regulated by approvals under the Ontario Water Resources Act (PTTW No. 7725-AACS54, dated September 22, 2016) and the Environmental Protection Act (ECA No. 1521-A4VJ4X, dated October 17th, 2016). These measures have, to the extent possible, been aligned with the monitoring requirements that exist under the AMP.

The AMP mitigation objectives are based on the release of the required volumes of water to the landscape in the vicinity of the wetlands without negatively affecting the surrounding environment. The initial discharge volumes, if and when required, will be based proportionately on the respective sizes of the surface drainage

catchment areas extracted from the respective watersheds (Beaver River or Batteaux Creek), in each Phase.

The proportionate discharge to each watershed/wetland can be adjusted, as necessary, based on the results of the AMP Performance Indicator Trigger Monitoring Program. Discharge into the wetlands will be managed by adjusting pumping rates and/or by means of flow restrictor valves in discharge lines, as required. Discharge into individual wetlands will be adjusted as necessary to maintain target hydrographs in each wetland/watercourse.

For more information on the proposed discharge points and designs that will be implemented progressively during the excavation of the Phases of the expansion quarry, please see Section 2.3 of the AMP document.

Routine water management activities are fully expected to maintain quarry operations in compliance with the AMP trigger criteria, and protect the surrounding natural environment and water resources.

In the event that the routine water management activities described above do not fully achieve the objectives of the AMP, contingency measures will be implemented.

4.2.1.5.2 CONTINGENCY MITIGATION MEASURES

Contingency mitigation measures were not required to be implemented during the 2018 monitoring period. As previously noted, the extraction of Phase 1 of the expansion Quarry is not expected to result in negative impacts to off-site water resources and/or ecological features and functions, given the extraction that historically has occurred in the Existing Quarry.

An overview of the proposed future contingency measures that may be implemented if necessary, is outlined in Section 2.4 of the AMP document.

4.2.2 SURFACE WATER TEMPERATURE

For water temperature in streams and/or Escarpment springs, monthly interim trigger values are established for the months of June through September to reflect the period when warm surface water temperatures have the potential to affect sensitive fish habitat areas that are present downstream, below the Escarpment brow. The trigger values are based on historic recorded temperatures with red triggers consisting of the highest monthly temperature recorded. The interim yellow zone trigger value is set at 10% below the interim red zone trigger value. The interim green zone trigger value is anything that is below the yellow zone trigger value.

Interim temperature trigger values are outlined in Table 3.6, ***Appendix B*** of the AMP document.

4.2.2.1 SURFACE WATER COURSES

The surface water monitoring stations (Table 4-1 and 4-2) are monitored once a month during the months of June through September and the surface water temperature is recorded and compared to the interim trigger values developed specifically for each surface water station.

4.2.2.2 ESCARPMENT SPRINGS

The Escarpment spring monitoring stations are monitored once a month during the months of June and September and bi-weekly in July and August. Surface water temperature is recorded and compared to the interim trigger values developed specifically for each Escarpment spring monitoring station.

4.2.2.3 CONTROL STATIONS

The Batteaux Creek (BC Control) and Pretty River (PR Control) control stations provide context to the recorded surface water temperature data. The control stations are discussed in section 4.2.1.3, above.

4.2.2.4 TRIGGER EXCEEDANCES

As outlined in Table 3.2 of the AMP, trigger monitoring criteria for water flows, water temperature and wetland water levels will apply during their respective trigger periods as soon as extraction proceeds beyond Phase 1. Interim trigger values have been developed for water flows and water temperature using historical monitoring data. These interim trigger values will be updated as further monitoring data become available during Phase 1.

Exceedances of the interim trigger values for water temperature are discussed below in chronological order. Monthly monitoring summary tables are included in ***Appendix B*** (Tables B7 - B 30).

JUNE 2018

Surface water temperature data were collected from the Escarpment springs and the surface water monitoring stations during the June monthly monitoring event (June 18-20, 2018).

The average monthly temperature in June was 16.7°C (WAI climate station). This is within 0.1°C of the 30 year climate normal average monthly temperature for June (16.6°C). The maximum daily temperature recorded at the WAI climate station for the five days leading up to the monitoring event ranges from 19°C to 30°C and the minimum air temperature does not drop below 10°C.

— Green zone temperature measured at: Escarpment spring stations and all surface water monitoring stations with the exception of SW77.

— Red zone temperature interim triggers measured at: SW77.

Surface water station SW77 is directly exposed to the afternoon sun, and the timing of the measurement of the surface water station will directly impact the temperature value. The maximum recorded air temperature at the WAI climate station on the date of the SW77 measurement was 22°C. The red zone temperature interim trigger recorded in June 2018 is attributed to the warm air temperature in the period leading up to the monthly monitoring event, and not to the expansion quarry.

JULY 2018

Surface water flow and temperature data were collected bi-weekly at the Escarpment springs in July 2018, as stipulated by the AMP. Monitoring events were completed on July 4th, 2018 and during the July monthly monitoring event on July 16-19, 2018. Surface water control stations were monitored during the monthly monitoring event only.

July 4th Event (Escarpment Springs only)

— Green zone temperature measured at: All Escarpment springs.

July 16-19, 2018 Event

— Green zone temperature measured at: Escarpment springs, and at all surface water stations, with the exception of SW6A.

— Yellow zone temperature interim triggers measured at: SW6A.

The maximum air temperature on July 18th, the day that SW6A was monitored, is recorded as 19°C. The red zone temperature interim triggers recorded in July 2018 are attributed to the warm air temperature in the period leading up to the monitoring events, and not to the expansion quarry.

AUGUST 2018

Surface water temperature data were collected during the August monthly monitoring event (August 22-24th, 2018). An additional site visit was completed on August 3rd, 2018 to make observations at the Escarpment springs, as stipulated in the AMP.

August 3rd Event (Escarpment springs only)

- Green zone temperature measured at: SW77.
- Red zone temperature interim triggers measured at: SW10, SW11, SW21C, and SW24A.

August 14-18th Event

- Green zone temperature measured at: all surface water monitoring stations with the exception of SW 6A, SW16 & SW17.
- Yellow zone temperature interim triggers measured at: SW11, SW21C, SW24A, SW6A, SW16 & SW17.
- Red zone temperature interim triggers measured at: SW10 & SW77.

The average air temperature reported on August 3rd is 27.5°C. The average air temperatures leading up to the monitoring event was 20.4°C. The average air temperatures during the monthly monitoring event are reported in the range of 15.3°C to 18.7°C. The low stream flow volume and shallow nature of the Escarpment springs water courses increase their sensitivity to warmer air temperatures. The trigger exceedances were re-measured the following week and all but SW16 were back to green zone trigger levels. The yellow and red zone temperature interim triggers recorded in August 2018 are attributed to the warm air temperature in the period leading up to, and during the monitoring events, and not to the expansion quarry.

SEPTEMBER 2018

Surface water temperature data was collected at the Escarpment springs and the surface water monitoring stations during the September monthly monitoring event (September 17-19, 2018).

- Green zone temperature measured at: SW1, SW2 and SW0-2.
- Yellow zone temperature interim triggers measured at: SW10, & SW14, SW17 & SW18
- Red zone temperature interim triggers measured at: SW11, SW21C, SW24A, SW77, SW6A, SW16 & SW17A.

Surface water SW10 and SW24A originate as Escarpment springs, but the water travels over the ground surface 30 to 80 m before the cross-section where the water temperature and flow are recorded. The low stream volume and shallow nature of the Escarpment springs water courses increases their sensitivity to warmer air temperatures. Surface water station SW77, as previously discussed, is directly exposed to afternoon sun, and the timing of the measurement of the surface water station can directly impact the value. The average daily temperature for the week prior to monitoring was 19.0°C, 4°C above the monthly average, causing increases in temperatures of surface water flows that originate ponds.

The yellow and red zone temperature interim triggers recorded in September 2018 are attributed to the warm air temperature and reduced stream flows in the period leading up to, and during the monitoring events, and not to the expansion quarry.

4.2.2.5 MITIGATION MEASURES UNDERTAKEN

Mitigation measures are not expected to be required in Phase 1, since extraction during Phase 1 is not expected to result in negative impacts to off-site water resources and/or ecological features and functions, given the extraction that historically has occurred in the Existing Quarry. No mitigation measures were required for 2018.

An overview of the proposed future mitigation measures that may be implemented if necessary, is outlined in Section 2.3 of the AMP document.

4.2.2.5.1 ROUTINE WATER MANAGEMENT MEASURES

See section 4.2.1.5.1 for routine water management measures

4.2.2.5.2 CONTINGENCY MITIGATION MEASURES

Contingency mitigation measures were not required to be implemented during the 2018 monitoring period. As previously noted, the extraction of Phase 1 of the expansion Quarry is not expected to result in negative impacts to off-site water resources and/or ecological features and functions, given the extraction that historically has occurred in the Existing Quarry.

An overview of the proposed future contingency measures that may be implemented if necessary, is outlined in Section 2.4 the AMP document.

4.2.3 WETLAND WATER LEVEL

The wetlands are protected by the retention of the majority of their catchment areas, such that nearby wetland features will continue to receive direct precipitation, as well as snowmelt and storm-event surface runoff from the lands to the north and east, and in the case of Rob Roy Swamp Wetland Complex unit RR2 wetland, from the American Hart's-Tongue Fern and Butternut protection areas to the south.

When required, wetland water levels will be managed during the active extraction phases of the quarry through to final rehabilitation by discharging quarry water into the wetlands as required to maintain the seasonal hydro-periods and surface water outflows. Discharge water quality will be regulated by approvals under the Environmental Protection Act (ECA for discharge of sewage Works).

Design and pumping rates will be refined in consultation with the MNRF, MECP and Conservation Authority staff through the Phase I extraction period as the monitoring database expands. Preliminary target hydrographs have been developed for the three major wetland types and include target ranges for wet, average and dry conditions. These conditions will be based on weather data provided by the WAI climate station and will be updated seasonally.

The data collected throughout Phase 1 will be used to update the preliminary hydrographs. The wetland target refinement process will be verified through the long term ecological monitoring of wetlands to obtain data on the trends in amphibian habitat conditions, wetland plant species diversity and percent cover, and other ecological indicators of healthy, functional wetlands.

During Phase 1 of quarry operations, a reference wetland station will be established in either the Nottawasaga Lookout Provincial Park or the Pretty River Provincial Park with input from MNRF and the Nottawasaga Valley Conservation Authority. Further information about the Reference Wetland selection process can be found in Section 4.2.36.

Drivepoint water level and ponded water depth were recorded during the following monitoring events, as outlined in the PITM:

- May 1st, 2018 (bi-weekly event)
- May monthly monitoring event (May 17th, 2018)
- June 1st, 2018 (bi-weekly event)
- June monthly monitoring event (June 18th, 2018)
- July 2nd, 2018 (bi-weekly event)
- July monthly monitoring event (July 17th, 2018)

Data from these events is included in Table B-31, ***Appendix B***.

Hydrographs for the drivepoint monitors are presented in ***Appendix C (Figures C-63 through C-73)*** and include the water level inside the drivepoint as well as the elevation of the surface water that is ponded around the drivepoint, where it is present. Table C-8 in ***Appendix C*** includes water level elevations at the drivepoint locations. During the winter and summer months drivepoints can become unmeasurable when the surrounding water freezes or dries up. These events are noted in Table C-8 where they were observed during the monitoring event. Drivepoint and wetland locations are provided on ***Figure 3 – Monitoring Locations***.

Trends and observations for drivepoint monitoring stations are outlined in Table 4-3, below.

Table 4-3 Drivepoint Monitoring Stations - Results

Monitoring Station	Figure	Observations
Bridson DP	C-73	Seasonal variation within previously reported values.
DP2	C-64	Water levels stable since 2010-2011.
DP4	C-66	Seasonal variation within previously reported values.
DP5	C-67	Water levels drop to new minimums for June and September.
DP6	C-68	Seasonal variation within previously reported values.
DP7	C-69	Limited data set.
DP8	C-70	Limited data set.
DP9	C-71	Limited data set.
DP10	C-72	Limited data set.

4.2.3.1 VERNAL BREEDING POOLS WATER LEVELS

Drivepoints DP5 and DP7 are located north of the expansion quarry in vernal pools that are part of Rob Roy PSW #2. DP5 was installed in the summer of 2007 and has been monitored monthly, when accessible, since then. Water levels at DP5 in 2018 reflect the atypically dry conditions of the summer of 2018. Water levels at DP5 in 2018 set new lowest recorded values for the months of June and September. Although the new lowest groundwater elevation was set, DP5 had previously been dry during the year 2007, 9 years prior to the initiation of AMP monitoring (as seen in hydrograph ***Figure C-67***). DP7 was installed in the summer of 2014 and water level monitoring has been completed monthly since the end of 2015. Water levels at DP7 in 2018 show seasonal variation, with peak water levels recorded in May.

The ANSI A wetland is located north of the expansion lands (***Figure 3***). Drivepoint DP6 is located in a vernal pool in the ANSI A wetland. Water levels at DP6 have been monitored on a monthly frequency since

the end of 2007 and show typical seasonal variation. Peak water elevations are reported in the spring. DP6 is often reported as “dry” over the summer months, which shows up in the hydrograph as gaps between the recorded data points.

4.2.3.2 SOIL GROUNDWATER TABLE LEVELS

Multiple drivepoints are installed within Rob Roy PSW#6, located west of the existing quarry, where the existing quarry currently discharges water pumped to dewater the excavated quarry floor. DP2 can be found directly north of the quarry discharge. This monitoring location was installed in the fall of 1999 and has shown little variance since 2011. DP2 water levels in 2018 showed a slight increase over previously recorded water levels, which could be attributed to the presence of the new secondary storage pond that was added east of the existing main storage pond, in the existing quarry in 2018 ***(see Figure 2c)***. DP4 can be found downstream of the quarry discharge and west of SW1. DP4 has been monitored since the fall of 1999 and has remained relatively consistent for the past 5 years. This year DP4 water levels dropped but have remained within seasonal variations. These lower than average water levels are most likely due to the extended below zero temperatures for the month of April and due to the lack of snowpack remaining after the melt in February. DP8 is located south of SW2 and was installed in 2014.Over the course of 2018 DP8 showed little variation.

Rob Roy PSW#3 is adjacent to PSW#2 and can be found north of the MAQ quarry property ***(Figure 3)***. The wetland contains a drivepoint that was installed at the end of 2015 known as DP10. Water levels over the course of the year have shown an overall decrease over the months of June through September.

Bridson DP, located on the former Bridson property, was installed to monitor ANSI B (***Figure 3***). Groundwater levels at Bridson DP show seasonal fluctuation, with a seasonal low water elevation typically in the late summer or early fall. Bridson DP was reported as “dry” during monitoring events in July and September of 2018, which is attributed to the atypically dry summer weather conditions.

Drivepoint DP9 was installed in 2014 and is located north-east of the expansion quarry footprint, in the ANSI B buffer lands owned by WAI. DP 9 was reported dry in September 2018 and the seasonal variation resembles closely to the year 2016 with the exception of this year having a fall recharge to the water level.

4.2.3.3 REFERENCE WETLANDS

During Phase 1 of quarry extraction, a reference wetland is to be established in the Nottawasaga Lookout Provincial Park or the Pretty River Provincial Park with input from the Ministry of Natural Resources and Forestry and the Nottawasaga Valley Conservation Authority. This wetland will be designated as Reference Wetland 1.

From the beginning of May until late August of 2018, wetlands mapped in the Nottawasaga Lookout Provincial Park Reserve and adjacent public lands were investigated by staff from Stantec and Walker. Much of the area mapped as wetland was in fact upland forest. The majority of wetlands encountered were on the lower bench of the escarpment and were seepage-dominated without substantial vernal pools. No wetlands that had a similar physiographic location or community composition to the Rob Roy Swamp PSW Complex or ANSI wetlands A and B were encountered. The search will continue in 2019 in the Pretty River watershed with an emphasis on private lands where long term access agreements can be negotiated

4.2.3.4 TRIGGER EXCEEDANCES

As per Table 3.2 in the AMP, the trigger period for the wetland water levels is spring and early summer (June/July) as soon as extraction proceeds beyond Phase 1. There are no interim triggers for the wetland water levels. Trigger levels based on wetland vegetation and amphibian habitat will be developed and

refined through the Phase 1 extraction period as the monitoring database expands and with input from agency staff.

4.2.3.5 MITIGATION MEASURES UNDERTAKEN

Mitigation measures are not expected to be required in Phase 1, since extraction during Phase 1 is not expected to result in negative impacts to off-site water resources and/or ecological features and functions, given the extraction that historically has occurred in the Existing Quarry. There were no mitigation measures undertaken in the year 2018.

An overview of the proposed future mitigation measures that may be implemented if necessary, is outlined in Section 2.3 of the AMP document.

4.2.3.5.1 ROUTINE WATER MANAGEMENT MEASURES

See section 4.2.1.5.1 for routine water management measures.

4.2.3.5.2 CONTINGENCY MITIGATION MEASURES

Contingency mitigation measures were not required to be implemented during the 2018 monitoring period. As previously noted, the extraction of Phase 1 of the expansion Quarry is not expected to result in negative impacts to off-site water resources and/or ecological features and functions, given the extraction that historically has occurred in the Existing Quarry.

An overview of the proposed future contingency measures that may be implemented if necessary, is outlined in Section 2.4 of the AMP document.

4.3 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the 2018 performance indicator trigger monitoring program the following conclusions and recommendations are made:

- Certain deficiencies that were apparent with the implementation of the program in 2016, including the flow and temperature interim trigger level values that were adopted for the PITM Escarpment spring and surface water monitoring stations, continued to be evident in the 2018 program. The performance indicator interim triggers for surface water flow and surface water temperature should be re-evaluated to incorporate the conditions observed in 2016 through 2018. The values recorded as having exceeded a specific seasonal maximum or minimum interim “trigger” value occurred as a result of atypical climatic conditions, and not as a result of quarry operations in Phase 1.
- Higher than normal temperatures in February contributed to an early spring melt resulting in multiple trigger events in March and April due to the lack of snowmelt left.
- Below average temperatures in April resulted in the spring melt to occur late in the month following the recorded monitoring event.
- A wetter than normal October resulted in most surface water flows for the month being reported in the green zone.
- Surface water stations SW21C, SW24A and SW77 show sensitivity to high air temperatures due to their low flow and shallow nature. These high surface water temperatures are interpreted to be due to climate conditions and are not related to the active extraction in the expansion quarry. The potential for off-site water-related effects to any of the provincially significant wetlands and/or Escarpment springs during Phase 1 is considered to be very low.

- During Phase 1 of quarry extraction, a reference wetland is to be established in the Nottawasaga Lookout Provincial Park or the Pretty River Provincial Park with input from the Ministry of Natural Resources and Forestry and the Nottawasaga Valley Conservation Authority. The search for the reference wetland will continue in 2019 through examining the Pretty River Provincial Park. This wetland will be designated as Reference Wetland 1.
- For PITM monitoring in 2019 all previous data should be included when creating interim triggers for both flows and temperature. As Phase 1 is unlikely to cause adverse impacts to off-site water resources the data from the years 2016 to 2018 will help account for the increasing reoccurrence of abnormal weather impacts caused by global climate change.

5 LONG TERM GROUNDWATER AND SURFACE WATER MONITORING PROGRAM

The Long Term Trend (LTT) groundwater and surface water monitoring program has been under operation prior to the expansion and a modified version of this monitoring will continue until the completion of the final rehabilitation of the quarry.

Long term trend monitoring is used to track seasonal and year-over-year natural variations in the groundwater and surface water systems, as well as the progressive response of those systems as the existing quarry winds down and the expansion quarry extraction operation continues over the next 20 to 30 years, followed by several decades of rehabilitation to lakes. The LTT monitoring program will provide data that will update the environmental baseline conditions as new data becomes available, and identify short-term and long-term climate trends.

5.1 METHODS

The surface water drainage divides, local catchment areas and monitoring stations for the Pretty River, Batteaux Creek, Beaver River and Mad River systems are provided on ***Figure 3.***The LTT includes selected PITM stations with additional LTT surface water and groundwater stations to help assess the long term trends of the surrounding hydrology.

The LTT monitoring program for the groundwater monitoring stations includes monthly manual groundwater level measurements and a network of pressure transducers that record hourly or twice daily water levels at selected groundwater monitoring wells.

Long term trend monitoring stations are listed, along with a description, in Table 4.1 of the AMP document. A summary of the well information is included in Table C-1 in ***Appendix C.*** Long term trend monitoring stations include groundwater monitoring wells in the following locations:

- Existing quarry: 98-8, 98-9, 98-12 and PW99-1;
- Expansion quarry (injection wells): IW1, IW2, IW3 and IW4;
- Expansion quarry (monitoring wells): BH02-1, BH02-2, BH02-3, BH02-4, BH02-5 nest, BH02-6, BH03-7 nest, BH03-8, BH08-1, BH08-2, BH08-3, NW1-9, NW10 nest, BH03-9, TW04-1, TW04-2 and TW04-3;
- Osprey quarry property: 101-B, 102-C, 103-D, 104-A, OW1-4, OW3-1 (not accessible), OW5-2 and OW6-3;
- Carmarthen Lake Farms property: CLF1 (not accessible), CLF2, CLF3, CLF4 and CLF5.

On the Osprey property, monitoring well OW1-6 and OW3-1 are no longer accessible, as noted in prior annual reports. On Carmarthen Lakes Farms access to CLF1 has been blocked and can no longer be monitored. The removal of these wells from the monitoring program does not affect the overall integrity of the program.

On the Expansion property, BH02-3 is recommended to be removed from the program as the well walls have failed and surrounding fill is now within the well itself. Due to its' close proximity to the quarry face as well as having BH02-4 roughly 20 meters north of its' location it is recommended that this borehole be

removed from the monitoring program. NW2 was excavated at the end of May as the quarry face has approached its' location.

There are several private domestic water wells located around the periphery of the predicted drawdown zone of influence of the expansion quarry (Jagger Hims, 2007). Locations of the groundwater supplies are identified on ***Figure 3*** as 'RW' (residential wells). Selected monitoring wells are monitored in the AMP under the Long Term Trend Groundwater and Surface Water Monitoring Program:

- East of existing and expansion quarry: RW1, RW2 (since new ownership we haven't received written consent to enter property), RW5, RW6, RW7, RW8, RW16 (owned by WAI), RW18 (owned by WAI, to be removed before extraction) and RW19 (owned by WAI, to be removed before extraction).
- North of expansion quarry: RW3, RW4 (owners have asked us to no longer monitor their well), RW17
- West of expansion quarry: RW9 (MAQ Aggregates property)

The owners of the RW4 property have requested a temporary stop to monitoring activities.

Pressure transducers were installed at residential wells in close proximity to the mine site. These pressure transducers in selected residential wells to record hourly or twice daily groundwater levels. In addition to the use of pressure transducers, the groundwater levels will be measured monthly. A limited number of residential wells are also sampled annually for general chemistry, major and minor ion constituents, nutrients, total petroleum and hydrocarbons, BTEX, total suspended solids and bacteriological parameters.

Some historical wells that were originally monitored are not part of the Long Term Trend monitoring program. These wells are RW10, RW11, RW12, RW13, RW14, RW15 and RW20. RW12 and RW13 are currently included in the monitoring events but are not part of the Long Term Trend monitoring program. RW14 and RW15 are monitoring wells that were historically part of the monitoring network at the existing quarry, but have been decommissioned.

The LTT monitoring program also includes drivepoints that are located in the following wetlands:

- ANSI A: DP6 (vernal pool)
- ANSI B: Bridson DP, DP9
- RR2: DP5 (vernal pool), DP7 (vernal pool), Staff Gauge 1 and Staff Gauge 2 (BH03-7 SG1/ SG2)
- RR3: DP11
- RR6: DP1, DP2, DP4, DP8
- CLF wetland: DP3

The groundwater depth, ponded water depth (where available) and surface water temperature are measured monthly at the drivepoints. The surface water depth is recorded monthly at the staff gauges. Selected drivepoint monitors also have pressure transducers installed which record twice daily groundwater levels.

The surface water monitoring program under the LTT monitoring program includes monthly stream flow and temperature measurements at the surface water monitoring stations. Pressure transducers are to be installed at selected surface water stations to record hourly water level stage. Annual water measurement of field chemistry parameters (temperature, pH, conductivity and dissolved oxygen) and water quality sampling also occurs at selected surface water stations.

The LTT surface water monitoring program includes monitoring stations located in the following watersheds:

- The Pretty River tributary system: SW20
- The Batteaux Creek tributary system: SW7, SW8, SW10, SW11E, SW13, SW19, SW21 series, SW22, SW22A and SW22C
- The Beaver River tributary system: SW3C ('RR3 Out')
- Existing quarry floor: QFSW2 and dewatering sump

The additional surface water stations with data included in this AMP summary report that are not PITM or LTT monitoring stations are the following: SWB-1, QFSW1, SW3A, SW4, SW5, SW6, SW12, SW12A, SW17B, SW21D, SW22B, SW23, SW24, SW24B, SW24C, SW25, SW26, SW26A, and SW27. The data for these additional stations is included in the report to provide context to the monitoring results for 2018 and to provide a historical record of the data collected in support of the Duntroon Quarry expansion. A description of each surface water monitoring station is provided in Table B-1, ***Appendix B***.

The additional surface water station SW12A will be removed as of this year from monitoring. The purpose of this removal is due to the fact a tree has grown around the monitoring location and it is no longer possible to get an accurate surface water flow measurement.

5.2 NEW MONITORS INSTALLED

New groundwater monitoring wells and drivepoints were installed in 2014, as required by the Site Plan for the expansion quarry. No new monitors have been installed in the year of 2018.

5.3 MONITORING RESULTS

5.3.1 GROUNDWATER LEVELS

5.3.1.1 SEASONAL VARIATION

Groundwater levels often reach their annual highest elevations during the spring after the snowmelt. Due to abnormal weather conditions, a majority of seasonal high levels occurred in February 2018 when a period of unseasonable warm temperatures occurred.

After the snowmelt water levels tend to decline as precipitation rates often drop and evapotranspiration rates begin to rise as time progresses into the summer months. During the fall water levels can either begin to rise or continue to fall based on the balance between precipitation and evapotranspiration rates. In the winter months, when precipitation is bound up in the snow pack and the shallow ground surface is frozen, groundwater levels tend to decline until the spring snow-melt, when the cycle repeats.

The magnitude of seasonal variation is generally the greatest at the topographically high groundwater recharge areas, with less seasonal variation occurring in the topographically lower lying lands and adjacent to surface water courses and/or lakes that serve as groundwater discharge areas.

5.3.1.1.1 WETLANDS

Wetland water levels showed the effects of seasonal variation to different degrees. Wetland water levels are discussed in more detail in section 3.2.3, above.

5.3.1.1.2 BEDROCK

Groundwater monitoring wells in the long term trend monitoring network showed a varying degree of influence due to seasonal climate conditions. The seasonal variation of groundwater levels in the bedrock is discussed in more detail in the following section, where it applies to selected monitors.

5.3.1.2 EXISTING QUARRY PROPERTY

Table 5-1 outlines the observations made in 2018 at the groundwater monitoring wells that are part of the Long Term Trend groundwater monitoring network on the Existing Quarry property.

Table 5-1 Existing Quarry - Results

Monitoring Station	Observations in 2018	Figure
98-8	Stable water levels throughout 2018. Water levels have gradually increased at monitoring well 98-8 over time with the operation of the main reservoir at the west end of the Existing Quarry.	C-2
98-9	Water levels show seasonal fluctuations comparable to previous monitoring years.	C-3
98-12	Water levels at 98-12 have been relatively stable since 2008.	C-4
PW99-1	Stable water levels throughout 2018. The operation of the main reservoir helps to buffer water levels at PW99-1.	C-5

Monitoring data from groundwater monitoring well MW6 ***(Figure C-1)*** has also been included in ***Appendix C*** to supplement the AMP data set, although this monitor is not included in the LTT monitoring program.

A majority of the historical groundwater monitors on the Existing Quarry property have been removed as part of aggregate extraction activities. The previously mentioned groundwater hydrographs (RW14, RW15 and RW 20) for monitoring wells that were not accessed in 2018 have not been included in this report.

5.3.1.3 OSPREY QUARRY PROPERTY

The following table summarizes the observations made in 2018 at the groundwater monitoring wells that are part of the Long Term Trend groundwater monitoring network on the Osprey Property.

The two groundwater monitoring wells mentioned prior (OW1-6 and OW3-1) were not monitored this year. A groundwater hydrograph with data up until November 2015 has been provided in ***Appendix C***.

Table 5-2 Osprey Quarry - Results

Monitoring Station	Observations in 2018	Figure
101-B	Water levels within previously recorded seasonal variations. New peak level in February.	C-35
102-C	Water levels within previously recorded seasonal variations.	C-36
103-D	Water levels within previously recorded seasonal variations. New peak level in February.	C-37
104-A	Water levels within previously recorded seasonal variations.	C-38
OW1-4	Water levels within previously recorded seasonal variations. New peak level in February.	C-39
OW3-1	No water level data recorded in 2016-2018.	C-40
OW5-2	Water levels within previously recorded seasonal variations.	C-41

Monitoring Station	Observations in 2018	Figure
OW6-3	Water levels within previously recorded seasonal variations.	C-42

Groundwater levels on the Osprey Property in 2018 were within previously recorded seasonal variations. As mentioned in Section 5.3.2 wells 101-B, 103-D and OW1-4 experienced new peak water levels during an abnormally early spring melt.

5.3.1.4 EXPANSION QUARRY PROPERTY

The following tables summarize the observations made in 2018 at the groundwater monitoring wells that are part of the Long Term Trend groundwater monitoring network on the expansion quarry property.

Table 5-3 Expansion Quarry Injection Wells – Results

Monitoring Station	Observations in 2018	Figure
IW1	Water levels within previously recorded seasonal variations. Less than 9m difference between peak and low water levels.	C-6
IW2	Water levels within previously recorded seasonal variations.	C-7
IW3	New low level set in September. Less than 10 m difference between peak and low water levels.	C-8
IW4	New low level set in September. Water levels show fluctuations related to seasonal climate variation over the course of 2016.	C-9

Water levels at the injection wells show fluctuations related to seasonal climate variation over the course of 2018. Due to the limited period of record for the injection wells (<3 years), further monitoring is required before more conclusions can be reached with respect to long term trends at these wells.

Table 5-4 Expansion Quarry Monitoring Wells - Results

Monitoring Station	Observations in 2018	Figure
BH02-1	Overall declining trend in water levels from 2003 to present.	C-10
BH02-2	Water levels declining after August 2016. New water level minimum set in October 2018.	C-11
BH02-3	Monitoring location removed due to mine progression.	C-12
BH02-4	Water levels declining after August 2016. New water level minimum set in October 2018.	C-13
BH02-5 nest	Water levels within previously recorded seasonal variations.	C-14
BH02-6	Water levels declining since October 2015. Monitor is immediately adjacent to the sinking cut made for tunnel construction. New water level minimum set in November 2018.	C-15
BH03-7 nest	Water levels within previously recorded seasonal variations.	C-16

Monitoring Station	Observations in 2018	Figure
BH03-8	Water levels declined August through November 2016, but have returned to normal with slightly less seasonal variation.	C-17
BH08-1	Water levels within previously recorded seasonal variations.	C-18
BH08-2	Water levels within previously recorded seasonal variations.	C-19
BH08-3	Water levels within previously recorded seasonal variations.	C-20
NW1	Water levels declining after July 2016. New low water level recorded in December 2018.	C-21
NW2	Monitoring ceased in May due to extraction progression.	C-22
NW3	Water levels in 2018 were within the previously reported range.	C-23
NW4	Peak water level recorded in February 2018. New low level recorded in October 2018.	C-24
NW5	Water levels declined in late 2016 and have continued to decline since. New low level recorded in October 2018.	C-25
NW6	New low elevation set in October 2018.	C-26
NW7	New low elevation set in November 2018.	C-27
NW8	New low elevation set in October 2018.	C-28
NW9	New low elevation set in October 2018.	C-29
NW10 nest	DP water levels remain relatively constant. NW10 shallow and deep monitoring well water levels show variation due to seasonal climactic influence. New maximum elevation set for NW10DP in November.	C-30
BH03-9	Water levels within previously recorded seasonal variations. New low elevation set in September 2018.	C-31
TW04-1	Water levels within previously recorded seasonal variations. New low elevation set in October 2018.	C-32
TW04-2	Water levels within previously recorded seasonal variations. New low elevation set in October 2018.	C-33
TW04-3	Water levels within previously recorded seasonal variations. New low elevation set in October 2018.	C-34

Groundwater levels on the expansion quarry property in 2018 are showing the influence of seasonal variation, as well as influence at some locations from the tunnel excavation and aggregate extraction activities. The influence of the tunnel excavation and aggregate extraction activities are limited to local influence at monitoring wells BH02-6 (immediately next to the tunnel excavation) BH02-4, BH02-1, NW1 and NW4 which are in close proximity to the active aggregate extraction area. The influence of the quarry activities on the groundwater levels at those wells that are in in the footprint of Phase 1 and in the vicinity of the current extraction activities was anticipated. During the late summer and early fall new minimum

water elevation levels were set for the TW series as well as BH03-9 but recovered back to normal levels by December.

Groundwater levels at the monitors on the expansion quarry property will continue to be monitored as part of the Long Term Trend monitoring program.

5.3.1.5 CARMARTHEN LAKE FARM PROPERTIES

Table 5-5 summarizes the observations made in 2018 at the groundwater monitoring wells that are part of the Long Term Trend groundwater monitoring network on the Carmarthen Lake Farms property.

As noted previously, monitoring well CLF1 is no longer accessible to obtain water levels. The water levels at CLF2, which is in close proximity to CLF1, have historically shown similar trends to the water levels at CLF1. The historical groundwater hydrograph for CLF1 is included in ***Appendix C*** as ***Figure C-43.***

Table 5-5 Carmarthen Lake Farm Properties - Results

Monitoring Station	Observations in 2018	Figure
CLF2	Water levels within previously recorded seasonal variations.	C-44
CLF3	Water levels within previously recorded seasonal variations.	C-45
CLF4	Water levels within previously recorded seasonal variations.	C-46
CLF5	Water levels within previously recorded seasonal variations.	C-47

5.3.1.6 RESIDENTIAL WELLS

Table 5-6 Residential Wells - Results

Monitoring Station	Observations in 2018	Figure
RW1	Water levels within previously recorded seasonal variations.	C-48
RW2	Have not received written consent to access property since new owners have purchased property.	C-49
RW3	Water levels within previously recorded seasonal variations.	C-50
RW4	Water levels within previously recorded seasonal variations. At home owners' request in November, it will no longer be monitored going forward.	C-51
RW5	Water levels within previously recorded seasonal variations.	C-52
RW6	Water levels within previously recorded seasonal variations.	C-53
RW7	Water levels within previously recorded seasonal variations.	C-54
RW8	RW8 is located on a local topographical high north of the existing and expansion quarries and outside of their influence. Water levels within previously recorded seasonal variations.	C-55
RW9	RW9 is located on the CBM quarry property and has not been accessed for monitoring since September 2014.	C-56

Monitoring Station	Observations in 2018	Figure
RW16 (Bridson)	Water levels within previously recorded seasonal variations.	C-59
RW17 (owned by WAI)	Water levels within previously recorded seasonal variations.	C-60
RW18 (owned by WAI)	Water levels within previously recorded seasonal variations.	C-61
RW19 (owned by WAI)	New minimum water level set in September 2018. Remaining water levels within seasonal averages.	C-62

Residential wells that are currently monitored but that are not part of the Long Term Trend monitoring program include: RW12 ***(Figure C-57)*** and RW13 ***(Figure C-58)***. Groundwater hydrographs for these residential wells, as indicated in parenthesis, have been included to supplement the 2018 AMP summary report.

The minimum water levels reported at several residential wells in the late summer/early fall of 2016 recovered in 2018 to within previously recorded seasonal variations. As the mine has continued to expand in a north east direction the drawdown effects have begun to become visible at RW 19.

5.3.1.7 DRIVEPOINTS

A majority of the drivepoint monitors are included in the PITM program and have already been discussed. Drivepoints that are exclusively part of the Long Term Trend monitoring program include DP1, DP3, DP11 and the staff gauges at BH03-7.

Table 5-7 Drivepoint Monitoring - Results

Monitoring Station	Observations in 2018	Figure
DP1	Water levels within previously recorded seasonal variations.	C-63
DP3	Water levels within previously recorded seasonal variations.	C-65
DP11	Monitored by Highland Quarry	N/A
BH03-7 SG1 / SG2	Minimal staff gauge readings (multiple records of station being “dry” or “buried in snow”)	C-74

Water levels at the drivepoints that are exclusively monitored under the Long Term Trend monitoring program were within previously recorded seasonal variations. DP11 is monitored under the joint monitoring agreement that WAI holds with the owner of the adjacent quarry (MAQ Highland Quarry).

The staff gauges at BH03-7 are monitored on a monthly frequency, as outlined in the AMP, but there is minimal water elevation data due to the stations being reported as “dry” or “buried in snow”.

Drivepoint water elevation data is presented in Table C-8 in ***Appendix C***.

5.3.1.8 GROUNDWATER CONFIGURATION

The borehole monitors and the residential water wells are constructed as open-holes that extend into and sometimes through the dolostone rock strata of the Amabel Formation and the Fossil Hill Formation. The exceptions are BH03-7-I, BH03-7-II, BH02-5 (mid) and NW10 (mid) on the expansion lands which are

shallow monitoring wells. For more information on each monitoring well, please see Table C-1, ***Appendix C***.

In the open-hole monitors, the overburden soil, where present, is cased off with metal casing that is seated into the buried surface of the rock. The water levels that are obtained in the monitors and water wells provide a general measure of the water table and groundwater conditions through the rock column, rather than the piezometric pressure head at a specific elevation within the rock mass that would be provided by a monitor that is screened across a specific horizon in the borehole. Since the open holes extend above and below the groundwater table, the water levels in the holes represent general water table conditions within the rock.

Groundwater level elevations at the monitors were contoured for April 2017 ***(Figure 4)***, October 2017 ***(Figure 5)***, April 2018 ***(Figure 6)*** and October 2018 ***(Figure 7)***. April contours represent spring conditions and October contours represent fall conditions. The groundwater contours are presented to illustrate the local groundwater configuration and general flow directions within the Amabel aquifer. These figures illustrate that the groundwater configuration and flow pattern remain generally the same regardless of the change in water levels associated with seasonal climatic conditions.

The interpreted groundwater configuration beneath the expansion quarry exhibits an elliptical radial pattern that is centred upon the areas of higher ground formed by local bedrock hills. A groundwater divide is present in the expansion lands. The groundwater movement beneath the eastern section of the quarry expansion lands is towards the Escarpment and generally to the Batteaux Creek sub-catchment. Beneath the western part of the quarry expansion lands, the groundwater movement is to the north, generally towards the Pretty River sub-catchment, and to the west, contributing to the Beaver River sub-catchment. A southerly component of groundwater flow towards the existing quarry is also present in the vicinity of BH02-6. The presence of the tunnel beneath County Road 91 and the extraction area in the expansion quarry (floor elevation approximately 501 m ASL) lowers the groundwater levels in the rock adjacent to the extraction area.

South of the existing quarry, groundwater movement is interpreted to be radially away from the higher ground and towards Edward Lake. Edward Lake is interpreted to be a local groundwater discharge area, as well as a collection area for local surface water run-off.

5.3.1.9 QUANTIFICATION OF DRAWDOWN INFLUENCE ZONE

In order to estimate the magnitude and the lateral extent of the zone of influence, and the distance drawdown effects of the existing quarry, expansion quarry and the MAQ Highland Quarry on the local groundwater system, the historical and recent groundwater level data obtained from the long term trend groundwater monitoring network have been evaluated.

Figure 8 provides a summary of the distance-drawdown relationships obtained at individual monitoring well locations. The figure illustrates a lower boundary influence envelope and an upper boundary influence envelope which identify the interpreted minimum and maximum extent of the distance-drawdown relationship.

5.3.1.9.1 EXISTING QUARRY

Within the extraction area of the existing quarry there has been a progressive drawdown influence of 12 m to 20 m on the local water table. As the size of the extracted area has increased, so has the zone of influence of the existing quarry on the local groundwater system. The magnitude of the drawdown influence is greatest within the extraction area at the existing quarry, and decreases relatively quickly with distance away from the extraction faces. The magnitude and lateral extent of the drawdown zone of influence is also variable around the quarry due to the variable hydraulic conductivity in the rock mass.

5.3.1.9.2 EXPANSION QUARRY

Select monitors on the expansion lands have shown influence from tunnel construction and extraction activities that were initiated in 2016. Groundwater monitors NW1, NW2, NW4 and NW7 have been included on ***Figure 8*** to update the distance-drawdown figure for 2018. These monitoring wells are all located on property owned by WAI and the draw-down effects at these on-site monitors was anticipated. NW4 is showing approximately 7 m of drawdown at a distance of approximately 70 m from the quarry face.

5.3.1.9.3 MAQ HIGHLAND QUARRY

The distance-drawdown effects of the MAQ Highland Quarry on the groundwater monitors on the expansion lands is still being developed. The groundwater monitoring wells along the south-west corner of the expansion property showed slower than usual recovery in the fall of 2016, but the water levels recovered by the spring of 2017. Since then water levels have been mostly within seasonal variations. During the late summer and early fall new minimum water elevation levels were set but recovered back to normal levels by December. Further investigation of the groundwater levels at NW9 and TW03-1, 2 and 3 is warranted as data are collected in 2019.

5.3.1.10 GROUNDWATER QUALITY

Annual sampling for the following parameters is required under the Long Term Trend Monitoring Program for two selected residential wells, RW1 and RW2:

- General chemistry,
- Major and minor ion constituents and nutrients,
- Total petroleum hydrocarbons and BTEX,
- Total suspended solids, and
- Bacteriological (E.coli, total coliform, heterotrophic plate count).

The samples from the groundwater monitoring locations were obtained from the two residential properties adjacent (RW1) and downgradient (RW2) from the existing and expansion properties on May 9, 2018. The samples were collected from outside taps at each property to try and bypass the water treatment systems. Field chemistry parameters (temperature, pH, conductivity and dissolved oxygen) were recorded at the time of sampling and observations on the appearance of the sampled groundwater were noted. Water quality samples were placed in a cooler with loose ice and shipped to an accredited laboratory for analysis (Caduceon Laboratories). The groundwater quality results are presented in Table C-10, ***Appendix C***.

The analytical results from the groundwater quality sampling are compared to the Ontario Drinking Water Quality Standards, Objectives and Guidelines (ODWQS, June 2006) and meet this guideline, with the exception of the following:

- The total coliform counts in the sample obtained from RW2 was elevated compared to the ODWQS. The home-owner was notified by phone once the sample results were received from the lab. These results are attributed to sampling conditions and the well water is not expected to be compromised.
- The sodium concentration in the samples obtained from RW2 did not meet the aesthetic guideline range specified in the ODWQS. Sodium has an aesthetic objective of 200 mg/L and a suggested maximum concentration of 20 mg/L under the ODWQS. The water quality at RW2 is interpreted to be representative of local groundwater quality, which is naturally hard (sodium 115 mg/L).
- The hardness in the samples obtained from RW1 and RW2 did not meet the aesthetic or operating guideline ranges specified in the ODWQS. Hardness has an operating guideline range of 80-100 mg/L indicated in the ODWQS. The water quality at RW2 is interpreted to be representative of local groundwater quality, which is naturally hard.

— The colour quality in the sample obtained from RW1 did not meet the ODWQS. Colour has an aesthetic objective of 5 TCU (Total Colour Units).

The concentration of hardness and colour is an operational guideline and is not health related. Operational guidelines are established for parameters that, if not controlled, may negatively affect the efficient and effective treatment, disinfection and distribution of the water.

The concentration of sodium at RW1 (107 mg/L) and RW2 (60.6 mg/L) is higher than the maximum suggested concentration of 20 mg/L. These results are expected to be due to the water softening process (RW1) and naturally occurring groundwater quality (RW2). Sodium is not toxic. Consumption of sodium in excess of 10 grams per day by healthy adults does not result in any apparent adverse health effects. In addition, the average intake of sodium from water is only a small fraction of that consumed in a normal diet. A maximum acceptable concentration for sodium in drinking water has, therefore, not been specified. Persons suffering from hypertension or congestive heart disease may require a sodium-restricted diet, in which case, the intake of sodium from drinking water could become significant. Public drinking water systems are required to sample for sodium on a regular basis and report to the Medical Officer of Health when sodium levels exceed 20 mg/L, so that this information may be passed on to local physicians.

The RPD was within 20% for a majority of the parameters with the exception of Total Coliform, phosphorus, and arsenic. Residential well sampling at RW1 and RW2 will be completed annually as part of the Long Term Trend monitoring program under the AMP.

5.3.2 SURFACE WATER SETTING

5.3.2.1 SURFACE WATER CHARACTERISTICS

The following sections outline the observations and monitoring results collected in 2018 at the surface water stations that are included in the Long Term Trend monitoring program.

An overview of the observed trends for LTT in 2018 will be provided in the following section. Long term data are available for selected surface water stations.

Surface water monitoring data are presented in ***Appendix B***, which includes: PITM triggers, surface water hydrographs, field chemistry parameters and laboratory analysis results.

5.3.2.1.1 SURFACE WATER MONITORING STATIONS

Table 5-8 Surface Water Monitoring - Results

Monitoring Station	Observations in 2018	Figure
QFSW2 & Dewatering Sump(s)	Flows are within previously recorded seasonal variations. QFSW2 flows into the main sump (Sump 1). Excess water from the expansion quarry is being directed to the sumps in the existing quarry.	B-6
SW7	Station reported as “Dry” in 2018 except for February and May.	B-13
SW8	Station reported as “Dry” in 2018 except for February.	B-14
SW10	Flows are within previously recorded seasonal variations.	B-16
SW11E	Flows are within previously recorded seasonal variations.	B-22

Monitoring Station	Observations in 2018	Figure
SW13	Flows are within previously recorded seasonal variations.	B-25
SW19	Flows are within previously recorded seasonal variations.	B-33
SW20	Flows are within previously recorded seasonal variations.	B-34
SW21	Flows are within previously recorded seasonal variations.	B-35
SW21A	Flows are within previously recorded seasonal variations.	B-36
SW21B	Flows are within previously recorded seasonal variations.	B-37
SW21C	Flows are within previously recorded seasonal variations.	B-38
SW22	Flows are within previously recorded seasonal variations.	B-40
SW22A	Flows are within previously recorded seasonal variations.	B-41
SW22C	Flows are within previously recorded seasonal variations.	B-43
SW3C ('RR3 OUT')	Flows are within previously recorded seasonal variations.	B-54

Table B-4 in ***Appendix B*** summarizes the high, low and seasonal flows for all of the surface water stations (PITM and LTT), for 2018 and, where available, includes historical data.

Table B-5, ***Appendix B***, tabulates the field chemistry parameters that were collected during each stream flow monitoring event in 2018 as well as the historical data at each monitoring location.

Overall, the results of the Long Term Trend monitoring program in 2018 fit within previously measured results for both surface water flow and water temperature.

5.3.2.1.2 BEAVER RIVER SUBCATCHMENT

The Beaver River Tributary North is an intermittent watercourse in the vicinity of the expansion quarry property. The Beaver River Tributary South is a perennial watercourse downstream (west) of Grey County Road 31. Flows to the Beaver River north and south tributary systems are continued through maintenance of wetland hydrology and associated discharge flow from Rob Roy Swamp PSW Complex units RR2 and RR6, respectively, including the pumping of excess quarry water during quarry operation and in the future by rehabilitation lake overflow (expansion quarry and existing quarry, respectively) after quarry closure. The Beaver River sub-catchment is identified on ***Figure 3.***

5.3.2.1.3 BATTEAUX CREEK SUBCATCHMENT

Tributaries of the Batteaux Creek that arise from springs below the Escarpment brow also support fisheries within approximately 1 km of their emergence (i.e. 1800 m to 2000 m southeast of the approved expansion quarry extraction area). Constructed online ponds and a golf course occur between the springs and the main areas of known fish habitat. Spatial separation and the presence of online ponds, including water withdrawal for irrigation occurring from the Batteaux Creek on-line ponds at the golf course, limit any potential impact of minor changes to flows from these springs on downstream fish habitat arising from quarry operations. The Batteaux Creek sub-catchment is identified on ***Figure 3.***

5.3.2.1.4 PRETTY RIVER SUBCATCHMENT

The lands between the quarry extraction area and the brow of the Escarpment continue to receive direct precipitation that contributes a substantial part of the recharge to the groundwater system in the dolostone aquifer that sustains local water supplies at residential wells and the seasonal flows at the Escarpment springs. This will continue throughout the extraction period and through to final rehabilitation.

Tributaries of the Pretty River that arise from springs below the Escarpment brow support fisheries within 300 m to 500 m of their emergence (approximately 1300 m to 1500 m northeast of the approved expansion quarry extraction area). A constructed pond occurs between some of the springs and the fish habitat in the Pretty River system.

The Pretty River sub-catchment is identified on **Figure 3**.

5.3.2.1.5 MAD RIVER SUBCATCHMENT

The Mad River sub-catchment is located south of the existing quarry and is identified, along with all previously mentioned sub-catchments, on ***Figure 3***. The Mad River sub-catchment does not overlap the expansion quarry property.

5.3.2.2 SURFACE WATER QUALITY

5.3.2.2.1 DEWATERING SUMPS

Surface water stations QFSW2 and the Dewatering Sump (Sump 1 and Sump 2, proposed Sump 3) are sampled quarterly for water quality. In 2018, the sampling for QFSW2 was included as the results for Sump 1 (QFSW2 flows into Sump 1). Sump 3 is planned for the quarry floor in the expansion quarry and will be included in the water quality sampling program when it is completed.

Field parameters are collected during the sampling event and are recorded in the dedicated project field book. Surface water quality samples are collected in dedicated, pre-labelled containers, placed in coolers filled with loose ice and then shipped to an accredited laboratory for the following analysis:

- General chemistry,
- Major and minor ion constituents and nutrients,
- Total petroleum hydrocarbons and BTEX,
- Total suspended solids, and
- Bacteriological (E.coli, total coliform, heterotrophic plate count).

Water quality samples were obtained from Sump 1 and Sump 2, in the Existing Quarry, on March 6th, May 9th, September 5th and December 6th, 2018. The results of the quarterly water quality sampling at the dewatering sumps are included in Table B-6, ***Appendix B***.

The water quality samples obtained in the first, second, third and fourth quarter at Sump 1 and Sump 2 met the Provincial Water Quality Objectives.

The relative percent difference (RPD) was calculated for the duplicate results taken during each monitoring event. The RPD was within 20% for a majority of the parameters, with the exception of the following parameters in one or more of the sampling events: heterotrophic plate count, total coliform, E. Coli, Colour, ammonia, total kjeldahl nitrogen, chromium and silver. Surface water sampling does not include filtering during the sampling for metals, which can influence the water chemistry results. Neither the Sump nor the DUP results exceeded the PWQO values over the course of the 2018 sampling events. Based on the RPD

values, certain parameters must be interpreted with caution, but the majority of the water quality results are considered acceptable in terms of quality assurance and controls.

Bacteriological results for the water quality analysis at Sump 1 and Sump 2 in March, May, September and December indicate that there were total coliform present in the dewatering sumps. E.coli was present in Sump 1 and Sump 2 in the March (Sump 2 only), May, September and December. The presence of bacteriological parameters in the sumps is expected, since the sumps exist as surface water ponds in the bottom of the existing quarry and as such are subject to surface water runoff from the quarry floor and are subject to use as temporary waypoints for waterfowl. There is no specific objective for bacteriological parameters under the PWQO.

The water sampled from the dewatering sumps on the Existing Quarry floor has hardness concentrations ranging from 214 - 330 mg/L, which is expected since a portion of the water collected in the sumps is from groundwater inflow to the quarry floor. The quarry floor in the Existing Quarry is excavated to a level that is below the local groundwater table.

5.3.2.2.2 SURFACE WATER STATIONS

The AMP monitoring program stipulates that annual sampling be completed at the Escarpment springs and the surface water monitoring stations as listed in Tables 3.3 and 4.2 of the AMP document. The samples are to be analyzed for the following list of parameters:

- General chemistry,
- Major and minor ion constituents and nutrients,
- Total petroleum hydrocarbons and BTEX and
- Total suspended solids.

The following Escarpment spring monitoring stations SW10, SW11A, SW11B, SW11C, SW11D, SW11E and SW21C also require laboratory analysis for bacteriological parameters (E.coli, total coliform, heterotrophic plate count).

Samples are to be obtained using standard surface water sampling procedures and then sent to an accredited laboratory for analysis.

The annual water quality sampling event was completed for the surface water monitoring stations on May 8-9th, 2018.

The surface water samples were obtained using standard surface water sampling procedures. Duplicate samples were obtained at SW1, SW 17 and SW21C. Field chemistry parameters (temperature, pH, conductivity and dissolved oxygen) were recorded at the time of sampling and observations on the flow volume and appearance of the surface water station were noted. Water quality samples were placed in a cooler with loose ice and shipped to an accredited laboratory for analysis (Caduceon Laboratories).

The relative percent difference (RPD) was calculated for the duplicate results obtained at SW1, SW 17 and SW 21C. The RPD was within 20% for a majority of the parameters with the exception of E. Coli, Total Coliform, ammonia, phosphorus, turbidity, aluminum, iron, manganese and titanium. Surface water sampling does not include field filtering of the sampled water, which can influence the water chemistry results. Neither the original nor the duplicate results exceeded the PWQO values. Based on the RPD values, certain parameters are interpreted with caution; however, the majority of the water quality results are considered acceptable in terms of quality assurance and controls.

Surface water quality analytical results are compared to the Provincial Water Quality Objectives (PWQO, July 1994). The water quality samples obtained in the fourth quarter at the designated surface water stations met the PWQO with the exception of the following:

- The concentration of total phosphorus in the sample obtained at SW2, and SW0-2.

Phosphorus occurs naturally in rocks and other mineral deposits and is an essential nutrient for all plant and animal life. Phosphates are not toxic to people or animals unless they are present in very high levels. The reason for the PWQO limit of 0.03 mg/L is to prevent excessive plant growth in rivers and streams.

5.4 CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the 2018 long term trend monitoring program the following conclusions and recommendations are made:

- Climate conditions were similar to 2016 resulting in multiple wells setting new water level minimums.
- Localized drawdown effects are occurring at groundwater monitors BH02-6, BH02-4 and BH02-1 as well as NW1 and NW4. Localized drawdown within the expansion quarry property was anticipated.
- Remove wells BH02-3 CLF1, OW1-6, OW3-1 and NW2 in Long Term Trend Monitoring from monitoring program since we no longer have access to them.
- Long Term Trend monitoring will continue in 2019 with no adjustments other than no longer monitoring wells previously mentioned.

6 LONG TERM TREND ECOLOGICAL MONITORING PROGRAM

6.1 METHODS

The long term trend ecological monitoring program is used to supplement the information from the long term trend groundwater and surface water monitoring program with information about the health and functioning of the natural heritage features in the vicinity of the expansion quarry.

The long term trend ecological monitoring program has established Phase 1 baseline monitoring as part of the quarry start-up, which includes the time period from start-up to three years (June 2016 through to June 2019).

6.1.1 AMPHIBIAN MONITORING PROGRAM

6.1.1.1 INTRODUCTION

The focus of the wetland component of the Long Term Trend Ecological Monitoring (LTTEM) program in the Walker Aggregates Inc. Duntroon Expansion Quarry Adaptive Management Plan (Stantec 2013) is on amphibian vernal breeding pools and ensuring hydroperiods are suitable for continued hydrophytic plant growth in the surrounding wetland zones. Wetland water level monitoring is conducted as part of the PITM and the LTTWM programs and will be interpreted from a natural heritage perspective.

Ecological monitoring to complement the water level monitoring will include two components: vegetation monitoring and wildlife monitoring. Wildlife monitoring in wetlands is focused on amphibians (Anura: frogs and toads and Urodela: salamanders). Amphibians are excellent indicators of the health of the wetland area and water regime trends that could be affecting wetland function. Wildlife monitoring was initiated in 2018 and is described below.

6.1.1.2 METHODS

Site visits occurred on Walker Aggregates Inc. Duntroon Expansion Quarry property on three occasions in 2018 (April 26, May 23, June 15). During the visits six predetermined Stations were surveyed (Stations 1 - 6) for amphibian habitat, and amphibian community through incidental observation and breeding evidence with egg mass surveys and breeding call surveys. These Stations were selected based on previous amphibian monitoring at the Subject Property and the proximity of the Stations to the Duntroon Quarry.

6.1.1.2.1 HABITAT ASSESSMENT

Habitat conditions were recorded at each Station. The habitat assessment included a variety of parameters which can affect the presence, abundance, reproduction, survival and diversity of amphibian communities; these were: average depth, maximum depth, average length and width, substrate type, amount of litter/debris, number of egg attachment sites, likelihood of fish, emergent/wetland vegetation, edge

vegetation, dominant surrounding vegetation/community, percent canopy closure and percent in-pond shrub cover and species.

A photographic record was completed at all Stations during each Site visit.

6.1.1.2.2 AMPHIBIAN EGG MASS SURVEY

During each Site visit two Stantec biologists surveyed for amphibian egg masses at Stations 2 and 4. Stations were surveyed by wading through the habitat for 30 minutes and visually looking for egg masses. Each egg mass encountered was recorded and identified to species, and mass condition was described (dead/alive/hatched). Polarized sunglasses were worn which decreased glare on the water, improving egg mass detection.

Incidental amphibian observations were recorded during the egg mass surveys.

6.1.1.2.3 AMPHIBIAN BREEDING CALL SURVEY

During the first Site visit, Automated Recording Units (ARU's) were fastened to a tree or pole at each station in proximity to wetland features, in areas with little ground vegetation to minimize background noise. The ARU was programmed to record daily between April 26 – June 25, 2018. For each day within the schedule period, four (4) 5-minute recording windows were programmed, starting:

1. 25 minutes before sunrise (pre-dawn)
2. 120 minutes after sunrise (dawn)
3. 10 minutes after sunset (evening)
4. 11:00pm (night)

Incidental records of amphibians observed were recorded during the deployment of ARU's and in subsequent Site visits. ARU's were visited during all Site visits to check on battery levels. ARU units were collected during the last Site visit (June 15, 2018) and brought back to the Stantec office for data downloading and analysis.

6.1.1.2.4 DATA ANALYSIS

The Bird Studies Canada (BSC) Marsh Monitoring Program (MMP) for Surveying Amphibians (BSC 2009) was utilized for analyzing the ARU data. Standardized methodology in the MMP provides repeatable data analysis for future years of monitoring. Following the MMP methodology, dates selected for amphibian call analysis at the Walker Aggregates Duntroon Quarry met the following conditions:

1. Each station was surveyed three times during spring and early summer, a minimum of 15 days apart, Per the MMP, if possible, survey dates should fall within these windows: Survey 1 – April 15 – 30, Survey 2 – May 15 – 30, Survey 3 June 15 – 30.
2. Air temperatures were: greater than 5°C for first survey, 10°C for second survey, and 17°C for third survey.
3. Each station was surveyed for 3 minutes, beginning at least one-half hour after sunset
4. Wind strength was Code 0, 1, 2 or 3

The ARU recording periods were analyzed on dates April 30, May 25 and June 14, 2018. Dates were selected through an analysis of weather conditions archived from the Environment Canada Collingwood weather station. Considerations were made for an appropriate spread between analysis dates, ideal weather conditions (light winds, no precipitation, seasonal temperatures) and background noise.

Each survey station included listening for three minutes for all calling toads and frogs. Call levels were described using values of 1, 2, or 3. Level 1 indicates that individuals could be counted, and calls were not simultaneous. Level 2 denotes that calls are distinguishable but with some simultaneous calling. Level 3 indicates a full chorus where calls are continuous and overlapping.

Data collected in 2018 was compared to previous years egg mass survey and breeding call survey data to observe trends in abundance and diversity. Previous studies include the following:

Egg Mass Surveys

- Investigation of Salamander Community, Wildlife Scientific Collector's Permit No. 1031106 (Stantec 2010)
- Investigation of Salamander Community, Wildlife Scientific Collector's Permit No. 10452052 (Stantec - April 2008)
- Investigation of Salamander Community (Stantec - April 2009)

Breeding Call Surveys

- Amphibian Breeding Call Survey (Stantec 2010)

6.1.1.3 RESULTS

6.1.1.3.1 HABITAT ASSESSMENT

An amphibian habitat assessment was completed at each of the six Stations. A photographic record showing habitat at each Station is provided in Appendix D. Station UTM coordinates are provided in Table B.1, Appendix D, and incidental amphibian observations in Table B.2, Appendix D. Station habitat descriptions are as follows:

Station 1

A small pond, approximately 10 m x 10 m, at the edge of a young mixed forest community bordered by a hay field/pasture. A creek approximately 15 m to the north flowed east past the feature, providing source water for the pond and surrounding area. Water was present in the pond on June 15th indicating the habitat likely supports the larval development period for most amphibians. Water depth was measured to be an average of 0.30 m and maximum depth of 0.70 m. Substrate was organic with litter/debris with a depth of 0.15 m. The pond was surrounded by willow and dogwood shrubs with a 10 % canopy closure. An abundance of grasses and vegetation provided 20 % in-pond cover. Fish were not observed and are likely not present in the feature. Depending on water depth at freeze up, this feature may provide aquatic overwintering amphibian habitat. Surrounding upland area would provide terrestrial overwintering amphibian habitat.

Station 2

This feature is a large flooded area in a mature deciduous swamp forest community which receives surface water runoff from surrounding lands. Average water depth was 0.30 m and maximum depth was 0.56 m. Water was present in the feature on June 15th indicating the habitat likely supports the larval development period for most amphibians (Harding 1997). Substrate was organic with an abundance of leaf litter and tree branch litter. Litter depth was approximately 0.10 m. Egg attachment sites were abundant, provided by organic debris and in-water shrubs. Percent canopy closure over feature was approximately 80 % by mature maple sp. Fish were not observed and likely not present in the feature. Depending on water depth at freeze

up, this feature may provide aquatic overwintering amphibian habitat. Nearby permanent ponds and surrounding upland area would provide aquatic and terrestrial overwintering amphibian habitat.

Station 3

Station 3 is within the mature deciduous swamp forest described for Station 2 but is located further east. Seemingly higher in elevation, Station 3 held less water than that observed at Station 2 with average depths of 0.15 m, maximum depth of 0.30 m and less flooded area. Substrate was organic with leaf litter and tree branch litter providing an abundance of egg attachment sites and in-water cover for stages of amphibian development. This feature was likely amphibian breeding and larval development habitat and not likely aquatic overwintering habitat; however, upland habitat would be available for those species that can overwinter in terrestrial habitat such as the American Toad, Western Chorus Frog, Wood Frog, Gray Treefrog, and Spring Peeper (Harding 1997).

Station 4

A low-lying area with dense dogwood and willow shrubs. This feature received drainage from a mature deciduous forest to the south and mixed forest to the north. Average water depth was 0.20 m and maximum depth of 0.45 m. Substrate was organic with leaf litter and shrub branch litter providing an abundance of egg attachment sites and approximately 70 % in-water cover for developing amphibians. Canopy closure was 50 %, mainly provided by shrubs. Fish were not observed and likely not present in the feature. This feature was likely amphibian breeding and larval development habitat and not likely aquatic overwintering habitat, however, upland habitat would be available for those species that can overwinter in terrestrial habitat.

Station 5

A dug pond that permanently holds water throughout the year. Approximately 21 m x 15 m, this pond had an average depth 1.0 m. Surrounding vegetation community was deciduous forest and meadow. The pond had dense emergent aquatic vegetation (cattail) along the edge and submergent vegetation (chara spp.) throughout. Substrate was a silty clay with detritus including leaf litter. Egg attachment sites were abundant from shrub debris and aquatic vegetation debris. Canopy closure was 5 % and in-water cover was 10 %, however water depth provides refuge for developing amphibians from predators. This feature would provide aquatic overwintering habitat for those species that hibernate in pond substrates such as Green Frog and Northern Leopard Frog (Harding 1997). Fish were observed which were likely Brook Stickleback (non-predatory to amphibians).

Station 6

This Station is a meadow marsh floodplain habitat with a creek that flows west. Grasses were dominant with wetland vegetation including marsh marigold and cattail. Trees and shrubs were sparse with mixed composition of deciduous and coniferous species. The floodplain held water during freshet events however there was minimal water or pooling in the floodplain during the May and June Site visits. Floodplain substrate was organic with detritus and cover was approximately 90 % from tall grasses and emergent vegetation. The amphibian community supported by this habitat would include those species and amphibian life stages adapted to drier conditions, such as the adult Northern Leopard Frog. Aquatic overwintering habitat in the floodplain would be provided in sections of the creek and surrounding uplands would provide terrestrial overwintering habitat.

6.1.1.3.2 AMPHIBIAN EGG MASS SURVEY

The amphibian egg mass survey was completed at Station 2 and Station 4 during each Site visit (April 26, May 23, and June 15). Suitable habitat was present during each survey, providing conditions for amphibian breeding and larval development. No egg masses were detected at either Station during the April survey. In the May survey, twenty (20) viable Spotted Salamander egg masses were observed at Station 2 and four (4) viable Spotted Salamander egg masses and one dead egg mass were observed at Station 4. The dead

egg mass appeared to be caused by low water levels and subsequent desiccation. During the June survey no egg masses were observed at either Station, however five (5) hatched Spotted Salamander egg masses were observed at Station 2 and one (1) hatched Spotted Salamander egg mass was observed at Station 4. Incidental amphibian observations were recorded during the egg mass surveys which included an abundance of tadpoles: adult Chorus Frog and Gray Treefrog at Station 2, and adult Chorus Frog, Spring Peeper, Green Frogs and unidentified tadpoles observed at Station 4.

In comparison to previous (Stantec 2010) egg mass surveys at Stations 2 and 4, Spotted Salamander egg mass records were similar (Table 1). However, Anura egg masses were not observed in 2018, whereas egg masses of multiple Anura species were observed in previous years surveys. Survey timing and weather leading up to the survey are the most likely explanations for the lack of detection of certain species. April is typically the month when “early breeders” including Spring Peeper, Wood Frog, Chorus Frog and Spotted Salamander will begin breeding activity (moving to breeding habitat, vocalization, mating, egg laying). However, in 2018 the arrival of spring weather was late, with average daily temperatures in April only 2.3°C. During the April survey in 2018, snow and ice was still on the forest floor and there was minimal open water. Air temperatures rose in May, with average daily temperatures of 14.4 8 C, signaling amphibians to head to breeding habitat. Many Anuran species have short egg incubation times, depending on water temperatures. The Spring Peeper develops from egg to larvae in 4 – 15 days, the Chorus Frog in 3 - 14 days and Wood Frog 4 days to 4 weeks (Harding 1997). In contrast, Spotted Salamander incubation period is 20 – 60 days (Harding 1997), which provides a longer window of survey detection. In the twenty-seven-day period between the April and May egg mass surveys, Anurans could have spawned, and larvae hatched out before Stantec was able to detect egg masses from those species. An abundance of tadpoles observed at both Station 2 and Station 4 during the May egg mass survey would indicate amphibian breeding occurred in early May and that egg masses had already hatched. Egg mass survey results from 2018, 2009, 2008 and 2006 is provided in Table 1.

Table 6-1 Amphibian Egg Mass Survey Results from 2018 and Previous Survey Years

Station	Survey Date	Species	Number of Egg Masses
Station 2	4/26/2018	-	-
	5/23/2018	Spotted Salamander	20
	6/15/2018	Spotted Salamander	5 (hatched)
	4/27/2009	Spotted Salamander	3
		Wood Frog	"Five large carpets"
	4/30/2008	Spotted Salamander	30
		Pseudacris sp.	1
		Wood Frog	"numerous carpets - mostly hatched"
	4/27/2006	Spotted Salamander	16
		Wood Frog	200
		Northern Leopard Frog	1
Station 4	4/26/2018	-	-
	5/23/2018	Spotted Salamander	4, 1 (dead)
	6/15/2018	Spotted Salamander	1 (hatched)
	4/27/2009	Spotted Salamander	14
	4/30/2008	Spotted Salamander	Number of egg masses not reported

6.1.1.3.3 AMPHIBIAN BREEDING CALL SURVEY

The amphibian breeding call survey was completed within the MMP guidelines except for the date selected for the June survey. The June 15 – 30 survey period is a guideline for the dates to complete the early summer survey, however the ARU data at all Stations past June 14 was poor quality and could not be used for analysis. The MMP states that air temperature and lack of wind are the most important factors to pay attention to when deciding to conduct surveys (BSC 2009). Variables including air temperature and weather were appropriate for the species associated with later breeding periods. Survey date, time and weather is provided in Table B.3, Appendix D.

Three surveys were completed at each of the six Stations for a total of eighteen surveys. The breeding call survey documented six (6) species utilizing habitat at the survey Stations: Wood Frog, Spring Peeper, Western Chorus Frog, American Toad, Green Frog and Gray Treefrog. Spring Peeper was the most commonly detected species with records from eight of eighteen surveys, followed by Western Chorus Frog (four of eighteen) and Gray Treefrog (three of eighteen). Spring Peeper was also the most abundant species with a full chorus at Station 3 and high individual counts (10 - 20) at multiple Stations. Station 5 had the greatest diversity of species (5 species) and Station 6 the least diversity (1 species). Background noise codes during the surveys ranged from 0 (no appreciable effect) to 2 (moderately affecting sampling) at the Stations. Incidental amphibian observations encountered during Site visits also provide insight into amphibian community at the surveyed Stations. For example, Northern Leopard Frog was not recorded on the breeding call survey however it was observed visually at Stations 1, 5 and 6. Breeding call survey data are provided in Table B.4, Appendix D, and incidental amphibian observations in Table B.2, Appendix D.

In comparison to breeding call surveys from 2007, the 2018 data are similar. Slight differences at some Stations were observed in amphibian community and abundance. As in 2018, the most common species in 2007 were the Spring Peeper and Western Chorus Frog. Amphibian activity, including breeding calls, can be hard to detect due to “explosive breeding” events. Some species, such as the Wood Frog, may only call for a few evenings and with most breeding completed in one evening (BSC 2009). When this is the case, entire species can be missed. Habitat at each Station has not changed since 2007 and therefore amphibian populations are expected to have remained similar. Station 3 and Station 6 did not have previous years data for comparison. Amphibian community documented at surveyed Stations in 2007 and 2018 is provided in Table 2. Individual counts and MMP call codes for each station, survey date and year are provided in Table B.4, Appendix D. Survey date, time and weather for 2007 surveys is provided in Table B.5, Appendix D.

Table 6-2 Amphibian Community Documented in Breeding Call Survey and Incidentally in 2018 and 2007

Station	Survey Year	Wood Frog	Spring Peeper	Western Chorus Frog	American Toad	Green Frog	Gray Treefrog	Leopard Frog
1	2018	✓	✓			✓[1]	✓	✓[1]
	2007		✓	✓	✓	✓	✓	
2	2018		✓	✓			✓[1]	
	2007	✓	✓	✓	✓		✓	✓[1]
3	2018	✓[1]	✓	✓				
4	2018		✓	✓		✓[1]		
	2007	✓	✓	✓				
5	2018		✓	✓	✓	✓	✓	✓[1]
	2007		✓	✓		✓	✓	
6	2018		✓			✓[1]		✓[1]

Note: ✓[1] denotes incidental species observation not recorded in breeding call survey.

6.2 CONCLUSIONS AND RECOMMENDATIONS

The 2018 Amphibian Monitoring Program at the Walker Aggregates Inc. Duntroon Expansion Quarry was completed successfully, fulfilling the requirement of the Adaptive Management Plan which forms part of the Aggregate Resources Act licence. Data of amphibian habitat, egg mass occurrence, incidental observation and breeding calls at each survey Station were collected, providing baseline conditions to compare with for future monitoring years. Habitat at each survey Station was suitable for amphibians and, when comparing 2018 data to previous years' surveys, amphibian communities were similar in diversity and abundance at each Station. Proper timing of egg mass surveys is critical when attempting to detect Anura species.

The following activities are planned for 2019 and 2020.

1. Establish one or more reference wetlands to support the PITM program (page 32 of the AMP)
2. Set up and monitor the first year for the Long Term Trend Ecological Monitoring Program (section 5.0 of the AMP)
3. Assess the Hart's Tongue Fern Population

7 ECOLOGICAL ENHANCEMENT AND MITIGATION MONITORING PROGRAM

7.1 METHODS

The ecological enhancement and mitigation measures monitoring (EEMM) program includes mitigation and enhancement measures not directly related to day to day operation of the quarry. The EEMM program is designed to make sure the ecological mitigation measures are properly implemented (e.g. appropriate number and species of trees are planted, amphibian habitat is self-sustaining) and that the resulting features are managed and adapted with changing conditions and trends (e.g. replanting for dead trees, controlling pest damage, control / allowing public access, etc.)

The EEMM program includes the Woodland Program, the Millar Pond relocation, the Bridson Pond enhancement and Butternut tree plantings incorporated into the Woodland Program.

The Woodland Program has been initiated. The remaining EEMM tasks required no action in 2018.

7.1.1 WOODLAND PROGRAM

The Woodland Program was initiated in 2015 in order to mitigate the impacts of woodland removal associated with later phases.

The Duntroon Quarry Reforestation Plan and planting quantities table are included in ***Appendix E***. These documents track what species of tree have been planted and identifies which areas have been planted in what year.

The proposed planting was completed in 2018 and ongoing monitoring indicates that the materials planted in 2015 and 2016 have acceptable survival rates. The monitoring and maintenance of materials planted in 2016 will wrap up in 2018 and material planted in 2018 will be monitored until 2019.

7.1.1.1 METHODS

7.1.1.1.1 OVERVIEW

The Woodland Program was initiated in 2015, with tree planting and other enhancement measures undertaken over three years from 2015 to 2017. Reforestation efforts were divided between areas of active reforestation and areas of natural regeneration, which were delineated in the field based on site conditions. Active reforestation lands included sodded fields, fallow fields, and worked fields which were treated with techniques including the planting and maintenance of varying sizes and species of trees. Natural regeneration lands consisted of areas of shallow soils, primary succession woodlots and naturalizing, disturbed areas. Grading to create variable microtopography was utilized in both natural regeneration areas and at the margins of active regeneration sites where the physical dimensions or site conditions were not feasible for active regeneration planting techniques.

Table 7-1 Woodland Dimensions

	Active Reforestation	Natural Regeneration	Microtopography[1]
2015	8.68 ha	17.52 ha	8.59 ha
2016	10.18 ha	11.12 ha	2.48 ha
2017	3.97 ha	0.00 ha	0.00 ha
Total	22.83 ha	28.64 ha	11.07 ha

1- As noted above, the creation of microtopography occurred where feasible both on active reforestation and natural regeneration lands.

7.1.1.1.2 ACTIVE REFORESTATION

Active reforestation areas were predominantly planted using a three-point-hitch shoe plow pulled by a tractor. The tractor pulled in parallel lines offset by 2.5 m on centre with a planting crew placing plant material behind the shoe plow. Two rear plow blades rolled the soil displaced by the shoe plow back over the planting row. Nursery workers followed the plow, straightening the material and lightly compacting the rooting zone to prevent blow-down. Plant material of varying sizes (from seedling to 25 mm branch class) were used and were sequenced to evenly distribute materials of different size classes throughout the site. A diverse pallet of species was specified for use in the project due to the varied topography and soils present on the site. Species were sequenced by the planting crew to accommodate species preferences throughout the site.

All 2015 and 2016 active reforestation areas were planted in the above-described manner, as well as some of the 2017 active regeneration area. The remainder of the 2017 active reforestation area was planted with seedling plugs installed by hand using either spades or hand drills.

7.1.1.1.3 NATURAL REGENERATION

Natural regeneration techniques included seeding of herbaceous species, tree seeding, and microtopography earthwork. Herbaceous seeding was conducted only on areas of exposed soil, whereas tree seed was applied to all natural regeneration areas. All seeding was completed by hand broadcasting. Microtopographic grading was completed using discs pulled behind a tractor to cut sodded areas prior to using a combination of bulldozer and excavator to redistribute the soil.

7.1.1.1.4 MANAGEMENT

The active reforestation areas were managed fashion similar to the management of native plant nursery, including the use of irrigation and fertilization. A cover crop was applied to the areas between planting rows to reduce erosion, reduce the soil temperature, and conserve soil moisture. Irrigation was applied through various means based on the availability of water and the topography of the site. The areas with the largest gradient were irrigated using an irrigation reel supplied by aluminum irrigation piping that was pressurized by a tractor driving a power-take-off (PTO) pump. Areas with less topographical variation were drip irrigated using drip tape pressurized by a small utility pump. Some spot irrigation was also preformed using spray guns powered by utility pumps or hard-lined into the aluminum irrigation piping. Not all active regeneration areas were irrigated due to logistical reasons, or due to adequate existing moisture levels.

Table 7-2 Irrigation Methods

	Drip Irrigation	Reel Irrigation	Spray Gun Irrigation
2015	1.26 ha	6.05 ha	0.00 ha
2016	7.43 ha	2.75 ha	0.00 ha
2017	0.00 ha	0.00 ha	1.50 ha

Natural regeneration areas were not actively managed.

7.1.1.2 RESULTS

The Woodland Program incorporated a total of 51.5 hectares through either active reforestation (22.8 ha) and natural regeneration (28.6 ha). Twenty species of trees from 16 genera and 10 families were planted in a diverse mix of sizes from seedlings to 25 mm branch whips. While the design intent was met with the final planted percentages of species, observed success rates, environmental conditions and available supply of material caused some deviation from the designed species composition from year to year. The bare root planting methods and environmental conditions on site were conducive to the survival of fibrous root stock such as *Acer* species while being detrimental to the coarsely rooted *Quercus* and *Juglandaceae* species. Species that leaf-out slightly later were less likely to be stressed by the planting process and limited availability of water in some instances.

Table 7-3 Design Results

Botanical Species	**Design Total**	**Design Percentage**	**Planted Total**	**Planted Percentage**
Abies balsamea	1696	4.82%	1,890	5.26%
Acer rubrum	2544	7.23%	1,925	5.36%
Acer saccharum	2544	7.23%	5,485	15.28%
Betula allegheniensis	848	2.41%	611	1.70%
Betula papyrifera	2544	7.23%	1,995	5.56%
Carya cordiformis	848	2.41%	1,180	3.29%
Fagus grandifolia	848	2.41%	121	0.34%
Juglans nigra	848	2.41%	1,040	2.90%
Larix laricina	1696	4.82%	1,750	4.87%
Picea glauca	1696	4.82%	2,925	8.15%
Pinus resinosa	2120	6.02%	1,100	3.06%
Pinus strobus	2120	6.02%	3,100	8.63%
Populus tremuloides	2544	7.23%	2,205	6.14%
Prunus serotina	2544	7.23%	1,330	3.70%
Quercus macrocarpa	848	2.41%	1,210	3.37%
Quercus rubra	2544	7.23%	2,132	5.94%
Thuja occidentalis	1696	4.82%	1,755	4.89%
Tilia americana	1696	4.82%	1,640	4.57%
Tsuga canadensis	2120	6.02%	1,500	4.18%
Ulmus americana	848	2.41%	1,010	2.81%
Total	**35,192**		**35,904**	

7.1.1.2.1 MONITORING

Mortality monitoring was conducted by the contractor each spring of the year following planting (i.e. spring 2016, 2017 and 2018), with Stantec completing a warranty inspection in early summer of the same year. Mortality replacements were planted annually, typically in the fall. Replacements were provided as species-for-species except where quality stock was not available, when the planting window was sub-optimal to transplant a certain species, or where it was believed that another species would survive better given the environmental conditions. Three new species were introduced as a part of the replacement planting process: *Fraxinus americana, Fraxinus pennsylvanica,* and *Quercus alba*.

Table 7-4 Tree Mortality Rates

Botanical Species	**Planted Total**	**2015 Mortality**	**2015 Replacement**	**2016 Mortality**	**2016 Replacement**	**2017 Mortality**	**2017 Replacement**
Abies balsamea	1,890	0	10	0	0	0	0
Acer rubrum	1,925	0	0	0	680	0	0
Acer saccharum	5,485	33	74	4	266	34	0
Betula allegheniensis	611	0	10	0	0	0	0
Betula papyrifera	1,995	56	71	32	40	14	0
Carya cordiformis	1,180	0	10	0	65	0	0
Fagus grandifolia	121	0	0	28	0	0	0
Fraxinus americana	0	0	0	0	20	0	0
Fraxinus pennsylvanica	0	0	0	0	35	0	0
Juglans nigra	1,040	84	51	206	64	22	0
Larix laricina	1,750	73	45	7	25	17	0
Picea glauca	2,925	14	54	8	50	11	0
Pinus resinosa	1,100	269	0	13	0	0	0
Pinus strobus	3,100	0	62	0	104	13	0
Populus tremuloides	2,205	146	112	42	270	51	0
Prunus serotina	1,330	40	0	55	0	14	0
Quercus alba	0	0	0	0	20	0	0
Quercus macrocarpa	1,210	0	0	0	0	0	0
Quercus rubra	2,132	188	0	12	30	43	0
Thuja occidentalis	1,755	0	10	12	190	8	0
Tilia americana	1,640	42	97	16	25	12	0
Tsuga canadensis	1,500	12	0	0	0	0	0
Ulmus americana	1,010	0	0	0	0	0	0
Total	**35,904**	**957**	**606**	**435**	**1,884**	**239**	**0**
						Total Mortality	**1,665**
						Total Replacement	**2,490**

The cumulative mortality incurred up to July 2018 has been 4.6%, which translates to a survival rate of 95.4%. Adding in the replacements, which outnumber the mortality, survivability is currently greater than 100% surpassing the project target. The final warranty inspection of the 2017 plantings will be conducted in the spring of 2019 and will conclude the warranty period for the project.

8 OPERATIONS IMPROVEMENT WORKSHOP FOR 2018

The operations improvement workshop was completed on July 13th, 2018.

As part of its commitment to working with the community, Walker Aggregates will hold an Annual Operations Improvement Workshop for neighbours and other interested stakeholders again in 2019. The 2018 AMP Summary Report will be an agenda item at the Workshop.

9 SUMMARY CONCLUSIONS AND RECOMMENDATIONS

Based on our review of the monitoring data collected to support the Adaptive Management Plan groundwater and surface water monitoring program in 2018, we offer the following conclusions:

- An early spring melt in February caused multiple trigger events in March due to the lack of snowmelt left. In addition, below average temperatures caused the spring melt to occur shortly after April's monitoring.
- A wetter than normal October resulted in most surface water flows for the month being reported in the green zone.
- Surface water stations SW21C, SW24A and SW77 show sensitivity to high air temperatures due to their low flow and shallow nature. These high surface water temperatures are interpreted to be due to climate conditions and are not related to the active extraction in the expansion quarry. The potential for off-site water-related effects to any of the provincially significant wetlands and/or Escarpment springs during Phase 1 is considered to be very low.
- No adverse impact to the surrounding off-site water resources were found in 2018.
- The habitat at each survey Station was suitable for amphibians and, when comparing 2018 data to previous years' surveys, amphibian communities were similar in diversity and abundance at each Station.
- The cumulative mortality incurred up to July 2018 has been 4.6%, which translates to a survival rate of 95.4%. Adding in the replacements, which outnumber the mortality, survivability is currently greater than 100% surpassing the project target.

Based on our review of the monitoring data collected to support the Adaptive Management Plan groundwater and surface water monitoring program in 2018, we offer the following recommendations:

- Certain deficiencies that were apparent with the implementation of the program in 2016, including the flow and temperature interim trigger level values that were adopted for the PITM Escarpment spring and surface water monitoring stations, continued to be evident in the 2018 program. The performance indicator interim triggers for surface water flow and surface water temperature should be re-evaluated to incorporate the conditions observed in 2016 through 2018. The values recorded as having exceeded a specific seasonal maximum or minimum interim "trigger" value occurred as a result of atypical climatic conditions, and not as a result of quarry operations in Phase 1.
- It is recommended that the groundwater stations BH02-3 CLF1, OW1-6, OW3-1 and NW2 should be removed as they are no longer accessible.
- During Phase 1 of quarry extraction, reference wetlands are to be established in the Nottawasaga Lookout Provincial Park or the Pretty River Provincial Park with input from the Ministry of Natural Resources and Forestry and the Nottawasaga Valley Conservation Authority. The search for the reference wetland will continue in 2019 through examining the Pretty River Provincial Park. This wetland will be designated as Reference Wetland 1.
- The new Millar Pond will be dug and planted this year. Amphibian monitoring at this location will begin in the spring of 2020.
- Transects and plots for wetland vegetation monitoring will be installed and monitored in 2019.
- The final warranty inspection of the 2017 plantings will be conducted in the spring of 2019 and will conclude the warranty period for the project.
- Certain inconsistencies between the AMP document and the Site Plan should be resolved through consultation with the MNRF. These include certain aspects of wetland monitoring, annual reporting

dates and the requirement of monthly reporting during Phase 1, when no adverse influences are expected. These should be addressed prior to the 5-year report.

We trust that the information provided is sufficient for your needs at this time. Please contact the undersigned if you have any questions or comments.

Respectfully Submitted,

Prepared By:
Walker Aggregates Inc.

James Kenny, MBA, B.APSc
Environmental Monitor

Reviewed By:
WSP Canada Inc.

Sarah Hutchesson, M.Sc. Eng.
Environmental Consultant

Reviewed By:
HIMS GEOENVIRONMENTAL LTD.

Andrew G. Hims, M.Sc., P.Eng.
Consulting Engineer

Prepared By:
Stantec

Melissa Cameron, M.Sc., M.LA, OALA
Ecologist

Reviewed By:
Stantec

David Charlton, M.Sc.
Applied Ecologist

10 LIMITATIONS

This report has been prepared for the exclusive use of Walker Aggregates Inc. WSP Canada Inc. (WSP) and Hims GeoEnvironmental Ltd. accept no responsibility for any damages incurred by any third party as a result of decisions made or actions taken based upon the information contained within this report.

All background information utilized in the preparation of this performance report has been relied upon in good faith, and WSP does not accept any responsibility for any mis-statements, inaccuracies, or deficiencies contained in those documents or records. The information contained in this report should be evaluated, interpreted and implemented only in the context of the assignment.

The findings and conclusions included in this report are valid only at the date of issuance. If additional information is provided in the future, such as the results of additional site-specific monitoring or observations, WSP will be pleased to re-evaluate our conclusions.

11 BIBLIOGRAPHY

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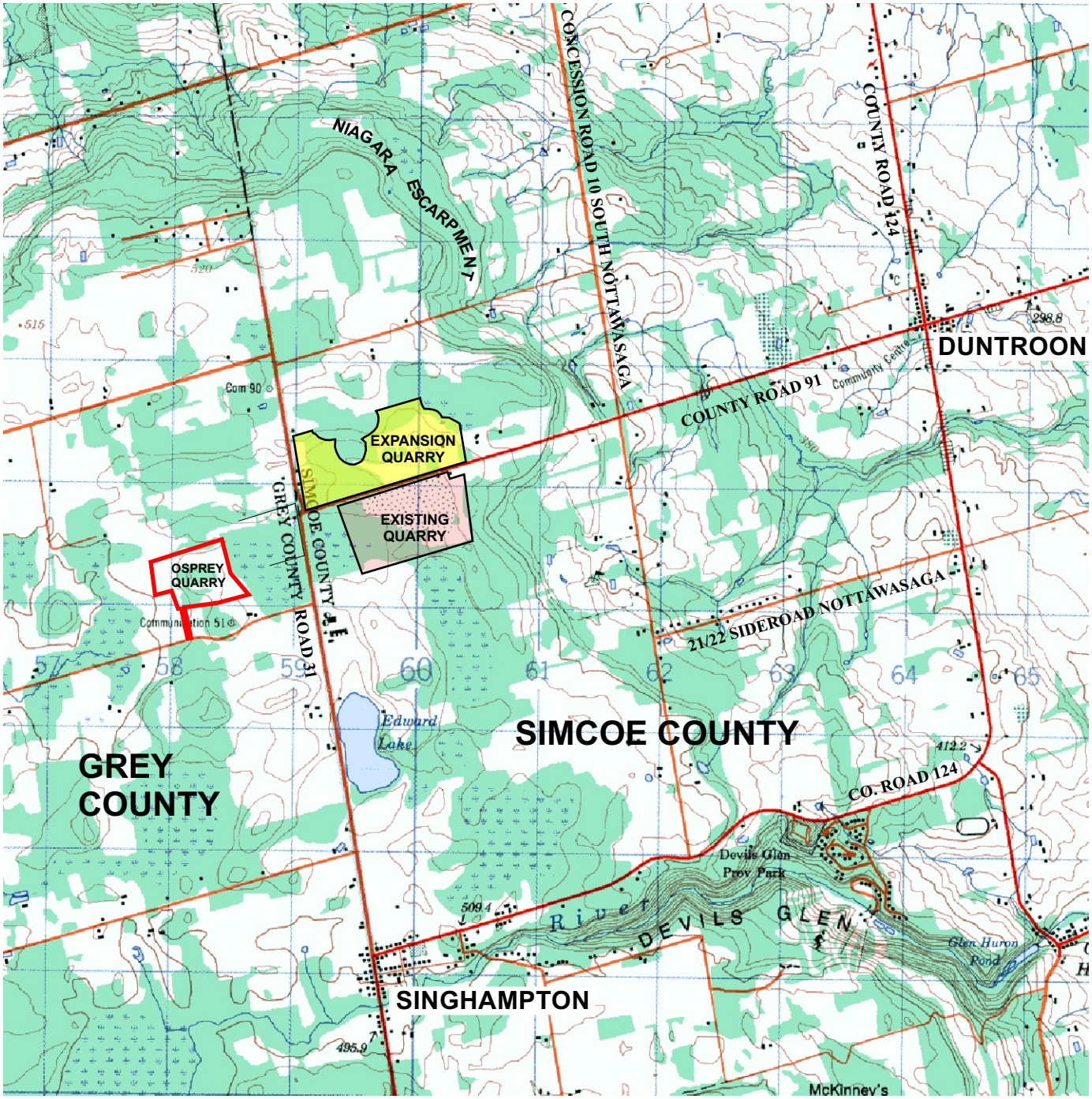
- Stantec. 2010. Duntroon Quarry Expansion Consolidated Natural Environment Report. Lot 25, Concession 12, Township of Clearview.

FIGURES



LEGEND

EXISTING QUARRY

EXPANSION QUARRY

LICENSED BUT UNDEVELOPED OSPREY QUARRY PROPERTY

0 1 km

N W E S

Map Reference:
1:50,000 NTS sheet 41A/8, Collingwood.

LOCATION MAP

DUNTROON QUARRY
2018 AMP SUMMARY REPORT

walker industries
Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:50000
PROJECT: 111-53312-00 A61	REF. NO.: 111-53312-00 A61 F1-LM

walker aggregates

FIGURE 1

DUNTROON NORTH & SOUTH QUARRY

LEGEND

- Crest - Level 1
- Crest - Level 2
- Crest of Berm
- Conveyor
- Pile Outline
- Toe of Berm
- Plant Equipment
- Settling Ponds
- HP - Hydro Poles
- Water
- 521.557 - Survey Benchmarks
- Rock Reserves
- Rehabilitation Area
- Renishaw Contours
- MHDC Contours
- Phase #1 Area - 490m
- Phase #2a Area - 500m
- Phase #1 Area - 500m
- Phase #2b Area - 500m
- BM1 - July 2018 Elevation Benchmarks
- Limit of Extraction - Phase 1
- Limit of Extraction - Phase 2a
- Proposed Limit of Extraction

2018 Driller Benchmarks

BM1	500.89
BM2	500.98
BM3	529.72
BM4	529.14
BM5	524.23

NOTES

1. All elevations are ASL.
2. Drawing grid is 50 m x 50 m.
3. Coordinates are UTM NAD83.
4. Phase lines taken from MHDC drawing 2A of 4, supplied by Walker Aggregates.
5. Depth of overburden based on very limited test hole data.
6. UTM coordinates & ASL elevations checked June 2017.
7. Rock removed between July 3/18 & October 22/18 = 183,730 m³

REV #	DESCRIPTION	DATE
R1	Inventory, North Quarry Extraction Line and BM	June 1, 2017
R2	Inventory, North Quarry Update & Aerial Image	June 29, 2017
R3A	Inventory, North Quarry Update & Aerial Image	October 16, 2017
R4A	Inventory, North Quarry Update & Aerial Image	July 3, 2018
R5A	Inventory, North Quarry Update & Aerial Image	October 22, 2018

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www.tec-survey.ca
1-613-880-6977

		DATE
DRAWN BY:	BG & AJ	Oct. 23/18
CHECKED BY:	BG	Oct. 23/18
SURVEYED BY:	AJ & WG	Oct. 22/18

DUNTROON QUARRY
2018 AMP SUMMARY REPORT

Walker Industries
Walker Aggregates Inc.

DATE: APRIL 2019 | SCALE: 1:1500
PROJECT: 111-53312-00 A61 | FILE NO.: 111-53312-00 A61 F2b

walker aggregates

FIGURE 2a

LEGEND

- EXISTING QUARRY
- DIRECTION OF WATER FLOW (EXISTING QUARRY)
- DIRECTION OF WATER FLOW (QUARRY EXPANSION)

40 20 0 40 metres

N

SITE PLAN

DUNTROON QUARRY
2018 AMP SUMMARY REPORT

walker Industries
Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:4000
PROJECT: 111-53312-00 A61	FILE NO.: 111-53312-00 A61 F2b

walker aggregates

FIGURE 2b

UPDATED AERIAL PHOTO - SUMMER 2017

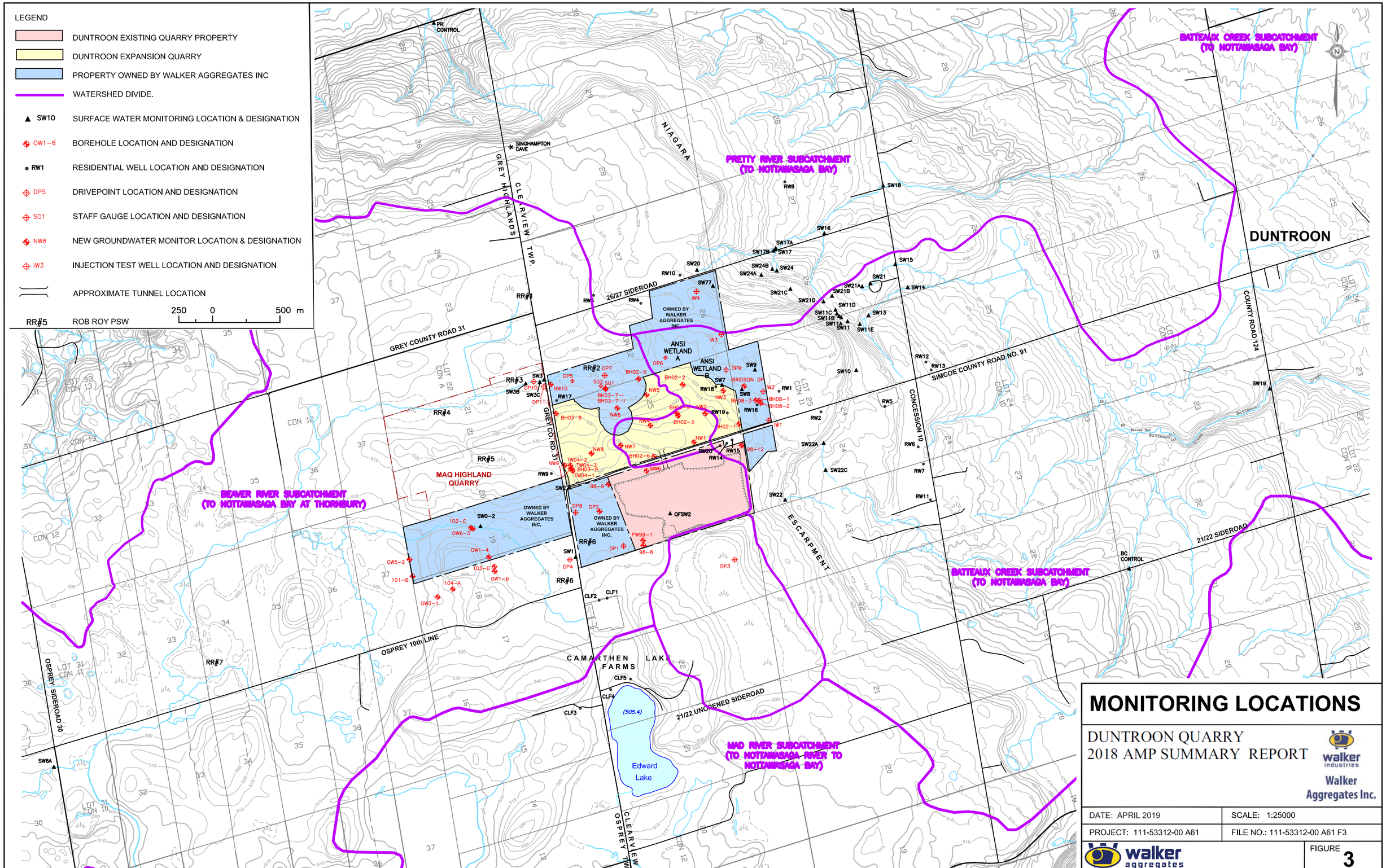
DUNTROON QUARRY
2018 AMP SUMMARY REPORT

Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: NOT SHOWN
PROJECT: 111-53312-00 A61	FILE NO.: 111-53312-00 A61 F2c

walker aggregates

FIGURE 2c



MONITORING LOCATIONS

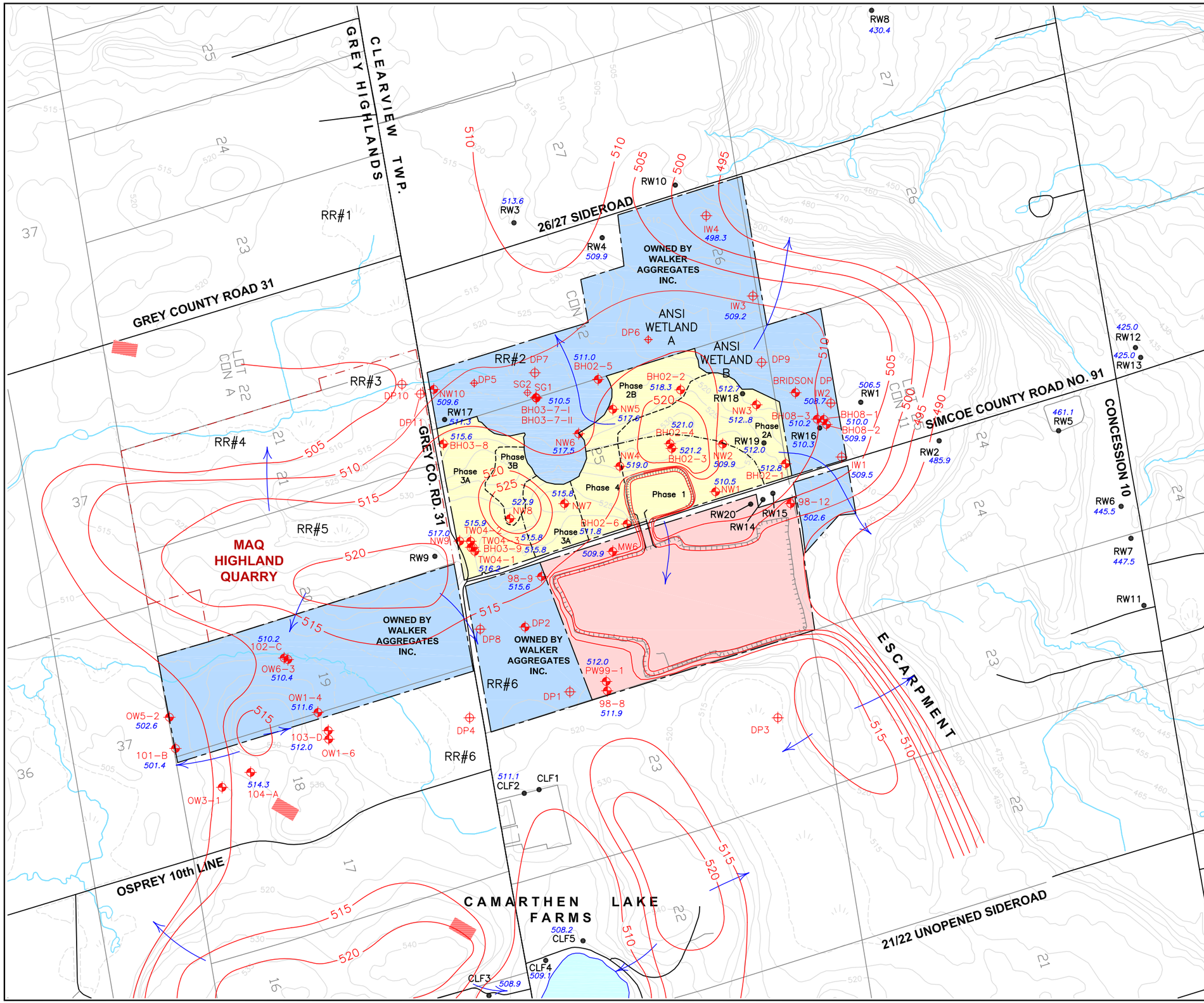
DUNTROON QUARRY
2018 AMP SUMMARY REPORT

walker industries
Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:25000
PROJECT: 111-53312-00 A61	FILE NO.: 111-53312-00 A61 F3

walker aggregates

FIGURE 3



LEGEND

- DUNTROON EXISTING QUARRY PROPERTY
- DUNTROON QUARRY EXPANSION PROPERTY
- PROPERTY OWNED BY WALKER AGGREGATES INC.
- BH02-6 511.8 — BOREHOLE/WELL LOCATION, DESIGNATION AND WATER LEVEL ELEVATION (mASL) APRIL 2017
- 515 — INTERPRETED BEDROCK GROUNDWATER CONTOUR mASL
- INFERRED GENERAL GROUNDWATER FLOW DIRECTION
- APPROXIMATE TUNNEL LOCATION

150 0 150 metres

BEDROCK GROUNDWATER LEVELS APRIL 2017

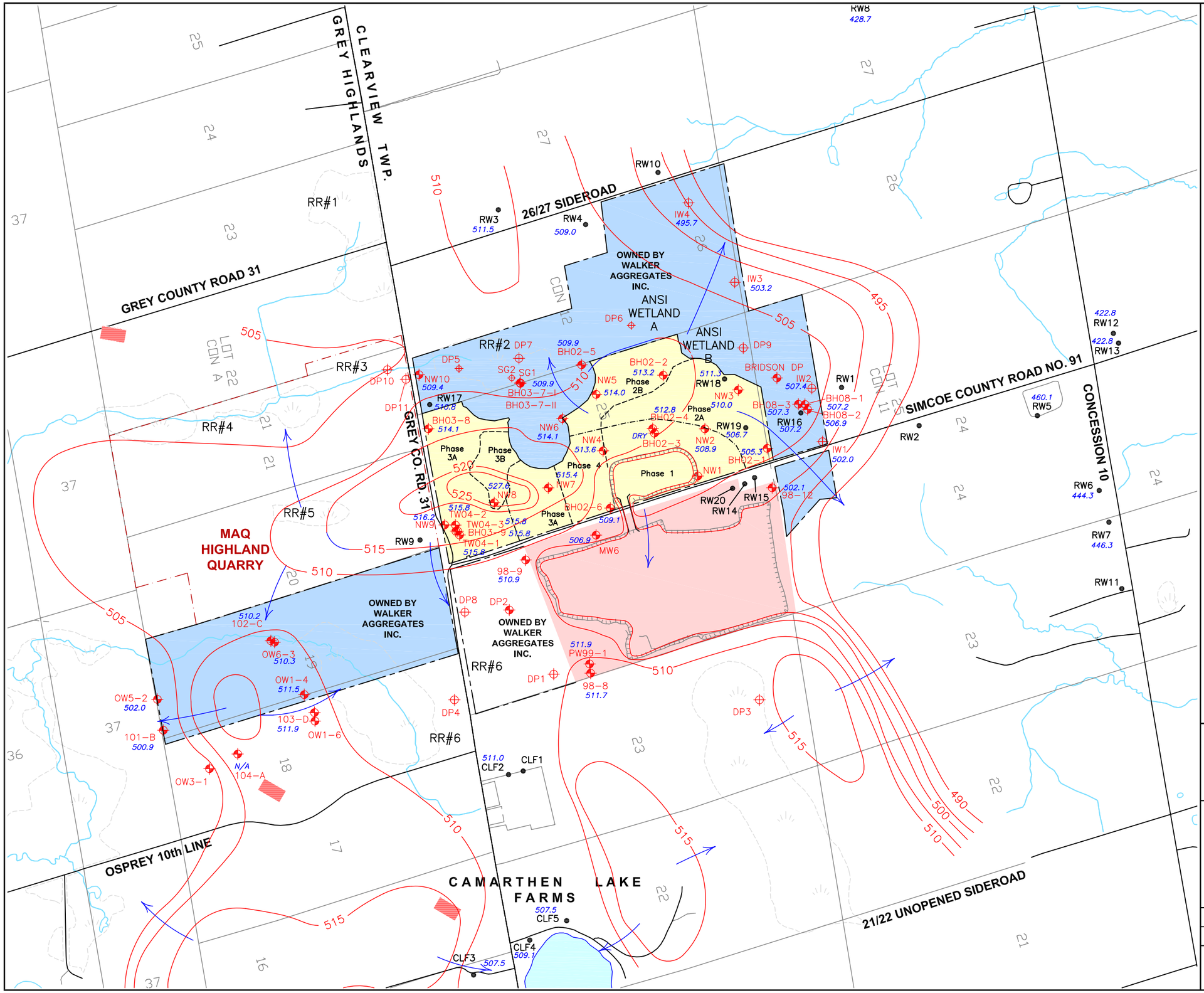
DUNTROON QUARRY
2018 AMP SUMMARY REPORT
For Walker Aggregates Inc.

walker industries
Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:15000
PROJECT: 111-53312-01 100	FILE NO.: 111-53312-01 100 F4

wsp

FIGURE 4



LEGEND

- DUNTROON EXISTING QUARRY PROPERTY
- DUNTROON QUARRY EXPANSION PROPERTY
- PROPERTY OWNED BY WALKER AGGREGATES INC.
- BH02-6 509.1 — BOREHOLE/WELL LOCATION, DESIGNATION AND WATER LEVEL ELEVATION (mASL) OCTOBER 2017
- 515 — INTERPRETED BEDROCK GROUNDWATER CONTOUR mASL
- INFERRED GENERAL GROUNDWATER FLOW DIRECTION
- APPROXIMATE TUNNEL LOCATION

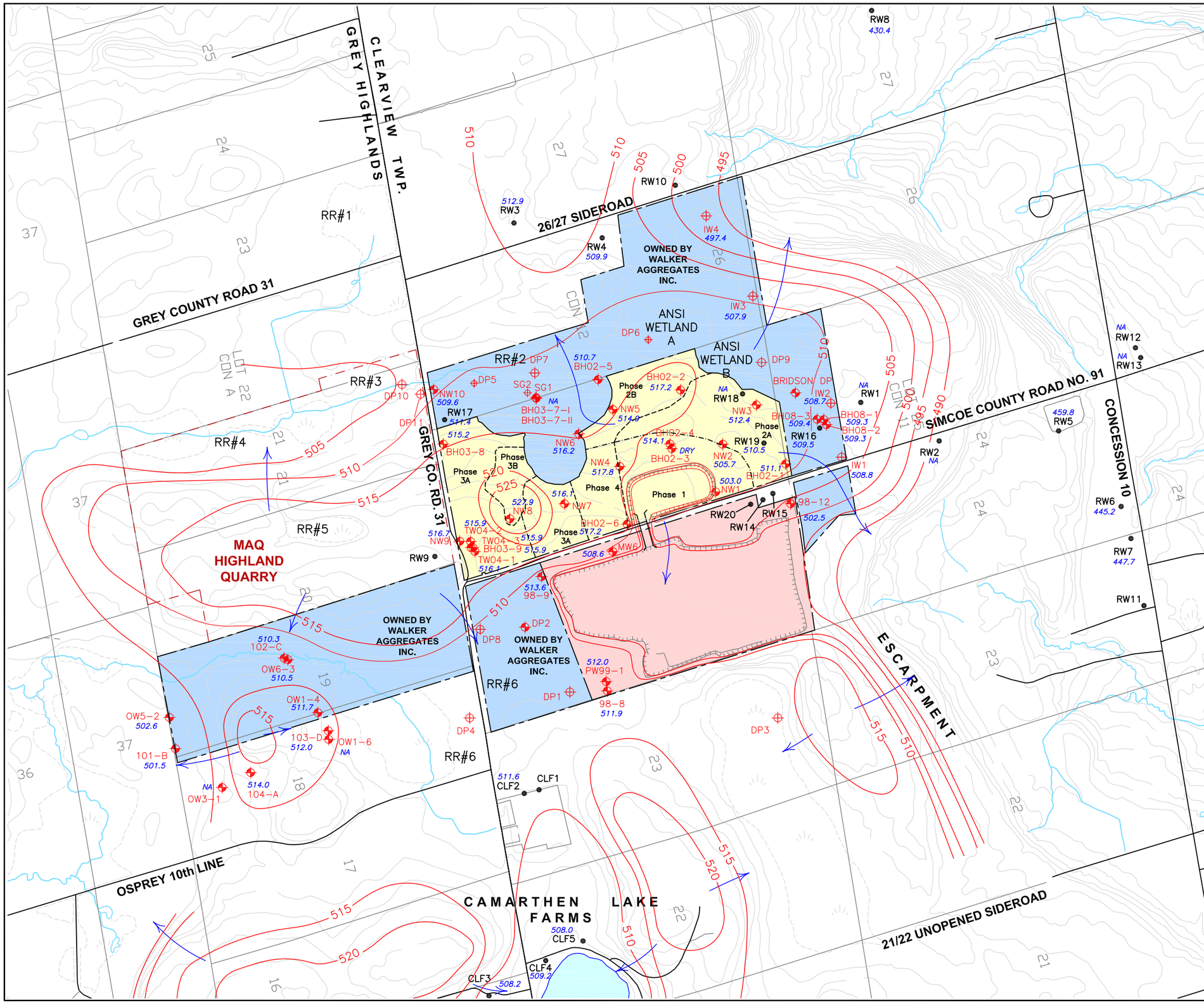
150 0 150 metres

BEDROCK GROUNDWATER LEVELS OCTOBER 2017

DUNTROON QUARRY
2018 AMP SUMMARY REPORT
For Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:15000
PROJECT: 111-53312-01 100	FILE NO.: 111-53312-01 100 F5

FIGURE 5



LEGEND

- DUNTROON EXISTING QUARRY PROPERTY
- DUNTROON QUARRY EXPANSION PROPERTY
- PROPERTY OWNED BY WALKER AGGREGATES INC.
- BH02-6 511.8 — BOREHOLE/WELL LOCATION, DESIGNATION AND WATER LEVEL ELEVATION (mASL) APRIL 2018
- 515 — INTERPRETED BEDROCK GROUNDWATER CONTOUR mASL
- INFERRED GENERAL GROUNDWATER FLOW DIRECTION
- APPROXIMATE TUNNEL LOCATION

150 0 150 metres

BEDROCK GROUNDWATER LEVELS APRIL 2018

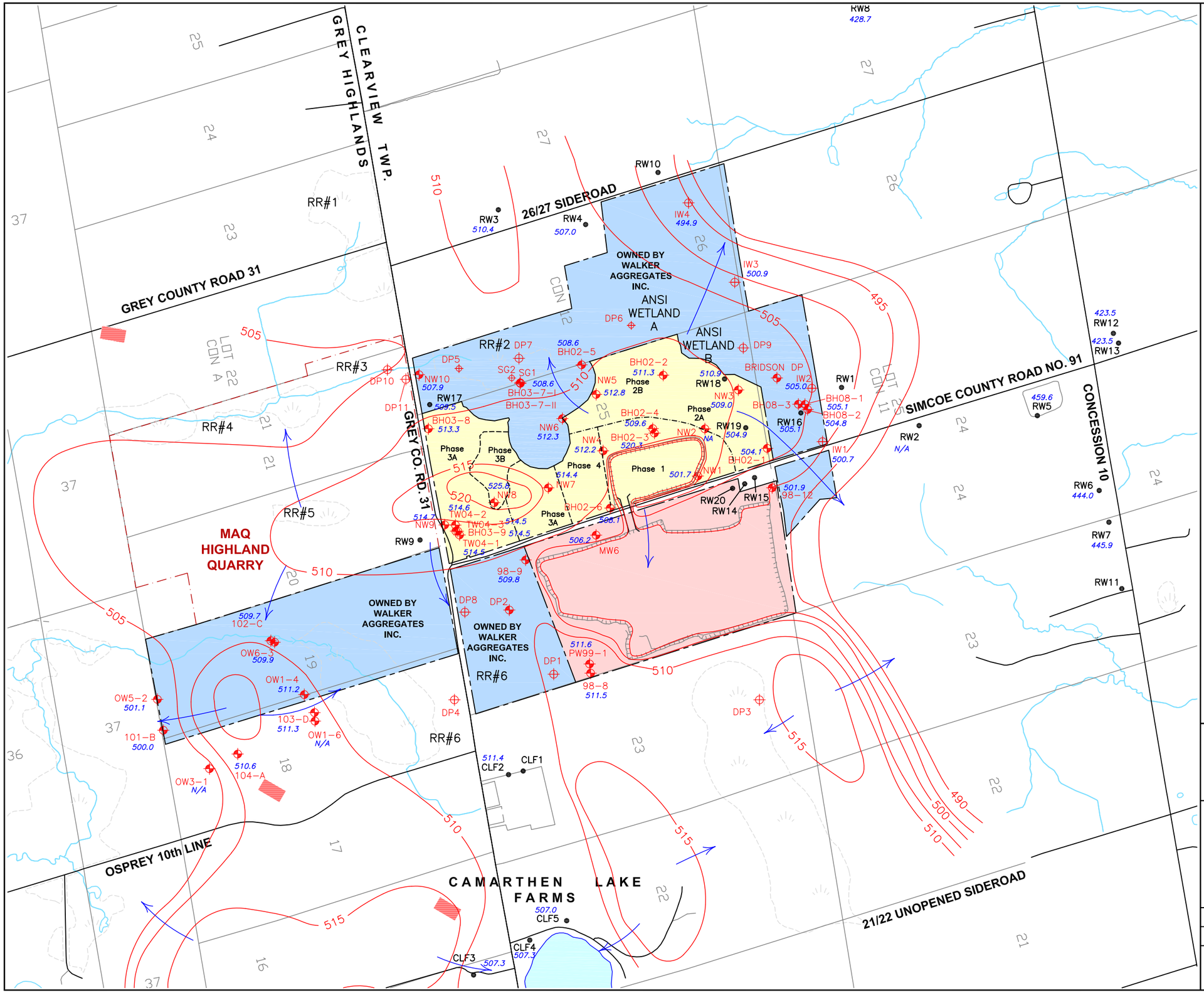
DUNTROON QUARRY
2018 AMP SUMMARY REPORT
For Walker Aggregates Inc.

walker industries
Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:15000
PROJECT: 111-53312-01 100	FILE NO.: 111-53312-01 100 F6

wsp

FIGURE 6



LEGEND

- DUNTROON EXISTING QUARRY PROPERTY
- DUNTROON QUARRY EXPANSION PROPERTY
- PROPERTY OWNED BY WALKER AGGREGATES INC.
- BH02-6 509.1 — BOREHOLE/WELL LOCATION, DESIGNATION AND WATER LEVEL ELEVATION (mASL) OCTOBER 2018
- 515 — INTERPRETED BEDROCK GROUNDWATER CONTOUR mASL
- INFERRED GENERAL GROUNDWATER FLOW DIRECTION
- APPROXIMATE TUNNEL LOCATION

150 0 150 metres

BEDROCK GROUNDWATER LEVELS OCTOBER 2018

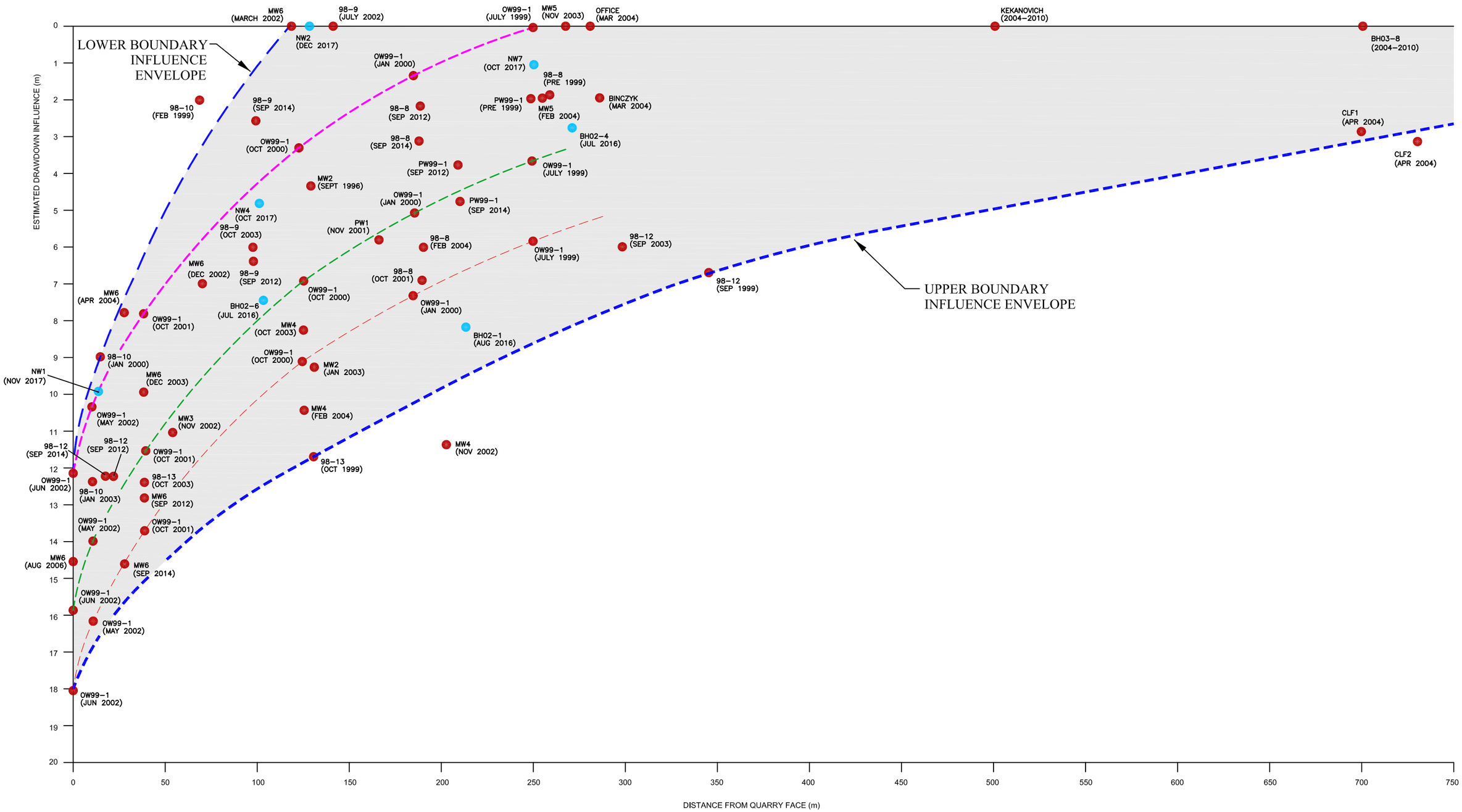
DUNTROON QUARRY
2018 AMP SUMMARY REPORT
For Walker Aggregates Inc.

walker industries
Walker Aggregates Inc.

DATE: APRIL 2019	SCALE: 1:15000
PROJECT: 111-53312-01 100	FILE NO.: 111-53312-01 100 F7

wsp

FIGURE 7



LEGEND

- MONITOR OW99-1 PLOT BASED ON PRE-EXTRACTION GROUNDWATER LEVEL OF 518.2 mASL
- MONITOR OW99-1 PLOT BASED ON PRE-EXTRACTION GROUNDWATER LEVEL OF 516 mASL
- MONITOR OW99-1 PLOT BASED ON PRE-EXTRACTION GROUNDWATER LEVEL OF 512.3 mASL

DISTANCE - DRAWDOWN RELATIONSHIP

DUNTROON QUARRY
2017 AMP SUMMARY REPORT
For Walker Aggregates Inc.

walker industries
Walker Aggregates Inc.

DATE: APRIL 2018	SCALES: AS SHOWN
PROJECT: 111-53312-00 A61	FILE NO.: 111-53312-00 A61 F8
wsp	FIGURE 8

APPENDIX A

SITE BACKGROUND DATA

APPENDIX A -SUMMARY OF SITE BACKGROUND INFORMATION

1.0 INTRODUCTION

1.1 THE SITE

The Duntroon Quarry is located on County Road 91, west of the village of Duntroon on Part Lot 24 and Lot 25, Concession XII in the Township of Clearview, County of Simcoe. Although Duntroon Quarry has been operating since the early 1960s, ownership was transferred to Walker Aggregates Inc. (WAI) in 1995. The existing quarry operates in accordance with Aggregate Resource Act (ARA) license number 3514 and has a licensed area of 57.5 ha (142.1 acres), of which 47.1 ha (116.4 acres) is approved for extraction. The existing and expansion quarry are located on opposite sides of County Road 91 and can be seen in Figure 1.

The Duntroon Quarry produces high quality dolostone that is used to help support the growing communities that surround the quarry. As the communities surrounding the quarry continue to grow the demand for the aggregate will increase. This forecasted demand led to WAI applying for and later receiving approval from the Consolidated Joint Board on June 18th 2012, to expand their quarry operation. The ARA license number 607841, issued August 6, 2014, allowed WAI to extract from the property north of County Road 91 (the expansion quarry). The expansion quarry property encompasses a total land area of 65.9 ha (162.9 acres), within which 58.5 ha (144.5 acres) is approved for extraction. In October 2015 a tunnel was constructed under County Road 91 to link the existing and expansion properties.

Since the both the existing and expansion quarry are licensed to extract aggregate below the water table this results in the accumulation of water on the working floor of the quarry. Environmental Compliance Approval Number 1521-A4VJ4X was issued to allow discharge from sewage Works that collect the water that accumulates in the aggregate extraction area from direct precipitation, surface runoff, snowmelt and groundwater inflow. The sewage Works discharge to a wetland located at the west side of the existing quarry property, and then to twin culverts located on Grey Road 31 (designated as “SW1”) and eventually to the Beaver River South Tributary.

Originally the Permit to Take Water (PTTW No.1168-665NHB) dictated the limitations on flow rate at the twin culverts on Grey Road 31 (‘SW1’). The PTTW was amended on September 22, 2016 and the ECA was issued on October 17, 2016. The Amended PTTW now dictates the maximum water taking from the quarry as measured in the discharge line with a flow meter. The ECA informs the limits on the sewage Works, including the total daily discharge rate and effluent limits based on water quality parameters.

1.2 MONITORING REQUIREMENTS

Walker Aggregates environmental commitment is to manage its lands so that upon reclamation the mine site is in better ecological condition than prior to mining. This will be accomplished through environmental initiatives detailed on the ARA Site Plans and the Adaptive Management Plan (AMP) to ensure that protection, mitigation, and enhancement measures sustain local environmental resource features and functions for future generations.

Given the extraction that has occurred in the existing quarry, extraction in Phase I of the expansion quarry is not expected to result in any negative impacts to off-site water resources and/or ecological features and functions. Therefore, the monitoring and mitigation requirements during this phase of extraction are such that the response of the natural environment system will be monitored by means of the groundwater, surface water and wetland monitoring network, and results compared to predictions.

Trigger monitoring criteria for water flows, water temperature and wetland water levels will apply during their respective trigger periods as soon as extraction proceeds beyond Phase 1. Groundwater and surface water monitoring data will be used to further update interim triggers as well as build statistically valid relationships between monitoring locations and control points.

1.3 COORDINATED MONITORING REPORT

The AMP consists of four component monitoring programs:

1. Performance Indicator Trigger Monitoring Program;
2. Long Term Trend Groundwater and Surface Water Monitoring Program;
3. Long Term Trend Ecological Monitoring Program;
4. Ecological Enhancement and Mitigation Monitoring Program.

The AMP annual summary report includes results, where available, from all four components of the AMP monitoring program.

1.4 WATERSHED AGGREGATE ACTIVITIES

1.4.1 DUNTROON EXPANSION QUARRY

Table 2.3 in the AMP document summarizes the expected timing for extraction in each Phase. The phasing is also detailed on the Site Plan 2B of 4 Operational Plan. Phase 1, Phase 2a and Phase 2b are identified on Figure 2a – Site Sketch.

In October 2015 a tunnel was constructed under County Road 91 to link the existing and expansion properties. Extraction of materials from the expansion quarry began in June 2016, as a result the year of 2016 is the first year for reporting the Adaptive Management Plan. From the tunnel cut the quarry will expand outward in a quasi-radial pattern from the southwest corner to the north and east.

Water managed by the quarry reflects the direct precipitation, surface runoff, snow melt and groundwater inflow that accumulates in the extraction area of the quarry. This accumulated water is managed using the Works outlined below. For information on the current estimated limit of extraction, please see Figure 2a (site sketch). The site sketch is based on conditions in the fall of 2018. Figure 2b is the site plan, including the location of the sumps, flow meter and the tunnel to the expansion lands. Figure 2c is an updated aerial photo from an oblique view in the summer of 2017 which includes the existing and expansion quarries.

1.4.2 DUNTROON EXISTING QUARRY

The current water management system consists of two sumps known as Sump 1 and Sump 2, both of which are equipped with submersible pumps (Please see Figure 2b – Site Sketch for sump locations). Currently the water that collects in the expansion quarry area is either pumped or moved via gravity flow to the existing quarry, where the water is managed with the existing sewage Works. Water from Sump 2 is pumped into the main reservoir for storage. Water movement is controlled using dam boards to channel water as needed to return it to the main sump using a gravity sewer line to Sump 1 (main sump). Sump 1 is equipped with a float switch, has a capacity of approximately 17,050 m^3, and discharges either directly off site or to the main reservoir. Water is primarily pumped off site, but if water is need on-site or if there is an issue with water quality, the water is

retained on site, in the main reservoir. The amount of flow moving off-site is controlled with a valve. The flow meter is installed downstream of the valve, on the discharge line where it moves off-site. The discharge line is a 10-inch line, which eventually discharges into the wetland located west of the existing quarry, upstream of SW1.

1.4.3 OTHER EXTRACTION OPERATIONS

1.4.3.1 MAQ Aggregates Highland Quarry

The expansion quarry is located adjacent to the approved (August 24, 2012) MAQ Aggregates Inc. (MAQ) Highland Quarry, an independent third party. The Highland Quarry is operated by CBM St. Marys Cement under the name Osprey Quarry. Aggregate extraction at the Osprey Quarry began in 2014. WAI and MAQ have a data sharing agreement which supports the reporting requirements for the respective quarries.

1.4.3.2 Other

Walker Aggregates is unaware of any additional extraction operations in the immediate vicinity of the Duntroon expansion quarry during 2018.

1.5 MONITORING PROGRAM CONTACT NAMES

Matthew McMahon M.Sc. – Environmental Performance Lead, Walker Industries

James Kenny B.ASc. – Environmental Monitor, Walker Industries

David Charlton M.Sc. – Senior Environmental Consultant and Ecologist, Stantec

Sarah Hutchesson M.Sc. – Environmental Consultant, WSP Canada Inc.

1.6 OTHER ACTIVITIES IN LOCAL WATERSHEDS

Walker Aggregates is unaware of any other large scale activities in local watersheds in the vicinity of the Duntroon expansion property during 2018.

TABLE A-1
30 YEAR NORMAL 1971-2000 WATER BUDGET
THORNBURY SLAMA CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2017)

111-53312.00 A61

Month	Mean Temperature (°C)	Total Precipitation (mm)	Calculated Snow Melt (mm)	Pot. E (mm)	Act. E (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)
JANUARY	-6.6	94.2	29.0	1.0	1.0	146.0	46.0	0.0
FEBRUARY	-6.1	63.8	42.0	2.0	2.0	150.0	53.0	0.0
MARCH	-1.6	63.5	86.0	8.0	8.0	150.0	117.0	0.0
APRIL	5.2	62.4	37.0	30.0	30.0	149.0	67.0	0.0
MAY	11.5	70.6	0.0	72.0	72.0	133.0	14.0	0.0
JUNE	16.6	75.7	0.0	106.0	105.0	101.0	2.0	0.0
JULY	19.7	80.9	0.0	128.0	121.0	58.0	3.0	7.0
AUGUST	19.0	85.8	0.0	114.0	103.0	41.0	0.0	11.0
SEPTEMBER	15.1	94.0	0.0	78.0	72.0	58.0	5.0	6.0
OCTOBER	9.0	81.0	0.0	42.0	40.0	93.0	6.0	2.0
NOVEMBER	2.9	97.2	12.0	14.0	14.0	137.0	33.0	0.0
DECEMBER	-3.1	97.0	25.0	3.0	3.0	146.0	42.0	0.0
TOTAL	**6.8**	**966.1**	**231.0**	**598.0**	**571.0**			
						SURPLUS:	**395.1**	**mm**

NOTES:

- Mean Temperature and Total Precipitation Data as reported by Environment Canada
- Calculated Snow Melt as calculated by Environment Canada
- Pot. E - Potential Evapotranspiration as calculated by Environment Canada
- Act. E - Actual Evapotranspiration as calculated by Environment Canada
- WHC - Water Holding Capacity as calculated by Environment Canada
- Calculated Surplus and Deficit as calculated by Environment Canada
- Data from the Thornbury Slama Climatological Station located at 44 ^{o}34'N 80°29'W/O, 213m

TABLE A-2
2015 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2017)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-10.7	0.0	0.0	0.82	0.0	62	150	62	0	62	0.0
FEBRUARY	-14.9	0.0	0.0	0.82	0.0	53	150	53	0	53	0.0
MARCH	-3.5	0.0	0.0	1.03	0.0	24	150	24	0	24	0.0
APRIL	6.2	1.4	25.9	1.12	29.0	61	150	32	0	32	0.0
MAY	15.3	5.4	72.3	1.27	91.9	38	96	0	54	0	0.0
JUNE	17.2	6.5	82.6	1.28	105.8	154	144	48	0	0	0.0
JULY	20.2	8.2	99.2	1.30	128.9	37	52	0	92	0	52
AUGUST	19.5	7.8	95.3	1.20	114.3	106	44	0	8	0	0
SEPTEMBER	18.9	7.4	92.0	1.04	95.6	67	16	0	28	0	16
OCTOBER	9.0	2.4	39.6	0.95	37.6	84	62	46	0	0	0.0
NOVEMBER	6.0	1.3	25.0	0.81	20.2	61	103	41	0	0	0.0
DECEMBER	3.1	0.5	11.8	0.78	9.2	40	133	30	0	0	0.0
TOTAL	**7.2**	**41.0**			**633**	**786**		**336**	**182**	**170**	**68**

(POTENTIAL) NET WATER SURPLUS= **154** mm

ACTUAL SURPLUS= **170** mm

NOTES:

- WHC - Water Holding Capacity
- Data from the Shanty Bay Climatological Station located at 44°24'N 79°37.8'W/O, 250.0m

FIGURE A-1: SHANTY BAY CLIMATOLOGICAL STATION

2015 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
MONTHLY PRECIPITATION AND WATER SURPLUS

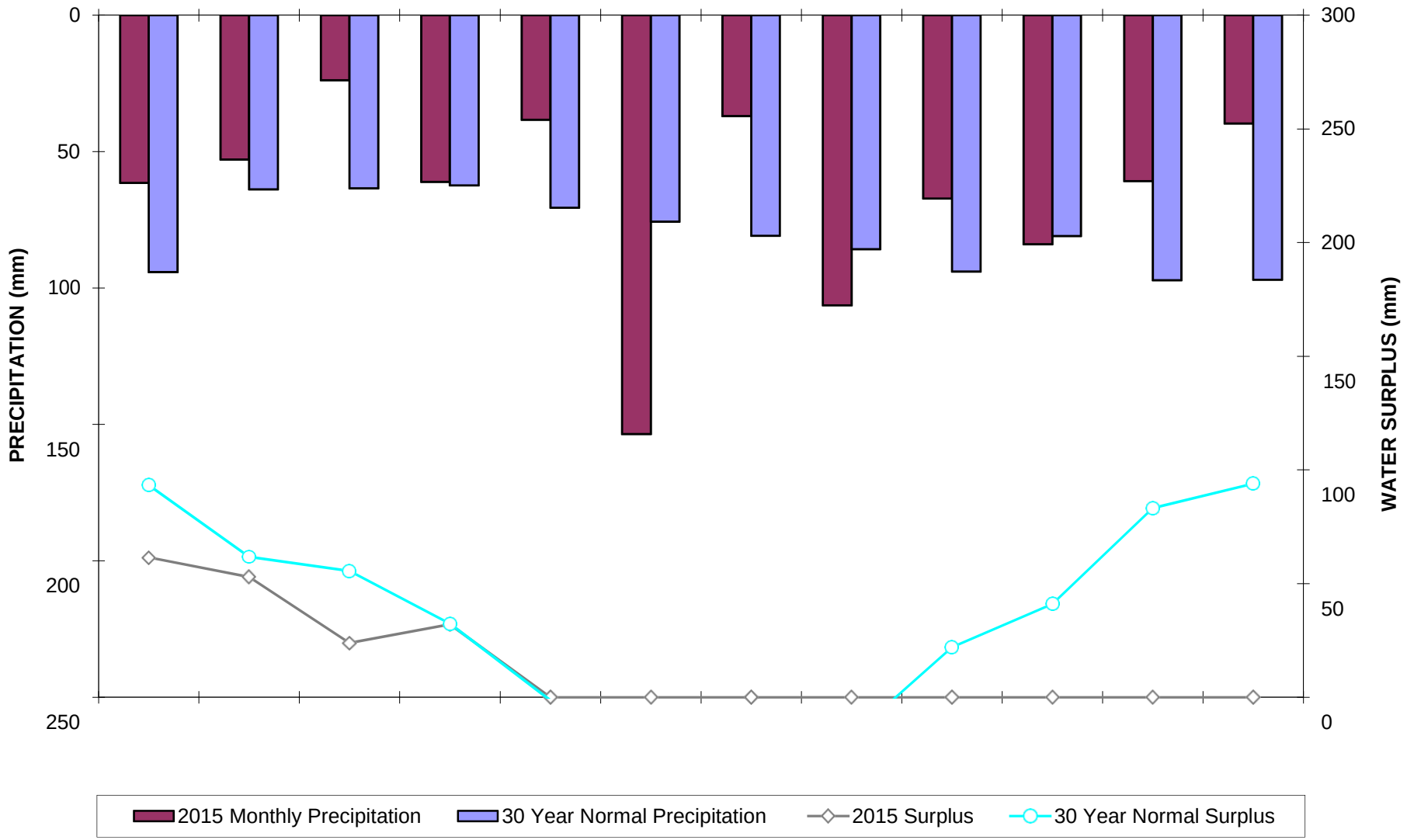


TABLE A-3
2016 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2017)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-5.7	0.0	0.0	0.82	0.0	116	150	116	0	116	0.0
FEBRUARY	-5.0	0.0	0.0	0.82	0.0	50	150	50	0	50	0.0
MARCH	0.5	0.0	1.4	1.03	1.4	156	150	155	0	155	0.0
APRIL	3.8	0.7	14.4	1.12	16.1	65	150	49	0	49	0.0
MAY	13.5	4.5	62.1	1.27	78.8	51	122	0	28	0	0.0
JUNE	18.0	6.9	86.4	1.28	110.7	39	50	0	72	0	49.9
JULY	21.9	9.3	108.4	1.30	140.9	54	0	0	87	0	37
AUGUST	22.4	9.6	111.2	1.20	133.5	118	0	0	15	0	15
SEPTEMBER	17.6	6.7	84.2	1.04	87.6	38	0	0	50	0	50
OCTOBER	10.8	3.2	48.0	0.95	45.6	79	33	33	0	0	0.0
NOVEMBER	5.6	1.2	22.5	0.81	18.2	52	66	33	0	0	0.0
DECEMBER	-2.7	0.0	0.0	0.78	0.0	124	150	124	0	40	0.0
TOTAL	**8.4**	**42.1**			**633**	**941**		**560**	**252**	**410**	**152**

(POTENTIAL) NET WATER SURPLUS= 308 mm

ACTUAL SURPLUS= 410 mm

NOTES:
- WHC - Water Holding Capacity
- Data from the Shanty Bay Climatological Station located at 44°24'N 79°37.8'W/O, 250.0m

FIGURE A-2: SHANTY BAY CLIMATOLOGICAL STATION

2016 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
MONTHLY PRECIPITATION AND WATER SURPLUS

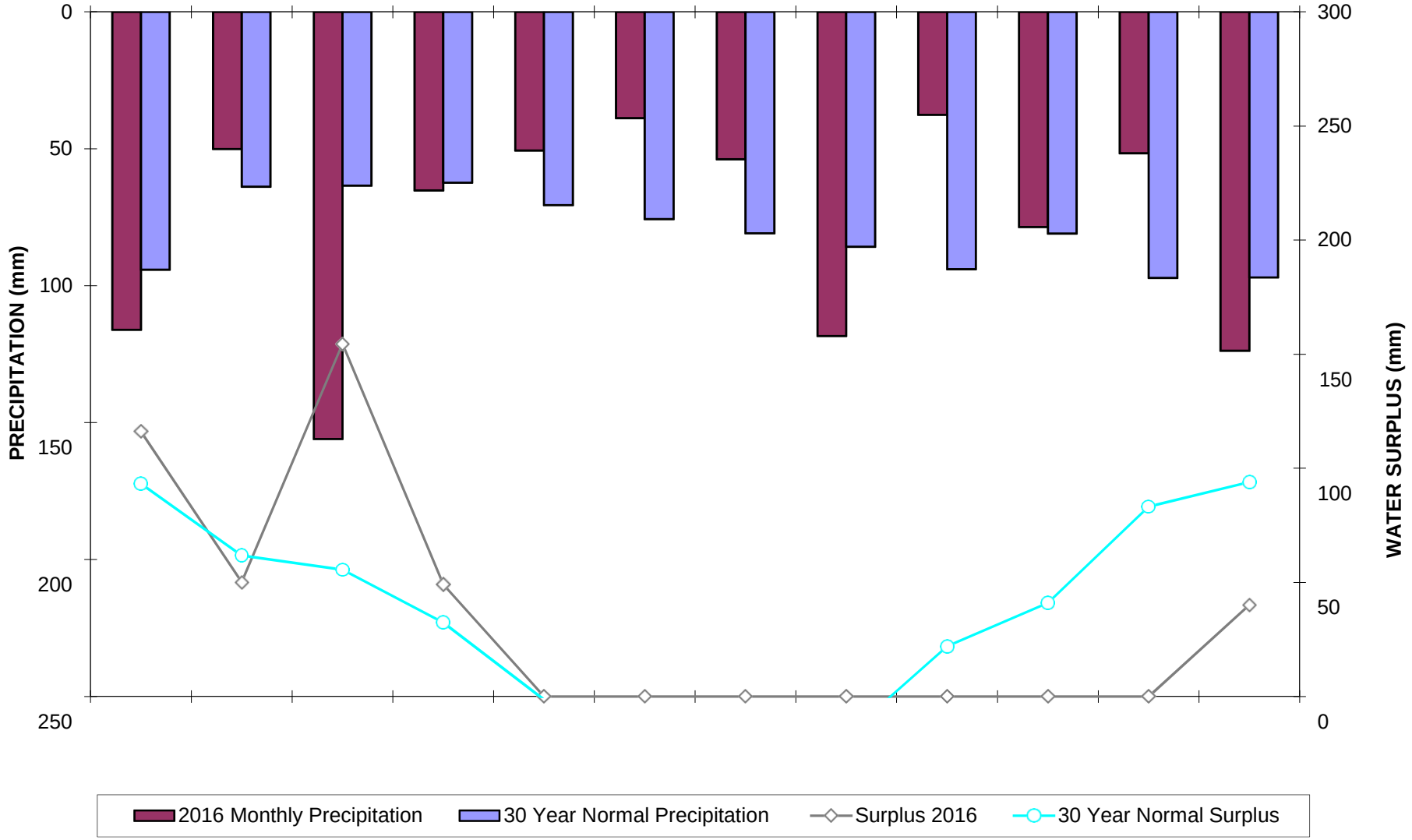


TABLE A-4
2016 WATER BUDGET
WALKER CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2017)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-5.7	0.0	0.0	0.82	0.0	64	150	64	0	64	0.0
FEBRUARY	-6.2	0.0	0.0	0.82	0.0	67	150	67	0	67	0.0
MARCH	-0.6	0.0	0.0	1.03	0.0	170	150	170	0	170	0.0
APRIL	4.5	0.9	20.3	1.12	22.7	24	150	1	0	1	0.0
MAY	12.2	3.8	58.9	1.27	74.8	40	115	0	35	0	0.0
JUNE	16.5	6.1	81.4	1.28	104.1	42	53	0	62	0	52.9
JULY	19.9	8.1	99.4	1.30	129.2	28	0	0	102	0	49
AUGUST	20.7	8.5	103.7	1.20	124.4	28	0	0	96	0	96
SEPTEMBER	16.1	5.8	79.2	1.04	82.4	8	0	0	75	0	75
OCTOBER	9.0	2.4	42.6	0.95	40.4	7	0	0	33	0	33.2
NOVEMBER	4.4	0.8	19.8	0.81	16.0	54	38	38	0	0	0.0
DECEMBER	-4.9	0.0	0.0	0.78	0.0	25	63	25	0	0	0.0
TOTAL	**7.2**	**36.5**			**594**	**556**		**364**	**403**	**301**	**306**

(POTENTIAL) NET WATER SURPLUS= -39 mm

ACTUAL SURPLUS= 301 mm

NOTES:

- WHC - Water Holding Capacity
- Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-3: WAI CLIMATOLOGICAL STATION

2016 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
MONTHLY PRECIPITATION AND WATER SURPLUS

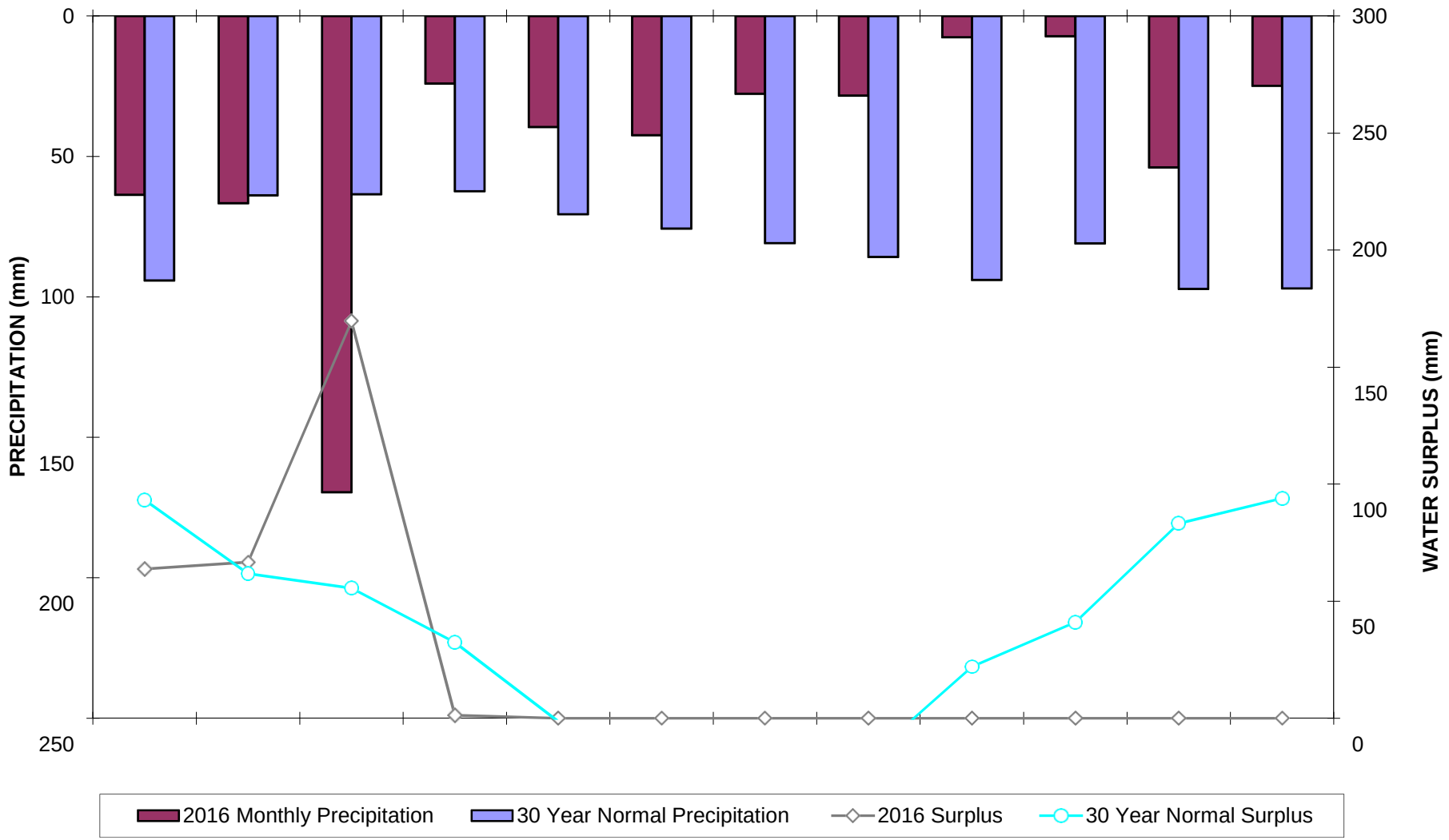


TABLE A-5
2017 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2017)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-3.7	0.0	0.0	0.82	0.0	131	150	131	0	131	0.0
FEBRUARY	-2.2	0.0	0.0	0.82	0.0	101	150	101	0	101	0.0
MARCH	-0.3	0.0	0.0	1.03	0.0	75	150	75	0	75	0.0
APRIL	8.0	2.0	36.4	1.12	40.7	122	150	81	0	81	0.0
MAY	11.6	3.6	54.6	1.27	69.4	124	150	54	0	54	0.0
JUNE	17.4	6.6	85.2	1.28	109.0	120	150	11	0	11	0.0
JULY	20.0	8.1	99.2	1.30	129.0	65	86	0	64	0	0
AUGUST	18.8	7.4	92.7	1.20	111.2	74	49	0	37	0	0
SEPTEMBER	17.2	6.5	84.1	1.04	87.5	57	18	0	31	0	18
OCTOBER	12.2	3.8	57.7	0.95	54.8	77	41	23	0	0	0.0
NOVEMBER	2.0	0.3	8.0	0.81	6.5	81	116	75	0	0	0.0
DECEMBER	-6.8	0.0	0.0	0.78	0.0	88	150	88	0	54	0.0
TOTAL	**7.9**	**38.2**			**608**	**1115**		**639**	**132**	**507**	**18**

(POTENTIAL) NET WATER SURPLUS= 507 mm

ACTUAL SURPLUS= 507 mm

NOTES:
- WHC - Water Holding Capacity
- Data from the Shanty Bay Climatological Station located at 44°24'N 79°37.8'W/O, 250.0m

FIGURE A-4: SHANTY BAY CLIMATOLOGICAL STATION

2017 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
MONTHLY PRECIPITATION AND WATER SURPLUS

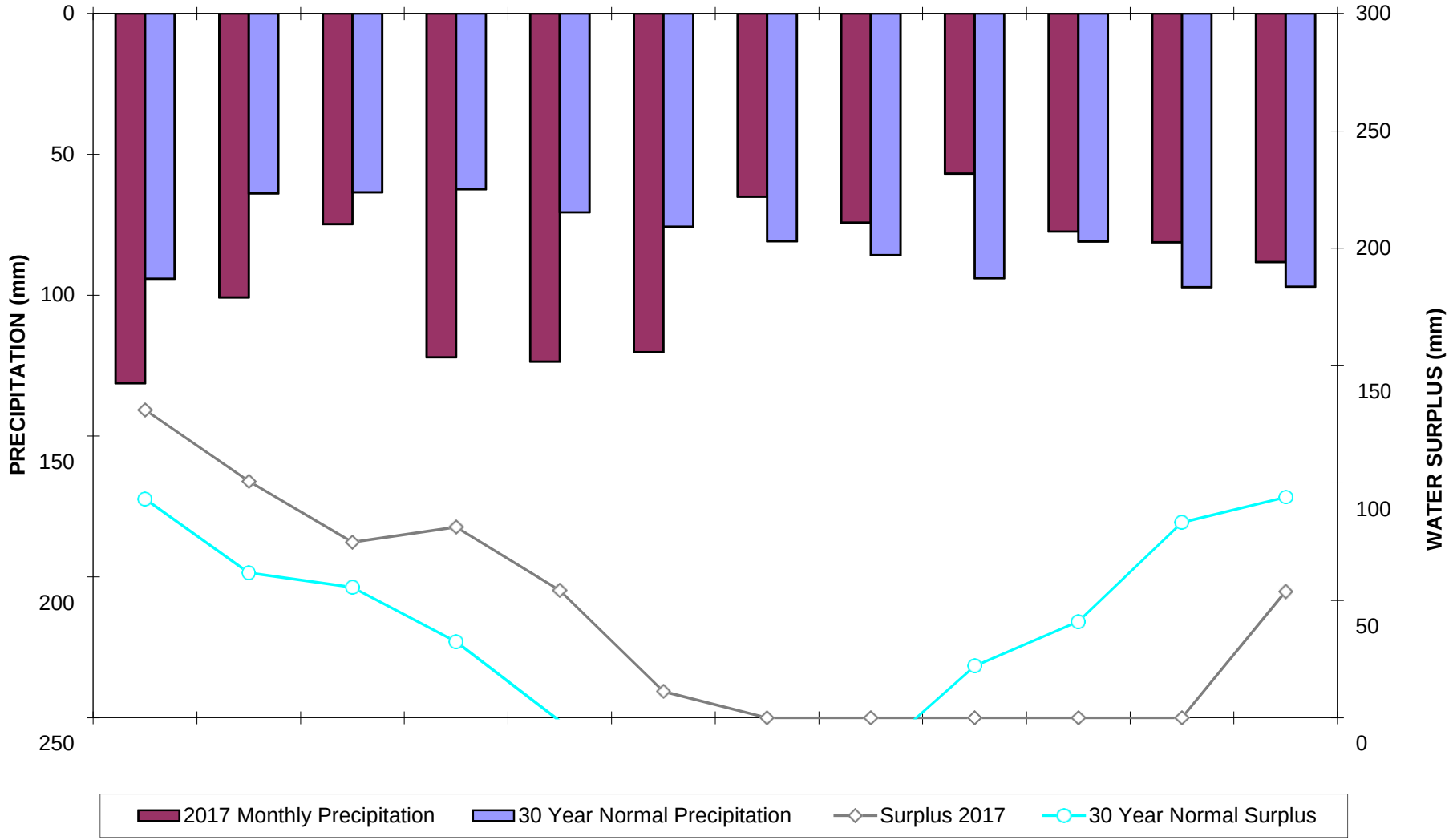


TABLE A-6
2017 WATER BUDGET
WALKER CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2017)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-5.0	0.0	0.0	0.82	0.0	86	150	86	0	86	0.0
FEBRUARY	-3.3	0.0	0.0	0.82	0.0	44	150	44	0	44	0.0
MARCH	-3.4	0.0	0.0	1.03	0.0	55	150	55	0	55	0.0
APRIL	6.1	1.3	30.8	1.12	34.5	134	150	100	0	100	0.0
MAY	9.9	2.8	50.2	1.27	63.8	132	150	68	0	68	0.0
JUNE	16.0	5.8	81.6	1.28	104.5	131	150	27	0	27	0.0
JULY	18.2	7.0	92.5	1.30	120.3	58	87	0	63	0	0
AUGUST	16.7	6.2	85.0	1.20	102.0	66	51	0	36	0	0
SEPTEMBER	15.8	5.7	80.4	1.04	83.7	88	55	4	0	0	0
OCTOBER	10.5	3.1	53.4	0.95	50.8	90	94	39	0	0	0.0
NOVEMBER	0.0	0.0	0.0	0.81	0.0	89	150	89	0	33	0.0
DECEMBER	-7.9	0.0	0.0	0.78	0.0	46	150	46	0	46	0.0
TOTAL	**6.1**	**31.9**			**559**	**1018**		**557**	**99**	**458**	**0**

(POTENTIAL) NET WATER SURPLUS= 458 mm

ACTUAL SURPLUS= 458 mm

NOTES:

- WHC - Water Holding Capacity
- Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-5: WAI CLIMATOLOGICAL STATION

2017 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)
MONTHLY PRECIPITATION AND WATER SURPLUS

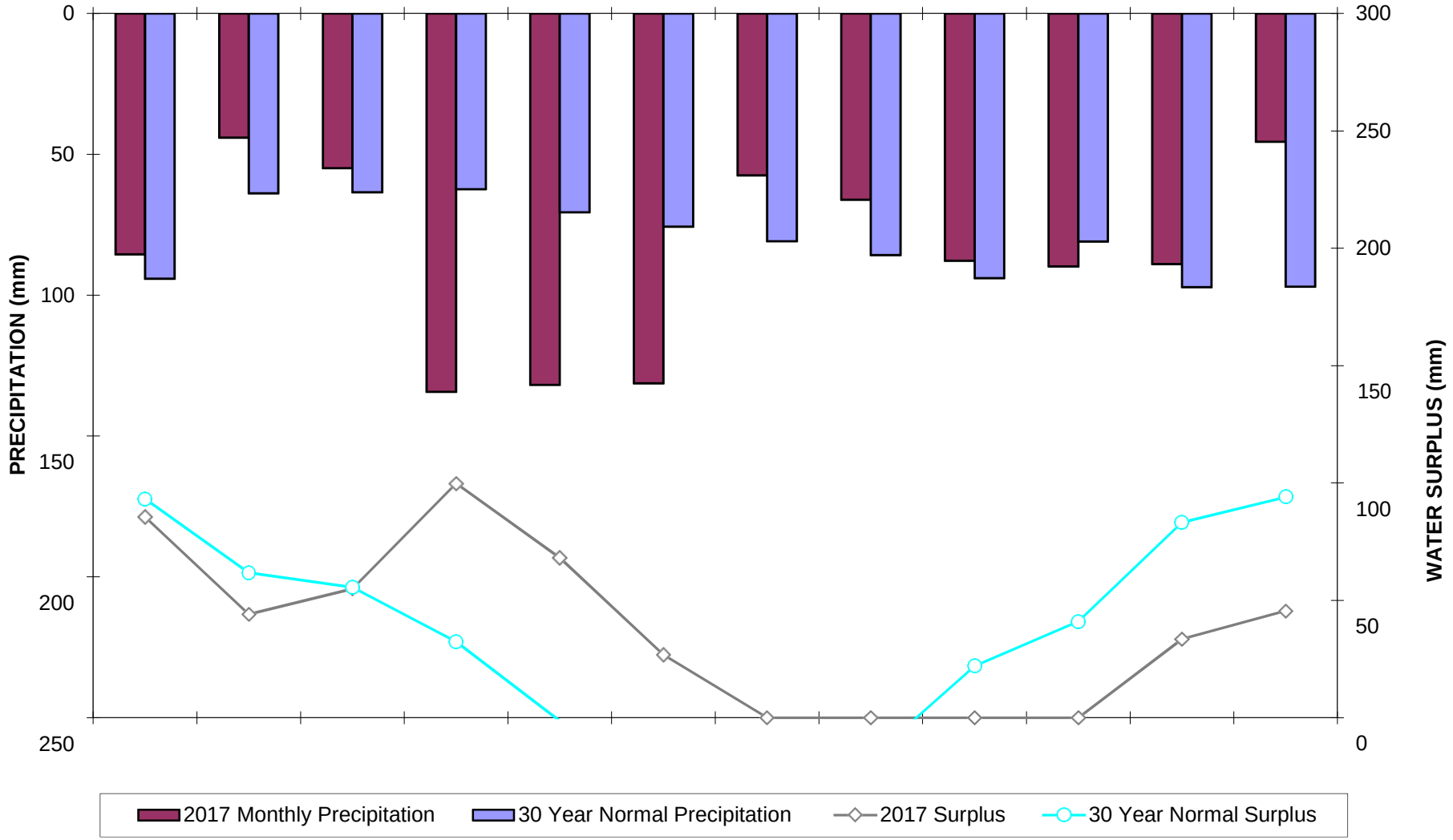


TABLE A-7
2018 WATER BUDGET
SHANTY BAY CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2018)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-8	0	0	0.82	0	79	150	79	0	79	0
FEBRUARY	-4	0	0	0.82	0	97	150	97	0	97	0
MARCH	-2	0	0	1.03	0	47	150	47	0	47	0
APRIL	2	0	0	1.12	0	133	150	133	0	133	0
MAY	16	6	76	1.27	96	68	122	0	28	0	0
JUNE	18	7	88	1.28	113	44	53	0	69	0	53
JULY	22	9	109	1.30	142	64	0	0	78	0	25
AUGUST	22	9	108	1.20	130	107	0	0	23	0	23
SEPTEMBER	18	7	85	1.04	89	21	0	0	68	0	68
OCTOBER	8	2	35	0.95	33	130	97	97	0	0	0
NOVEMBER	0	0	0	0.81	0	103	150	103	0	50	0
DECEMBER	-2	0	0	0.78	0	98	150	98	0	98	0
TOTAL	7	40			602	991		653	265	503	168
									(POTENTIAL) NET WATER SURPLUS=	388 mm	
									ACTUAL SURPLUS=	503 mm	

NOTES: WHC - Water Holding Capacity

Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-6: SHANTY BAY CLIMATOLOGICAL STATION

2018 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

MONTHLY PRECIPITATION AND WATER SURPLUS

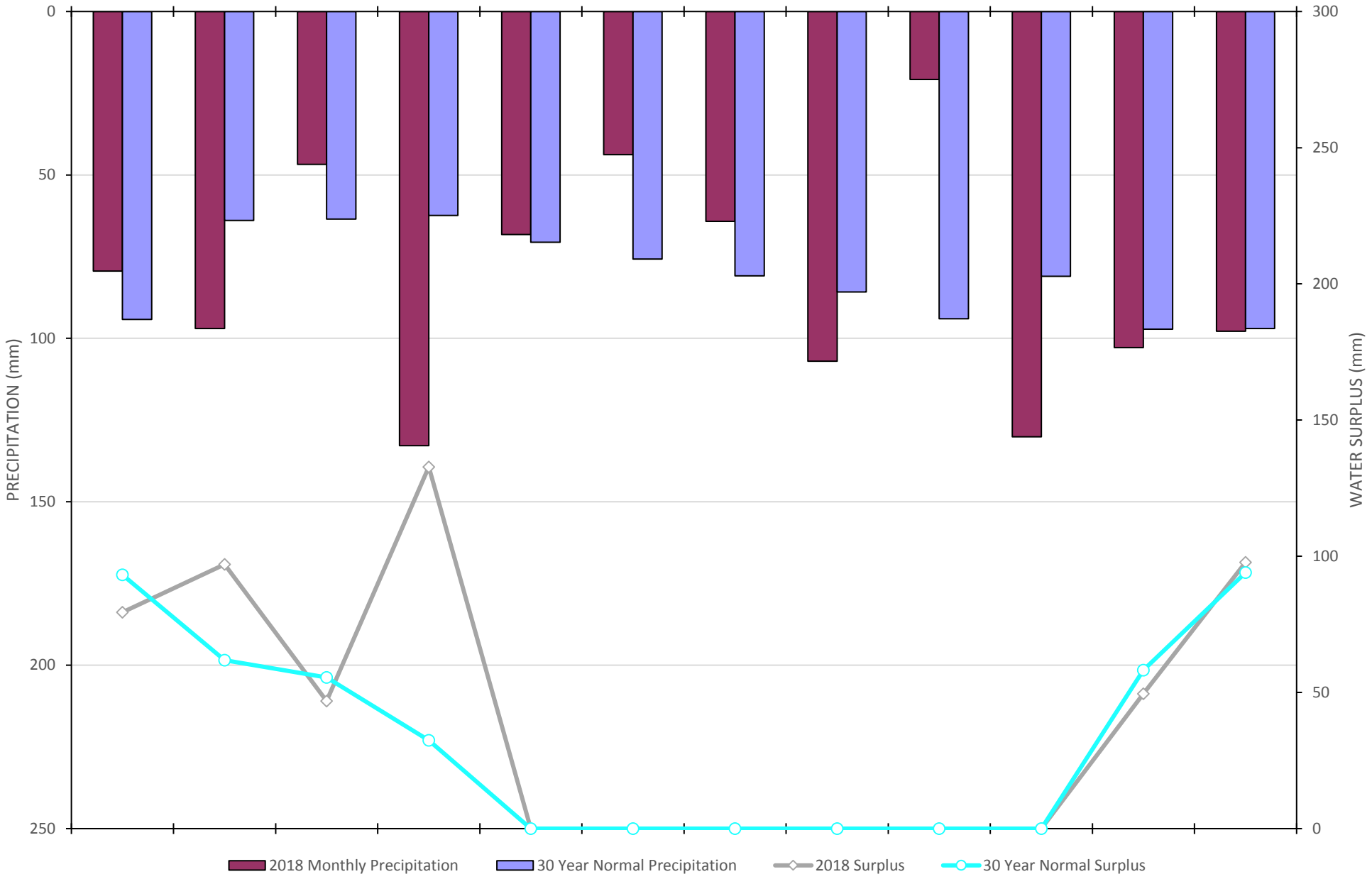


TABLE A-8
2018 WATER BUDGET
WALKER CLIMATOLOGICAL STATION

DUNTROON QUARRY - AMP SUMMARY REPORT (2018)

111-53312.00 A61

Month	Mean Temperature (°C)	Heat Index (unitless)	Evaporation (mm)	Daylight Factor (unitless)	Evaporation (adjusted) (mm)	Total Precipitation (mm)	WHC (mm)	Calculated Surplus (mm)	Calculated Deficit (mm)	ACTUAL SURPLUS (mm)	ACTUAL DEFICIT (mm)
JANUARY	-8	0	0	0.82	0	60	150	60	0	60	0
FEBRUARY	-5	0	0	0.82	0	63	150	63	0	63	0
MARCH	-4	0	0	1.03	0	23	150	23	0	23	0
APRIL	-1	0	0	1.12	0	104	150	104	0	104	0
MAY	15	5	74	1.27	94	76	132	0	18	0	0
JUNE	17	6	83	1.28	107	44	69	0	63	0	0
JULY	20	8	102	1.30	133	45	0	0	88	0	19
AUGUST	20	8	100	1.20	120	84	0	0	36	0	36
SEPTEMBER	16	6	77	1.04	80	22	0	0	58	0	58
OCTOBER	6	1	28	0.95	27	105	78	78	0	0	0
NOVEMBER	-2	0	0	0.81	0	66	144	66	0	0	0
DECEMBER	-4	0	0	0.78	0	65	150	65	0	60	0
TOTAL	6	35			560	756		458	263	308	113
									(POTENTIAL) NET WATER SURPLUS=	196 mm	
									ACTUAL SURPLUS=	308 mm	

NOTES: WHC - Water Holding Capacity

Data from the Walker Climatological Station. Located in proximity to the existing quarry, approx. 520 m asl.

FIGURE A-7: WAI CLIMATOLOGICAL STATION

2018 AND 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

MONTHLY PRECIPITATION AND WATER SURPLUS

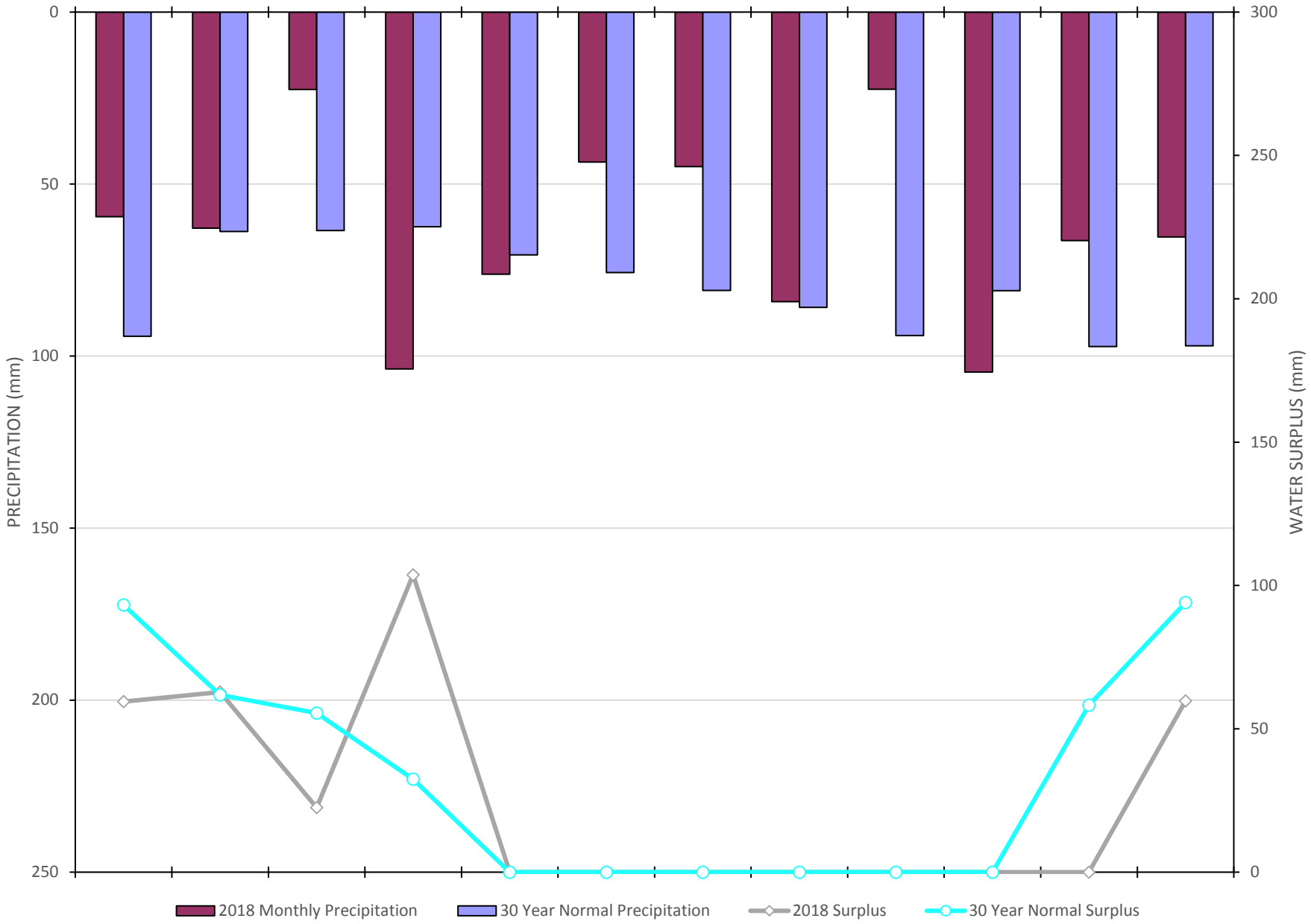


FIGURE A-8: MEAN MONTHLY TEMPERATURE

2018 (SHANTY BAY WAI STATIONS) vs. 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

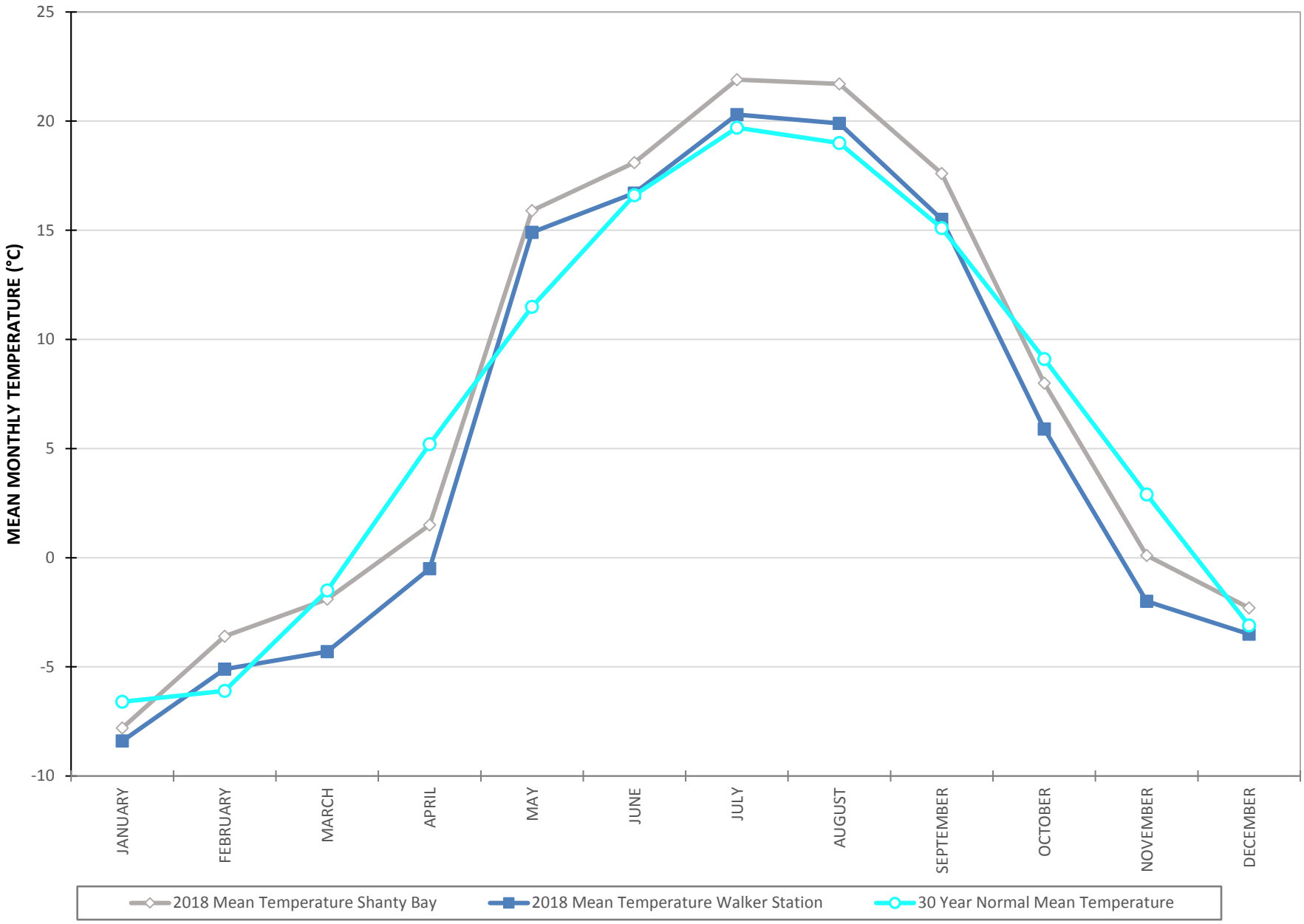


FIGURE A-9: TOTAL PRECIPITATION

2018 (SHANTY BAY WAI STATIONS) vs. 30 YEAR NORMAL 1971-2000 (THORNBURY SLAMA)

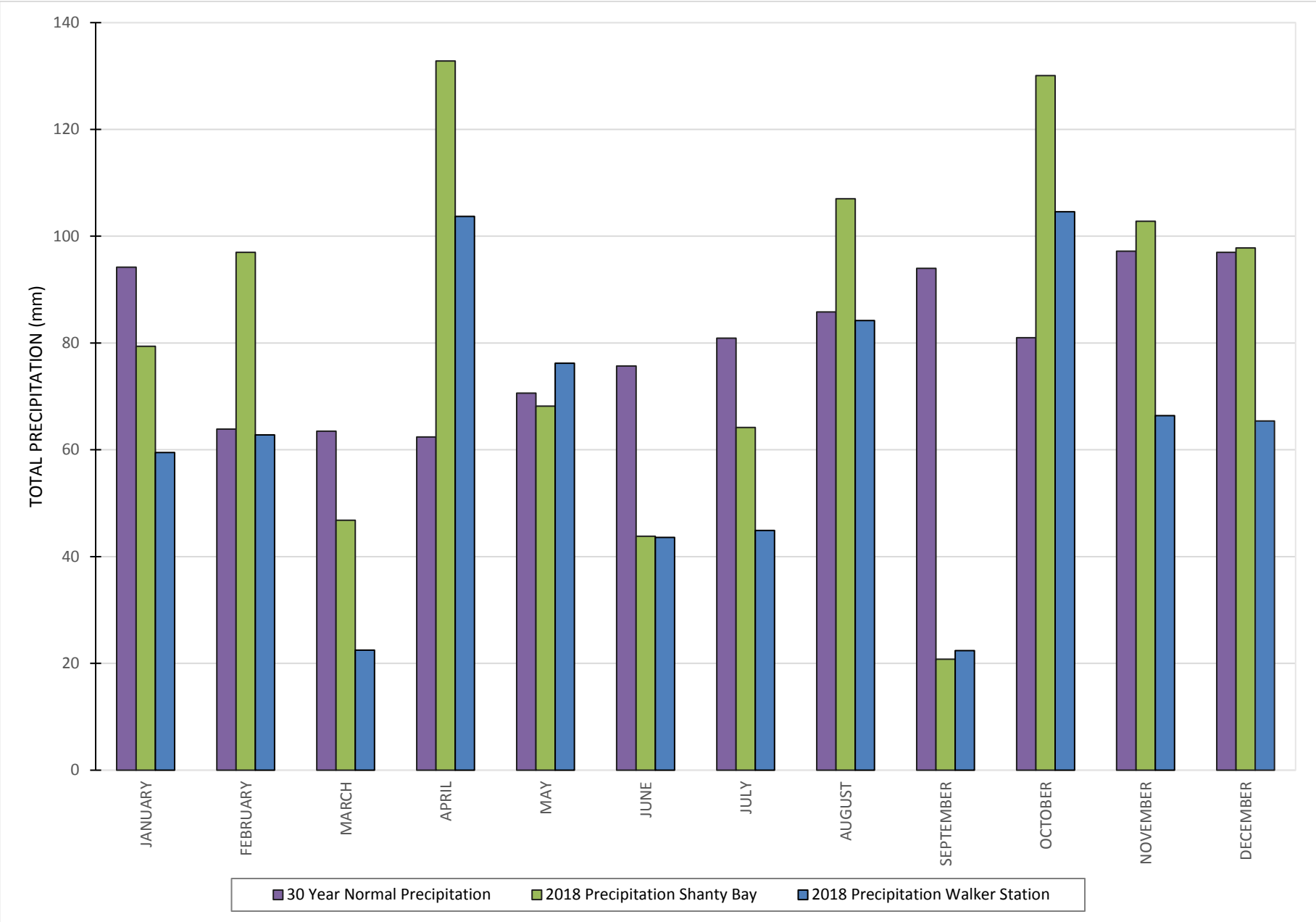
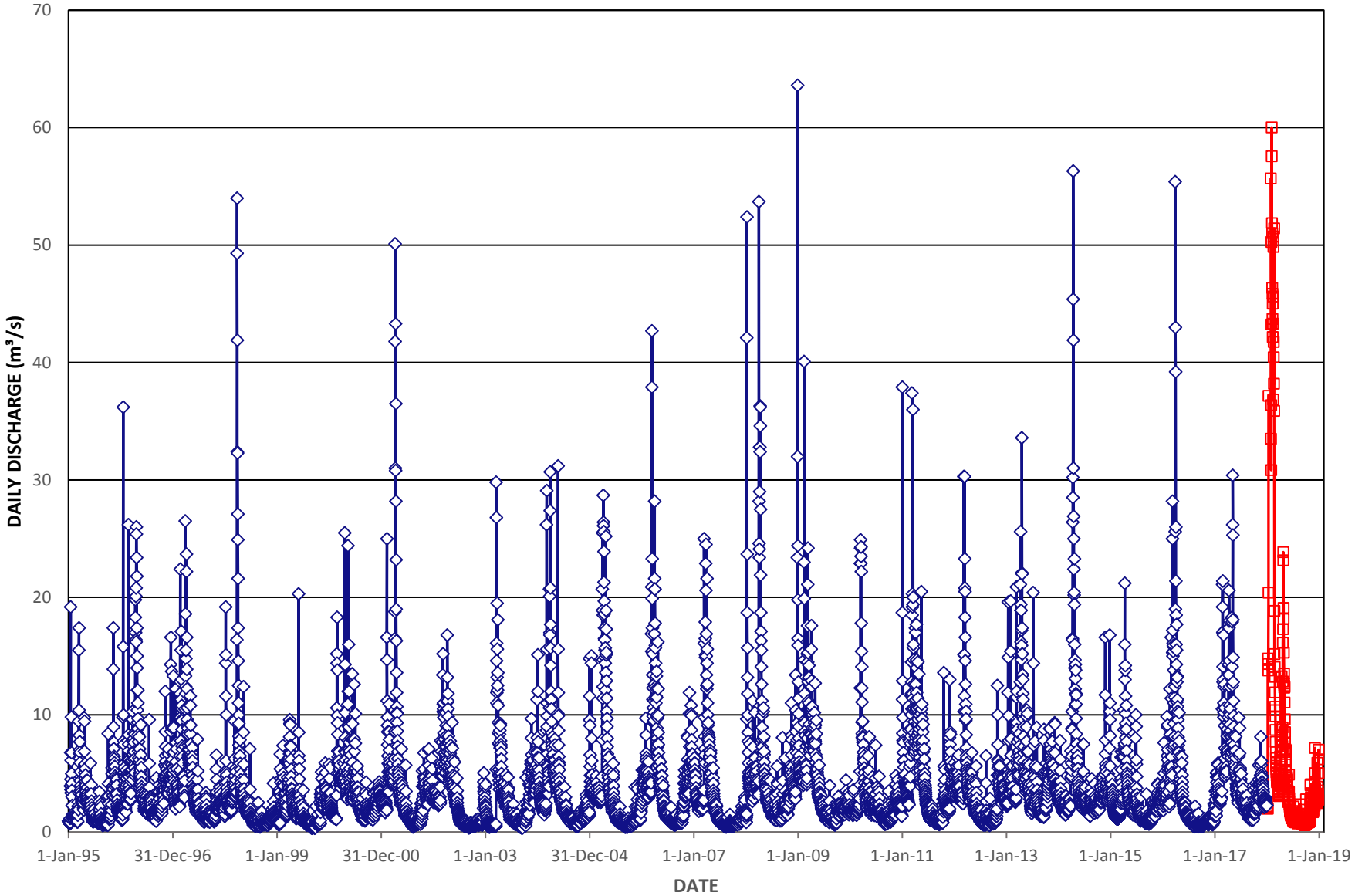


FIGURE A-10

SURFACE WATER HYDROGRAPH
Mad River at Avening
Environment Canada Station 02ED015



NOTE: Data for this graph obtained from Government of Canada Hydrometric Data Station 02ED015. (https://wateroffice.ec.gc.ca)

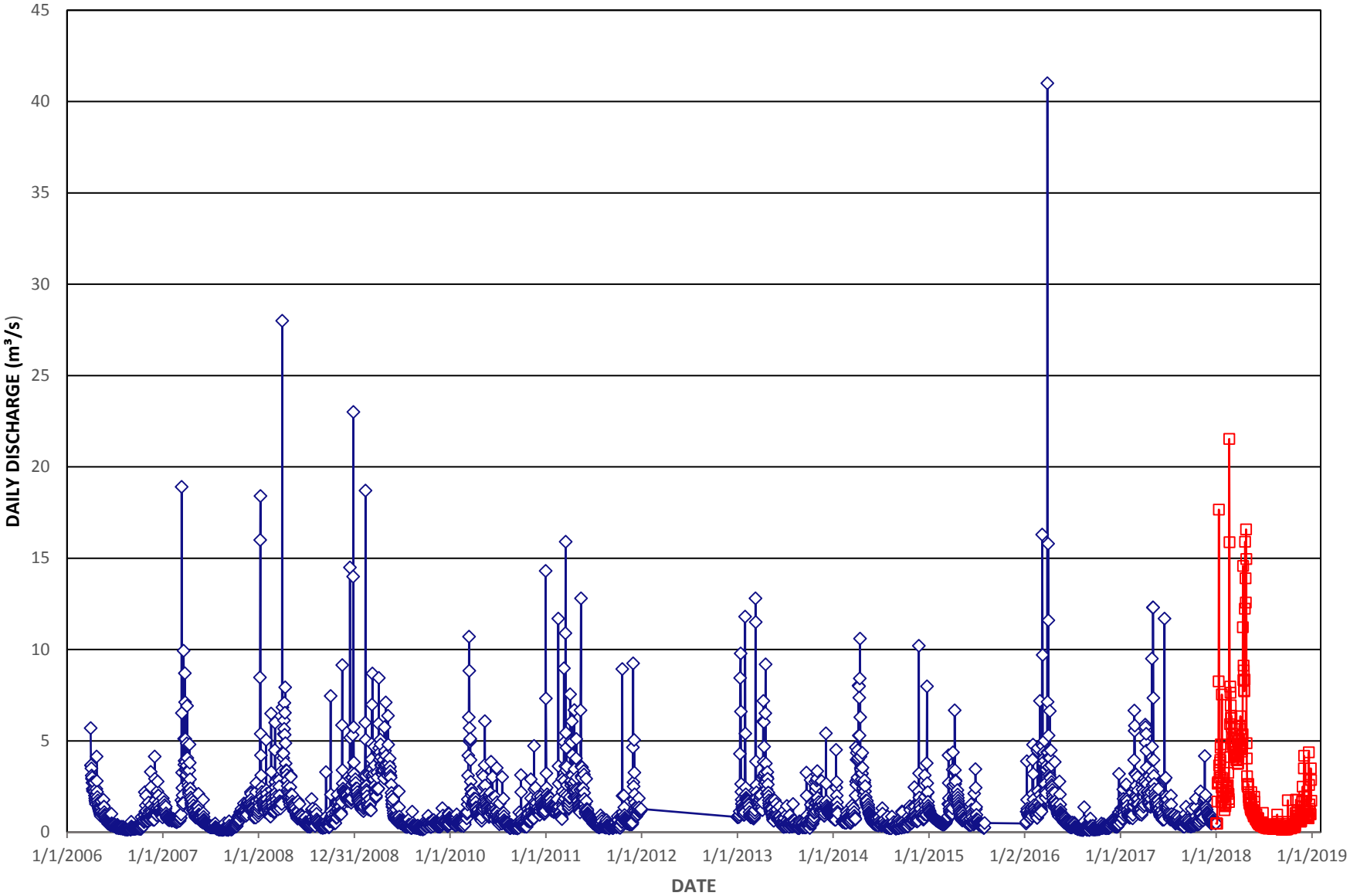
Flow — 1995-2017

FIGURE A-11

SURFACE WATER HYDROGRAPH

Pretty River at Collingwood

Environment Canada Station 02ED031



NOTE: Data for this graph obtained from Government of Canada Hydrometric Data Station 02ED015. (https://wateroffice.ec.gc.ca)

2006-2017 2018

APPENDIX B & C – HISTORIC SURFACE WATER AND GROUNDWATER DATA

For the purposes of paper conservation both Appendix B and C can be found on Walker Industries company website. From the corporate website under the divisions tab select aggregates. From here select Duntroon Quarry from the options listed. In addition, a link to the historic data is provided below:

http://www.walkerind.com/walker-aggregates/Duntroon-Quarry/

APPENDIX B

PERFORMANCE INDICATOR MONITORING PROGRAM RESULTS

TABLE B-1
PERFORMANCE INDICATOR MONITORING PROGRAM SURFACE WATER LOCATION INFORMATION

DUNTROON QUARRY - AMP REPORT (2017)
111-53312-00 A61

DESIGNATION	NAD27 EASTING	NAD27 NORTHING	APPROXIMATE GROUND ELEVATION (m ASL)	DESCRIPTION	CULVERT DIMENSIONS	MONITORING PROGRAM	MEASUREMENT TYPE
SW1	559102	4914051	513	Twin culverts located at southwest corner of quarry wetland at Grey County Road 31 (Townline Road)	South culvert dia. 0.62m, North culvert dia. 0.60m	Performance Indicator	V, M
SW2	559063	4914546	515	Single culvert located at northwest corner of quarry wetland	Oblong shaped culvert	Performance Indicator	V,M
SWB-1	559491	4914187	513	Single culvert located at southwest corner of quarry; outlet into quarry wetland	Oblong shaped culvert	Historical	-
QFSW1	559487	4914389	500	Quarry floor influx from west face	Stream Channel Flow	Historical	-
QFSW2	559810	4914354	499	Quarry floor surface water flow in channel prior to main sump pond	Stream Channel Flow	Long Term Trend	V
SWO-2	558414	4914264	510	Stream Channel west of SW1 on Osprey Quarry Property	Stream Channel Flow	Performance Indicator	V,M
SW3	558875	4915721	510	Single culvert located across Grey Rd 31 at north edge of proposed quarry property	Oblong shaped culvert	Performance Indicator	V,M,E
SW3A	558805	4915721	511	Single culvert located under Grey Rd 31, just south of intersection with 26/27 Sideroad	Oblong shaped culvert	Historical	V,B,E
SW4	558876	4913736	515	Single culvert located on Osprey 10th Line, east of Kenwell farm buildings	Culvert Diameter: 0.57 m	Historical	E,V
SW5	556683	4913070	499	Single concrete culvert located on Osprey 10th Line	4.91 m wide square concrete culvert	Historical	V
SW6	556103	4912881	500	Single concrete culvert located on Osprey 10th Line	4.78 m wide square concrete culvert	Historical	V
SW6A	555237	4912472	495	Double culvert on Osprey Sideroad 30, south of Osprey 10th Line	Stream Channel Flow	Performance Indicator	V
SW7	560196	4915307	512	Millar pond outlet	Stream Channel Flow	Long Term Trend	V,E
SW8	560343	4915276	510	Bridson pond outlet	Bucket Capture of Flow out of partial culvert	Long Term Trend	V,E
SW9	560440	4915421	508	Channel flow beneath walking path into sinkhole on Bridson property	Stream Channel Flow	Performance Indicator	V,M,E

NOTE:
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- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- * indicates historical surface water station that is not included in the Performance Indicator Monitoring Program.
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement

TABLE B-1
PERFORMANCE INDICATOR MONITORING PROGRAM SURFACE WATER LOCATION INFORMATION
DUNTROON QUARRY - AMP REPORT (2017)
111-53312-00 A61

DESIGNATION	NAD27 EASTING	NAD27 NORTHING	APPROXIMATE GROUND ELEVATION (m ASL)	DESCRIPTION	CULVERT DIMENSIONS	MONITORING PROGRAM	MEASUREMENT TYPE
SW10	561192	4915418	477	Seep uphill of B. Franks' well tile catchment	Stream Channel Flow	Performance Indicator	V,M,E
SW11	561128	4915780	445	Culmination of B. Franks' seeps into a stream; taken near toe of scarp where stream passes beneath path	Stream Channel Flow	Performance Indicator	V,M,E
SW11A	561081	4915809	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	Performance Indicator	V,M,E
SW11B	561065	4915819	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	Performance Indicator	V,M,E
SW11C	561048	4915838	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	Performance Indicator	V,M,E
SW11D	561038	4915866	446	B. Franks' seep, located near toe of scarp in rock talus	Stream Channel Flow	Performance Indicator	V,M,E
SW11E	561219	4915760	435	Stream from B. Franks' seeps into pond; downstream from SW11 and just upstream of pond	Stream Channel Flow	Performance Indicator	V,E,B
SW12	561273	4915694	435	Single culvert into B. Franks' pond from south	Bucket capture of flow out of culvert	Historical	V,E,B
SW12A	561471	4915441	450	Single culvert near B. Franks' barn	Stream Channel Flow	Historical	V,E
SW13	561283	4915824	427	B. Franks' pond outlet	Bucket capture of flow out of culvert	Long Term Trend	V,E,B
SW14	561574	4916032	410	Channel flow east of Conc. 10, from culvert crossing Conc. 10 south of H. Franks' driveway	Stream Channel Flow	Performance Indicator	V
SW15	561481	4916204	420	Channel flow east of Conc. 10, from culvert crossing Conc. 10 north of H. Franks' driveway	Stream Channel Flow	Performance Indicator	V
SW16	560955	4916433	415	Single culvert under 26/27 Sideroad east of F. Sestito's property	Stream Channel Flow	Performance Indicator	E
SW17	560592	4916314	431	Sestito pond outlet channel on south side of 26/27 Sideroad, measured just west Sestito property driveway	Stream Channel Flow	Performance Indicator	V,M,E
SW17A	560595	4916324	430	Stream channel on north side of 26/27 Sideroad, measured across from Sestito property driveway	Stream Channel Flow	Performance Indicator	V

NOTE:
- Ground Elevation data determined from Ontario Base Map elevation contours
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- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- * indicates historical surface water station that is not included in the Performance Indicator Monitoring Program
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement

TABLE B-1
PERFORMANCE INDICATOR MONITORING PROGRAM SURFACE WATER LOCATION INFORMATION

DUNTROON QUARRY - AMP REPORT (2017)
111-53312-00 A61

DESIGNATION	NAD27 EASTING	NAD27 NORTHING	APPROXIMATE GROUND ELEVATION (m ASL)	DESCRIPTION	CULVERT DIMENSIONS	MONITORING PROGRAM	MEASUREMENT TYPE
SW17B	560593	4916314	431	Stream channel on south side of 26/27 Sideroad, measured west of Sistito property driveway, upstream of where 17/17B join.	Stream Channel Flow	Historical	V
SW18	561392	4916787	390	Single culvert on Concession 10, north of 26/27 Sideroad	Stream Channel Flow	Performance Indicator	V
SW19	564260	4915281	335	Single large diameter culvert for Batteaux Creek on County Rd. 124	Stream Channel Flow	Long Term Trend	V
SW20	560010	4916161	495	Concrete crib north of 26/27 sideroad adjacent to Pretty River Provincial Park/Bruce Trail	Stream Channel Flow	Long Term Trend	V,E
SW21	561298	4916061	430	H. Franks' pond outlet	Bucket capture of flow out of culvert	Long Term Trend	V,E,B
SW21A	561236	4916039	433	H. Franks' pond inlet	Stream Channel Flow	Long Term Trend	V,E,B
SW21B	561013	4915969	449	Cistern overflow channel uphill of H. Franks' pond, feeds pond inlet	Stream Channel Flow Cistern outlet pipe diameter: 0.10 m	Long Term Trend	V,M,E
SW21C	560703	4916021	470	H. Franks' water supply system cistern inlet/overflow culvert	Stream channel Flow	Performance Indicator	V,E
SW21D	560949	4915928	450	Single culvert under H. Franks field access trail at base of scarp	Bucket capture of flow out of culvert	Historical	V,B,E
SW22	560645	4914445	492	Single culvert under ski trail west of Sampson fields	Bucket capture of flow out of culvert	Long Term Trend	V,B
SW22A	560950	4914876	485	Seep feeding small stream in northwest corner of Sampson fields	Stream Channel Flow	Long Term Trend	B,E
SW22B	560804	4914711	477	Swamp/seep area on north side of access trail from Sampson fields to ski trails	Stream Channel Flow	Historical	-
SW22C	560800	4914701	477	Culvert on south side of access trail from Sampson fields to ski trails. Culvert is infilled with sediment and channel is relatively flat. Treated as stream flow.	Stream Channel Flow just downstream of culvert	Long Term Trend	V
SW23	561197	4916509	410	Single culvert crossing 26/27 Sideroad west of Concession 10	Bucket capture of flow out of culvert	Historical	-
SW24	560603	4916157	445	F. Sestito's pond inlet from H. Franks' property	Stream Channel Flow	Historical	V,M,E

NOTE:
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- V indicates Valeport Electronic Flow Velocity Meter measurement
- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- * indicates historical surface water station that is not included in the Performance Indicator Monitoring Program
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement

TABLE B-1
PERFORMANCE INDICATOR MONITORING PROGRAM SURFACE WATER LOCATION INFORMATION

DUNTROON QUARRY - AMP REPORT (2017)
111-53312-00 A61

DESIGNATION	NAD27 EASTING	NAD27 NORTHING	APPROXIMATE GROUND ELEVATION (m ASL)	DESCRIPTION	CULVERT DIMENSIONS	MONITORING PROGRAM	MEASUREMENT TYPE
SW24A	560487	4916124	460	F. Sestito's water supply: barrel overflow and pipe discharges (below Manitoulin formation outcrop)	Bucket capture of flow out of pipes, Valeport measurement of stream channel	Performance Indicator	V,B,E
SW24B	560569	4916169	445	Seep channel just up from F. Sestito's garden	Bucket capture of flow out of pipes, Valeport measurement of stream channel	Historical	V,B,E
SW24C	560600	4916150	442	Stream just east of where SW24A and SW24B combine and upstream of outlet into Sistito pond.	Stream Channel Flow	Historical	V
SW25	559425	4912202	507	Single culvert outlet into swamp southwest of Edward Lake; fed by Edward Lake and open grate in the ditch north of SW25	Culvert Diameter: 0.62 m	Historical	-
SW25A	559435	4912359	508	Channel outlet from Edward Lake into a culvert which crosses beneath Grey Road 31. Only monitored when input from open grate/ditch is observed when monitoring SW25.	Stream Channel Flow	Historical	-
SW26	560781	4913072	507	Channel flow upstream of sinkhole on ski trails near unopened road allowance for 21/22 Sideroad	Stream Channel Flow	Historical	-
SW26A	560745	4913095	512	Two culverts upstream of SW26 sinkhole	East Culvert Diameter: 0.38 m West Culvert: Oblong Shaped	Historical	-
SW27	560266	4916323	462	Culmination of SW27A and SW27B	Stream Channel Flow	Historical	-
SW27A	560021	4916333	492	Groundwater seep, located east of SW28, east of Bruce Trail	Stream Channel Flow	Historical	-
SW27B	559989	4916364	497	Groundwater seep, located north-west of SW27A, east of Bruce Trail	Stream Channel Flow	Historical	-
SW77	560149	4916284	494	Groundwater seep, located south-east of SW20, west of Bruce Trail	Stream Channel Flow	Performance Indicator	V

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- Ground Elevation data determined from Ontario Base Map elevation contours
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- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- * indicates historical surface water station that is not included in the Performance Indicator Monitoring Program
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement

TABLE B-1
PERFORMANCE INDICATOR MONITORING PROGRAM SURFACE WATER LOCATION INFORMATION

DUNTROON QUARRY - AMP REPORT (2017)
111-53312-00 A61

DESIGNATION	NAD27 EASTING	NAD27 NORTHING	APPROXIMATE GROUND ELEVATION (m ASL)	DESCRIPTION	CULVERT DIMENSIONS	MONITORING PROGRAM	MEASUREMENT TYPE
SW3B (RR3 KARST)	558854	4915346	510	RR3 Wetland Karst Sink Point Channel, west of Grey County Road 31, downstream of SW3 and SW3C.	Stream Channel Flow	Performance Indicator	V
SW3C (RR3 OUT)	558875	4915347	510	RR3 Wetland outflow from pond that is downstream of SW3. West of Grey County Road 31.	Stream Channel Flow	Long Term Trend	V
PR Control	558052	4918002	360	Pretty River Control Station on 30/31 Sideroad. Flow measured on south side of road, upstream of culvert.	Stream Channel Flow	Performance Indicator	V
BC Control	563207	4913957	405	Batteaux Creek Control Station on 21/22 Sideroad. Flow measured on north side of road, downstream of culvert.	Stream Channel Flow	Performance Indicator	V

NOTE:
- Ground Elevation data determined from Ontario Base Map elevation contours
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- M indicates manual velocity measurement
- - indicates SW location not currently monitored for discharge volumes
- * indicates historical surface water station that is not included in the Performance Indicator Monitoring Program
- E indicates visual estimate velocity measurement
- B indicates bucket collection velocity measurement

TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
8-Jul-96	3.4					
6-Sep-96	47.0	1.4				
23-Dec-96	11.3	11.3				
26-Feb-97	91.2	55.2				
8-May-97	42.1	24.0				
26-Aug-97	7.0	3.6				
19-Dec-97	4.5	9.4				
27-Feb-98	NA	NA				
8-Apr-98	32.2	2.7				
10-Aug-98	Dry	1.7				
29-Dec-98	NA	NA				
24-Feb-99	NA	NA				
28-Apr-99	7.1	5.8		29.1		
26-May-99	15.0	4.0		19.5		
29-Jun-99	1.0	2.0				
26-Jul-99	Dry	0.5				
17-Aug-99	Dry	1.0				
27-Sep-99	Dry	0.4				
25-Oct-99	18.0	1.8				
21-Nov-99	25.0	6.0				
21-Dec-99	NA	NA				
25-Jan-00	Frozen	14.3				
29-Feb-00	98.0	17.4				
31-Mar-00	41.0	8.0				
2-Jun-00	51.6	11.5	131.9			
8-Jun-00	35.0	8.9	110.5			
15-Jun-00	107.0	23.6	78.7			
22-Jun-00	93.6	15.8	70.5			
29-Jun-00	106.0	14.0	72.5			
7-Jul-00	57.0	12.0	69.0			
13-Jul-00	45.0	10.0	64.0			
20-Jul-00	54.0	13.0	55.0			
27-Jul-00	49.0	11.0	59.0			
3-Aug-00	58.8	17.0	43.4			
17-Aug-00	27.0	6.0	26.0			
24-Aug-00	29.0	5.0	25.0			
29-Aug-00	27.0	5.0	25.0			

NOTE:
- All surface water flow measurements recorded in L/s
- SW1 - 2 Culverts across Townline Road.
- SW2 - Culvert across County Road 63
- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
- QFSW1 - Represents seepage inflow in southwest corner/west wall of quarry (not monitorable after July 16, 2004).
- QFSW2 - Stream flow measurement of surface water prior to main sump pond
- NA indicates flow not available
- Frozen indicates flow not measured due to snow accumulation or frozen water conditions
- Dry indicates no flow or ponded water at surface water station

TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
7-Sep-00	23.0	5.0	37.0			
14-Sep-00	23.0	5.0	21.0			
21-Sep-00	13.0	1.0	NA			
28-Sep-00	16.0	5.0	17.0			
5-Oct-00	25.0	9.0	21.0			
12-Oct-00	29.0	9.0	43.0			
19-Oct-00	32.0	10.0	35.0			
26-Oct-00	24.0	6.0	22.0			
2-Nov-00	68.0	7.0	42.0			
9-Nov-00	40.0	8.0	42.0			
16-Nov-00	71.0	7.0	38.0			
18-Nov-00	46.1	NA	NA			
24-Nov-00	41.0	5.0	19.0			
30-Nov-00	45.7	13.2	14.1			
21-Dec-00	45.0	196105.0	19.0			
16-Feb-01	35.0	11.9	31.6			
22-Feb-01	62.0	11.0	22.0			
1-Mar-01	99.0	11.1	24.6			
8-Mar-01	64.0	13.2	19.3			
15-Mar-01	72.0	12.5	23.6			
22-Mar-01	54.0	11.0	28.0			
29-Mar-01	53.0	9.0	20.8			
6-Apr-01	72.0	28.7	51.9			
12-Apr-01	152.0	35.0	82.8			
19-Apr-01	191.0	42.0	72.8			
26-Apr-01	110.0	19.0	56.0			
2-May-01	94.0	13.0	39.0			
10-May-01	76.0	8.0	26.0			
17-May-01	56.0	6.0	24.0			
24-May-01	74.0	6.0	26.0			
31-May-01	45.5	6.0	25.1			
7-Jun-01	47.0	5.0	30.2			
12-Jun-01	49.8	5.0	21.0			
21-Jun-01	Dry	3.9	76.3			
28-Jun-01	66.0	4.0	76.0			
5-Jul-01	30.0	11.0	20.0			
12-Jul-01	32.0	1.9	16.0			

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- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
- QFSW1 - Represents seepage inflow in southwest corner/west wall of quarry (not monitorable after July 16, 2004).
- QFSW2 - Stream flow measurement of surface water prior to main sump pond
- NA indicates flow not available
- Frozen indicates flow not measured due to snow accumulation or frozen water conditions
- Dry indicates no flow or ponded water at surface water station

TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
19-Jul-01	16.0	2.0	25.0			
26-Jul-01	10.0	2.0	78.0			
30-Jul-01	13.0	2.0	80.0			
9-Aug-01	13.0	3.0	74.0			
16-Aug-01	14.0	1.0	76.0			
23-Aug-01	21.2	2.0	4.0			
30-Aug-01	35.3	1.5	7.1			
6-Sep-01	30.0	2.0	0.3			
13-Sep-01	46.0	2.0	Dry			
20-Sep-01	38.0	2.0	Dry			
27-Sep-01	35.8	2.2	Dry			
4-Oct-01	38.1	2.4	Dry			
11-Oct-01	34.4	2.2	Dry	9.2		
18-Oct-01	51.7	10.2	Dry			
24-Oct-01	73.0	13.0	81.0			
1-Nov-01	93.0	12.0	58.4			
6-Nov-01	85.9	11.7	73.4			
15-Nov-01	97.6	10.4	72.5			
29-Nov-01	81.4	12.8	59.6			
6-Dec-01	73.9					
12-Dec-01	72.6					
4-Jan-02	70.0	8.0	12.0			
10-Jan-02	60.0	6.0	7.0			
16-Jan-02	57.5	7.0	8.0			
24-Jan-02	53.0	8.0	5.0			
31-Jan-02	55.0	6.0	3.0			
7-Feb-02	58.5	7.0	1.0			
14-Feb-02	51.0	7.0	4.0			
21-Feb-02	64.0	21.0	29.0			
28-Feb-02	71.5	14.0	26.0			
7-Mar-02	74.0	15.0	29.0			
14-Mar-02	94.5	35.0	76.0			
21-Mar-02	80.5	24.0	49.0			
28-Mar-02	78.0	14.0	13.0			
4-Apr-02	86.5	17.0	19.0			
12-Apr-02	104.0	42.0	81.0			
18-Apr-02	92.5	25.0	67.0			
25-Apr-02	86.0	15.0	47.0			
16-May-02	79.0	18.0	66.0			

NOTE:
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- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
- QFSW1 - Represents seepage inflow in southwest corner/west wall of quarry (not monitorable after July 16, 2004).
- QFSW2 - Stream flow measurement of surface water prior to main sump pond
- NA indicates flow not available
- Frozen indicates flow not measured due to snow accumulation or frozen water conditions
- Dry indicates no flow or ponded water at surface water station

TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
23-May-02	62.5	15.0	76.0			
30-May-02	67.0	11.0	83.0			
6-Jun-02	46.0	7.5	78.0			
13-Jun-02	90.0	8.0	77.0			
20-Jun-02	45.0	5.0	75.0			
28-Jun-02	48.5	6.0	70.0			
4-Jul-02	<0.1	2.0	66.0			
11-Jul-02	38.0	3.0	69.0			
18-Jul-02	1.0	2.0	47.0			
25-Jul-02	19.5	3.6	82.0			
1-Aug-02	36.6	2.1	Dry			
8-Aug-02	16.5	1.3	82.8	2.2		
15-Aug-02	36.1	10.0	Dry			
23-Aug-02	40.3					
30-Aug-02	21.7	3.7	72.0			
6-Sep-02	16.0	1.5	10.0			
13-Sep-02	20.7	1.1	Dry			
19-Sep-02	1.0	1.0	Dry			
26-Sep-02	46.6	1.0	Dry			
3-Oct-02	56.4	1.0	Dry			
11-Oct-02	Dry	1.0	Dry			
17-Oct-02	Dry	1.0	Dry			
25-Oct-02	92.0	1.0	76.3			
1-Nov-02	62.2	1.0	63.0			
8-Nov-02	<0.1	1.0	72.3			
15-Nov-02	66.2	1.0	60.8			
22-Nov-02	56.1	1.0	Dry			
28-Nov-02	54.0	1.6	Dry			
6-Dec-02	36.6	1.0	Dry			
12-Dec-02	31.4	1.0	Dry			
20-Dec-02	20.2	5.5	Dry			
3-Jan-03	29.5	2.5	Dry			
10-Jan-03	20.8	2.3	Dry			
16-Jan-03	22.8	Frozen	Dry			
24-Jan-03	24.2	Frozen	Dry			
31-Jan-03	22.0	Frozen	Dry			
7-Feb-03	20.7	Frozen	Dry			
14-Feb-03	19.6	Frozen	Dry			

NOTE:
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- SW1 - 2 Culverts across Townline Road.
- SW2 - Culvert across County Road 63
- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
- QFSW1 - Represents seepage inflow in southwest corner/west wall of quarry (not monitorable after July 16, 2004).
- QFSW2 - Stream flow measurement of surface water prior to main sump pond
- NA indicates flow not available
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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
21-Feb-03	17.1	Frozen	Dry			
28-Feb-03	18.5	Frozen	Dry			
7-Mar-03	16.4	Frozen	Dry			
14-Mar-03	17.8	Frozen	Dry			
21-Mar-03	23.0	26.7	Dry			
28-Mar-03	134.9	38.3	Dry			
4-Apr-03	119.5	26.7	65.5			
9-Apr-03	61.0	12.6	66.9			
17-Apr-03	94.6	27.0	67.4			
25-Apr-03	60.4	13.2	67.4			
2-May-03	88.9	21.1	75.3			
9-May-03	96.7	7.9	78.9			
15-May-03	87.7	5.7	0.0			
22-May-03	11.9	5.0	25.2			
29-May-03	Dry	11.8	62.9			
9-Jun-03	19.3	8.3	64.8			
13-Jun-03	17.3	9.6	73.3			
23-Jun-03	89.6	5.8	74.7			
4-Jul-03	69.8	4.0	78.1			
11-Jul-03	54.2	3.4	69.3			
18-Jul-03	42.7	3.6	78.9			
22-Jul-03	2.6	3.6	50.8			
24-Jul-03	4.5	2.8	52.6			
31-Jul-03	42.6	2.8	72.3			
8-Aug-03	3.6	4.3	19.6			
15-Aug-03	Dry	2.3	Dry			
20-Aug-03	Dry	2.6	6.9			
27-Aug-03	35.2	1.6	75.5			
5-Sep-03	Dry	2.3	76.4			
11-Sep-03	22.9	1.4	<1.0			
18-Sep-03	13.5	0.8	76.5			
25-Sep-03	0.7	0.5	Dry			
2-Oct-03	33.1	0.8	Dry			
9-Oct-03	Dry	0.4	Dry			
17-Oct-03	58.3	1.7	Dry			
23-Oct-03	<0.1	1.4	Dry			
31-Oct-03	49.5	3.2	Dry			

NOTE:
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- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
7-Nov-03	46.6	8.0	73.2			
17-Nov-03	67.8	11.1	45.2			
28-Nov-03	60.4	13.3	29.5			
19-Dec-03	55.8	12.5	2.2			
31-Dec-03	55.8	15.7	5.5			
12-Jan-04	106.1	16.8	5.3			
16-Jan-04	76.9	13.0	6.2			
20-Jan-04	68.8	9.8	Frozen			
30-Jan-04	58.9	6.6	Dry			
6-Feb-04	49.2	5.4	5.1			
12-Feb-04	44.4	4.6	6.0			
27-Feb-04	39.9	3.9	Frozen			
4-Mar-04	66.1	12.8	5.6			
12-Mar-04	101.7	24.2	4.7			
19-Mar-04	73.9	12.8	19.0			
26-Mar-04	136.1	58.8	8.8			114.7
2-Apr-04	117.1	58.1	85.3			82.2
8-Apr-04	104.8	30.1	79.6			Flooded
16-Apr-04	86.7	19.9	80.2			Flooded
23-Apr-04	91.3	13.5	76.4		30.0	153.2
30-Apr-04	62.4	10.5	72.3			210.2
7-May-04	88.9	11.9	Dry			NA
14-May-04	4.1	9.8	27.9			217.0
19-May-04	18.2	7.6	78.4			278.6
28-May-04	112.8	26.6	72.7			308.7
4-Jun-04	95.6	10.6	71.0			242.3
11-Jun-04	9.8	6.9	Dry			172.2
17-Jun-04	84.6	6.9	Dry			179.5
24-Jun-04	Dry	5.9	Dry		34.0	125.1
1-Jul-04	44.7	3.8	Dry	7.7	23.0	108.3
9-Jul-04	Dry	3.7	74.9	3.5	29.0	NA
16-Jul-04	58.3	4.2	70.5	60.8	27.0	293.0
22-Jul-04	45.3	3.3	66.6	20.6		213.8
29-Jul-04	76.7	3.2	Dry	24.0		133.5
6-Aug-04	Dry	1.8	Dry	13.3		159.1
12-Aug-04	Dry	2.7	Dry	4.3		155.5
19-Aug-04	26.8					
20-Aug-04	36.5	6.6	Dry	19.8		84.2

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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
26-Aug-04	36.5	2.4	Dry	9.5		116.9
3-Sep-04	Dry	1.3	Dry	4.9		176.6
9-Sep-04	Dry	2.3	Dry	1.9		163.4
17-Sep-04	49.6	3.2	Dry	2.6		194.3
23-Sep-04	Dry					
26-Sep-04	Dry	2.1	Dry	9.5		126.7
1-Oct-04	Dry	<1.0	Dry	6.6		128.9
7-Oct-04	Dry	<1.0	Dry	0.1		86.9
14-Oct-04	Dry	3.2	Dry	1.2		77.1
20-Oct-04	Dry	0.9	Dry	31.3		122.7
24-Oct-04	42.4					
28-Oct-04	Dry	1.2	Dry	7.7		141.1
4-Nov-04	90.0	2.7	Dry	60.0		124.2
7-Nov-04	90.0					
11-Nov-04	Dry	1.7	Dry	42.4		78.0
19-Nov-04	Dry	1.8	42.4	10.2		97.6
25-Nov-04	Dry	0.4	79.5	0.0		88.8
2-Dec-04	Dry	0.3	66.3	23.3		87.8
9-Dec-04	Dry	3.9	69.9	23.8		71.9
17-Dec-04	0.6	Frozen	31.5	19.2		57.6
29-Dec-04	44.1	Frozen	Frozen	Frozen		Frozen
5-Jan-05	59.4	10.7	4.9	108.9		107.2
13-Jan-05	Dry	41.9	70.7	258.5		
20-Jan-05	79.2	18.1	Frozen	Frozen		121.1
28-Jan-05	45.5	9.3	4.7	Frozen		78.0
3-Feb-05	50.6	8.1	5.6	Frozen		71.3
10-Feb-05	Dry	5.5	64.9	Frozen		80.4
16-Feb-05	64.0	9.0	Dry	Frozen		80.2
24-Feb-05	9.0	3.8	Dry	Frozen		62.3
3-Mar-05	3.3	5.7	Dry	Frozen		59.5
10-Mar-05	Dry	9.4	Dry	Frozen		67.6
17-Mar-05	<1.0	9.4	Dry	Frozen		62.6
24-Mar-05	38.5	8.9	Dry	Frozen		68.5
30-Mar-05	71.4	15.6	Dry	124.3		77.0
7-Apr-05	15.2	46.6	46.3	Flooded		65.7
15-Apr-05	121.8	49.9	66.7	Flooded		233.4
21-Apr-05	90.8	39.8	73.1	253.6		319.3
28-Apr-05	70.3	43.1	44.3	348.6		323.8
6-May-05	60.1	19.4	67.1	116.2		268.9
13-May-05	21.7	11.3	Dry	73.4		272.0

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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
20-May-05	21.2	8.7	Dry	68.5		356.3
27-May-05	44.4	7.4	38.0	90.8		268.7
3-Jun-05	23.5	5.8	34.2	62.2		258.3
10-Jun-05	Dry	4.6	Dry	8.5		273.4
17-Jun-05	11.0	5.1	Dry	53.8		283.9
24-Jun-05	1.1	3.7	NA	4.9		313.2
30-Jun-05	9.3	3.8	42.3	3.6		346.8
7-Jul-05	4.6	3.1	32.5	10.6		244.5
15-Jul-05	25.0	2.7	57.8	Dry		238.6
21-Jul-05	16.2	1.8	56.1	Dry		226.1
28-Jul-05	Dry	1.7	54.4	Dry		251.2
2-Aug-05	Dry	1.7	53.7	Dry		256.0
12-Aug-05	Dry	1.4	59.3	Dry		309.1
19-Aug-05	Dry	1.4	NA	Dry		373.3
24-Aug-05	Dry	0.6	Dry	Dry		263.0
1-Sep-05	Dry	0.8	62.1	Dry		201.0
9-Sep-05	Dry	0.8	34.7	Dry		436.8
16-Sep-05	Dry	0.6	65.0	Dry		258.7
23-Sep-05	Dry	0.3	<0.1	Dry		317.2
30-Sep-05	Dry	1.0	<0.1	Dry		371.9
7-Oct-05	Dry	0.9	Dry	Dry		280.3
14-Oct-05	Dry	0.8	Dry	0.1		357.7
21-Oct-05	Dry	0.5	Dry	1.9		256.0
28-Oct-05	Dry	0.6	Dry	10.1		205.9
4-Nov-05	Dry	0.5	Dry	4.4		254.8
11-Nov-05	Dry	0.2	Dry	4.1		210.7
18-Nov-05	57.0	1.0	66.2	42.9		222.3
25-Nov-05	49.5	0.5	61.1			231.2
2-Dec-05	51.5	2.0	71.3	32.7		221.8
9-Dec-05	44.1	1.9	56.8	28.5		175.0
16-Dec-05	45.8	1.8				Flooded
22-Dec-05	39.0	1.3	62.3	56.6		220.0
30-Dec-05	55.4	2.5				
6-Jan-06	40.7	5.9	62.7	88.1		207.8
13-Jan-06	Dry	10.0	58.0	48.2		202.1
20-Jan-06	44.7	11.6	65.3	85.5		194.5
27-Jan-06	53.1	11.0	75.0	78.8		210.5

NOTE:
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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
3-Feb-06	53.5	16.7	63.8	154.3		179.6
10-Feb-06	52.8	11.4	Dry	94.6		194.5
20-Feb-06	51.9	10.2	Dry	Frozen		191.9
24-Feb-06	50.4	9.7	Dry	Frozen		153.2
3-Mar-06	55.3	7.9	Dry	Frozen		177.4
10-Mar-06	58.7	35.6	72.8	134.3		229.0
17-Mar-06	92.4	41.8	87.4	166.4		208.2
24-Mar-06	74.4	21.4	71.6	143.4		215.0
31-Mar-06	79.7	24.7	71.3	184.9		266.8
7-Apr-06	162.9	35.1	70.5	238.5		Flooded
10-Apr-06	111.0	29.3				
13-Apr-06	55.1	35.1	Dry	133.9		274.4
21-Apr-06	59.8	15.5	Dry	88.6		190.8
26-Apr-06	60.2	15.4	Dry	92.0		225.8
5-May-06	64.1	11.9	Dry	102.0		202.0
12-May-06	57.7	8.7	Dry	84.6		253.8
19-May-06	48.5	9.3	Dry	61.4		219.6
25-May-06	43.0	4.7	Dry	77.7		197.5
2-Jun-06	35.4	5.3	Dry	29.0		192.3
9-Jun-06	48.5	5.1	Dry	39.3		194.4
16-Jun-06	6.1	3.9	Dry	8.6		120.1
23-Jun-06	Dry	3.6	Dry	12.9		236.8
30-Jun-06	Dry	3.7	Dry	4.5		251.6
7-Jul-06		1.5	Dry	10.5		225.1
10-Jul-06	1.0					
14-Jul-06	Dry	1.3	Dry	5.2		249.6
21-Jul-06	Dry	1.7		12.7		226.0
28-Jul-06	Dry	2.5	Dry	7.2		214.4
4-Aug-06	32.8	5.1	Dry	10.8		245.0
11-Aug-06	Dry	0.3	Dry	2.7		232.7
18-Aug-06	Dry	0.9	Dry	4.4		197.2
25-Aug-06	4.4	0.1	Dry	3.8		197.9
1-Sep-06	13.8	<0.1	Dry	4.0		204.3
8-Sep-06	2.2	<0.1	Dry	8.9		192.7
15-Sep-06	33.8	<0.1	Dry	18.6		185.7
21-Sep-06	2.0	0.4	Dry	19.2		191.6
28-Sep-06	15.6	0.8		18.7		212.0

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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
6-Oct-06		0.7		17.5		170.4
13-Oct-06		0.1	Dry	12.9		189.7
20-Oct-06	48.2	0.5	Dry	7.4		209.0
26-Oct-06		2.6	Dry	24.5		213.1
3-Nov-06	95.4	5.7	Dry	123.3		153.9
10-Nov-06	77.8	9.4	Dry	62.7		186.3
17-Nov-06	26.4	17.8	Dry	45.6		167.8
24-Nov-06	51.5	12.7	Dry	47.2		196.5
4-Dec-06	92.9	13.1	Dry	80.3		Flooded
8-Dec-06	70.2	11.5	Dry	Frozen		128.8
28-Dec-06	54.9	10.2		86.8		141.1
5-Jan-07	60.1	11.1		78.3		164.8
12-Jan-07	56.1	10.8		Frozen		150.0
19-Jan-07	58.8	9.3		Frozen		136.9
26-Jan-07	4.9	7.4		Frozen		125.7
2-Feb-07	63.4	7.4		Frozen		122.2
9-Feb-07	63.6	5.1		Frozen		102.9
16-Feb-07	60.0	4.8		Frozen		94.3
22-Feb-07	58.4	3.5		Frozen		114.8
2-Mar-07	60.8	4.2		Frozen		134.7
9-Mar-07	32.4	4.3		Frozen		105.4
16-Mar-07	105.0	27.6		Frozen		Flooded
23-Mar-07	53.6	38.8		112.0		109.8
30-Mar-07	106.9	41.1		118.4		Flooded
5-Apr-07	108.9	35.0		177.2		Flooded
13-Apr-07	74.5	16.8		89.1		223.9
20-Apr-07	95.2	14.0		109.9		172.0
28-Apr-07	7.4	11.6		150.4		214.0
4-May-07	80.5	8.1		91.5		111.5
11-May-07	43.3	7.0		34.7		165.5
18-May-07	74.8	6.4		68.9		141.8
25-May-07	61.2	4.2		46.9		138.9
1-Jun-07	0.1	4.8		25.8		100.5
8-Jun-07	58.1	3.6		20.3		90.4
14-Jun-07	47.9	3.1		31.6		103.2

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DUNTROON QUARRY - AMP MONITORING REPORT 2016
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DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
22-Jun-07	0.0	1.8		0.0		121.0
29-Jun-07	17.0	1.6		21.2		147.4
6-Jul-07	20.5	3.8		15.2		150.0
13-Jul-07	0.0	5.2		4.9		97.0
20-Jul-07	0.1	1.7		3.6		140.9
27-Jul-07	1.6	1.4		0.0		148.6
3-Aug-07	0.0	0.6		0.0		141.8
10-Aug-07	0.1	0.6		0.0		93.0
17-Aug-07	10.1	0.6		0.0		147.7
24-Aug-07	0.0	1.1		2.1		157.2
30-Aug-07	7.6	0.6		7.3		100.3
7-Sep-07	21.1	1.1		17.7		71.6
14-Sep-07	1.2	0.7		13.1		65.4
21-Sep-07	10.7	0.2		3.3		86.9
28-Sep-07	9.8	<0.1		13.4		84.1
5-Oct-07	27.4	<0.1		15.9		78.3
12-Oct-07	Dry	0.1		28.8		76.4
19-Oct-07	10.4	<0.1		20.7		169.1
26-Oct-07	0.9	<0.1		26.3		99.0
2-Nov-07	27.2	<0.1		32.1		118.2
9-Nov-07	47.1	1.8		32.2		118.9
16-Nov-07	45.3	<0.1		57.9		122.8
23-Nov-07	35.6	0.7		Frozen		172.8
30-Nov-07	36.1	N/A		Frozen		139.6
7-Dec-07	48.9	0.7		Frozen		128.2
14-Dec-07	19.3	4.2		N/A		117.3
20-Dec-07	18.2	Frozen		Frozen		138.3
28-Dec-07	56.5	5.7		Frozen		N/A
4-Jan-08	31.1	7.0		Frozen		165.0
11-Jan-08	38.4	81.9		194.5		284.3
18-Jan-08	41.5	30.9		Frozen		593.7
25-Jan-08	57.3	26.2		Frozen		172.2
1-Feb-08	57.6	8.9		Frozen		180.9
8-Feb-08	48.0	25.8		Frozen		160.4
15-Feb-08	41.5	11.0		Frozen		135.9
22-Feb-08	63.4	10.8		Frozen		153.8
29-Feb-08	55.9	16.8		Frozen		131.6

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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
7-Mar-08	61.3	12.0		Frozen		151.7
14-Mar-08	53.1	14.8		Frozen		146.3
20-Mar-08	58.5	2.8		Frozen		161.9
28-Mar-08	63.5	5.1		Frozen		132.9
4-Apr-08	86.5	41.8		125.8		N/A
11-Apr-08	145.7	93.3		295.2		N/A
15-Apr-08	91.8	50.0		N/A		N/A
18-Apr-08	88.1	66.2		265.7		N/A
25-Apr-08	74.1	18.5		77.7		183.3
2-May-08	92.0	22.0		138.4		177.6
8-May-08	74.4	12.8		103.9		184.5
15-May-08	75.6	11.6		181.9		82.1
23-May-08	59.5	12.6		66.7		184.1
30-May-08	64.9	51.1		16.1		104.3
6-Jun-08	67.2	32.6		93.8		165.4
13-Jun-08	12.7	8.3		36.7		277.3
20-Jun-08	Dry	6.5		36.5		169.0
27-Jun-08	42.5	5.0		55.4		95.0
4-Jul-08	Dry	2.2		9.8		256.1
11-Jul-08	Dry	3.3		1.7		153.7
18-Jul-08	30.7	3.9		10.8		291.4
25-Jul-08	41.7	1.2		30.6		156.9
1-Aug-08	3.0	1.8		15.9		97.2
8-Aug-08	Dry	15.3		57.4		287.6
15-Aug-08	8.9	4.0		28.8		184.1
22-Aug-08	Dry	7.1		61.5		166.6
28-Aug-08	21.2	5.1		10.8		159.1
5-Sep-08	Dry	9.3		5.1		259.7
12-Sep-08	4.2	2.9		27.5		149.3
19-Sep-08	Dry	2.3		35.9		236.1
26-Sep-08	7.2	0.6		19.6		168.1
3-Oct-08	48.2	13.3		67.2		185.5
10-Oct-08	46.5	17.9		29.5		396.5
17-Oct-08	45.2	15.5		27.1		188.4
24-Oct-08	1.7	18.9		17.7		162.3
31-Oct-08	30.7	6.9		51.0		184.8
7-Nov-08	34.8	6.2		48.8		347.1

NOTE:
- All surface water flow measurements recorded in L/s
- SW1 - 2 Culverts across Townline Road.
- SW2 - Culvert across County Road 63
- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
- QFSW1 - Represents seepage inflow in southwest corner/west wall of quarry (not monitorable after July 16, 2004).
- QFSW2 - Stream flow measurement of surface water prior to main sump pond
- NA indicates flow not available
- Frozen indicates flow not measured due to snow accumulation or frozen water conditions
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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
13-Nov-08	34.8	13.2		85.5		204.8
21-Nov-08	12.0	Buried		Frozen		N/A
28-Nov-08	14.2	Frozen		Frozen		121.8
30-Nov-08	5.1	Buried		Frozen		Frozen
7-Dec-08	30.4	10.6		Frozen		154.9
19-Dec-08	26.8	N/A		Frozen		N/A
23-Dec-08	70.1	13.1		Frozen		151.5
29-Dec-08	103.2	69.3		Frozen		N/A
9-Jan-09	40.2	0.8		Frozen		Flooded
16-Jan-09	16.5	9.2		Frozen		193.2
23-Jan-09	0.9	11.0		Frozen		156.6
30-Jan-09	63.4	5.8		Frozen		N/A
6-Feb-09	<0.1	5.1		Frozen		77.5
13-Feb-09	53.7	35.0		Frozen		Flooded
20-Feb-09	67.1	14.6		Frozen		121.7
27-Feb-09	4.8	13.8		Frozen		128.6
6-Mar-09	0.6	13.0		Frozen		189.6
13-Mar-09	21.0	31.2		Frozen		179.6
20-Mar-09	55.3	26.3		88.0		142.3
27-Mar-09	40.5	19.2		104.3		139.1
3-Apr-09	109.6	28.3		166.7		226.5
9-Apr-09	92.3	26.6		Frozen		182.0
17-Apr-09	109.7	22.4		104.1		196.0
24-Apr-09	94.2	18.0		112.2		178.5
1-May-09	98.4	22.6		185.3		168.4
8-May-09	77.9	14.6		98.2		142.2
15-May-09	76.1	11.2		62.2		167.5
22-May-09	79.0	8.8		46.9		126.9
29-May-09	87.5	6.4		59.5		177.8
5-Jun-09	65.3	5.3		50.1		152.6
12-Jun-09	38.2	6.0		37.5		151.8
19-Jun-09	86.8	4.0		36.3		86.4
26-Jun-09	83.2	3.7		37.8		137.3
2-Jul-09	<0.1	2.0		63.4		131.2
10-Jul-09	4.0	1.3		9.6		141.6
17-Jul-09	0.2	2.2		3.3		150.1
24-Jul-09	<0.1	1.6		19.0		229.0

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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
31-Jul-09	<0.1	0.5		11.8		167.8
7-Aug-09	Dry	1.4		6.7		268.3
14-Aug-09	Dry	6.4		129.9		18.7
21-Aug-09	Dry	4.8		21.0		161.5
28-Aug-09	0.5	0.9		20.1		271.0
4-Sep-09	Dry	0.8		11.8		151.4
11-Sep-09	Dry	4.0		8.4		168.1
18-Sep-09	Dry	1.0		8.6		209.0
25-Sep-09	Dry	0.8		8.0		188.8
2-Oct-09	2.5	0.9		26.8		166.0
9-Oct-09	51.3	0.4		47.3		238.6
16-Oct-09	10.3	0.5		29.0		207.6
23-Oct-09	69.3	3.1		33.0		130.1
30-Oct-09	73.5	4.2		32.8		257.2
6-Nov-09	54.4	1.3		25.9		311.6
13-Nov-09	39.7	1.5		15.2		181.5
20-Nov-09	2.9	1.5		24.0		236.7
27-Nov-09	17.4	2.7		10.5		370.2
4-Dec-09	35.2	6.9		27.1		141.8
11-Dec-09	47.4	2.7		Frozen		94.1
18-Dec-09	12.9	13.4		Frozen		104.6
22-Dec-09	54.8	2.8		Frozen		135.1
28-Dec-09	52.6	4.7		Frozen		N/A
8-Jan-10	52.8	4.9		Frozen		N/A
15-Jan-10	55.2	4.5		Frozen		114.4
22-Jan-10	13.8	3.7		Frozen		80.2
29-Jan-10	32.7	8.2		Frozen		N/A
5-Feb-10	55.5	7.5		Frozen		95.8
12-Feb-10	40.3	8.2		Frozen		71.9
19-Feb-10	26.8	3.0		Frozen		86.0
1-Mar-10	28.0	2.5		Frozen		122.6
5-Mar-10	42.4	2.2		Frozen		100.8
12-Mar-10	23.1	12.5		Frozen		133.5
19-Mar-10	32.5	68.9		156.8		129.2
26-Mar-10	35.3	26.9		69.3		135.6
2-Apr-10	75.2	28.2		102.1		N/A
9-Apr-10	61.2	6.5		78.0		140.5
16-Apr-10	48.0	10.1		50.0		123.5

NOTE:
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- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
23-Apr-10	48.6	8.6		43.6		248.1
30-Apr-10	17.6	15.8		31.7		163.3
7-May-10	75.2	3.6		28.3		199.4
14-May-10	2.5	26.3		132.0		229.0
21-May-10	77.8	7.9		37.7		244.7
28-May-10	10.3	11.1		33.5		139.4
4-Jun-10	76.5	13.9		59.9		244.2
11-Jun-10	39.4	10.8		64.5		141.1
18-Jun-10	18.6	9.4		29.4		163.6
25-Jun-10	72.8	8.3		56.7		171.2
1-Jul-10	80.3	9.7		36.0		N/A
9-Jul-10	0.8	9.6		105.5		250.5
15-Jul-10	2.2	7.8		38.8		92.0
23-Jul-10	0.3	9.3		89.6		123.7
30-Jul-10	0.2	8.5		41.6		202.1
6-Aug-10	<0.1	9.7		26.0		118.3
13-Aug-10	0.0	4.6		21.1		182.7
20-Aug-10	0.0	2.8		17.1		153.8
27-Aug-10	0.0	3.5		14.0		117.2
3-Sep-10	0.0	5.9		1.4		162.1
10-Sep-10	0.0	5.4		2.0		172.0
17-Sep-10	0.0	5.3		21.3		302.9
24-Sep-10	0.2	3.2		41.7		199.9
1-Oct-10	3.6	7.8		53.5		276.6
8-Oct-10	17.6	6.6		33.5		285.1
15-Oct-10	4.2	5.6		45.2		151.5
22-Oct-10	7.2	2.6		24.2		182.7
29-Oct-10	1.3	4.2		27.1		169.8
5-Nov-10	1.3	6.2		68.8		162.8
12-Nov-10	6.4	11.1		40.3		182.8
19-Nov-10	11.5	22.6		83.3		139.1
26-Nov-10	16.6	13.8		106.6		150.7
3-Dec-10	5.0	12.7		68.3		140.0
9-Dec-10	15.5	9.3		Frozen		151.7
17-Dec-10	43.8	8.1		Frozen		106.0
23-Dec-10	10.4	6.3		Frozen		81.3
30-Dec-10	32.7	9.7		Frozen		N/A
7-Jan-11	34.0	23.6		Frozen		99.3

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SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
14-Jan-11	43.7	10.5		Frozen		123.9
21-Jan-11	42.0	8.1		Frozen		118.4
28-Jan-11	42.4	8.3		Frozen		93.9
4-Feb-11	34.8	6.4		Frozen		107.8
11-Feb-11	46.6	7.4		Frozen		69.4
18-Feb-11	12.6	16.5		Frozen		112.5
25-Feb-11	63.1	12.5		Frozen		102.1
4-Mar-11	6.8	4.8		Frozen		117.7
11-Mar-11	17.4	13.9		Frozen		82.0
18-Mar-11	10.3	42.0		Frozen		293.8
22-Mar-11	N/A	31.4		N/A		N/A
25-Mar-11	9.7	24.3		Frozen		120.5
1-Apr-11	11.7	15.8		158.7		132.1
8-Apr-11	14.2	34.0		134.2		171.4
5-Apr-11	73.7					
8-Apr-11	14.2	34.0		134.2		171.4
15-Apr-11	53.3	30.0		124.6		172.6
21-Apr-11	86.0	26.3		148.1		278.8
29-Apr-11	51.0	18.7		123.7		
5-May-11	57.9	3.3		103.2		200.2
13-May-11	45.5	3.9		94.0		206.2
20-May-11	81.7	24.4		144.1		328.9
27-May-11	18.7	14.2		132.7		
3-Jun-11	13.1	5.5		74.4		239.5
10-Jun-11	39.9	14.0		77.5		279.7
17-Jun-11	66.3	7.0		70.3		184.7
24-Jun-11	3.0	4.9		52.2		158.6
30-Jun-11	17.7	5.0		71.2		158.6
8-Jul-11	Dry	5.0		37.6		113.5
14-Jul-11	Dry	6.4		34.7		304.6
22-Jul-11	Dry	4.7		22.4		95.4
29-Jul-11	Dry	4.4		36.9		105.2
5-Aug-11	Dry	4.6		20.3		105.3
12-Aug-11	Dry	4.9		7.5		73.5
19-Aug-11	Dry	0.9		5.1		110.6
26-Aug-11	Dry	3.4		12.3		81.0
2-Sep-11	Dry	2.5		9.3		91.3
9-Sep-11	Dry	1.7		6.0		136.2
16-Sep-11	0.6	1.7		4.4		119.2
23-Sep-11	Dry	3.9		12.2		N/A

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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
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DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
30-Sep-11	Dry	3.1		15.5		105.0
6-Oct-11	40.2	1.7		20.5		57.7
14-Oct-11	Dry	3.3		41.2		177.6
20-Oct-11	-	9.4		-		-
21-Oct-11	42.0	4.4		79.3		258.3
28-Oct-11	10.6	4.9		50.4		326.5
4-Nov-11	32.6	1.6		43.8		111.2
11-Nov-11	0.3	7.3		43.6		91.8
18-Nov-11	32.5	2.5		39.6		N/A
25-Nov-11	45.1	2.6		28.9		85.6
2-Dec-11	45.3	9.7		56.9		N/A
9-Dec-11	52.9	13.4		75.7		142.7
16-Dec-11	18.0	13.7		65.5		116.8
23-Dec-11	36.8	14.0		Frozen		N/A
30-Dec-11	21.1	10.1		Frozen		N/A
6-Jan-12	17.7	1.1		Frozen		107.0
13-Jan-12	48.7	-		Frozen		-
20-Jan-12	41.0	15.5		Frozen		105.4
27-Jan-12	37.3	12.1		Frozen		92.7
3-Feb-12	56.7	12.7		Frozen		103.4
10-Feb-12	42.1	11.2		Frozen		85.4
17-Feb-12	30.1	5.5		Frozen		109.6
24-Feb-12	41.2	8.5		Frozen		N/A
1-Mar-12	46.5	4.1		Frozen		109.4
9-Mar-12	36.7	37.8		Frozen		Flooded
16-Mar-12	136.7	70.3		529.8		
23-Mar-12	26.7	29.0		131.3		146.3
30-Mar-12	42.1	11.1		180.4		128.7
6-Apr-12	47.5	9.8		N/A		N/A
13-Apr-12	16.6	8.0		163.8		296.9
20-Apr-12	37.0	18.2		185.5		388.5
27-Apr-12	1.5	7.9		218.5		167.7
4-May-12	5.0	9.5		290.7		208.7
11-May-12	4.0	5.8		121.9		181.5
18-May-12	32.7	8.1		191.8		173.5
25-May-12	24.8	6.8		170.1		204.3
1-Jun-12	7.9	6.3		54.5		162.0
8-Jun-12	23.2	6.2		43.3		141.0

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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
15-Jun-12	10.8	5.4		31.7		119.0
22-Jun-12	28.5	1.7		29.9		77.4
28-Jun-12	1.1	2.1		27.7		136.6
6-Jul-12	2.4	5.1		10.1		59.0
13-Jul-12	0.0	6.3		16.4		201.6
20-Jul-12	0.0	3.0		16.3		130.7
27-Jul-12	0.0	1.9		27.6		141.7
3-Aug-12	0.0	2.0		12.5		165.2
10-Aug-12	1.3	2.1		67.0		457.5
17-Aug-12	30.8	8.7		82.8		254.4
24-Aug-12	0.0	4.9		31.7		222.2
31-Aug-12	0.9	4.3		34.6		222.1
7-Sep-12	0.0	3.5		19.6		183.1
14-Sep-12	1.2	5.5		30.7		149.1
21-Sep-12	0.0	3.5		41.2		130.8
28-Sep-12	1.0	3.9		12.4		206.1
5-Oct-12	3.6	3.4		29.0		246.5
12-Oct-12	1.3	4.9		43.0		121.2
19-Oct-12	7.7	5.0		21.4		145.2
26-Oct-12	2.8	3.2		40.8		117.4
2-Nov-12	11.7	36.3		120.0		136.3
9-Nov-12	14.7	16.8		103.7		146.8
16-Nov-12	2.2	16.5		83.3		127.0
23-Nov-12	23.4	15.7		66.9		165.1
30-Nov-12	9.9	14.5		60.8		152.7
7-Dec-12	35.0	11.3		73.7		149.6
14-Dec-12	42.7	7.8		56.8		140.0
21-Dec-12	39.9	8.5		67.5		148.6
28-Dec-12	49.3	7.7		Frozen		N/A
4-Jan-13	47.8	5.8		Frozen		102.5
11-Jan-13	62.4	11.8		Frozen		163.8
17-Jan-13	48.4	16.7		Frozen		133.4
25-Jan-13	24.7	14.0		Frozen		146.0
1-Feb-13	60.8	31.3		Frozen		N/A
8-Feb-13	53.7	9.9		Frozen		N/A
15-Feb-13	52.0	10.2		Frozen		123.5
22-Feb-13	52.0	6.2		Frozen		138.1
1-Mar-13	47.9	6.1		Frozen		138.5

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- SW2 - Culvert across County Road 63
- SWB-1 - Culvert under western berm (represents old sump discharge)
- SWO-2 - Stream Flow west of SW1 on Osprey Quarry Property
- QFSW1 - Represents seepage inflow in southwest corner/west wall of quarry (not monitorable after July 16, 2004).
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- N/A indicates flow not available
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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
8-Mar-13	49.8	7.5		Frozen		99.0
15-Mar-13	50.7	15.2		Frozen		96.8
22-Mar-13	50.4	12.7		Frozen		129.5
28-Mar-13	48.9	9.2		118.7		116.7
5-Apr-13	45.1	8.8		76.7		129.5
12-Apr-13	81.9	9.8		113.2		131.1
19-Apr-13	123.1	57.8		405.3		-
26-Apr-13	61.3	24.5		164.6		125.5
3-May-13	19.9	28.2		71.0		279.3
9-May-13	46.7	12.8		67.6		88.7
16-May-13	25.0	9.0		53.9		204.5
24-May-13	55.7	23.6		104.5		216.8
31-May-13	58.7	6.8		51.2		341.3
7-Jun-13	49.2	11.7		53.4		N/A
14-Jun-13	48.7	7.1		63.7		274.0
21-Jun-13	41.2	8.4		43.8		155.1
27-Jun-13	5.6	7.7		32.0		197.3
5-Jul-13	37.1	8.2		49.9		222.3
12-Jul-13	5.5	8.8		53.7		203.8
19-Jul-13	3.2	7.9		36.4		119.8
25-Jul-13	29.0	2.7		41.2		236.8
2-Aug-13	4.0	2.6		84.2		259.9
8-Aug-13	3.4	3.1		69.5		193.1
16-Aug-13	0.6	2.8		40.4		81.2
23-Aug-13	0.0	2.4		35.5		65.6
30-Aug-13	0.5	2.7		35.4		62.3
6-Sep-13	0.5	2.4		42.2		59.9
13-Sep-13	7.0	2.2		44.3		129.4
20-Sep-13	2.4	2.7		25.8		131.3
27-Sep-13	18.7	2.5		26.7		131.3
4-Oct-13	24.8	4.1		41.3		N/A
11-Oct-13	58.1	4.2		37.6		116.7
18-Oct-13	7.3	5.2		67.0		165.6
25-Oct-13	24.9	9.5		150.6		204.3
31-Oct-13	35.5	12.5		257.4		302.3
8-Nov-13	48.0	14.9		255.1		159.6
14-Nov-13	49.0	16.1		240.1		171.2
22-Nov-13	44.5	17.8		244.9		116.8

NOTE:
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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
29-Nov-13	47.8	5.5		-		85.4
6-Dec-13	29.2	14.2		119.7		121.6
13-Dec-13	42.7	Frozen		Frozen		N/A
19-Dec-13	39.5	Frozen		Frozen		118.4
27-Dec-13	36.8	Frozen		Frozen		N/A
3-Jan-14	34.5					65.3
10-Jan-14	13.8	6.3				88.7
17-Jan-14	10.5	8.1				80.4
24-Jan-14	35.9					102.6
31-Jan-14	37.8	5.0				92.1
7-Feb-14	14.1	6.1				86.6
14-Feb-14	7.1	3.1				110.8
21-Feb-14	29.2	-				92.8
28-Feb-14						73.4
7-Mar-14	21.1	4.1				69.3
14-Mar-14	31.9	3.7				82.2
21-Mar-14	33.8	3.8				88.0
28-Mar-14	34.4	6.6				114.5
4-Apr-14	26.2	14.4				98.1
11-Apr-14	52.3	33.6				215.1
17-Apr-14	177.9	104.1		247.6		244.9
25-Apr-14	65.4	88.3		469.4		166.7
1-May-14	93.7	67.1		288.6		147.4
9-May-14	35.8	9.4		151.0		197.1
16-May-14	31.4	8.2		142.7		110.8
23-May-14	12.8	28.8		82.1		214.9
30-May-14	33.3	9.0		86.4		185.2
6-Jun-14	5.6	7.5		51.7		186.0
13-Jun-14	5.6	4.2		49.6		161.0
20-Jun-14	9.1	5.5		52.9		135.7
27-Jun-14	3.9	4.6		40.7		132.9
4-Jul-14	1.8	1.4		24.5		149.0
11-Jul-14	8.2	0.8		15.4		127.1
18-Jul-14	5.0	1.6		39.5		145.0
25-Jul-14	2.8	0.5		15.9		147.8
1-Aug-14	0.7	1.3		11.8		149.3
8-Aug-14	0.6	1.0		10.1		128.5
15-Aug-14	4.4	1.1		13.3		148.0

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TABLE B-2
SURFACE WATER FLOW SUMMARY
SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
22-Aug-14	2.9	0.3		12.8		237.3
29-Aug-14	1.4			11.2		147.8
5-Sep-14	4.0	0.1		N/A		167.3
12-Sep-14	1.2	0.8		15.1		91.5
19-Sep-14	4.3	0.9		17.7		88.9
26-Sep-14	3.9	0.8		20.4		98.5
3-Oct-14	4.7	0.3		21.9		81.3
10-Oct-14	8.4	0.1		25.1		85.1
16-Oct-14	5.4	0.2		39.1		102.0
24-Oct-14	1.6	2.9		10.8		124.2
31-Oct-14	11.5	1.8		14.8		156.0
7-Nov-14	51.6	6.0		20.8		92.8
14-Nov-14	14.4	9.2		26.2		71.9
28-Nov-14	65.3	2.8		Frozen		54.0
5-Dec-14	12.0	4.1		Frozen		52.8
12-Dec-14	13.7	2.1		Frozen		53.0
19-Dec-14	45.3	2.4		Frozen		48.4
26-Dec-14	84.6	5.2		169.2		-
2-Jan-15	36.4	2.4		Frozen		N/A
8-Jan-15	Frozen	2.3		Frozen		44.2
14-Jan-15	33.0	1.3		Frozen		45.2
22-Jan-15	28.4	2.4		Frozen		45.9
30-Jan-15	10.8	5.0		Frozen		N/A
6-Feb-15	15.8	1.8		Frozen		60.5
12-Feb-15	21.2	0.9		Frozen		N/A
27-Feb-15	24.5	0.6		Frozen		82.1
6-Mar-15	4.3	0.7		Frozen		103.1
13-Mar-15	7.5	2.4		Frozen		124.0
20-Mar-15	17.8	5.9		Frozen		87.8
26-Mar-15	6.8	3.6		Frozen		107.4
2-Apr-15	6.1	3.4		27.0		87.8
10-Apr-15	83.3	32.3		Flooded		164.0
17-Apr-15	63.3	23.6		Flooded		86.9
23-Apr-15	51.0	18.8		99.4		96.6
1-May-15	10.3	7.7		44.2		204.6
8-May-15	6.3	7.0		40.0		200.0
15-May-15	2.4	3.1		14.5		199.6
21-May-15	3.1	4.1		15.3		164.2
28-May-15	8.3	3.2		19.3		219.4
4-Jun-15	5.1	3.3		12.6		167.4

NOTE:
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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
12-Jun-15	2.5	1.9	-	22.3	-	191.5
18-Jun-15	2.8	3.1	-	23.3	-	172.2
26-Jun-15	10.3	1.6	-	N/A	-	178.8
1-Jul-15	77.9	11.0	-	N/A	-	N/A
10-Jul-15	5.0	7.9	-	28.3	-	106.2
17-Jul-15	8.0	7.3	-	30.0	-	135.9
22-Jul-15	4.9	3.6	-	13.1	-	86.7
30-Jul-15	3.4	0.9	-	5.2	-	89.9
5-Aug-15	19.2	1.9	-	23.0	-	92.2
13-Aug-15	7.8	2.3	-	15.6	-	120.2
21-Aug-15	2.3	0.8	-	10.8	-	159.7
28-Aug-15	1.9	0.9	-	8.5	-	95.3
3-Sep-15	4.6	0.6	-	6.6	-	99.5
10-Sep-15	1.8	0.8	-	15.6	-	65.1
18-Sep-15	DRY	0.3	-	5.0	-	68.5
25-Sep-15	3.4	0.5	-	7.8	-	68.0
2-Oct-15	14.8	0.4	-	4.8	-	81.3
9-Oct-15	1.3	0.6	-	11.0	-	97.8
16-Oct-15	3.3	0.5	-	8.0	-	84.9
23-Oct-15	3.1	0.3	-	14.1	-	70.6
30-Oct-15	27.0	0.7	-	48.6	-	124.2
5-Nov-15	2.6	2.2	-	20.7	-	103.7
10-Nov-15	9.4	-	-	-	-	-
13-Nov-15	61.5	1.5	-	78.0	-	70.3
19-Nov-15	17.1	1.1	-	33.3	-	86.0
26-Nov-15	0.8	1.3	-	36.6	-	81.6
4-Dec-15	2.3	0.9	-	24.0	-	100.5
10-Dec-15	12.3	1.4	-	20.9	-	102.9
17-Dec-15	21.2	2.2	-	41.5	-	127.2
23-Dec-15	32.0	3.9	-	49.7	-	63.7
30-Dec-15	34.4	1.7	-	63.5	-	67.5
8-Jan-16	11.8	2.6	-	30.4	-	73.9
14-Jan-16	12.1	2.1	-	FROZEN	-	70.8
22-Jan-16	12.1	2.0	-	FROZEN	-	58.2
29-Jan-16	16.7	1.2	-	FROZEN	-	38.0
5-Feb-16	77.1	10.4	-	FROZEN	-	65.6
11-Feb-16	53.4	3.9	-	FROZEN	-	104.1
18-Feb-16	19.2	5.7	-	FROZEN	-	83.6
25-Feb-16	10.2	3.9	-	FROZEN	-	136.2
4-Mar-16	66.8	9.7	-	FROZEN	-	93.6
10-Mar-16	160.7	53.4	-	388.1	-	48.6
18-Mar-16	54.8	19.2	-	156.6	-	169.1

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SW1, SW2, SWB-1, SWO-2, QFSW1 AND QFSW2

DUNTROON QUARRY - AMP MONITORING REPORT 2016
111-53312-00 A52.1

DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
28-Mar-16	233.3	93.3	-	576.7	-	107.1
1-Apr-16	253.8	36.9	-	509.4	-	26.7
7-Apr-16	168.5	19.7	-	301.6	-	258.2
15-Apr-16	61.9	11.5	-	130.6	-	180.8
22-Apr-16	50.9	12.8	-	84.3	-	149.7
29-Apr-16	41.6	8.6	-	36.6	-	230.6
6-May-16	40.3	6.7	-	25.4	-	129.0
13-May-16	30.2	5.3	-	36.6	-	135.4
20-May-16	23.6	5.3	-	20.2	-	183.7
27-May-16	22.7	3.9	-	22.6	-	224.5
2-Jun-16	18.8	3.9	-	28.5	-	73.1
10-Jun-16	11.7	2.7	-	15.4	-	194.2
17-Jun-16	10.4	2.2	-	5.2	-	82.9
24-Jun-16	6.3	1.7	-	3.9	-	169.4
28-Jun-16	6.9	1.8	-	6.2	-	132.0
5-Jul-16	5.0	-	-	-	-	-
8-Jul-16	5.0	1.6	-	4.3	-	151.9
15-Jul-16	6.6	2.6	-	4.7	-	139.7
22-Jul-16	2.7	6.2	-	2.1	-	94.1
29-Jul-16	3.1	0.2	-	1.1	-	134.5
5-Aug-16	0.8	0.5	-	DRY	-	81.5
12-Aug-16	DRY	0.9	-	DRY	-	117.1
19-Aug-16	26.9	0.6	-	N/A	-	42.0
26-Aug-16	2.1	0.3	-	N/A	-	85.8
2-Sep-16	0.6	1.6	-	N/A	-	99.0
9-Sep-16	9.6	1.3	-	N/A	-	51.3
16-Sep-16	2.6	5.5	-	N/A	-	131.4
21-Sep-16	3.6	0.4	-	N/A	-	103.4
30-Sep-16	4.4	0.6	-	N/A	-	73.7
7-Oct-16	6.7	1.6	-	9.0	-	99.0
13-Oct-16	13.7	0.9	-	N/A	-	112.2
19-Oct-16	13.9	1.0	-	N/A	-	77.8
27-Oct-16	13.1	0.5	-	25.6	-	55.3
3-Nov-16	19.1	0.6	-	25.2	-	80.8
11-Nov-16	11.2	0.8	-	N/A	-	46.6

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DUNTROON QUARRY - AMP MONITORING REPORT 2016
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DATE	SW 1	SW 2	SW B-1	SW 0-2	QFSW 1	QFSW 2
18-Nov-16	2.5	0.3	-	8.9	-	51.0
24-Nov-16	7.5	0.6	-	12.8	-	79.6
2-Dec-16	24.5	0.6	-	55.0	-	40.9
7-Dec-16	28.6	0.5	-	N/A	-	78.7
16-Dec-16	27.4	0.8	-	14.1	-	94.3
22-Dec-16	Frozen	0.2	-	Frozen	-	60.4
30-Dec-16	Frozen	0.7	-	Frozen	-	N/A
6-Jan-17	Frozen	3.4	-	Frozen	-	30.5
13-Jan-17	Frozen	2.1	-	Frozen	-	94.8
20-Jan-17	12.8	2.5	-	Frozen	-	65.4
26-Jan-17	55.9	8.5	-	94.6	-	65.7
3-Feb-17	Frozen	0.6	-	Frozen	-	49.5
10-Feb-17	Frozen	0.9	-	Frozen	-	49.0
17-Feb-17	Frozen	1.4	-	Frozen	-	61.7
19-Apr-17	53.7	8.0	-	58.5	-	160.6
3-May-17	-	-	-	-	-	122.8
16-May-17	95.5	4.4	-	99.4	-	136.2
28-Jun-17	34.0	3.6	-	53.6	-	141.7
18-Jul-17	8.9	2.6	-	40.7	-	63.7
15-Aug-17	14.4	1.4	-	36.2	-	107.8
18-Sep-17	21.8	0.6	-	26.8	-	53.8
18-Oct-17	37.3	2.6	-	58.6	-	118.8
14-Nov-17	33.2	1.1	-	44.5	-	84.9
13-Dec-17	Frozen	Frozen	-	Frozen	-	71.1
17-Jan-18	Frozen	6.3	-	Frozen	-	55.1
18-Feb-18	128.6	29.3	-	280.5	-	Flooded
18-Mar-18	Frozen	8.8	-	Frozen	-	77.9
18-Apr-18	Frozen	9.3	-	Frozen	-	28.3
13-May-18	76.2	3.6	-	66.7	-	73.1
19-Jun-18	3.4	1.9	-	6.6	-	73.6
18-Jul-18	1.8	1.5	-	1.5	-	53.7
23-Aug-18	54.2	5.8	-	39.2	-	69.4
19-Sep-18	1.1	2.4	-	4.5	-	93.8
24-Oct-18	18.1	1.7	-	12.5	-	35.3
21-Nov-18	-	0.9	-	-	-	59.1
12-Dec-18	Frozen	1.6	-	Frozen	-	39.4

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FIGURE B-1

SURFACE WATER HYDROGRAPH
SW1

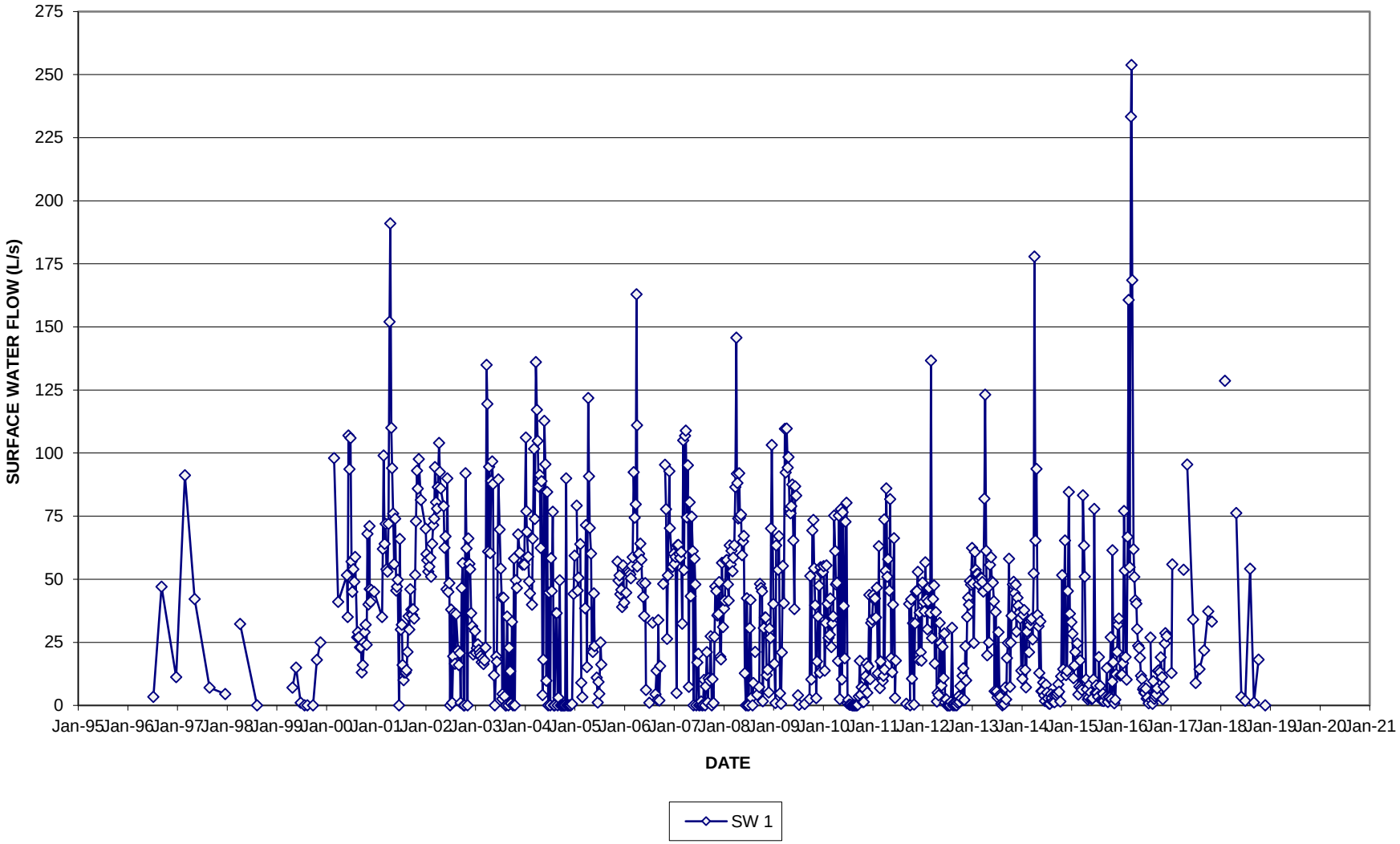

FIGURE B-1 (a)

SURFACE WATER HYDROGRAPH
SW1

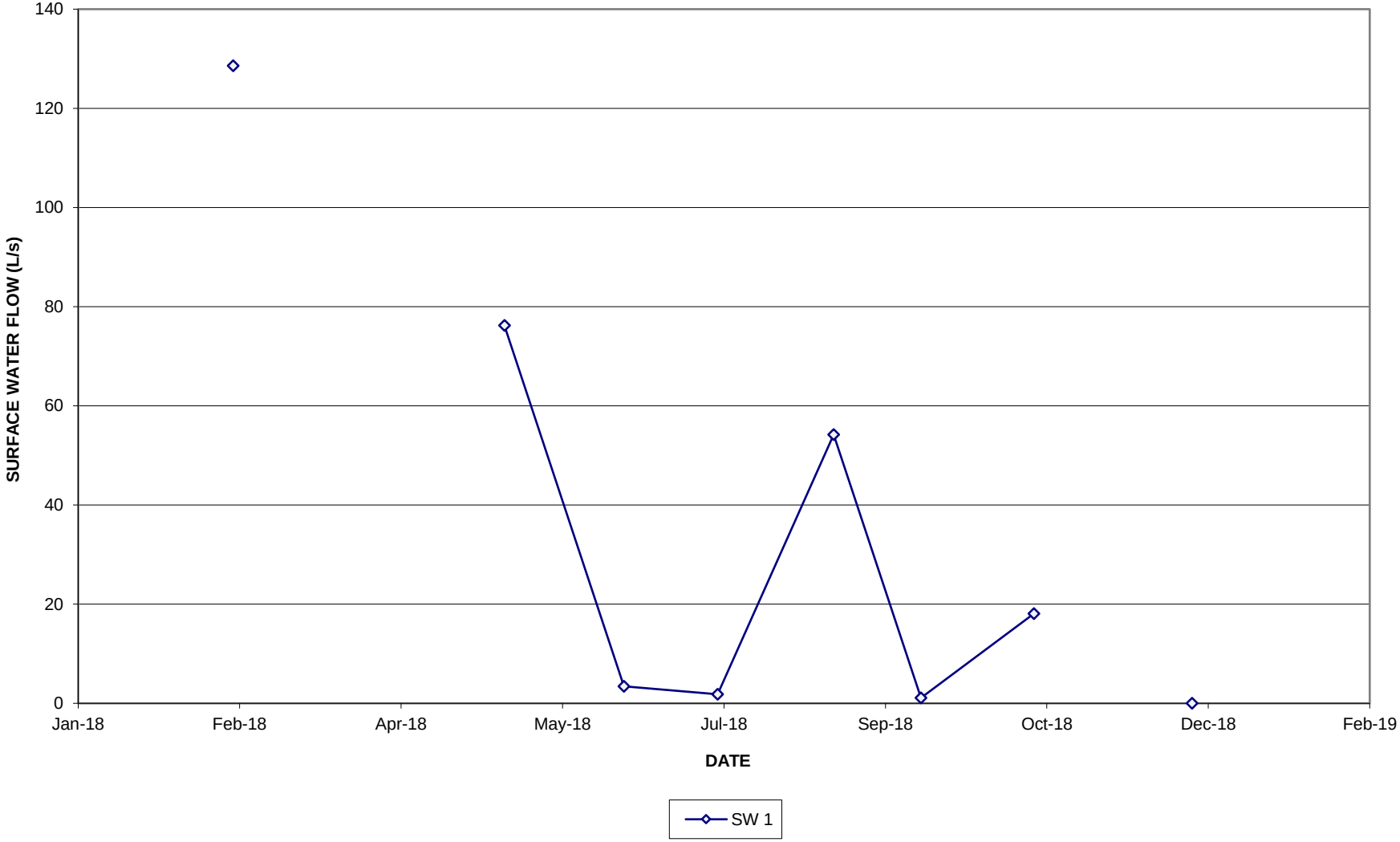

FIGURE B-1 (b)

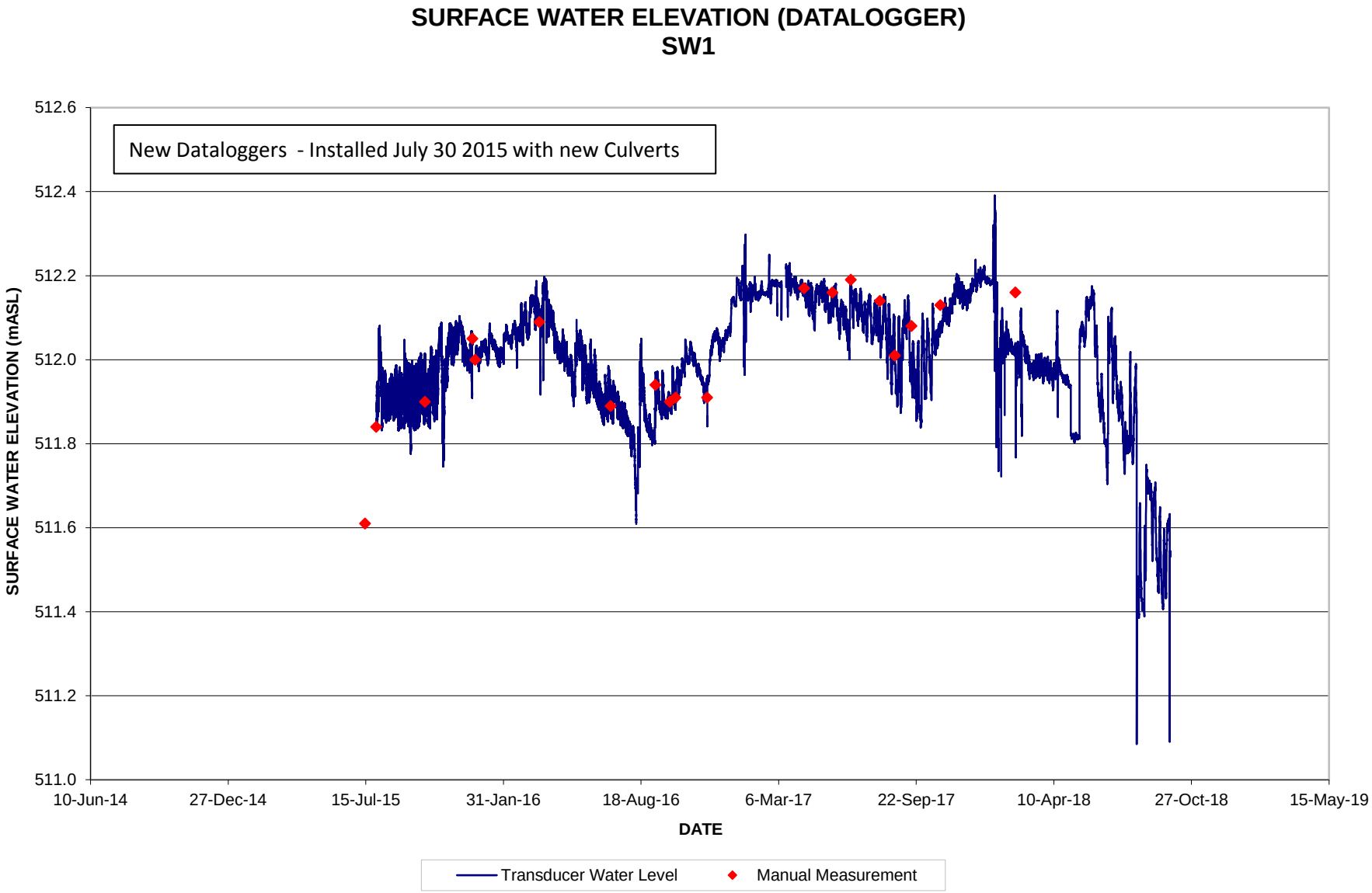
SURFACE WATER ELEVATION (DATALOGGER)
SW1
New Dataloggers - Installed July 30 2015 with new Culverts
SURFACE WATER ELEVATION (mASL)
512.6
512.4
512.2
512.0
511.8
511.6
511.4
511.2
511.0
10-Jun-14
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Transducer Water Level
Manual Measurement

FIGURE B-1 (c)

SURFACE WATER TEMPERATURE (DATALOGGER)
SW1

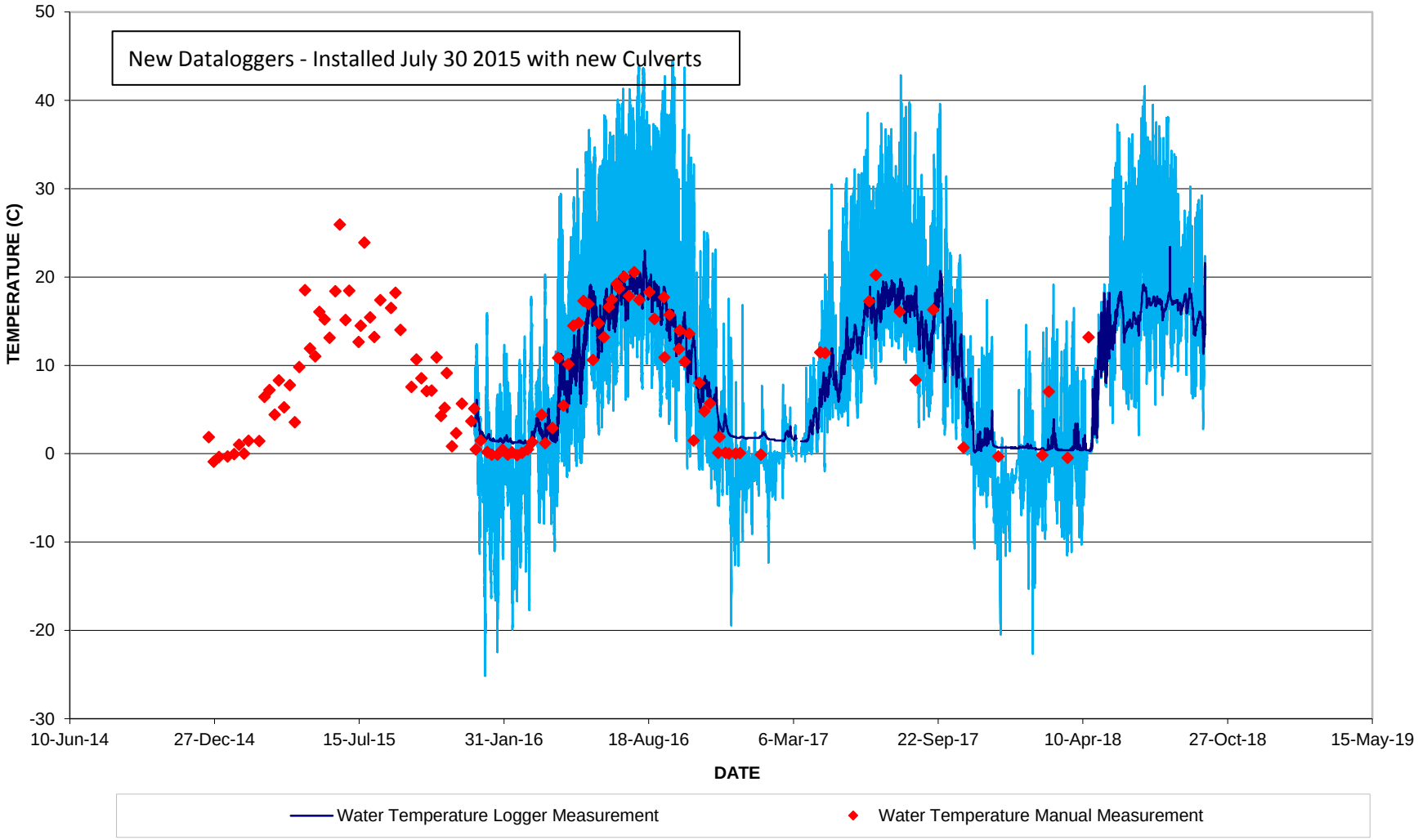

FIGURE B-2

SURFACE WATER HYDROGRAPH
SW2

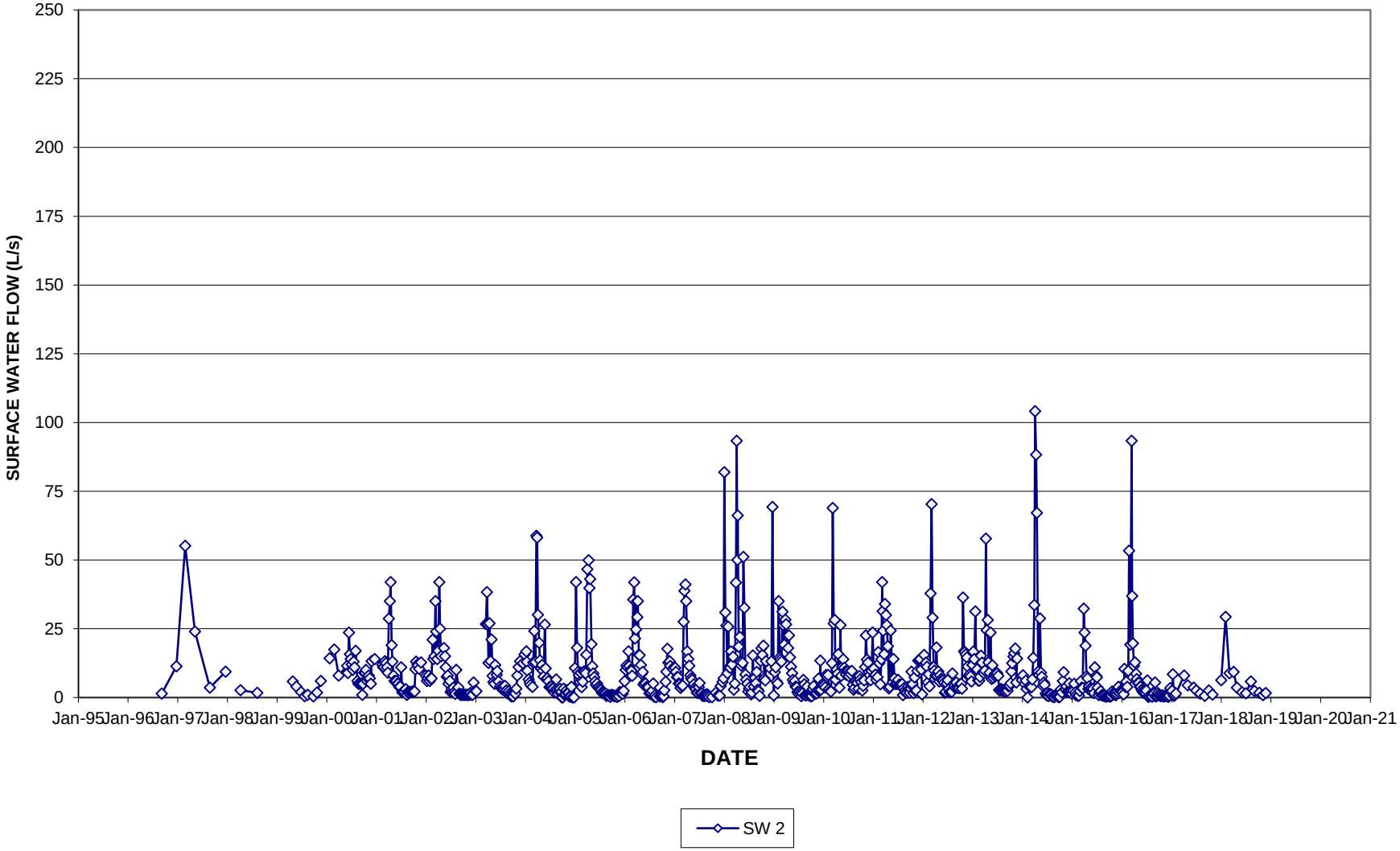

FIGURE B-2 (a)

SURFACE WATER HYDROGRAPH
SW2

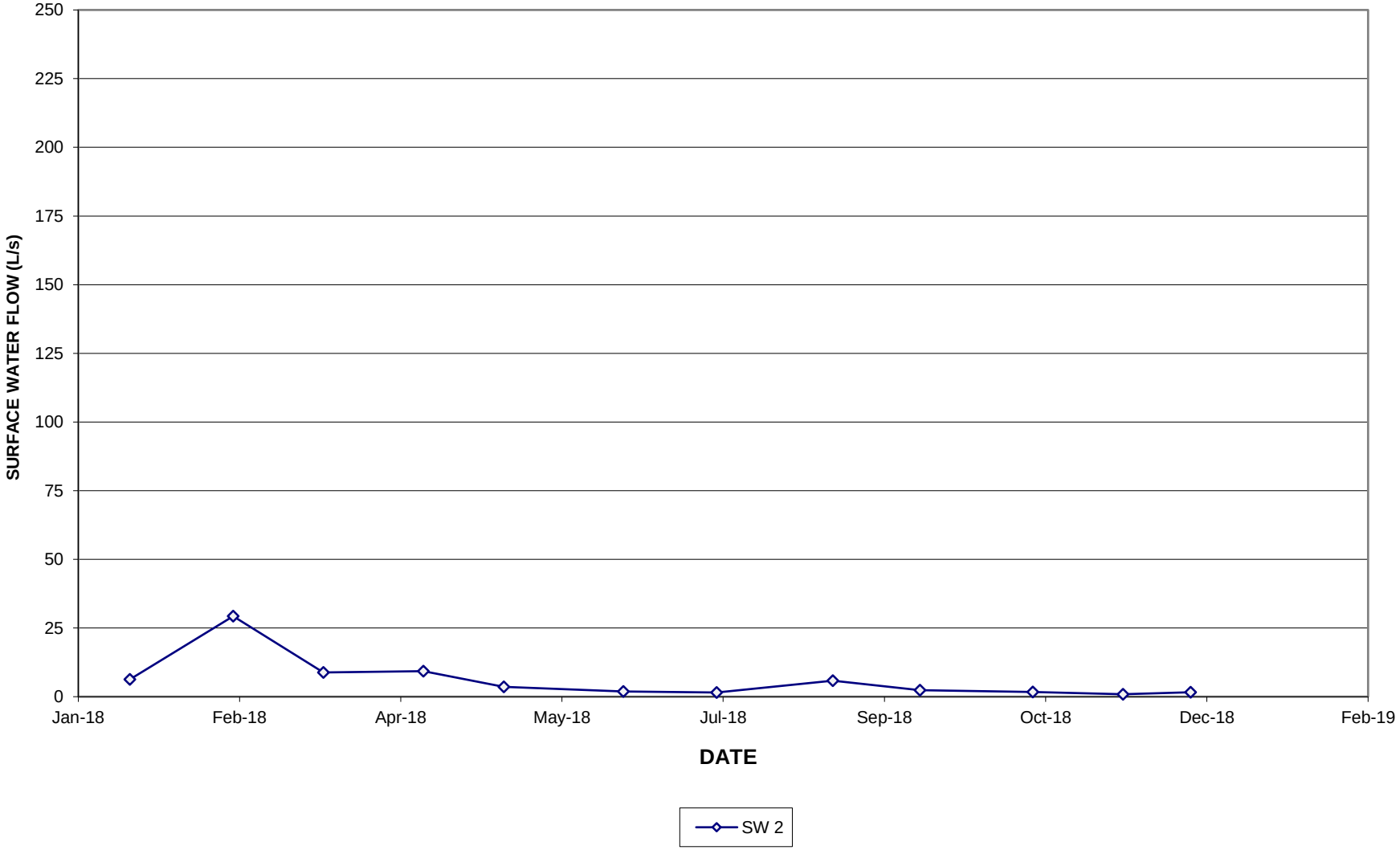

FIGURE B-2 (b)

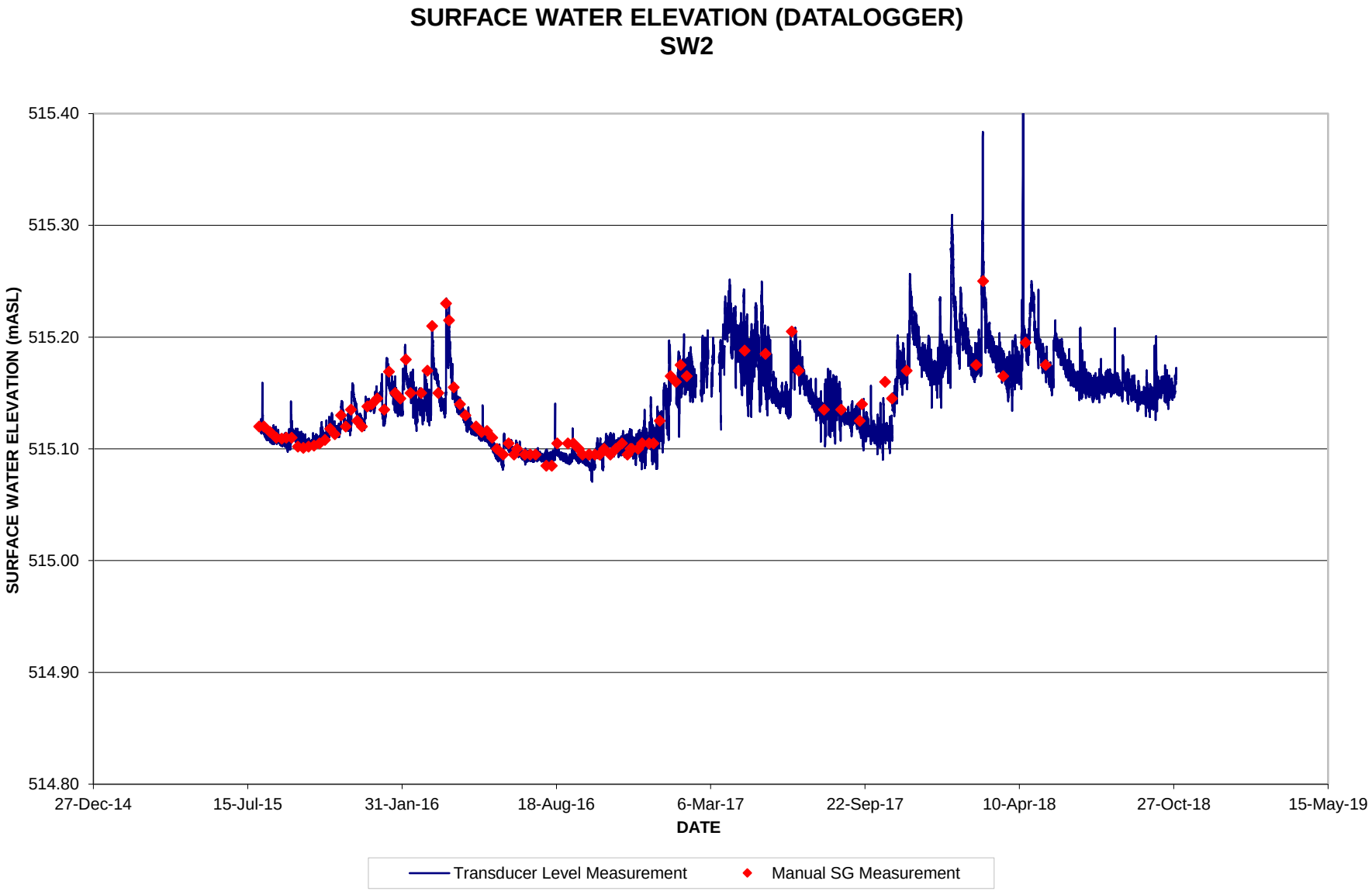
SURFACE WATER ELEVATION (DATALOGGER)
SW2
SURFACE WATER ELEVATION (mASL)
515.40
515.30
515.20
515.10
515.00
514.90
514.80
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Transducer Level Measurement
Manual SG Measurement

FIGURE B-2 (c)

SURFACE WATER TEMPERATURE (DATALOGGER)
SW2

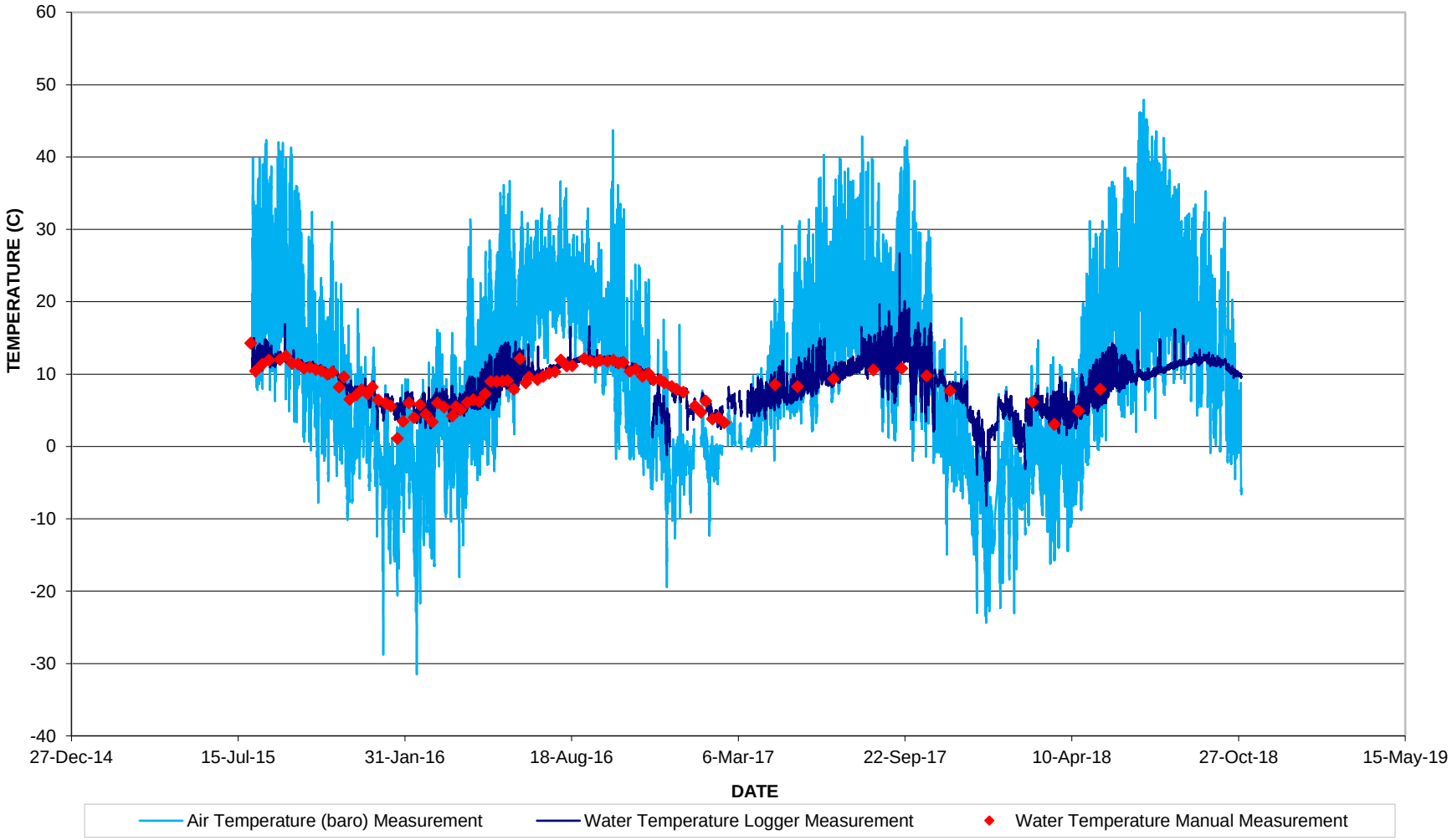

FIGURE B-3

SURFACE WATER HYDROGRAPH
SWB-1

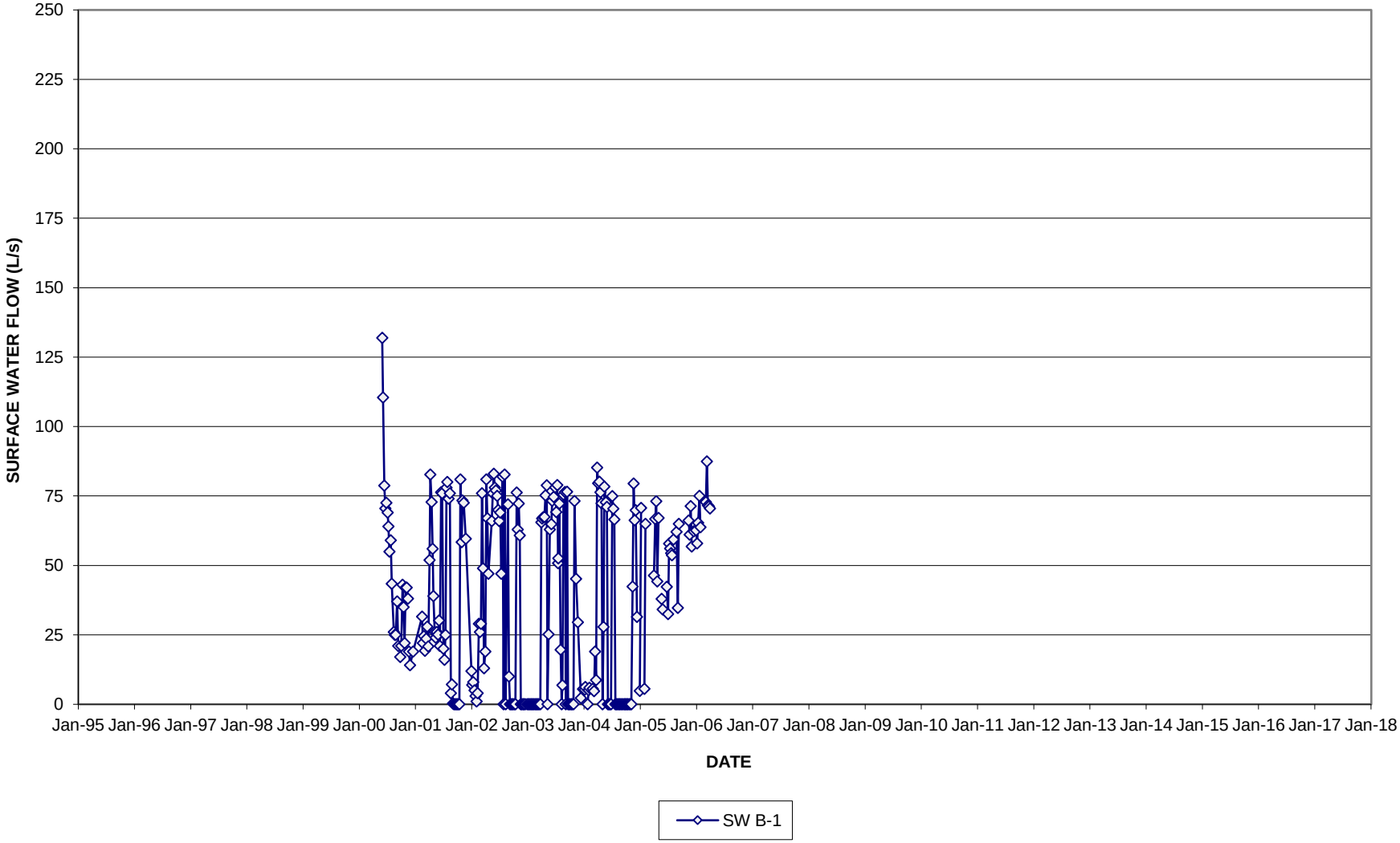

FIGURE B-4

SURFACE WATER HYDROGRAPH
SWO-2

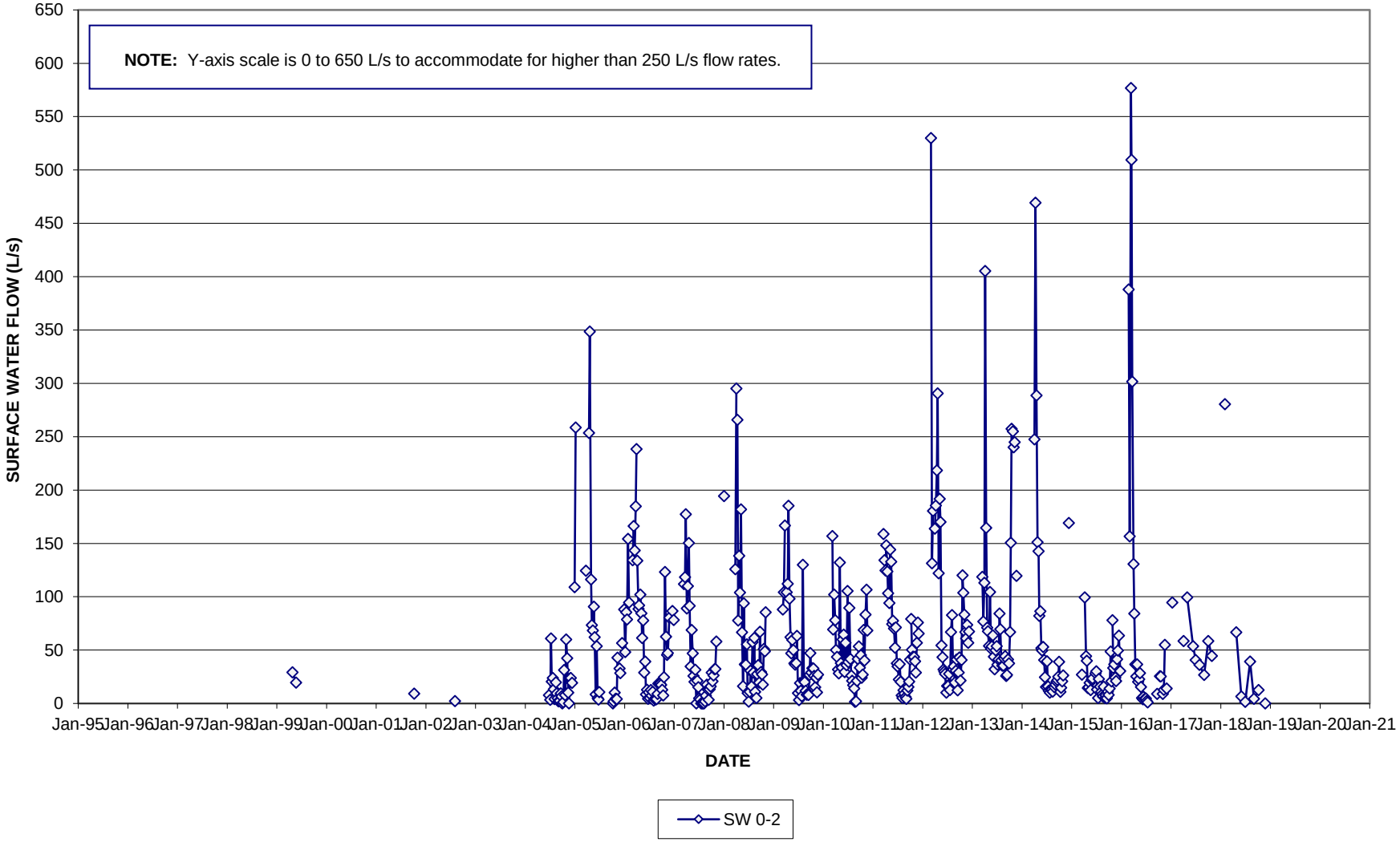

FIGURE B-4 (a)

SURFACE WATER HYDROGRAPH
SWO-2

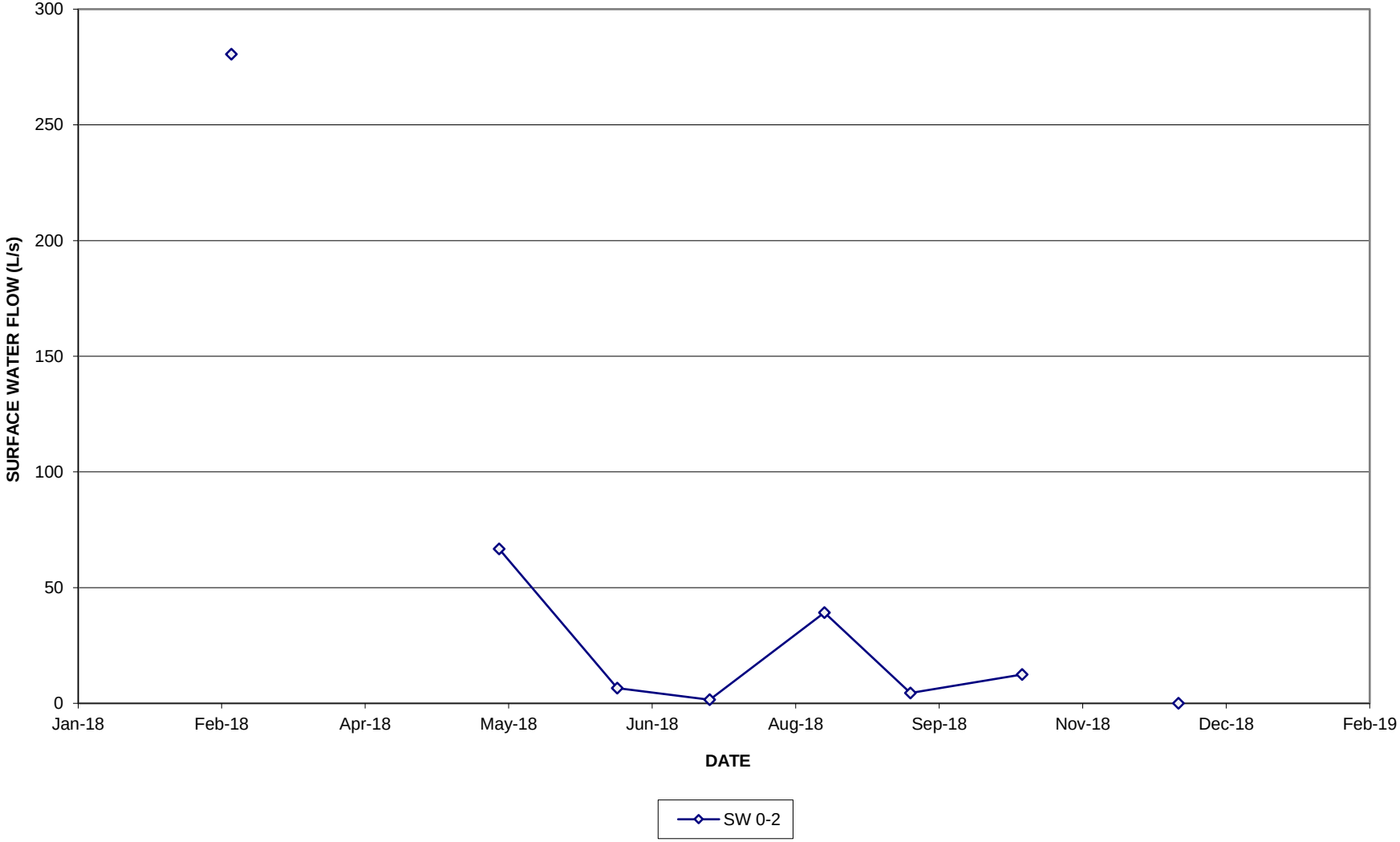

FIGURE B-4 (b)

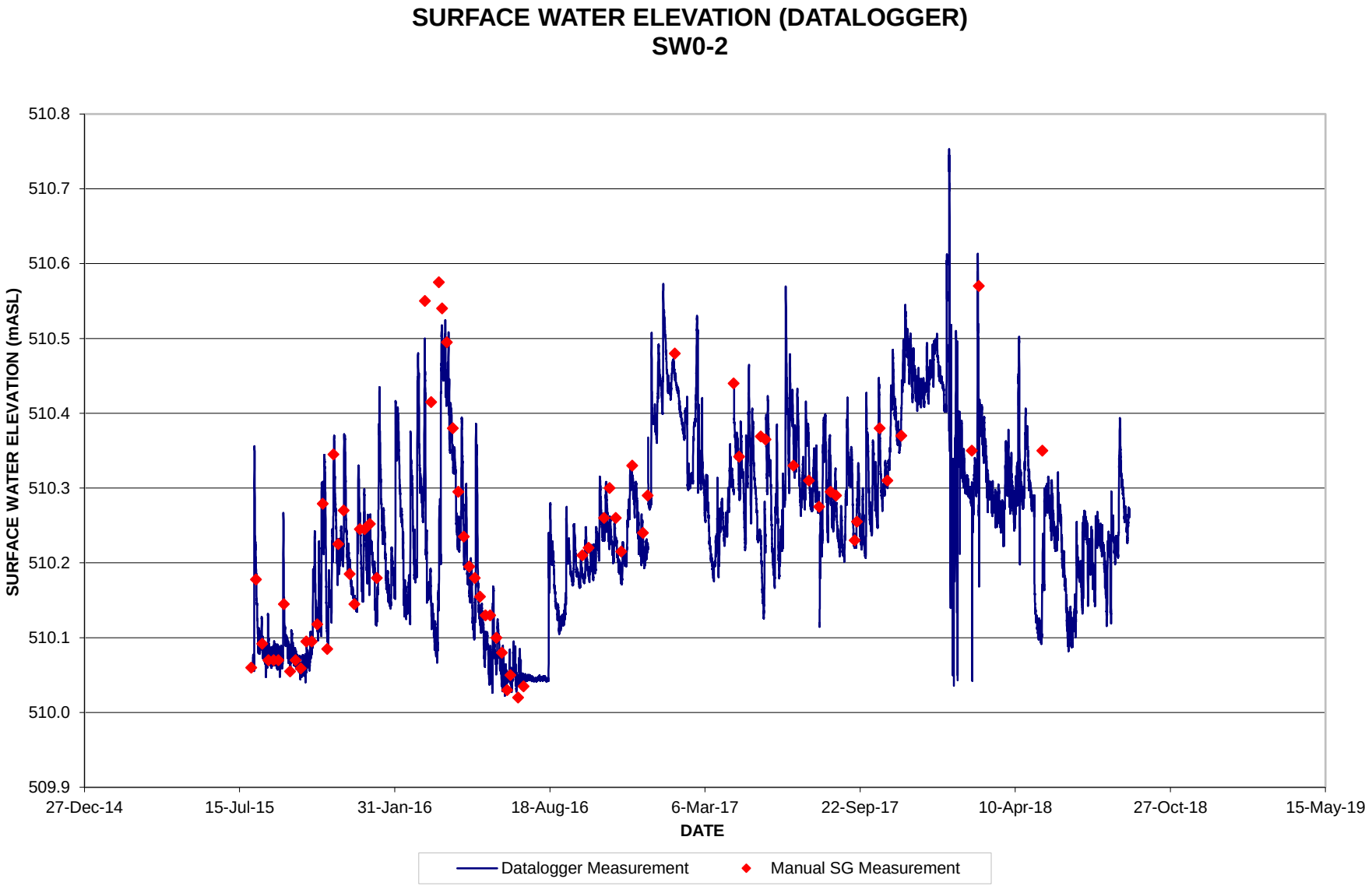
SURFACE WATER ELEVATION (DATALOGGER)
SW0-2
SURFACE WATER ELEVATION (mASL)
510.8
510.7
510.6
510.5
510.4
510.3
510.2
510.1
510.0
509.9
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Datalogger Measurement
Manual SG Measurement

FIGURE B-4 (c)

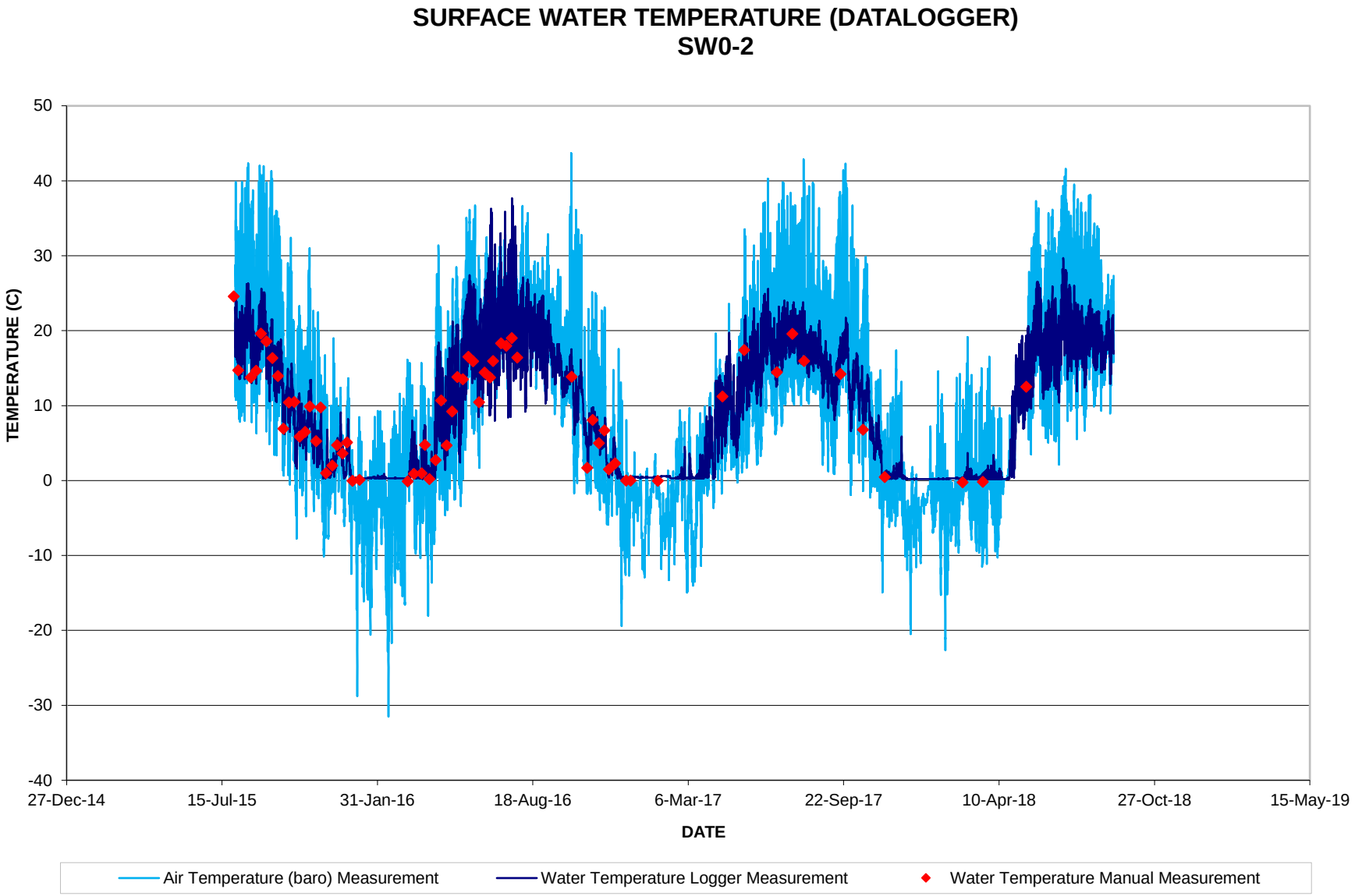
SURFACE WATER TEMPERATURE (DATALOGGER)
SW0-2
TEMPERATURE (C)
50
40
30
20
10
0
-10
-20
-30
-40
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Air Temperature (baro) Measurement
Water Temperature Logger Measurement
Water Temperature Manual Measurement

FIGURE B-5

SURFACE WATER HYDROGRAPH
QFSW1

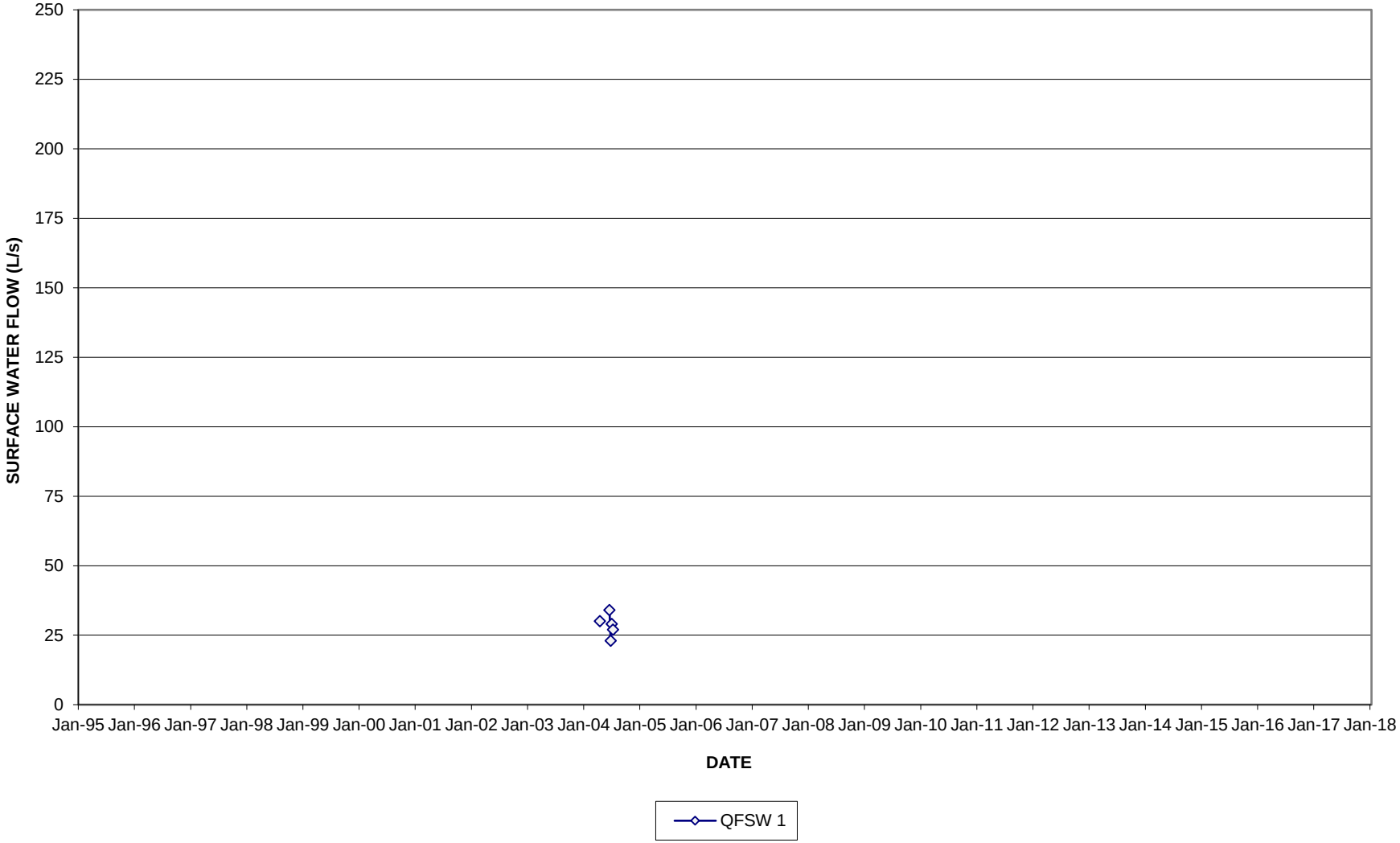

FIGURE B-6

SURFACE WATER HYDROGRAPH
QFSW2

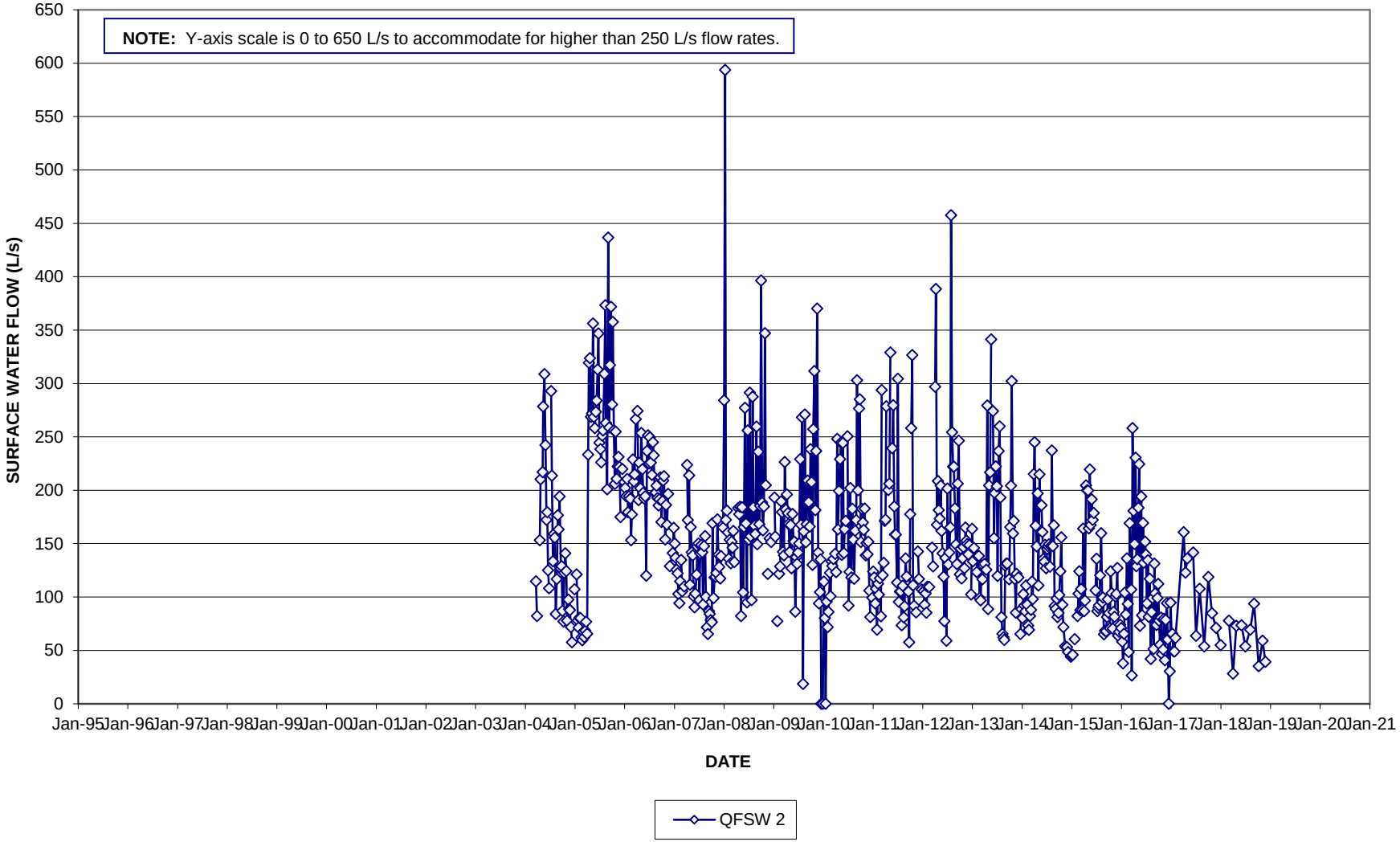

FIGURE B-6 (a)

SURFACE WATER HYDROGRAPH
QFSW2

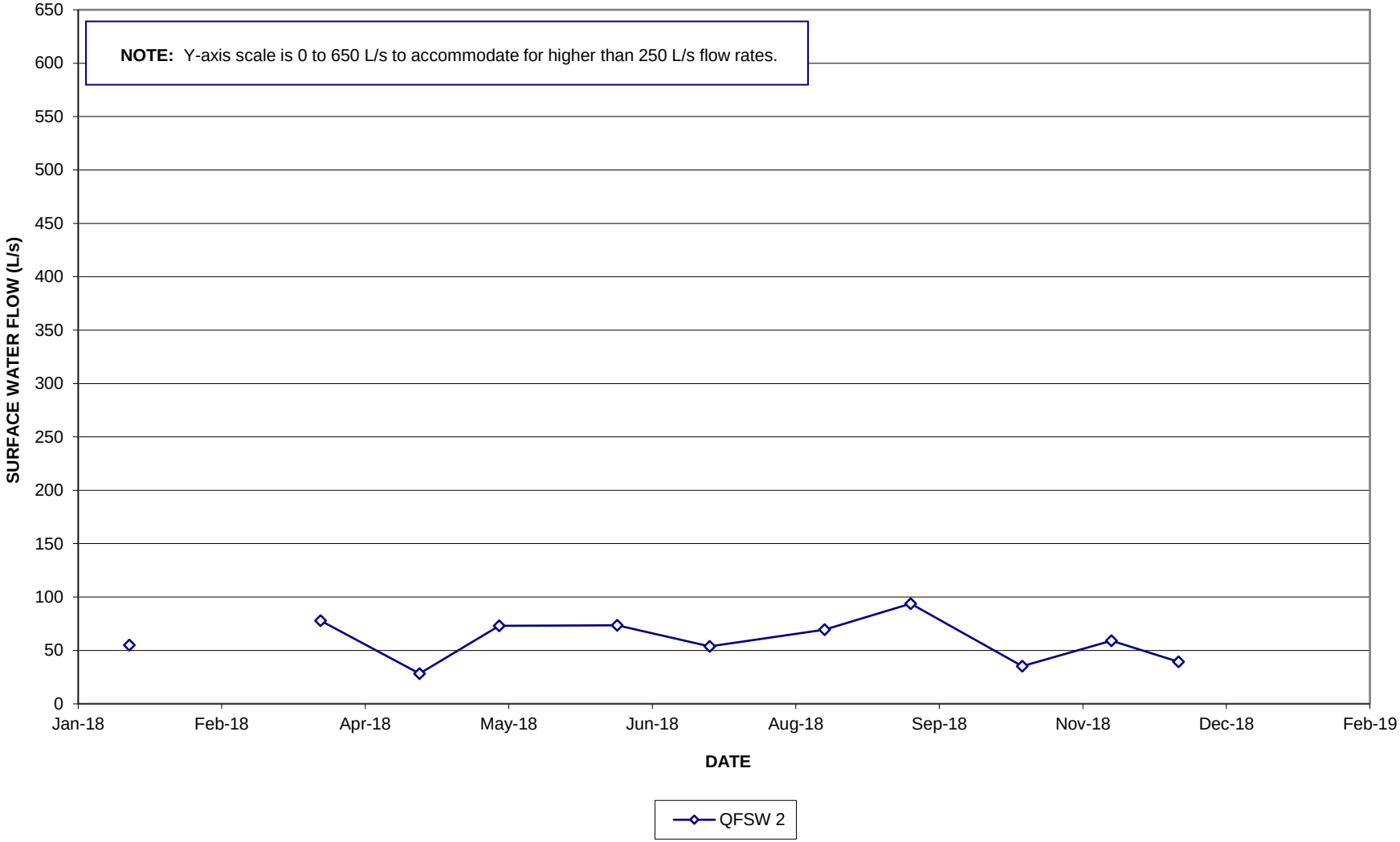

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	0.0	E	4.1 (1)	B	0.0	E	112.8	V	46.0	V	164.4	V	0.1	E
23-Jun-03	0.0	E	0.0	E	0.0	E	(*)	(*)	18.6	V	58.3	V	0.5	E
22-Jul-03	0.0	E	0.0	E	0.0	E	(*)	(*)	59.6	V	92.5	V	0.3	E
20-Aug-03	0.0	E	0.0	E	0.0	E	9.8 (*)	V	14.9	V	57.6	V	0.0	E
25-Sep-03	0.0	E	0.0	E	0.0	E	3.6 (*)	V	<0.1	E	9.0	V	0.0	E
22-Oct-03	0.0	E	1.5	B	0.0	E	19.0	V	14.6	V	50.8	V	0.0	E
28-Nov-03	0.0	E	1.4	B	0.0	E	116.9	V	183.4	V	214.9	V	0.5	E
19-Dec-03	0.2	M	2.8	B	0.0	E	184.5	V	Frozen	E	266.5	V	Frozen	E
10-Feb-04	Frozen	E	Frozen	E	0.0	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
18-Mar-04	2.8	V	1.8	B	0.0	E	246.5	V	Frozen	E	473.4	V	0.5	E
19-Apr-04	14.4	V	4.9	B	0.0	E	225.2	V	371.1	V	606.6	V	0.6	E
19-May-04	0.8	V	1.0	V	0.0	E	78.3	V	182.0	V	291.5	V	0.4	E
24-Jun-04	0.0	E	<0.1	E	0.0	E	68.9	V	111.9	V	185.9	V	1.0	E
29-Jul-04	0.0	E	0.0	E	0.0	E	22.6	V	32.1	V	100.5	V	0.5	E
23-Aug-04	0.0	E	0.0	E	0.0	E	12.3	V	7.3	V	24.9	V	0.0	E
21-Sep-04	0.0	E	0.0	E	0.0	E	8.5	V	7.0	V	41.3	V	0.0	E
21-Oct-04	0.0	E	0.0	E	0.0	E	11.0	V	12.7	V	41.5	V	0.0	E
17-Nov-04	0.0	E	0.0	E	0.0	E	24.7	V	26.9	V	69.8	V	0.5	E
15-Dec-04	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- (1) indicates measurement taken on June 9, 2003.
- (*) indicates flow not measureable/affected due to beaver activity

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	Frozen	E	Frozen	E	63.2	V	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Feb-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
27-Mar-05	0.8	V	3.1	B/E	Frozen	E	98.8	V	Frozen	E	220.0	V	Frozen	E
10-Apr-05	31.4	V	7.5	B/E	Frozen	E	742.4	V	1376.5	V	1671.0	V	Frozen	E
22-May-05	0.0	E	0.8	B/E	0.0	E	120.4	V	184.8	V	286.6	V	<0.1	E
26-Jun-05	0.0	E	0.0	E	0.0	E	33.0	V	61.6	V	123.0	V	<0.1	E
10-Jul-05	0.0	E	0.0	E	0.0	E	21.3	V	30.6	V	87.5	V	0.0	E
21-Aug-05	0.0	E	0.0	E	0.0	E	7.6	V	20.9	V	53.2	V	0.0	E
25-Sep-05	0.0	E	0.0	E	0.0	E	1.0	V	26.2	V	14.7	V	0.0	E
23-Oct-05	0.0	E	0.0	E	0.0	E	8.3	V	19.8	V	46.0	V	0.0	E
13-Nov-05	0.0	E	0.0	E	0.0	E	3.4	V	12.3	V	32.8	V	0.0	E
11-Dec-05	0.0	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	166.9	E/V/M	Frozen	E
15-Jan-06	2.4	V	3.8	B/E	Frozen	E	Frozen	E	Frozen	E	133.0	E/V/M	Frozen	E
19-Feb-06	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
19-Mar-06	39.7	V	2.7	V	6.0	E	389.2	V	Frozen	E	966.1	V	Frozen	E
16-Apr-06	5.2	V	1.1	V	0.0	E	223.2	V	366.7	V	569.4	V	0.4	B/E
21-May-06	0.8	V	1.0	V	0.0	E	203.3	V	215.6	V	407.6	V	<0.1	E
18-Jun-06	0.0	E	<0.1	V	0.0	E	16.8	V	2.6	V	83.4	V	0.0	E
9-Jul-06	0.0	E	0.0	E	0.0	E	9.4	V	4.6	V	55.6	V	0.0	E

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- (1) indicates measurement taken on June 9, 2003.
- (*) indicates flow not measureable/affected due to beaver activity

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	0.0	E	0.0	E	0.0	E	<0.1	E	<0.1	E	32.0	V	0.0	E
17-Sep-06	0.0	E	0.0	E	0.0	E	1.2	V	<0.1	E	36.4	V	0.0	E
15-Oct-06	0.0	E	0.0	E	0.0	E	54.1	V	57.9	V	124.8	V	0.0	E
19-Nov-06	0.0	E	1.0	V	0.0	E	134.7	V	152.0	V	286.8	V	<0.1	V
17-Dec-06	1.3	V	1.0	V	0.0	E	167.8	V	212.3	V	382.9	V	0.5	V
21-Jan-07	0.1	V	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
18-Feb-07	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
18-Mar-07	Frozen	E	Frozen	E	9.1	V	281.9	V	Frozen	E	492.0	V	Frozen	E
16-Apr-07	4.3	V	1.2	V	0.0	E	227.0	V	286.4	V	574.2	V	1.4	V
13-May-07	0.0	E	0.3	V	0.0	E	71.5	V	97.7	V	170.1	V	0.5	V
17-Jun-07	0.0	E	0.0	E	0.0	E	24.7	V	55.9	V	92.8	V	0.0	E
15-Jul-07	0.0	E	0.0	E	0.0	E	9.7	V	0.0	E	47.5	E	0.0	E
19-Aug-07	0.0	E	0.0	E	0.0	E	0.0	E	0.0	E	32.1	V	0.0	E
16-Sep-07	0.0	E	0.0	E	0.0	E	0.0	E	0.0	E	14.2	V	0.0	E
14-Oct-07	0.0	E	0.0	E	0.0	E	4.6	V	0.0	E	47.0	V	0.0	E
18-Nov-07	0.0	E	0.0	E	0.0	E	97.0	V	85.1	V	123.9	V	0.0	E
9-Dec-07	Frozen	E	Frozen	E	Frozen	E	110.7	V	Frozen	E	Frozen	E	Frozen	E
20-Jan-08	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	883.4	V	Frozen	E
17-Feb-08	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry or ponded.
- (1) indicates measurement taken on June 9, 2003.
- (*) indicates flow not measureable/affected due to beaver activity

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	Frozen	E	Frozen	E	Frozen	E	145.4	V	Frozen	E	178.8	V	Frozen	E
30-Mar-08	12.9	V	9.6	V	8.8	V	525.3	V	1637.1	V	964.1	V	2.8	V
20-Apr-08	11.1	V	0.9	V	0.0	E	184.7	V	395.2	V	624.1	V	0.7	V
18-May-08	0.4	V	2.1	V	0.0	E	141.7	V	173.8	V	283.7	V	0.2	V
15-Jun-08	0.0	E	0.5	B	0.0	E	33.1	V	43.8	V	158.4	V	0.0	E
13-Jul-08	0.0	E	Dry	E	0.0	E	7.3	V	28.9	V	56.2	V	0.0	E
17-Aug-08	0.0	E	<0.1	E	0.0	E	31.8	V	42.7	V	105.1	V	0.0	E
14-Sep-08	0.0	E	Dry	E	0.0	E	150.0	V	200.0	V	60.7	V	0.0	E
19-Oct-08	0.0	E	0.3	V	0.0	E	14.5	V	44.9	V	119.3	V	0.0	E
23-Nov-08	Frozen	E	Frozen	E	Frozen	E	280.2	V/E	Frozen	E	357.9	V	Frozen	E
14-Dec-08	Frozen	E	Frozen	E	0.0	E	Frozen	E	Frozen	E	474.6	V	Frozen	E
18-Jan-09	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	261.7	V	Frozen	E
8-Feb-09	Buried	E	Buried	E	Dry	E	361.4	V	Frozen	E	545.2	V	Buried	E
15-Mar-09	8.8	V	2.4	V	4.4	V	491.0	V	675.0	V	1095.0	V	0.4	V
12-Apr-09	9.1	V	2.8	V	1.3	V	197.4	V	332.6	V	382.7	V	0.9	V
17-May-09	0.8	V	0.3	V	Dry	E	109.8	V	222.4	V	393.6	V	0.9	V
14-Jun-09	Dry	E	<0.1	V	Dry	E	71.5	V	88.7	V	155.8	V	Dry	E
12-Jul-09	Dry	E	Dry	E	Dry	E	30.4	V	39.1	V	106.6	V	Dry	E
9-Aug-09	Dry	E	Dry	E	Dry	E	82.4	V	123.8	V	169.3	V	Dry	E

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- (1) indicates measurement taken on June 9, 2003.
- (*) indicates flow not measureable/affected due to beaver activity

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	Dry	E	Dry	E	Dry	E	9.4	V	6.2	V	44.4	V	Dry	E
11-Oct-09	Dry	E	0.2	V	Dry	E	84.6	V	56.8	V	150.7	V	Dry	E
15-Nov-09	Dry	E	<0.1	V	Dry	E	45.9	V	44.5	V	123.9	V	Dry	E
13-Dec-09	Buried	E	Buried	E	Dry	E	Frozen	E	Frozen	E	151.0	V	Buried	E
17-Jan-10	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	113.0	V	Buried	E
7-Feb-10	Frozen	E	Frozen	E	Buried	E	Frozen	E	Frozen	E	134.9	V	Frozen	E
14-Mar-10	26.4	V	3.0	V	8.1	V	662.8	V	810.2	V	1499.6	V	0.8	V
4-Apr-10	6.7	V	0.6	V	-	-	-	-	-	-	-	-	-	-
11-Apr-10	3.4	V	0.4	V	Ponded	E	151.2	V	240.9	V	303.4	V	1.1	V
16-May-10	1.3	V	0.3	V	Dry	E	187.1	V	116.4	V	247.0	V	0.3	V
23-May-10	Dry	E	<0.1	V	-	-	-	-	-	-	-	-	-	-
13-Jun-10	3.0	V	0.5	V	Dry	E	115.9	V	169.6	V	240.0	V	0.1	V
18-Jul-10	3.1	V	7.4	V	1.1	V	156.6	V	197.4	V	287.1	V	Dry	E
15-Aug-10	Dry	E	Dry	E	Dry	E	55.6	V	48.0	V	106.9	V	Dry	E
12-Sep-10	Dry	E	Dry	E	Dry	E	12.5	V	21.1	V	89.1	V	Dry	E
17-Oct-10	Dry	E	<0.1	V	Dry	E	103.6	V	82.5	V	99.5	V	Dry	E
14-Nov-10	0.3	V	0.6	V	Ponded	E	181.5	V	187.0	V	276.6	V	Dry	E
19-Dec-10	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	241.2	V	Buried	E

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11	1.7	V		E		E		E		E	305.3	V		E
20-Feb-11	Buried	E	Buried	E		E		E		E	418.7	V		E
13-Mar-11	6.0	V	Buried	E	Buried	E	141.1	V	Buried	E	387.8	V	Buried	E
17-Mar-11	11.2	V	-	-	-	-	-	-	-	-	-	-	-	-
18-Mar-11	59.8	V	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-11	15.8	V	Buried	E	Buried	E	-	-	-	-	962.9	V	Buried	E
1-Apr-11	4.4	V	-	-	-	-	-	-	-	-	-	-	-	-
5-Apr-11	32.4	V	-	-	-	-	-	-	-	-	-	-	-	-
8-Apr-11	17.1	V	-	-	-	-	-	-	-	-	-	-	-	-
12-Apr-11	48.7	V	-	-	-	-	-	-	-	-	-	-	-	-
15-Apr-11	18.0	V	-	-	-	-	-	-	-	-	-	-	-	-
17-Apr-11	14.0	V	1.1	V	Ponded	E	368.0	V	515.8	V	699.4	V	3.7	V
20-Apr-11	33.3	V	-	-	-	-	-	-	-	-	-	-	-	-
21-Apr-11	20.9	V	-	-	-	-	-	-	-	-	-	-	-	-
26-Apr-11	14.0	V	-	-	-	-	-	-	-	-	-	-	-	-
29-Apr-11	19.5	V	-	-	-	-	-	-	-	-	-	-	-	-
3-May-11	8.4	V	-	-	-	-	-	-	-	-	-	-	-	-
6-May-11	4.2	V	-	-	-	-	-	-	-	-	-	-	-	-
10-May-11	1.5	V	-	-	-	-	-	-	-	-	-	-	-	-
13-May-11	8.1	V	-	-	-	-	-	-	-	-	-	-	-	-

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15-May-11	95.3	V	1.2	V	Ponded	E	315.3	V	426.0	V	577.0	V	1.8	V
16-May-11	28.8	V	-	-	-	-	-	-	-	-	-	-	-	-
18-May-11	22.5	V	-	-	-	-	-	-	-	-	-	-	-	-
19-May-11	23.1	V	-	-	-	-	-	-	-	-	-	-	-	-
20-May-11	16.8	V	-	-	-	-	-	-	-	-	-	-	-	-
27-May-11	17.8	V	-	-	-	-	-	-	-	-	-	-	-	-
3-Jun-11	3.8	V	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-11	1.5	V	0.1	V	Ponded	-	149.6	V	160.8	V	296.3	V	<0.1	V
17-Jul-11	Dry	E	Dry	E	Dry	E	45.9	V	33.9	V	89.5	V	Dry	E
14-Aug-11	Dry	E	Dry	E	Dry	E	31.3	V	9.7	V	61.5	V	Dry	E
18-Sep-11	Dry	E	Dry	E	Dry	E	7.9	V	12.6	V	42.5	V	Dry	E
16-Oct-11	Dry	E	0.3	E	Dry	E	85.6	V	74.9	V	90.1	V	Dry	E
20-Nov-11		E	0.1	V		E	53.1	V	50.6	V	96.9	V		E
18-Dec-11	3.7	V	2.3	V	Dry	E	151.7	V	Frozen	E	284.5	V	Buried	E
15-Jan-12	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	174.6	V	Buried	E
19-Feb-12	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	164.9	V	Buried	E
18-Mar-12	13.7	V	1.4	V	Dry	E	486.3	V	735.1	V	981.3	V	0.9	V
15-Apr-12	0.0	E	0.2	V	Dry	E	79.5	V	122.1	V	200.0	V	0.0	V
13-May-12	0.0	E	0.1	V	Dry	E	139.1	V	87.5	V	168.9	V	0.0	E
17-Jun-12	0.0	E	0.0	E	0.0	E	34.2	V	31.7	V	81.0	V	0.0	E

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-Jul-12	0.0	E	0.0	E	0.0	E	2.1	V	16.7	V	48.1	V	0.0	E
12-Aug-12	0.0	E	0.7	V	0.0	E	98.7	V	64.0	V	126.6	V	0.0	E
16-Sep-12	0.0	E	0.0	E	0.0	E	48.0	V	65.3	V	79.3	V	0.0	E
14-Oct-12	0.0	E	0.4	V	0.0	E	72.6	V	40.3	V	85.1	V	0.0	E
18-Nov-12	4.7	V	0.6	V	0.0	E	178.2	V	175.1	V	245.1	V	0.0	E
16-Dec-12	5.2	V	1.6	V	2.1	V	113.4	V	-	Frozen	257.4	V	0.0	E
13-Jan-13	9.8	V	0.0	E	0.2	V	384.3	V	-	Frozen	557.6	V	0.0	E
17-Feb-13	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen	190.7	V	-	Frozen
17-Mar-13	5.5	V	-	Frozen	-	Frozen	-	Frozen	-	Frozen	363.6	V	-	Frozen
14-Apr-13	18.3	V	2.6	V	1.3	V	365.2	V	653.3	V	901.3	V	1.3	V
12-May-13	7.2	V	0.6	V	Dry	E	249.4	V	100.8	V	394.8	V	0.3	V
16-Jun-13	Dry	E	Dry	E	Dry	E	118.2	V	117.2	V	252.6	V	0.0	E
14-Jul-13	Dry	E	Dry	E	Dry	E	38.7	V	57.2	V	157.3	V	0.0	E
18-Aug-13	Dry	E	Dry	E	Dry	E	30.9	V	12.9	V	63.0	V	0.0	E
15-Sep-13	Dry	E	Dry	E	Dry	E	34.6	V	38.1	V	84.1	V	0.0	E
13-Oct-13	Dry	E	Dry	E	Dry	E	75.5	V	121.4	V	183.8	V	0.0	E
17-Nov-13	6.2	V	0.6	V	1.0	V	157.7	V	95.5	V	369.5	V	0.0	E
15-Dec-13	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	262.4	V	Frozen	E
19-Jan-14	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
16-Feb-14	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E

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16-Mar-14	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Apr-14	50.5	V	9.1	V	14.0	V	1082.8	V	1833.9	V	1147.5	V	Frozen	E
11-May-14	2.4	V	0.4	V	<0.1	E	134.2	V	244.0	V	413.9	V	0.3	V
15-Jun-14	Dry	E	Dry	E	Dry	E	35.5	V	74.5	V	113.2	V	Dry	V
13-Jul-14	Dry	E	Dry	E	Dry	E	51.7	V	75.0	V	131.8	V	Dry	E
17-Aug-14	Dry	E	0.1	B	Dry	E	26.8	V	<0.1	E	72.4	V	Dry	E
7-Sep-14	Dry	E	0.1	B	Dry	E	29.9	V	52.5	V	61.0	V	Dry	E
19-Oct-14	Ponded	E	0.4	V	1.1	V	22.1	V	40.1	V	208.0	V	Dry	E
16-Nov-14	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	Frozen	E	Buried	E
14-Dec-14	3.0	V	Buried	E	Buried	E	Frozen	E	Frozen	E	277.6	V	Buried	E
18-Jan-15	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	Frozen	E	Buried	E
15-Feb-15	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	Frozen	E	Buried	E
15-Mar-15	Buried	E	Buried	E	Buried	E	Frozen	E	Frozen	E	172.4	D	Buried	E
19-Apr-15	5.4	V	1.5	V	0.6	V	250.6	V	389.3	V	535.0	V	0.4	V
17-May-15	Ponded	E	0.3	V	Dry	E	44.3	V	78.6	V	163.3	V	Ponded	E
14-Jun-15	2.3	V	2.1	V	Ponded	E	105.8	V	169.6	V	233.4	V	Ponded	E
19-Jul-15	Dry	E	0.1	E	Dry	E	30.9	V	52.7	V	64.2	V	Ponded	E
9-Aug-15	Dry	E	<0.1	E	Dry	E	20.2	V	22.5	V	57.4	V	Dry	E
23-Aug-15	Dry	E	-	-	-	-	-	-	-	-	59.4	V	-	-
6-Sep-15	Dry	E	Dry	E	Dry	-	18.9	V	7.3	V	31.3	V	Dry	E

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11-Oct-15	Dry	E	Dry	E	Dry	E	7.2	V	23.5	V	21.7	V	Dry	E
8-Nov-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Nov-15	Dry	E	0.2	V	Dry	E	58.9	V	84.2	V	110.6	V	Dry	E
6-Dec-15	Dry	E	0.2	V	Dry	E	69.0	V	77.7	V	101.1	V	Dry	E
17-Jan-16	22.0	V	Frozen	E	Buried	E	Frozen	E	Frozen	E	227.6	V	Buried	E
14-Feb-16	3.0	V	Buried	E	Buried	E	Frozen	E	Frozen	E	Frozen	E	Buried	E
13-Mar-16	48.1	V	6.9	V	10.1	V	567.6	V	914.5	V	951.7	V	2.5	V
17-Apr-16	10.6	V	0.9	V	0.4	V	182.7	V	273.3	V	409.5	V	2.9	V
15-May-16	4.0	V	1.0	V	0.6	V	174.0	V	219.0	V	302.8	V	0.9	V
19-Jun-16	Dry	E	0.1	V	Dry	E	26.8	V	48.0	V	86.7	V	Dry	E
3-Jul-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Jul-16	Dry	-	Dry	-	Dry	-	18.7	V	25.3	V	47.8	V	Dry	-
7-Aug-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Aug-16	Dry	-	Dry	-	Dry	-	20.9	V	14.5	V	38.2	V	Dry	-
18-Sep-16	Dry	-	Dry	-	Dry	-	13.5	V	17.9	V	30.9	V	Dry	-
16-Oct-16	Dry	-	Dry	-	Dry	-	34.5	V	27.7	V	48.9	V	Dry	-
18-Nov-16	Dry	-	Dry	-	Dry	-	34.4	V	27.5	V	46.9	V	Dry	-
12-Dec-16	Dry	-	Dry	-	Dry	-	Frozen	-	Frozen	-	54.4	V	Dry	-
22-Jan-17	Buried	-	0.4	V	4.4	V	Frozen	-	Frozen	-	340.4	V	Buried	-
15-Feb-17	Buried	-	Buried	-	Buried	-	Buried	-	Buried	-	163.3	V	Buried	-
19-Mar-17	3.2	V	1.9	V	1.0	V	120.9	V	181.3	V	298.7	V	6.3	V
16-Apr-17	7.7	V	1.6	V	0.2	V	178.3	V	271.9	V	380.1	V	0.7	V
14-May-17	5.5	V	1.0	V	0.6	V	224.3	V	389.9	V	487.2	V	2.2	V

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28-Jun-17	2.5	V	1.4	V	1.4	V	212.1	V	325.0	V	457.4	V	0.3	V
7-Jul-17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Jul-17	1.1	V	0.5	V	Dry	E	76.5	V	132.8	V	236.7	V	Dry	E
27-Jul-17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Aug-17	Ponded	E	0.4	V	Dry	E	63.4	V	98.8	V	148.7	V	Dry	E
17-Sep-17	Dry	E	0.1	V	Dry	E	18.0	V	54.2	V	100.2	V	Dry	E
17-Oct-17	2.3	V	1.5	V	2.5	V	93.7	V	137.4	V	204.0	V	Dry	E
14-Nov-17	0.9	V	0.5	V	3.1	V	60.9	V	135.1	V	190.9	V	Dry	E
12-Dec-17	Frozen	E	0.4	V	Frozen	E	Frozen	E	Frozen	E	219.0	V	Frozen	E
17-Jan-18	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	381.9	V	Frozen	E
18-Feb-18	27.5	V	3.2	V	206.1	V	669.2	V	Frozen	E	1793.4	V	1.1	V
18-Mar-18	Frozen	E	Frozen	E	0.4	V	Frozen	E	Frozen	E	276.6	V	Frozen	E
18-Apr-18	Buried	E	Frozen	E	5.4	V	206.5	V	Frozen	E	502.4	V	Frozen	E
13-May-18	3.6	V	3.2	V	0.2	V	110.4	V	240.6	V	324.8	V	0.8	V
19-Jun-18	0.0	V									238.2	V		
20-Jun-18			0.0	V	0.0	V	3.6	V	13.9	V			0.0	V
4-Jul-18														
18-Jul-18	0.0	V									1008.8	V		
19-Jul-18			0.0	V	0.0	V	0.8	V	3.4	V			0.0	V
3-Aug-18														
23-Aug-18	0.0	V	0.0	V	0.0	V	6.4	V	16.5	V	72.9	V	0.0	V
24-Aug-18														
19-Sep-18	0	V	0	V	0	V	1.4	V	3.4	V	26.9	V	0	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW3		SW3A		SW4		SW5		SW6		SW6A		SW7	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18														
24-Oct-18	0	V	0	V	0	V	23.4	V	33.6	V	60.5	V	0	V
25-Oct-18														
21-Nov-18	0	V	0	V	0	V	0	V	0	V	111.1	V	0	V
22-Nov-18														
12-Dec-18	0	V	0	V	0	V	0	V	0	V	187.9	V	0	V
13-Dec-18														

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	0.2	B	0.0	E	0.6	E	23.0	M	2.1 (1)	B/E	12.0 (1)	B/E	2.4 (1)	B/E
23-Jun-03	0.0	B	0.0	E	0.3	E	3.8	M	0.8	E	1.0	E	0.4	E
22-Jul-03	0.0	E	0.0	E	1.1	E	0.8	M	1.4	E	0.8	E	0.0	E
20-Aug-03	0.0	E	0.0	E	<0.1	E	3.2	M	0.0	E	0.4	E	0.0	E
25-Sep-03	0.0	E	0.0	E	<0.1	M/V	1.0	M	0.1	E	0.1	E	0.0	E
22-Oct-03	0.0	E	0.0	E	0.7	E	-	-	0.2	B	1.3	B	0.1	E
28-Nov-03	0.1	B	2.0	V	<0.1	E	6.9	V	0.3	B/E	0.3	B/E	0.6	B/E
19-Dec-03	Frozen	E	4.5	V	2.0	E	13.1	V	0.5	E	0.6	E	1.0	E
10-Feb-04	Frozen	E	2.1	V	0.3	E	6.7	V	1.5	E	0.8	E	0.5	E
18-Mar-04	Frozen	E	5.2	V	0.2	B	22.4	M	1.7	B/E	0.8	B/E	0.6	B/E
19-Apr-04	0.5	B	7.0	V	1.1	B/E	27.4	M	12.2	B/E	5.8	M	1.8	B/E
19-May-04	0.2	B	1.4	V	0.2	B/E	11.1	M	2.7	M	0.9	B	0.6	B
24-Jun-04	0.1	B	0.6	V	0.1	B/E	4.0	M	0.4	B/E	0.3	B/E	0.1	B/E
29-Jul-04	0.0	E	0.0	E	<0.1	B/E	3.0	M	0.5	E	1.5	E	<0.1	E
23-Aug-04	0.0	E	0.0	E	<0.1	B/E	0.2	M	<0.1	E	0.3	E	DRY	E
21-Sep-04	0.0	E	0.0	E	<0.1	B/E	0.2	M	<0.1	E	0.1	E	DRY	E
21-Oct-04	0.0	E	0.0	E	<0.1	B/E	1.1	M	<0.1	E	0.1	E	DRY	E
17-Nov-04	0.0	E	0.0	E	<0.1	B/E	5.9	M	<0.1	E	0.1	E	DRY	E
15-Dec-04	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Feb-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
27-Mar-05	Frozen	E	4.2	V	0.4	B/E	18.4	M	15.0	E	10.0	E	4.0	E
10-Apr-05	Frozen	E	41.7	V	3.2	B/E	62.1	M	12.0	E	10.0	E	8.0	E
22-May-05	0.1	B/E	1.1	V	0.2	B/E	10.4	V	5.3	V	2.2	V	1.4	V
26-Jun-05	0.0	E	0.0	E	0.1	E	3.2	V	0.1	B/E	0.9	V	0.0	E
10-Jul-05	0.0	E	0.0	E	<0.1	E	5.0	E	1.0	E	2.0	E	0.0	E
21-Aug-05	0.0	E	0.0	E	<0.1	E	0.9	V	0.1	E	0.4	E	0.0	E
25-Sep-05	0.0	E	0.0	E	0.1	E	0.9	M	<0.1	E	0.5	E	0.0	E
23-Oct-05	0.0	E	0.0	E	0.5	E	0.8	V	0.0	E	0.1	E	0.0	E
13-Nov-05	0.0	E	0.0	E	0.1	B/E	2.2	V	0.2	V	1.7	V	0.1	E
11-Dec-05	Frozen	E	0.0	E	0.1	E	3.5	E	0.3	V	0.9	V	0.0	E
15-Jan-06	Frozen	E	5.5	V	2.7	V	20.2	V	7.6	E/V/M	6.3	E/V/M	9.7	E/V/M
19-Feb-06	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
19-Mar-06	Frozen	E	15.3	V	2.0	V	29.2	V	11.4	V	3.5	V	1.7	V
16-Apr-06	0.3	B/E	5.6	V	3.8	V	22.1	V	5.2	V	4.1	V	2.1	V
21-May-06	0.1	B	2.4	V	<0.1	V	10.7	V	3.3	V	1.1	V	2.2	V
18-Jun-06	0.0	E	0.0	E	<0.1	V	3.0	V	0.5	V	1.6	V	0.0	E
9-Jul-06	0.0	E	0.0	E	0.4	V	2.6	V	0.3	V	2.0	V	<0.1	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	0.0	E	0.0	E	<0.1	E	1.0	V	0.7	V	0.5	V	0.0	E
17-Sep-06	0.0	E	0.0	E	<0.1	V	1.5	V	0.3	E	0.6	E	0.0	E
15-Oct-06	0.0	E	0.0	E	<0.1	V	2.2	V	0.9	V	1.6	V	0.1	E
19-Nov-06	0.0	E	2.4	V	1.5	M	16.8	V	3.8	V	1.9	V	3.3	V
17-Dec-06	0.1	V	3.9	V	0.5	V	19.8	V	5.4	V	7.0	V	3.7	V
21-Jan-07	Frozen	E	Frozen	E	Frozen	E	35.0	E	15.0	E	4.0	E	3.0	E
18-Feb-07	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
18-Mar-07	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
15-Apr-07	1.0	V	7.2	V	1.7	V	26.2	V	6.3	V	4.9	V	1.4	V
13-May-07	<0.1	E	2.0	V	0.2	V	11.1	V	4.6	V	2.3	V	0.6	V
17-Jun-07	0.0	E	0.0	E	0.1	V	2.8	V	0.1	V	0.0	E	2.1	V
15-Jul-07	0.0	E	0.0	E	<0.1	E	1.0	V	<0.1	E	0.5	E	0.6	V
19-Aug-07	0.0	E	0.0	E	<0.1	E	0.6	V	0.0	E	0.0	E	0.2	V
16-Sep-07	0.0	E	0.0	E	<0.1	E	0.5	V	0.0	E	0.0	E	1.3	V
14-Oct-07	0.0	E	0.0	E	0.1	E	0.4	V	0.0	E	0.0	E	0.0	E
18-Nov-07	0.0	E	0.0	E	0.2	V	1.4	V	0.0	E	0.0	E	1.5	V
9-Dec-07	Frozen	E	Frozen	E	Frozen	E	2.8	V	2.5	V	0.6	V	2.5	V
20-Jan-08	Frozen	E	Frozen	E	Frozen	E	73.6	V	1.1	V	7.3	V	5.6	V
17-Feb-08	Frozen	E	Frozen	E	Frozen	E	15.3	V	4.3	V	4.7	V	4.1	V

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SURFACE WATER FLOW SUMMARY SW3 TO SW27

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DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	Frozen	E	Frozen	E	Frozen	E	2.1	V	1.2	V	7.2	V	2.9	V
30-Mar-08	<0.1	V	0.1	V	2.8	V	100.8	V	3.3	V	11.1	V	8.9	V
20-Apr-08	0.3	E	12.5	V	0.2	V	32.6	V	2.0	V	6.0	V	3.1	V
18-May-08	<0.1	E	2.8	V	0.4	V	13.1	V	0.5	V	3.8	V	1.4	V
15-Jun-08	0.0	E	0.0	E	0.1	V	13.1	V	0.3	V	4.3	V	1.1	V
13-Jul-08	0.0	E	0.0	E	<0.1	V	0.8	V	<0.1	E	0.4	V	0.5	V
17-Aug-08	0.0	E	0.0	E	0.3	V	7.3	V	0.2	V	0.2	V	0.9	V
14-Sep-08	0.0	E	0.0	E	0.3	V	7.5	V	1.6	V	1.4	V	1.4	V
19-Oct-08	0.0	E	0.0	E	0.4	V	0.8	V	0.2	V	1.3	V	1.6	V
23-Nov-08	Frozen	E	Frozen	E	0.9	V	7.5	V	2.2	V	3.0	V	1.6	V
14-Dec-08	Frozen	E	Frozen	E	0.6	V	17.4	V	1.9	V	5.7	V	10.7	V
18-Jan-09	Frozen	E	Frozen	E	Frozen	E	11.0	V	1.3	V	2.8	V	0.5	V
8-Feb-09	Buried	E	Buried	E	1.8	V	51.1	V	5.3	V	10.8	V	7.5	V
15-Mar-09	0.3	V	0.4	V	1.7	V	43.8	V	4.8	V	9.6	V	4.6	V
12-Apr-09	2.4	V	17.2	V	0.7	V	27.3	V	3.8	V	10.4	V	6.1	V
17-May-09	0.3	V	5.9	V	0.2	V	5.1	V	0.2	V	4.5	V	1.8	V
14-Jun-09	Dry	E	Dry	E	0.1	V	2.3	V	0.1	V	1.8	V	1.3	V
12-Jul-09	Dry	E	Dry	E	<0.1	V	0.8	V	0.2	V	0.5	V	1.6	V
9-Aug-09	Dry	E	Dry	E	0.2	V	0.8	V	0.1	V	0.5	V	1.2	V

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DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	Dry	E	Dry	E	<0.1	E	0.8	V	<0.1	E	<0.1	E	0.5	V
11-Oct-09	Dry	E	Dry	E	0.1	V	1.1	V	<0.1	V	0.2	V	0.5	V
15-Nov-09	Dry	E	Dry	E	0.4	V	2.4	V	0.1	V	1.0	V	0.7	V
13-Dec-09	Dry	E	Buried	E	<0.1	V	0.9	V	0.8	V	1.1	V	1.1	V
17-Jan-10	Buried	E	Buried	E	Buried	E	1.2	V	0.2	V	4.0	V	0.7	V
7-Feb-10	Frozen	E	Frozen	E	Buried	E	1.4	V	0.2	V	1.0	V	0.9	V
14-Mar-10	Buried	E	25.4	V	2.0	V	19.5	V	2.3	V	15.0	V	4.4	V
4-Apr-10	-	-	11.2	V	-	-	-	-	-	-	-	-	-	-
11-Apr-10	0.1	V	8.3	V	0.5	V	9.0	V	0.6	V	6.7	V	2.3	V
16-May-10	Dry	E	5.4	V	0.3	V	12.0	V	0.4	V	4.1	V	0.6	V
23-May-10	-	-	0.6	V	-	-	-	-	-	-	-	-	-	-
13-Jun-10	Dry	E	2.6	V	0.7	V	8.0	V	0.6	V	2.5	V	0.5	V
18-Jul-10	Dry	E	1.6	V	<0.1	V	6.2	V	1.5	V	5.5	V	1.8	V
15-Aug-10	Dry	E	Dry	E	0.2	V	1.3	V	<0.1	V	0.4	V	0.5	V
12-Sep-10	Dry	E	Dry	E	<0.1	V	0.2	V	<0.1	E	<0.1	E	0.3	V
17-Oct-10	Dry	E	0.8	V	0.2	V	6.0	V	0.2	V	1.9	V	0.8	V
14-Nov-10	Dry	E	1.7	V	1.4	V	16.9	V	1.4	V	6.2	V	2.7	V
19-Dec-10	Buried	E	Buried	E	Buried	E	5.3	V	Buried	E	Buried	E	Buried	E

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11		E		E		E	10.3	V	0.5	V		E		E
20-Feb-11		E		E	0.4	V	4.6	V	0.4	V	4.0	V	1.6	V
13-Mar-11	Buried	E	Buried	E	0.2	V	9.5	V	1.0	V	5.8	V	1.2	V
17-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-11	-	-	17.1	V	-	-	-	-	-	-	-	-	-	-
1-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Apr-11	0.7	V	45.3	V	0.9	V	8.2	V	0.7	V	6.4	V	2.6	V
20-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11	0.5	V	16.9	V	2.1	V	41.7	V	8.2	V	12.8	V	6.5	V
16-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Jun-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-11	<0.1	V	1.2	V	0.1	V	3.6	V	0.2	V	3.3	V	1.2	V
17-Jul-11	Dry	E	Dry	E	0.1	V	0.9	V	<0.1	E	0.3	E	0.2	E
14-Aug-11	Dry	E	Dry	E	<0.1	E	0.1	V	<0.1	E	<0.1	E	<0.1	E
18-Sep-11	Dry	E	Dry	E	<0.1	V	<0.1	V	<0.1	E	<0.1	E	<0.1	E
16-Oct-11	Dry	E	Dry	E	2.2	V	7.0	V	0.6	V	4.3	V	0.8	V
20-Nov-11		E		E	0.1	V	5.2	V	0.2	V	0.7	V	0.1	V
18-Dec-11	Buried	E	Buried	E	0.6	V	3.8	V	0.8	V	1.6	V	1.2	V
15-Jan-12	Buried	E	Buried	E	-	-	17.6	V	Buried	E	Buried	E	Buried	E
19-Feb-12	Buried	E	Buried	E	0.5	V	4.4	V	Buried	E	Buried	E	Buried	E
18-Mar-12	0.1	V	12.2	V	1.2	V	22.7	V	5.1	V	5.1	V	1.3	V
15-Apr-12	0.0	V	0.3	V	0.4	V	5.8	V	0.3	V	0.7	V	0.2	V
13-May-12	0.0	E	<0.1	V	0.7	V	2.5	V	0.2	V	0.9	V	0.1	V
17-Jun-12	0.0	E	0.0	E	0.1	V	1.9	V	<0.1	V	0.5	V	0.2	V

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111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-Jul-12	0.0	E	0.0	E	0.1	V	1.1	V	0.0	E	<0.1	E	0.2	V
12-Aug-12	0.0	E	0.0	E	0.6	V	1.7	V	0.2	V	0.4	V	0.4	V
16-Sep-12	0.0	E	0.0	E	0.2	V	1.3	V	<0.1	E	<0.1	E	0.1	V
14-Oct-12	0.0	E	0.0	E	0.3	V	1.1	V	<0.1	E	<0.1	E	<0.1	E
18-Nov-12	0.0	E	0.0	E	0.3	V	10.1	V	1.0	V	1.3	V	0.9	V
16-Dec-12	0.0	E	10.1	V	0.1	V	6.1	V	0.4	V	1.1	V	0.6	V
13-Jan-13	0.0	E	5.1	V	0.8	V	19.8	V	0.9	V	3.6	V	0.9	V
17-Feb-13	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen
17-Mar-13	-	Frozen	-	Frozen	-	Frozen	19.8	V	0.3	V	1.3	V	1.2	V
14-Apr-13	0.1	V	24.4	V	1.1	V	42.8	V	5.1	V	12.5	V	4.8	V
12-May-13	<0.1	V	11.8	V	0.1	V	15.3	V	0.2	V	2.6	V	0.4	V
16-Jun-13	0.0	E	0.8	V	<0.1	V	4.0	V	0.1	V	0.5	V	0.2	V
14-Jul-13	0.0	E	0.0	E	<0.1	V	1.7	V	<0.1	V	<0.1	E	<0.1	E
18-Aug-13	0.0	E	0.0	E	0.1	V	1.0	V	<0.1	E	<0.1	E	<0.1	E
15-Sep-13	0.0	E	0.0	E	<0.1	V	0.5	V	<0.1	E	<0.1	E	<0.1	E
13-Oct-13	0.0	E	0.0	E	0.7	V	3.2	V	0.4	V	2.4	V	0.7	V
17-Nov-13	0.0	E	6.4	V	4.6	V	5.5	V	0.3	V	2.6	V	0.5	V
15-Dec-13	Frozen	E	Frozen	E	Buried	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
19-Jan-14	Frozen	E	Frozen	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E
16-Feb-14	Frozen	E	Frozen	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-14	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Apr-14	Frozen	E	58.0	V/E	6.7	V	47.5	V	1.3	V	10.9	V	23.9	V
11-May-14	0.1	V	6.4	V	0.2	V	10.9	V	0.5	V	2.7	V	1.6	V
15-Jun-14	Dry	E	Dry	E	0.5	V	12.5	V	2.6	V	7.1	V	4.5	V
13-Jul-14	Dry	E	Dry	E	<0.1	V	1.1	V	<0.1	E	<0.1	E	<0.1	E
17-Aug-14	Dry	E	Dry	E	Ponded	E	1.0	V	<0.1	E	<0.1	E	<0.1	E
7-Sep-14	Dry	E	Dry	E	<0.1	E	0.3	V	<0.1	E	<0.1	E	<0.1	E
19-Oct-14	Dry	E	1.5	V	<0.1	V	2.3	V	<0.1	V	0.1	V	0.4	V
16-Nov-14	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E
14-Dec-14	Buried	E	Buried	E	Buried	E	2.8	V	0.6	V	0.1	V	0.4	V
18-Jan-15	Buried	E	Buried	E	Buried	E	0.3	V	Buried	E	Buried	E	Buried	E
15-Feb-15	Buried	E	Buried	E	Buried	E	N/A	E	N/A	E	N/A	E	N/A	E
15-Mar-15	Buried	E	Buried	E	Frozen	E	5.3	V	0.2	V	0.9	V	<0.1	E
19-Apr-15	0.2	V	7.7	V	0.2	V	25.7	V	1.5	V	2.7	V	2.9	V
17-May-15	Dry	E	Ponded	E	<0.1	V	1.5	V	0.1	V	0.5	V	0.1	V
14-Jun-15	Dry	E	0.8	V	0.1	V	6.6	V	0.3	V	0.6	V	0.4	V
19-Jul-15	Dry	E	Dry	E	0.2	V	5.3	V	0.3	V	0.2	V	0.3	V
9-Aug-15	Dry	E	Dry	E	0.3	V	2.7	V	<0.1	V	0.2	V	0.2	V
23-Aug-15	-	-	Dry	E	0.2	E	0.4	V	<0.1	E	<0.1	E	0.3	E
6-Sep-15	Dry	E	Dry	E	<0.1	E	0.8	V/E	0.3	E	0.2	V	0.1	V

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TABLE B-3
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111-53312-00 A52.1

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
11-Oct-15	Dry	E	Dry	E	0.2	E	0.6	E/V	0.2	E	0.3	E	0.5	E
8-Nov-15	-	-	-	-	0.4	-	-	-	-	-	-	-	-	-
15-Nov-15	Dry	E	Dry	E	<0.1	V	1.6	V	0.2	V	0.3	V	0.5	V
6-Dec-15	Dry	E	Dry	E	0.3	V	1.1	V	0.1	V	1.0	V	0.3	V
17-Jan-16	Buried	E	Buried	E	0.5	V	5.2	V	0.4	V	2.4	V	0.6	V
14-Feb-16	Buried	E	Buried	E	0.6	V	8.1	V	1.9	V	2.0	V	1.1	V
13-Mar-16	0.3	V	30.7	V	3.5	V	51.9	V	3.5	V	2.2	V	5.1	V
17-Apr-16	<0.1	E	8.5	V	1.0	V	23.4	V	1.0	V	1.9	V	4.3	V
15-May-16	DRY	E	5.5	V	0.1	V	13.3	V	0.2	V	1.8	V	2.1	V
19-Jun-16	Dry	E	Dry	E	0.2	V	4.3	V	0.2	V	1.0	V	0.1	V
3-Jul-16	-	-	-	-	0.2	V	12.2	V	0.1	V	0.8	V	0.1	V
17-Jul-16	Dry	-	Dry	-	0.2	V	2.1	V	0.1	V	0.7	V	0.1	V
7-Aug-16	-	-	-	-	<0.1	E	0.4	E/V	0.1	E	0.2	E	0.3	E
21-Aug-16	Dry	-	Dry	-	<0.1	E	0.8	V	<0.1	E	0.4	V	0.3	V
18-Sep-16	Dry	-	Dry	-	0.1	V	1.1	V	<0.1	E	0.2	E	0.4	V
16-Oct-16	Dry	-	Dry	-	0.2	V	0.4	V	<0.1	E	<0.1	E	0.3	V
18-Nov-16	Dry	-	Dry	-	0.2	V	0.9	V	<0.1	E	0.9	V	0.1	V
12-Dec-16	Dry	-	Dry	-	0.9	V	2.5	V	0.1	V	0.7	V	0.5	V
22-Jan-17	Buried	-	4.0	V	1.5	V	12.9	V	4.7	V	3.8	V	1.3	V
15-Feb-17	Buried	-	Buried	-	0.7	V	8.5	V	0.1	V	1.7	V	0.7	V
21-Mar-17	Buried	-	7.7	V	1.6	V	23.4	V	0.6	V	2.6	V	0.5	V
19-Apr-17	Dry	-	20.1	V	0.5	V	18.8	V	0.6	V	1.6	V	0.9	V
14-May-17	Dry	-	5.0	V	1.7	V	33.4	V	0.8	V	0.3	V	2.0	V

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TABLE B-3
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111-53312-00 A52.1

DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
28-Jun-17	Dry	E	2.1	V	1.7	V	21.5	V	0.2	V	1.4	V	1.1	V
7-Jul-17	-	-	-	-	0.4	V	2.4	V	0.2	V	3.0	V	0.1	V
18-Jul-17	Dry	E	Dry	E	0.4	V	4.2	V	0.4	V	1.6	V	0.4	V
27-Jul-17	-	-	-	-	0.4	V	0.9	V	0.2	V	0.4	V	0.2	V
13-Aug-17	Dry	E	Dry	E	0.5	V	2.5	V	0.2	V	0.5	V	0.7	V
17-Sep-17	Dry	E	Dry	E	0.2	V	1.3	V	0.1	V	0.4	V	0.4	V
17-Oct-17	Dry	E	Dry	E	0.5	V	7.4	V	0.2	V	0.7	V	0.7	V
14-Nov-17	Dry	E	0.2	V	0.5	V	5.5	V	0.1	V	0.9	V	0.3	V
12-Dec-17	Frozen	E	Frozen	E	0.2	V	5.7	V	0.5	V	1.7	V	0.8	V
17-Jan-18	Frozen	E	Frozen	E	4.9	V	18.2	V	0.5	V	1.6	V	0.9	V
18-Feb-18	0.4	V	17.9	V	1.1	V	39.5	V	3.6	V	2.7	V	7.8	V
18-Mar-18	Frozen	E	Frozen	E	0.3	V	13.7	V	0.8	V	0.4	V	0.8	V
18-Apr-18	Frozen	E	Frozen	E	Buried	E	16.0	V	0.6	V	2.0	V	1.8	V
13-May-18	Dry	E	20.1	V	0.5	V	23.8	V	0.2	V	0.8	V	1.2	V
19-Jun-18			0.0	V										
20-Jun-18		Dry			0.8	V	3.5	V	0.6	V	0.6	V	0.5	V
4-Jul-18					0.3	V	1.4	V	0.2	V	0.3	V	0.4	V
18-Jul-18			0.0	V										
19-Jul-18		Dry			0.2	V	1.1	V	0.0	V	0.3	V	0.3	V
3-Aug-18					0.1	V	2.1	V	0.0	V	0.2	V	0.2	V
23-Aug-18	0.0	V	0.0	V										
24-Aug-18					0.1	V	1	V	0	V	0.2	V	0.2	V
19-Sep-18	0	V	0	V										

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DATE	SW8		SW9		SW10		SW11		SW11A		SW11B		SW11C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18					0	V	2.3	V	0	V	0.2	V	0.3	V
24-Oct-18	0	V	0	V										
25-Oct-18					0.3	V	0.9	V	0	V	0.1	V	0.2	V
21-Nov-18	0	V	0	V										
22-Nov-18					0.1	V	2.3	V	0	V	0.4	V	0.2	V
12-Dec-18	0	V	0.5	V										
13-Dec-18					0.6	V	5.6	V	0.4	V	0.8	V	0.1	V

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SURFACE WATER FLOW SUMMARY SW3 TO SW27

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DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	2.4 (1)	B/E	27.8 (1)	B/E	1.7	B	0.0	E	6.0	B	15.0	V	1.8	B
23-Jun-03	0.8	E	2.5	B	0.9	B	0.0	E	4.7	B	6.2	V	0.5	B
22-Jul-03	0.8	E	1.4	B	0.6	B	0.0	E	2.8	B	2.8	V	2.9	E
20-Aug-03	0.1	E	1.9	E	0.3	B	0.0	E	2.2	B	2.2	V	1.2	M
25-Sep-03	0.2	E	0.4	E	0.3	B	0.0	E	1.9	B	3.0	V	0.8	B
22-Oct-03	0.1	B	2.2	E	1.9	B	0.0	E	2.7	B	6.2	V	1.1	B
28-Nov-03	0.8	B/E	12.5	B/E	4.3	B	-(**)	E	8.0	B/E	17.1	V	8.2	B/E
19-Dec-03	1.2	E	26.5	B/E	4.7	B	10.0	E	25.0	E	12.8	M	12.9	M
10-Feb-04	0.8	E	3.5	B	1.7	B	Frozen	E	10.0	E	3.0	V	Frozen	E
18-Mar-04	0.9	B/E	11.9	B/E	3.7	B	Frozen	E	8.0	E	49.0	V	Frozen	E
19-Apr-04	8.4	B	22.0	B/E	11.4	B	4.4	M	30.0	E	46.3	V	1.9	V
19-May-04	6.7	M	5.9	B	3.0	B	-(**)	E	11.2	B,E	14.2	V	1.6	V
24-Jun-04	0.2	B/E	3.4	BE	1.1	B	0.0	E	6.4	BE	1.8	V	1.4	BE
29-Jul-04	1.0	E	0.8	BE	0.7	B	0.0	E	3.3	BE	1.1	V	1.4	BE
23-Aug-04	<0.1	E	0.3	BE	0.3	B	0.0	E	1.6	BE	1.6	V	0.7	BE
21-Sep-04	<0.1	E	0.2	BE	0.2	B	0.0	E	0.6	BE	<0.1	V	<0.1	E
21-Oct-04	<0.1	E	0.2	BE	0.2	B	0.0	E	0.9	BE	0.8	V	0.8	BE
17-Nov-04	<0.1	E	0.4	BE	0.3	B	0.0	E	1.1	BE	1.3	V	1.0	BE
15-Dec-04	Frozen	E	1.05	BE	Frozen	E	Frozen	E	Frozen	E	2.53	V	1.52	BE

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Feb-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
27-Mar-05	10.0	E	33.0	B/E	0.8	E	4.9	B/E	50.0	E	5.5	V	Frozen	E
10-Apr-05	5.7	E	61.0	B/E	16.1	B/E	6.7	B/E	80.0	E	70.7	V	5.3	B/E
22-May-05	2.8	V	13.4	B/E	2.1	B/E	0.0	E	8.2	B/E	7.4	V	3.5	B/E
26-Jun-05	0.2	E	3.0	B/E	1.0	B/E	0.0	E	10.0	B/E	2.9	V	0.2	B/E
10-Jul-05	1.5	E	6.0	B/E	0.7	B/E	0.0	E	5.0	E	2.1	V	1.0	B/E
21-Aug-05	0.3	E	1.0	B/E	0.3	B/E	0.0	E	1.1	B/E	1.1	V	1.4	B/E
25-Sep-05	0.1	E	0.9	E	0.2	B	0.0	E	0.0	E	1.3	V	0.4	B
23-Oct-05	0.1	E	2.0	B/E	0.2	B	0.0	E	1.5	E	1.7	V	1.9	B
13-Nov-05	1.2	V/E	1.4	B/E	1.0	B	0.0	E	8.8	E/V/M	6.7	V	1.0	B/E
11-Dec-05	0.2	V	1.4	V	0.9	B	Frozen	E	6.5	E/V/M	5.1	V	3.4	B
15-Jan-06	9.8	E/V/M	22.4	V	5.6	B	Frozen	E	19.6	V	15.6	V	Frozen	E
19-Feb-06	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
19-Mar-06	4.2	V	30.4	V	5.5	B	0.5	V	37.3	VB	25.1	V	Frozen	E
16-Apr-06	8.6	V	29.4	V	3.2	V	0.5	V	30.0	V	19.5	V	5.7	V
21-May-06	3.4	V	19.9	V	1.3	V	0.2	V	13.8	V	8.8	V	3.5	V
18-Jun-06	0.3	V	16.7	V	0.7	V	0.0	E	3.4	V	1.6	V	2.5	V
9-Jul-06	0.4	V	3.7	V	0.9	V	0.0	E	2.4	E/V/M	3.0	V	1.5	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	0.7	V	1.9	V	0.2	V	0.0	E	0.8	V	0.4	V	1.0	V
17-Sep-06	0.2	V	1.9	V	0.4	V	0.0	E	0.9	V	1.9	V	2.2	V
15-Oct-06	0.6	V	5.2	V	0.7	V	0.0	E	2.2	V	5.0	V	1.8	V
19-Nov-06	4.9	V	17.2	V	3.3	V	0.1	V	26.5	V	10.6	V	1.5	V
17-Dec-06	2.6	V	23.2	V	3.7	V	0.9	V	37.4	V	17.8	V	1.3	V
21-Jan-07	15.0	E	37.0	E	8.0	E	Frozen	E	48.0	E	Frozen	E	Frozen	E
18-Feb-07	Frozen	E	6.2	V	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
18-Mar-07	Frozen	E	17.5	E/V/M	5.1	V	0.8	V	Frozen	E	Frozen	E	Frozen	E
15-Apr-07	3.3	V	59.3	V	6.9	V	0.6	V	33.8	V	14.3	V	2.1	V
13-May-07	1.6	V	15.3	V	0.4	V	0.0	E	5.6	V	4.1	V	2.2	V
17-Jun-07	0.4	V	0.9	V	0.3	V	0.0	E	5.6	V	1.7	V	1.3	V
15-Jul-07	0.3	V	0.7	V	3.0	V	0.0	E	3.9	V	0.5	V	0.8	V
19-Aug-07	0.1	V	3.5	V	0.2	V	0.0	E	1.7	V	1.1	V	0.7	V
16-Sep-07	0.2	V	2.3	V	0.1	V	0.0	E	1.5	V	1.3	V	0.4	V
14-Oct-07	0.0	V	0.6	V	0.1	V	0.0	E	0.2	V	0.3	V	0.5	V
18-Nov-07	0.2	V	0.3	V	0.4	V	0.0	E	1.6	V	6.9	V	1.1	V
9-Dec-07	0.9	V	3.2	V	0.6	V	Frozen	E	Frozen	E	Frozen	E	0.7	V
20-Jan-08	8.1	V	10.4	V	2.4	V	Frozen	E	Frozen	E	12.6	V	Frozen	E
17-Feb-08	14.5	V	17.4	V	3.7	V	Frozen	E	35.3	V	Frozen	E	Frozen	E

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TABLE B-3
MONTHLY STATIONS
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DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	12.5	V	12.8	V	Frozen	E	Frozen	E	20.9	V	Frozen	V	Frozen	E
30-Mar-08	2.7	V	50.2	V	17.2	V	5.0	V	107.8	V	67.1	V	34.5	V
20-Apr-08	3.1	V	65.4	V	4.2	V	0.6	V	98.0	V	41.4	V	1.5	V
18-May-08	2.3	V	20.2	V	0.7	V	0.8	V	36.5	V	14.4	V	0.5	V
15-Jun-08	0.1	V	9.8	V	1.2	B	0.0	E	11.5	V	4.0	V	0.3	V
13-Jul-08	0.0	E	0.2	V	0.5	B	0.0	E	3.3	V	0.6	V	0.0	V
17-Aug-08	0.0	E	1.8	V	0.4	V	0.0	E	4.0	V	6.1	V	0.1	V
14-Sep-08	<0.1	V	6.3	V	0.6	V	0.0	E	10.2	V	7.0	V	0.6	V
19-Oct-08	0.1	V	2.2	V	0.4	V	0.0	E	20.4	V	10.2	V	0.5	V
23-Nov-08	3.5	V	12.2	V	2.8	V	1.1	V	35.6	V	13.4	V	Frozen	E
14-Dec-08	2.9	V	41.0	V	4.2	V	9.7	V	55.8	V	54.0	V	Frozen	E
18-Jan-09	Frozen	E	3.4	V	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
8-Feb-09	0.9	V	46.5	V	26.4	V	3.8	V	142.7	V	Buried	E	Buried	E
15-Mar-09	1.6	V	109.7	V	16.5	V	16.5	V	107.6	V	43.4	V	4.6	V
12-Apr-09	3.4	V	55.2	V	7.5	V	0.9	V	60.7	V	44.7	V	5.4	V
17-May-09	0.8	V	18.1	V	1.6	V	0.2	V	29.9	V	11.2	V	0.3	V
14-Jun-09	Dry	E	2.1	V	0.4	V	Dry	E	9.8	V	7.1	V	<0.1	V
12-Jul-09	Dry	E	0.7	V	0.3	V	Dry	E	3.4	V	1.9	V	0.2	V
9-Aug-09	Dry	E	1.0	V	0.3	V	Dry	E	18.8	V	3.8	V	0.1	V

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	Dry	E	0.2	V	0.2	V	Dry	E	1.3	V	0.5	V	<0.1	V
11-Oct-09	Dry	E	3.5	V	0.4	V	Dry	E	8.3	V	3.6	V	0.3	V
15-Nov-09	Dry	E	0.7	V	0.5	V	Dry	E	4.6	V	0.9	V	0.2	V
13-Dec-09	Buried	E	1.2	V	0.5	V	Buried	E	4.9	V	6.2	V	0.6	V
17-Jan-10	Buried	E	3.6	V	0.6	V	Buried	E	Frozen	E	Buried	E	Buried	E
7-Feb-10	Buried	E	1.1	V	Frozen	E	Buried	E	Frozen	E	Buried	E	Buried	E
14-Mar-10	0.5	V	57.5	V	14.3	V	2.5	V	125.8	V	100.6	V	15.9	V
4-Apr-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-Apr-10	0.5	V	18.2	V	1.5	V	0.4	V	29.6	V	15.7	V	0.5	V
16-May-10	0.6	V	21.0	V	2.2	V	0.2	V	36.4	V	28.6	V	0.6	V
23-May-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Jun-10	0.6	V	10.6	V	1.1	V	0.1	V	24.3	V	27.6	V	0.6	V
18-Jul-10	0.3	V	21.8	V	2.7	V	0.4	V	31.4	V	45.0	V	0.7	V
15-Aug-10	Dry	E	0.6	V	0.4	V	Dry	E	3.0	V	1.3	V	Dry	E
12-Sep-10	Dry	E	0.8	V	0.2	V	Dry	E	2.1	V	0.8	V	Dry	E
17-Oct-10	<0.1	V	2.3	V	0.9	V	Dry	E	18.5	V	5.6	V	0.7	V
14-Nov-10	0.4	V	32.1	V	7.3	V	2.3	V	54.9	V	16.6	V	0.5	V
19-Dec-10	Buried	E	8.7	V	Buried	E	Buried	E	Frozen	E	Buried	E	Buried	E

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DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11		E	3.0	V		E		E		E		E		E
20-Feb-11		E	4.6	V		E		E		E		E		E
13-Mar-11	0.6	V	22.5	V	7.4	V	Frozen	E	72.6	V	38.2	V	Frozen	E
17-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-11	-	-	-	-	8.4	V	2.0	V	76.8	V	47.8	V	5.9	V
1-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Apr-11	1.3	V	28.0	V	2.5	V	0.9	V	28.2	V	31.1	V	0.6	V
20-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11	3.3	V	48.3	V	6.4	V	4.2	V	80.4	V	49.5	V	1.6	V
16-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Jun-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-11	0.5	V	8.1	V	0.6	V	Ponded	E	8.6	V	10.0	V	0.4	V
17-Jul-11	<0.1	E	1.1	V	0.2	V	Dry	E	6.6	V	1.1	V	Dry	V
14-Aug-11	Dry	E	0.1	V	0.1	V	Dry	E	0.6	V	0.6	V	Dry	V
18-Sep-11	Dry	E	1.0	V	0.1	V	Dry	E	1.3	V	0.5	V	Dry	V
16-Oct-11	0.3	V	42.5	V	15.2	V	5.2	V	131.0	V	98.4	V	0.1	V
20-Nov-11	0.04	V	2.5	V	0.4	V		E	12.5	V	3.1	V	0.6	V
18-Dec-11	0.6	V	15.5	V	2.0	V	3.5	V	36.0	V	23.3	V	0.8	V
15-Jan-12	Buried	E	24.1	V	2.0	V	Frozen	E	21.3	V	Buried	E	Buried	E
19-Feb-12	Buried	E	11.1	V	0.7	V	Buried	E	12.8	V	Buried	E	Buried	E
18-Mar-12	4.6	V	47.7	V	5.8	V	1.7	V	71.8	V	37.9	V	1.5	V
15-Apr-12	<0.1	V	7.4	V	0.3	V	Dry	E	7.7	V	6.5	V	<0.1	V
13-May-12	0.3	V	6.3	V	0.6	V	Dry	E	15.4	V	11.6	V	<0.1	V
17-Jun-12	0.0	E	3.1	V	0.4	V	0.0	E	4.3	V	2.8	V	0.0	E

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-Jul-12	0.0	E	1.8	V	0.1	V	0.0	E	2.4	V	1.2	V	0.0	E
12-Aug-12	<0.1	V	12.9	V	1.8	V	0.6	V	13.2	V	7.7	V	0.6	V
16-Sep-12	0.0	E	0.4	V	0.3	V	0.0	E	3.8	V	4.3	V	0.1	V
14-Oct-12	0.0	E	0.5	V	0.4	V	0.0	E	4.9	V	11.1	V	0.3	V
18-Nov-12	0.2	V	14.9	V	1.1	V	0.4	V	10.9	V	19.6	V	0.8	V
16-Dec-12	0.3	V	13.9	V	1.8	V	0.3	V	15.4	V	17.5	V	1.2	V
13-Jan-13	0.9	V	29.1	V	5.2	V	1.7	V	111.9	V	35.7	V	6.8	V
17-Feb-13	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen
17-Mar-13	0.5	V	17.9	V	5.2	V	1.7	V	32.8	V	25.1	V	-	Frozen
14-Apr-13	4.3	V	47.4	V	11.3	V	2.3	V	131.3	V	66.5	V	2.9	V
12-May-13	0.3	V	16.6	V	1.1	V	0.1	V	14.8	V	19.9	V	0.7	V
16-Jun-13	0.2	V	7.9	V	0.4	V	0.0	E	8.4	V	17.0	V	0.2	V
14-Jul-13	<0.1	E	1.4	V	0.3	V	0	E	6.9	V	10.9	V	<0.1	E
18-Aug-13	<0.1	E	2.0	V	0.1	V	0.0	E	0.9	V	3.4	V	<0.1	E
15-Sep-13	<0.1	E	0.9	V	0.1	V	0.0	E	1.2	V	0.9	V	0.0	E
13-Oct-13	0.9	V	6.5	V	0.9	V	0.2	V	12.4	V	10.9	V	0.8	V
17-Nov-13	1.1	V	19.0	V	2.2	V	1.7	V	28.1	V	20.3	V	0.9	V
15-Dec-13	Frozen	E	12.9	V	0.6	V	Frozen	E	9.2	V	Frozen	E	Frozen	E
19-Jan-14	Buried	E	9.5	V	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E
16-Feb-14	Buried	E	3.9	V	Buried	E	Buried	E	11.1	V	Buried	E	Buried	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-14	Frozen	E	5.5	V	Frozen	E	Frozen	E	7.1	V	Frozen	E	Frozen	E
13-Apr-14	2.2	V	51.4	V	17.0	V	5.3	V	108.5	V	108.6	V	6.7	V
11-May-14	1.2	V	13.5	V	2.8	V	0.5	V	45.5	V	29.3	V	0.4	V
15-Jun-14	8.0	V	10.5	V	0.5	V	DRY	E	6.4	V	2.1	V	DRY	E
13-Jul-14	<0.1	E	2.3	V	0.2	V	DRY	E	5.2	V	2.6	V	<0.1	E
17-Aug-14	<0.1	E	0.2	V	0.1	V	DRY	E	1.2	V	DRY	V	3.2	V
7-Sep-14	<0.1	E	1.1	V	0.1	V	DRY	E	1.5	V	0.6	V	0.1	V
19-Oct-14	0.2	V	11.2	V	1.7	V	0.2	V	21.2	V	0.8	V	0.1	V
16-Nov-14	Buried	E	5.4	V	Buried	E	Buried	E	4.5	V	Buried	E	Buried	E
14-Dec-14	0.3	V	9.7	V	0.1	V	Buried	E	0.1	V	Buried	E	1.1	V
18-Jan-15	Buried	E	19.2	V	0.2	V	Buried	E	7.9	V	Buried	E	Buried	E
15-Feb-15	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E
15-Mar-15	Buried	E	19.2	V	Buried	E	Buried	E	Frozen	E	Buried	E	Buried	E
19-Apr-15	1.0	V	28.9	V	9.8	V	3.3	V	28.7	V	16.4	V	2.5	V
17-May-15	0.3	V	25.9	V	0.5	V	Dry	E	3.4	V	6.8	V	1.0	E
14-Jun-15	2.5	V	25.9	V	2.4	V	Dry	E	17.9	V	12.6	V	0.8	V
19-Jul-15	0.1	V	25.9	V	0.4	V	DRY	E	6.1	V	4.3	V	0.3	V
9-Aug-15	0.4	V	1.2	V	0.3	V	DRY	E	3.4	V	5.3	V	DRY	V
23-Aug-15	<0.1	E	0.9	V	-	-	-	-	-	-	1.3	V	DRY	E
6-Sep-15	0.2	V	0.7	V	1.0	E	DRY	E	3.5	V	1.9	V	DRY	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
11-Oct-15	<0.1	V	0.3	V	0.1	V	Dry	E	0.6	V	0.4	V	Dry	E
8-Nov-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Nov-15	0.2	V	2.7	V	0.4	V	Dry	E	13.9	V	3.9	V	0.4	V
6-Dec-15	0.1	V	2.3	V	1.5	V	Dry	E	3.6	V	2.5	V	0.5	V
17-Jan-16	3.4	V	6.9	V	2.7	V	Buried	E	Frozen	E	11.5	V	1.1	V
14-Feb-16	3.5	V	5.2	V	4.3	V	Buried	E	Frozen	E	Buried	E	Buried	E
13-Mar-16	12.9	V	77.0	V	50.4	V	23.6	V	166.1	V	175.4	V	5.3	V
17-Apr-16	10.5	V	35.4	V	5.5	V	1.3	V	74.6	V	64.7	V	1.2	V
15-May-16	5.4	V	11.2	V	3.0	V	0.1	V	19.5	V	30.3	V	0.8	V
19-Jun-16	0.9	V	17.0	V	0.6	V	Dry	E	7.9	V	1.2	V	Dry	V
3-Jul-16	0.4	V	2.0	V	-	-	-	-	-	-	-	-	-	-
17-Jul-16	0.3	V	2.7	V	Dry	-	0.4	V	1.3	V	3.5	V	Dry	-
7-Aug-16	0.4	E	1.5	E	-	-	-	-	-	-	-	-	-	-
21-Aug-16	0.3	V	1.2	V	0.2	V	Dry	E	2.9	V	1.5	V	0.1	V
18-Sep-16	0.3	V	1.0	V	0.3	V	Dry	E	5.4	V	2.3	V	0.5	V
16-Oct-16	0.1	V	1.0	V	0.1	V	Dry	E	1.8	V	1.9	V	0.6	V
18-Nov-16	0.4	V	1.6	V	0.2	V	Dry	E	2.1	V	2.3	V	0.5	V
12-Dec-16	0.1	V	1.9	V	0.3	V	Dry	E	0.3	V	3.7	V	1.8	V
22-Jan-17	10.3	V	19.5	V	6.2	V	0.8	V	26.9	V	39.6	V	3.8	V
15-Feb-17	3.3	V	6.5	V	1.1	V	Buried	-	Frozen	-	Buried	-	Buried	-
21-Mar-17	7.5	V	10.9	V	2.2	V	Frozen	V	3.6	V	19.6	V	1.2	V
19-Apr-17	20.7	V	32.0	V	4.2	V	3.0	V	51.6	V	46.1	V	1.3	V
14-May-17	14.5	V	19.5	V	2.6	V	0.1	V	13.0	V	23.1	V	1.9	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
28-Jun-17	5.5	V	17.9	V	2.3	V	0.1	V	34.0	V	43.9	V	2.2	V
7-Jul-17	0.8	V	8.9	V	-	-	-	-	-	-	-	-	-	-
18-Jul-17	1.1	V	4.9	V	1.3	V	Dry	E	11.6	V	6.1	V	0.4	V
27-Jul-17	0.4	V	4.3	V	-	-	-	-	-	-	-	-	-	-
13-Aug-17	1.0	V	1.8	V	0.5	V	Dry	E	7.2	V	5.8	V	0.3	V
17-Sep-17	0.2	V	1.8	V	0.7	V	Dry	E	6.7	V	10.7	V	0.5	V
17-Oct-17	0.3	V	3.1	V	1.2	V	Dry	E	7.3	V	18.4	V	1.9	V
14-Nov-17	0.8	V	6.0	V	1.4	V	Dry	E	11.2	V	13.8	V	1.3	V
12-Dec-17	2.0	V	7.8	V	1.6	V	Dry	E	18.7	V	14.5	V	Frozen	E
17-Jan-18	5.1	V	21.9	V	5.1	V	Frozen	E	26.7	V	29.4	V	Frozen	E
18-Feb-18	19.9	V	52.6	V	18.6	V	4.8	V	76.9	V	101.6	V	3.5	V
18-Mar-18	4.1	V	7.7	V	1.2	V	Frozen	E	41.0	V	12.4	V	0.9	V
18-Apr-18	7.3	V	15.3	V	3.8	V	Buried	E	23.4	V	43.8	V	3.5	V
13-May-18	5.5	V	51.9	V	3.7	V	1.9	V	25.3	V	35.2	V	2.4	V
19-Jun-18											10.4	V	0.5	V
20-Jun-18	0.3	V	2.7	V	1.1	V	0.0	V	4.2	V				
4-Jul-18	1.6	V	1.4	V										
18-Jul-18											3.0	V	0.0	V
19-Jul-18	0.4	V	0.7	V	0.2	V	0.0	V	2.2	V				
3-Aug-18	0.1	V	1.1	V										
23-Aug-18					0.5	V					2.5	V	0.1	V
24-Aug-18	0.2	V	0.7	V			0	V	2	V				
19-Sep-18					0.3	V					0.6	V	0	V

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MONTHLY STATIONS
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111-53312-00 A52.1

DATE	SW11D		SW11E		SW12		SW12A		SW13		SW14		SW15	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18	0.1	V	0.3	V			0	V	0.4	V				
24-Oct-18														
25-Oct-18	0	V	1.3	V	0.4	V	0	V	1	V	4.8	V	0.5	V
21-Nov-18														
22-Nov-18	0.2	V	4.2	V	0	V	0	V	6.7	V	5.6	V	0.7	V
12-Dec-18														
13-Dec-18	1.3	V	7.5	V	0.6	V	0	V	13	V	0	V	0.8	V

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	1.0	B	2.2	B	12.0	V			46.0	V	95.6	V	0.3	E
23-Jun-03	1.6	E	1.5	B	10.4	V			11.8	V	40.5	V	3.0	B
22-Jul-03	0.3	E	1.6	B	9.5	B			13.3	V	19.1	V	0.7	B
20-Aug-03	<0.1	E	1.0	B	4.1	B			4.0	V	38.3	V	0.2	E
25-Sep-03	<0.1	E	0.1	B	1.9	V			1.6	V	21.3	V	0.0	E
22-Oct-03	2.5	E	2.6	B	3.3	B			25.8	V	68.3	V	0.4	E
28-Nov-03	2.5	E	6.9	B/E	10.6	V			36.7	V	104.2	V	0.3	E
19-Dec-03	2.0	E	5.0	B/E	18.5	V			33.7	V	- (na)	- (na)	1.5	E
10-Feb-04	Frozen	E	1.9	B	9.2	B			47.9	V	71.6	V	2.0	E
18-Mar-04	2.0	E	4.3	B	19.4	V			48.7	V	209.3	V	5.0	E
19-Apr-04	40.4	V	13.3	B	72.4	V			123.6	V	507.9	V	18.9	M
19-May-04	3.4	B,E	4.6	B	15.4	V			31.3	V	133.2	V	4.0	M
24-Jun-04	0.6	BE	1.9	BE	12.0	V			20.5	V	48.2	V	1.5	V
29-Jul-04	1.9	M	0.5	BE	5.9	V			9.2	V	25.1	V	2.5	V
23-Aug-04	<0.1	E	0.5	BE	2.9	BE			7.2	V	12.5	V	<0.1	M
21-Sep-04	<0.1	E	0.4	BE	3.5	V			3.8	V	9.3	V	<0.1	M
21-Oct-04	0.3	E	0.4	BE	3.2	V	0.2	B/E	4.0	V	17.7	V	DRY	E
17-Nov-04	2.3	E	0.5	BE	4.3	V	-	-	4.6	V	28.8	V	DRY	E
15-Dec-04	Frozen	E	1.93	BE	5.42	V	Frozen	E	Frozen	E	82.08	V	Frozen	E

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Feb-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
27-Mar-05	4.1	V	3.2	B/E	14.7	V	Frozen	E	Frozen	E	171.4	V	3.3	V
10-Apr-05	27.0	V	17.5	B/E	68.6	V	18.6	V	207.2	V	700.0	E	19.3	V
22-May-05	3.6	V	6.0	B/E	22.6	V	9.0	V	27.7	V	140.0	V	10.9	V
26-Jun-05	0.4	V	2.3	B/E	7.2	V	1.4	V	11.5	V	29.0	V	2.4	V
10-Jul-05	0.5	V	1.4	B/E	6.1	V	1.0	V	6.6	V	9.6	V	0.7	V
21-Aug-05	0.0	V	0.2	B/E	5.2	V	0.5	V	4.4	V	8.1	V	0.5	E
25-Sep-05	0.1	E	0.2	B/E	3.1	V	0.9	V	6.3	V	9.3	V	0.1	E
23-Oct-05	0.0	E	0.2	B/E	3.6	V	1.0	V	5.9	V	15.5	V	0.0	E
13-Nov-05	0.0	E	0.3	B/E	2.9	V	1.8	V	7.9	V	9.1	V	0.0	E
11-Dec-05	0.6	V	1.4	B/E	11.7	V	Frozen	E	Frozen	E	27.6	V	0.1	E
15-Jan-06	13.0	V	3.7	B/E	17.3	V	3.9	V	31.6	V	201.8	V	3.4	V
19-Feb-06	Frozen	E	Frozen	E	Frozen	E	Frozen	E	10.0	V	Frozen	E	Frozen	E
19-Mar-06	12.4	V	13.2	V	37.2	V	11.2	V	78.2	V	429.2	V	11.2	V
16-Apr-06	4.6	V	24.5	V	48.8	V	9.2	V	80.7	V	229.9	V	10.7	V
21-May-06	3.4	V	6.4	V	17.1	V	6.4	V	44.8	V	144.9	V	5.1	V
18-Jun-06	0.9	V	4.4	V	8.6	V	1.6	V	11.9	V	35.5	V	3.8	V
9-Jul-06	0.1	E	1.7	V	5.6	V	0.3	V	8.3	V	15.2	V	2.2	V

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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	0.0	E	1.0	V	3.3	V	0.1	V	3.5	V	3.8	V	0.6	V
17-Sep-06	0.0	E	2.9	V	6.3	V	2.0	V	15.9	V	15.0	V	0.7	V
15-Oct-06	0.6	V	1.4	V	6.5	V	1.3	V	12.9	V	66.7	V	0.3	V
19-Nov-06	7.1	V	4.4	V	14.1	V	0.8	V	33.5	V	107.5	V	4.0	V
17-Dec-06	12.3	V	6.7	V	19.9	V	1.8	V	62.5	V	183.8	V	7.4	V
21-Jan-07	Frozen	E	2.4	V	15.5	E/V/M	Frozen	E	Frozen	E	79.9	V	7.7	V
18-Feb-07	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	2.7	V
18-Mar-07	Frozen	E	9.2	V	27.4	V	Frozen	E	50.5	V	408.9	V	8.6	V
15-Apr-07	10.5	V	28.7	V	34.7	V	4.2	V	102.5	V	346.6	V	19.0	V
13-May-07	2.4	V	2.8	V	24.6	V	9.4	V	30.9	V	228.3	V	9.6	V
17-Jun-07	0.1	V	0.6	V	10.5	V	0.2	V	21.0	V	49.5	V	1.9	V
15-Jul-07	0.0	E	0.3	V	2.9	V	0.3	V	7.1	V	12.8	V	3.6	V
19-Aug-07	0.0	E	0.1	V	0.9	V	0.4	V	5.4	V	5.3	V	0.4	V
16-Sep-07	0.0	E	0.3	V	1.2	V	0.1	V	4.3	V	10.2	V	0.1	E
14-Oct-07	0.0	E	0.4	V	2.3	V	0.3	V	3.3	V	21.7	V	0.0	E
18-Nov-07	0.1	V	0.6	V	2.2	V	0.6	V	33.5	V	228.5	V	0.0	E
9-Dec-07	Frozen	E	Frozen	E	2.6	V	Frozen	E	11.3	V	106.9	V	Frozen	V
20-Jan-08	39.5	V	1.4	V	35.1	V	Frozen	E	36.1	V	243.1	V	22.2	V
17-Feb-08	16.7	V	7.6	V	21.8	V	Frozen	E	77.1	V	1019.2	V	10.8	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	15.6	E/V/M	1.8	V	11.7	V	Frozen	E	66.0	V	229.2	V	6.2	V
30-Mar-08	167.3	V	7.0	V	50.1	V	23.5	V	159.6	V	580.3	V	24.5	V
20-Apr-08	34.0	V	5.5	V	35.2	V	3.9	V	178.3	V	427.1	V	13.9	V
18-May-08	4.5	V	1.3	V	9.6	V	1.8	V	41.5	V	226.4	V	8.7	V
15-Jun-08	1.9	V	2.9	V	11.0	V	1.1	V	15.6	V	120.1	V	3.0	V
13-Jul-08	0.4	V	0.2	V	2.4	V	0.1	V	11.7	V	31.0	V	1.1	V
17-Aug-08	0.6	V	1.1	V	5.9	V	0.3	V	14.6	V	74.8	V	2.6	V
14-Sep-08	0.9	V	3.2	V	5.9	V	0.7	V	31.6	V	202.7	V	0.6	V
19-Oct-08	0.7	V	2.7	V	4.1	V	0.8	V	13.6	V	104.9	V	2.7	V
23-Nov-08	Frozen	E	5.1	V	24.5	V	1.7	V	44.3	V	Frozen	E	2.7	V
14-Dec-08	7.0	V	2.4	V	14.4	V	3.1	V	114.8	V	446.9	V	14.2	V
18-Jan-09	Frozen	E	1.8	V	35.4	V	Frozen	E	Frozen	E	Frozen	E	25.6	V
8-Feb-09	9.7	V	1.9	V	16.4	V	Buried	E	73.7	V	Flooded	E	3.6	V
15-Mar-09	12.1	V	6.6	V	23.2	V	2.6	V	150.6	V	1522.2	V	13.9	V
12-Apr-09	8.1	V	6.1	V	16.6	V	8.4	V	203.8	V	794.0	V	29.3	V
17-May-09	3.2	V	2.7	V	12.5	V	2.6	V	65.3	V	157.1	V	2.6	V
14-Jun-09	5.7	V	1.6	V	3.9	V	0.8	V	30.0	V	109.4	V	1.5	V
12-Jul-09	0.6	V	0.5	V	15.3	V	0.1	V	23.5	V	26.4	V	1.4	V
9-Aug-09	Dry	E	1.0	V	2.5	V	0.3	V	7.0	V	93.3	V	3.0	V

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	Dry	E	1.8	V	1.1	V	0.2	V	4.6	V	6.7	V	0.2	V
11-Oct-09	1.0	V	1.7	V	2.6	V	0.1	V	13.0	V	164.4	V	0.4	V
15-Nov-09	4.2	V	3.5	V	5.2	V	0.6	V	8.8	V	71.2	V	2.4	V
13-Dec-09	Frozen	E	1.1	V	1.8	V	Buried	E	18.1	V	174.8	V	2.4	V
17-Jan-10	Buried	E	Buried	E	0.6	V	Buried	E	Buried	E	227.8	V	3.9	V
7-Feb-10	Buried	E	0.9	V	2.6	V	Buried	E	Frozen	E	Frozen	E	6.7	V
14-Mar-10	26.0	V	6.9	V	12.8	V	2.4	V	332.6	V	1785.5	V	4.8	V
4-Apr-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-Apr-10	2.9	V	3.3	V	15.1	V	3.9	V	67.6	V	227.1	V	14.0	V
16-May-10	5.7	V	4.6	V	26.8	V	1.8	V	128.1	V	299.3	V	7.8	V
23-May-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Jun-10	6.3	V	4.6	V	10.5	V	0.8	V	78.5	V	441.1	V	8.6	V
18-Jul-10	7.3	V	2.7	V	7.3	V	2.1	V	58.4	V	101.7	V	3.0	V
15-Aug-10	0.7	V	2.6	V	6.4	V	0.4	V	10.3	V	26.4	V	7.8	V
12-Sep-10	Ponded	E	1.1	V	2.3	V	0.3	V	2.4	V	36.0	V	0.7	V
17-Oct-10	0.2	V	1.9	V	5.4	V	0.3	V	26.6	V	249.1	V	1.4	V
14-Nov-10	1.0	V	4.1	V	6.2	V	1.7	V	25.2	V	705.7	V	6.6	V
19-Dec-10	2.4	V	1.1	V	5.5	V	Buried	E	9.3	V	328.4	V	0.8	V

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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11	6.1	V	4.1	V	12.3	V		E		E		E	7.0	V
20-Feb-11		E		E	11.6	V		E		E	361.0	V	10.2	V
13-Mar-11	17.4	V	5.7	V	14.1	V	Buried	E	115.1	V	385.2	V	9.1	V
17-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-11	-	-	7.8	V	48.3	V	8.2	V	108.6	V	901.9	V	-	-
1-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Apr-11	4.9	V	2.9	V	29.9	V	3.4	V	102.3	V	1452.8	V	11.0	V
20-Apr-11	-	-	-	-	-	-	-	-	243.0	V	-	-	-	-
21-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11	11.1	V	2.7	V	30.7	V	5.9	V	144.0	V	686.4	V	21.3	V
16-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Jun-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-11	2.7	V	0.5	V	22.1	V	2.7	V	23.8	V	198.1	V	6.6	V
17-Jul-11	4.0	V	0.3	V	4.7	V	0.2	V	12.0	V	23.4	V	2.1	V
14-Aug-11	3.0	V	0.3	V	0.5	V	0.1	V	3.0	V	14.5	V	0.8	V
18-Sep-11	3.7	V	1.5	V	1.2	V	0.1	V	3.1	V	27.5	V	0.4	V
16-Oct-11	1.8	V	2.4	V	1.5	V	0.5	V	9.3	V	101.6	V	0.3	V
20-Nov-11	2.8	V	1.2	V	4.1	V	0.84	V	8.6	V	87.3	V	0.37	V
18-Dec-11	7.8	V	3.1	V	4.5	V	1.6	V	37.4	V	277.9	V	3.1	V
15-Jan-12	Frozen	E	5.6	V	27.5	V	Buried	E	Frozen	E	Frozen	E	2.1	V
19-Feb-12	6.5	V	1.9	V	2.4	V	Buried	E	15.5	V	178.0	V	2.0	V
18-Mar-12	15.7	V	11.0	V	53.6	V	3.1	V	95.4	V	426.3	V	8.8	V
15-Apr-12	3.0	V	1.6	V	14.7	V	0.2	V	29.5	V	105.0	V	2.9	V
13-May-12	6.9	V	1.9	V	10.7	V	1.2	V	25.3	V	87.1	V	2.7	V
17-Jun-12	1.8	V	0.3	V	6.9	V	0.4	V	15.0	B	40.7	V	0.6	V

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DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
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15-Jul-12	0.5	V	0.2	V	1.7	V	0.1	V	3.8	V	14.4	V	0.3	V
12-Aug-12	3.5	V	2.8	V	3.1	V	0.4	V	23.2	V	117.3	V	1.0	V
16-Sep-12	3.0	V	0.9	V	2.0	V	0.1	V	13.1	V	46.3	V	0.6	V
14-Oct-12	2.8	V	0.9	V	4.5	V	0.8	V	14.6	V	82.0	V	1.2	V
18-Nov-12	5.1	V	2.3	V	14.5	V	0.4	V	46.3	V	219.4	V	6.9	V
16-Dec-12	4.5	V	1.9	V	11.0	V	1.4	V	57.6	V	291.9	V	2.8	V
13-Jan-13	21.8	V	8.0	V	23.4	V	1.3	V	78.1	V	447.7	V	6.9	V
17-Feb-13	-	Frozen	8.0	V	17.0	V	-	Frozen	-	Frozen	-	Frozen	4.0	V
17-Mar-13	-	Frozen	4.0	V	36.1	V	-	Frozen	-	Frozen	288.0	Frozen	6.8	V
14-Apr-13	100.4	V	3.1	V	58.7	V	6.1	V	166.7	V	1180.9	V	11.8	V
12-May-13	1.6	V	2.0	V	27.6	V	1.5	V	25.6	V	234.5	V	2.8	V
16-Jun-13	1.0	V	0.4	V	5.4	V	0.1	V	28.0	V	120.0	V	2.6	V
14-Jul-13	0.9	V	0.3	V	5.7	V	0.2	V	14.1	V	124.4	V	2.4	V
18-Aug-13	1.4	V	1.3	V	3.4	V	0.4	V	3.3	V	21.3	V	0.4	V
15-Sep-13	1.3	V	0.9	V	2.6	V	0.3	V	10.7	V	43.1	V	0.8	V
13-Oct-13	3.4	V	0.7	V	4.3	V	2.6	V	32.2	V	137.6	V	3.5	V
17-Nov-13	7.9	V	7.1	V	12.8	V	1.4	V	50.5	V	207.1	V	9.9	V
15-Dec-13	3.8	V	Frozen	E	11.3	V	Frozen	E	Frozen	E	Frozen	E	1.9	V
19-Jan-14	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Frozen	E	3.1	V
16-Feb-14	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Frozen	E	10.4	V

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-14	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	1.6	V
13-Apr-14	17.2	V	7.2	V	123.5	V	0.6	V	261.7	V	1825.7	V	17.1	V
11-May-14	10.3	V	7.3	V	32.5	V	3.4	V	64.3	V	284.6	V	10.0	V
15-Jun-14	0.9	V	1.7	V	8.0	V	1.1	V	31.7	V	222.2	V	1.6	V
13-Jul-14	7.1	V	0.9	V	18.3	V	2.3	V	47.4	V	225.6	V	0.7	V
17-Aug-14	1.6	V	0.6	V	2.2	V	0.2	V	6.1	V	52.9	V	0.5	V
7-Sep-14	0.2	V	1.0	V	2.3	V	0.3	V	2.3	V	31.5	V	0.2	V
19-Oct-14	1.2	V	2.6	V	3.7	V	0.9	V	16.3	V	117.1	V	0.1	V
16-Nov-14	Buried	E	Buried	E	Buried	E	Buried	E	Frozen	E	N/A	E	0.2	V
14-Dec-14	1.3	V	1.4	V	7.0	V	1.7	V	61.1	V	N/A	E	6.1	V
18-Jan-15	Buried	E	Buried	E	4.9	V	Buried	E	Frozen	E	N/A	E	3.6	V
15-Feb-15	Buried	E	N/A	E	N/A	E	N/A	E	Frozen	E	N/A	E	N/A	E
15-Mar-15	Buried	E	Buried	E	15.6	V	Buried	E	Frozen	E	N/A	E	4.6	V
19-Apr-15	2.0	V	3.5	V	32.8	V	6.4	V	99.4	V	556.5	V	12.7	V
17-May-15	0.6	V	2.6	V	7.1	V	0.6	V	40.0	V	138.8	V	2.6	V
14-Jun-15	5.0	V	2.0	V	8.9	V	0.9	V	22.4	V	155.5	V	5.2	V
19-Jul-15	0.5	V	0.6	V	8.5	V	1.1	V	13.3	V	78.0	V	1.7	V
9-Aug-15	0.3	V	1.4	V	3.3	V	0.5	V	8.4	V	52.4	V	0.6	V
23-Aug-15	0.3	V	0.8	V	4.8	V	-	-	8.2	V	-	-	-	-
6-Sep-15	0.4	V	0.7	V	2.2	V	0.3	V	4.4	V	185.0	V	0.7	V

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- V indicates valeport electromagnetic flow meter value
- D indicates doppler flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- - (na) indicates unsafe access conditions therefore surface water flow not measured

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
11-Oct-15	0.3	V	0.9	V	1.2	V	0.1	V	2.5	V	17.4	V	0.1	V
8-Nov-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Nov-15	2.5	V	2.2	V	1.8	V	0.9	V	25.5	V	47.6	V	0.6	V
6-Dec-15	4.1	V	1.4	V	3.8	V	0.9	V	11.3	V	120.6	V	0.9	V
17-Jan-16	7.8	V	3.1	V	4.2	V	1.4	V	Frozen	E	395.1	V	2.2	V
14-Feb-16	2.3	V	2.9	V	13.0	V	2.6	V	39.5	V	Frozen	E	3.6	V
13-Mar-16	28.5	V	57.3	V	64.3	V	14.6	V	218.8	V	Flooded	E	20.0	V/E
17-Apr-16	14.1	V	3.8	V	29.6	V	4.9	V	136.8	V	514.8	V	27.0	V/E
15-May-16	9.3	V	2.9	V	25.3	V	3.9	V	57.2	V	394.9	V	7.2	V
19-Jun-16	1.9	V	2.0	V	9.6	V	0.8	V	19.5	V	46.0	V	3.5	V
3-Jul-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Jul-16	0.2	V	0.6	V	4.0	V	0.1	V	5.9	V	35.8	V	1.1	V
7-Aug-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Aug-16	1.8	V	0.7	V	6.6	V	0.1	V	5.2	V	11.7	V	0.5	V
18-Sep-16	1.4	V	1.9	V	3.2	V	0.6	V	3.6	V	9.4	V	0.4	V
16-Oct-16	4.5	V	0.7	V	4.9	V	0.4	V	5.5	V	15.8	V	0.3	V
18-Nov-16	1.2	V	0.8	V	1.8	V	0.5	V	9.3	V	12.5	V	0.2	V
12-Dec-16	0.8	V	0.8	V	4.8	V	0.8	V	17.4	V	41.2	V	0.6	V
22-Jan-17	7.9	V	4.4	V	21.6	V	4.3	V	76.8	V	440.5	V	4.9	V
15-Feb-17	4.4	V	3.3	V	13.8	V	7.7	V	Frozen	-	131.1	V	1.9	V
21-Mar-17	6.3	V	2.6	V	20.6	V	2.1	V	70.7	V	300.9	V	8.0	V
19-Apr-17	12.2	V	8.8	V	37.1	V	5.8	V	77.7	V	420.3	V	10.5	V
14-May-17	2.5	V	19.6	V	45.0	V	2.1	V	79.0	V	200.4	V	14.8	V

NOTE:
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- Frozen indicates surface water frozen or snow covered
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- 0.0 indicates no flow, surface water location dry.
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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
28-Jun-17	5.2	V	14.5	V	55.3	V	4.4	V	49.4	V	210.8	V	9.3	V
7-Jul-17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Jul-17	2.2	V	2.1	V	19.1	V	0.6	V	28.5	V	100.5	V	3.2	V
27-Jul-17	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Aug-17	0.8	V	0.6	V	8.4	V	0.7	V	13.8	V	32.1	V	2.1	V
17-Sep-17	1.5	V	0.6	V	7.0	V	0.3	V	10.5	V	33.1	V	1.1	V
17-Oct-17	4.4	V	3.8	V	7.9	V	1.2	V	22.6	V	90.9	V	1.4	V
14-Nov-17	6.3	V	4.0	V	8.7	V	1.7	V	29.3	V	147.1	V	2.3	V
12-Dec-17	Frozen	E	6.0	V	16.3	V	Frozen	E	27.8	E	119.4	V	2.3	V
17-Jan-18	Frozen	E	4.9	V	23.4	V	9.1	V	61.3	V	263.6	V	6.0	V
18-Feb-18	17.8	V	31.2	V	70.5	V	33.2	V	159.0	V	468.9	V	17.4	V
18-Mar-18	2.9	V	6.3	V	24.0	V	3.1	V	34.6	V	267.7	V	6.1	V
18-Apr-18	13.6	V	12.1	V	42.8	V	7.7	V	95.1	V	598.0	V	10.0	V
13-May-18	22.1	V	13.4	V	50.7	V	2.7	V	160.6	V	251.5	V	5.6	V
19-Jun-18	1.3	V	3.6	V	6.8	V			23.8	V				
20-Jun-18							0.8	V			47.1	V	0.5	V
4-Jul-18														
18-Jul-18	2.3	V	1.8	V	13.6	V			4.5	V				
19-Jul-18							0.2	V			13.2	V	1.1	V
3-Aug-18														
23-Aug-18	2.1	V	0.4	V	3.8	V			3.8	V	49.5	V	0.4	V
24-Aug-18							0.7	V						
19-Sep-18	0.8	V	0.4	V	2.4	V			4.7	V	8.6	V	0.1	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW16		SW17		SW17A		SW17B		SW18		SW19		SW20	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18							0.4	V						
24-Oct-18											45.7	V	0.1	V
25-Oct-18	2.5	V	27.2	V	3.4	V	0.5	V	6.1	V				
21-Nov-18											60	V	1.3	V
22-Nov-18	2.5	V	1.2	V	6.6	V	1.1	V	0	V				
12-Dec-18											127	V	6.1	V
13-Dec-18	5.1	V	2.2	V	17.7	V	1	V	25.3	V				

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- D indicates doppler flow meter value
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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW21		SW21A		SW21B		SW21C		SW21D		SW22		SW22A	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23-Jun-03	-	-	-	-	-	-	-	-	-	-	1.6	B	2.0	B
22-Jul-03	1.9	B	1.5	B	1.9	M	2.0	E	0.0	E	1.5	B	1.1	B
20-Aug-03	1.6	B	1.5	B	0.9	M	0.8	E	0.0	E	1.2	B	0.5	E
25-Sep-03	1.4	B	0.9	B	1.2	M	1.2	E	0.0	E	0.2	B	0.6	E
22-Oct-03	2.1	B	1.0	B	1.0	M	2.0	B	<0.1	B	0.3	B	1.0	E
28-Nov-03	1.8	B	0.4	B/E	2.3	M	2.8	B/E	0.2	B	2.1	B	1.9	B
19-Dec-03	1.7	B	Frozen	E	3.0	M	2.0	E	Frozen	E	3.2	B	1.6	B/E
10-Feb-04	0.9	B	Frozen	E	3.0	M	2.0	E	Frozen	E	2.1	B	2.5	E
18-Mar-04	1.0	B	Frozen	E	Frozen	E	3.0	E	Frozen	E	3.8	B	2.2	B
19-Apr-04	1.4	B	0.3	E	0.1	E	4.0	B/E	1.4	B	8.4	B	3.0	B/E
19-May-04	2.1	B	1.8	B,E	0.8	M	4.8	B,E	0.2	B	3.9	B	1.9	B,E
24-Jun-04	1.1	V	0.4	V	4.0	M	2.5	BE	0.0	E	2.4	B	1.0	BE
29-Jul-04	1.8	B	0.9	BE	4.7	M	1.2	BE	0.0	E	1.3	B	0.2	BE
23-Aug-04	1.4	BE	0.9	BE	1.1	V	0.1	BE	DRY	E	0.9	BE	0.3	BE
21-Sep-04	0.2	BE	DRY	E	0.3	E	0.7	BE	DRY	E	0.4	BE	0.1	BE
21-Oct-04	1.0	BE	0.2	BE	4.2	M	0.7	BE	DRY	E	0.3	BE	0.3	BE
17-Nov-04	1.0	BE	0.4	BE	1.3	M	1.4	BE	DRY	E	0.3	BE	0.2	BE
15-Dec-04	Frozen	E	0.7	BE	Frozen	E	Frozen	E	Frozen	E	0.4	BE	Frozen	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW21		SW21A		SW21B		SW21C		SW21D		SW22		SW22A	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
13-Feb-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
27-Mar-05	2.0	E	1.2	B/E	5.1	M	2.8	B/E	Frozen	E	1.6	B/E	2.2	B/E
10-Apr-05	3.9	B/E	5.8	B/E	3.1	M	16.6	B/E	Frozen	E	9.5	B/E	4.9	B/E
22-May-05	1.3	B/E	0.2	B/E	3.4	V	4.8	B/E	<0.1	E	4.2	B/E	1.8	V
26-Jun-05	0.8	B/E	0.1	B/E	0.1	E	2.1	B/E	0.0	E	2.3	B/E	1.0	V
10-Jul-05	1.8	B/E	1.3	B/E	6.0	M	4.5	B/E	0.0	E	1.6	B/E	0.9	V
21-Aug-05	1.7	B/E	1.0	B/E	2.7	V	2.6	B/E	0.0	E	1.1	B/E	0.9	V
25-Sep-05	1.4	B/E	1.3	B/E	2.7	B/E	1.2	E	0.0	E	0.4	B/E	0.7	V
23-Oct-05	1.8	B	2.0	V	2.2	V	1.2	B/E	0.0	E	0.3	B/E	0.2	V
13-Nov-05	1.0	B	1.2	V	2.3	V	1.3	B/E	0.0	E	0.3	B/E	0.4	V
11-Dec-05	2.3	B/E	4.7	V	2.4	V	1.5	B/E	Frozen	E	0.3	B/E	0.2	V
15-Jan-06	12.1	V	9.8	V	0.7	V	2.8	V	Frozen	E	10.4	V	3.8	V
19-Feb-06	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
19-Mar-06	1.0	V	0.5	V	Frozen	E	1.7	B/E	Frozen	E	9.4	V	3.5	V
16-Apr-06	4.1	V	3.4	V	5.6	V	6.4	V	0.6	V	10.9	V	6.0	V
21-May-06	3.4	V	4.7	V	2.3	V	3.5	V	0.2	V	3.9	V	1.5	V
18-Jun-06	3.6	V	3.8	V	2.5	V	6.1	V	0.0	E	2.9	V	1.4	V
9-Jul-06	2.5	V	3.5	V	1.4	V	3.3	V	0.0	E	1.6	V	1.4	V

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- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- Monthly monitoring of SW22B discontinued commencing January 2005 as no flowing water was observed at location from May 2003 to December 2004.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW21		SW21A		SW21B		SW21C		SW21D		SW22		SW22A	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	2.1	V	3.0	V	1.0	V	2.9	V	0.0	E	0.6	V	0.5	V
17-Sep-06	4.3	V	4.0	V	1.3	V	3.5	V	0.0	E	0.5	V	0.7	V
15-Oct-06	4.2	V	2.6	V	3.2	V	1.9	V	0.0	E	0.5	V	0.7	V
19-Nov-06	2.0	V	2.1	V	1.6	V	4.6	V	0.0	E	1.6	V	1.5	V
17-Dec-06	1.0	V	0.7	V	0.8	V	4.2	V	0.0	E	4.7	V	1.9	V
21-Jan-07	Frozen	E	Frozen	E	3.6	V	2.9	V	Frozen	E	3.6	V	4.2	V
18-Feb-07	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	2.2	V	Frozen	E
18-Mar-07	Frozen	E	Frozen	E	Frozen	E	4.5	V	Frozen	E	3.4	V	3.1	V
15-Apr-07	1.2	V	1.0	V	3.3	V	8.3	V	0.1	V	7.7	V	1.4	V
13-May-07	2.6	V	2.5	V	3.4	V	11.4	V	<0.1	E	6.5	V	1.5	V
17-Jun-07	1.5	V	1.2	V	6.0	V	0.6	V	0.0	E	2.0	V	6.8	V
15-Jul-07	2.8	V	1.9	V	1.6	V	0.7	V	0.0	E	1.8	V	3.6	V
19-Aug-07	1.1	V	0.8	V	1.3	V	0.3	V	0.0	E	1.5	V	0.2	V
16-Sep-07	1.7	V	2.4	V	1.2	V	0.7	V	0.0	E	1.2	V	0.6	V
14-Oct-07	0.7	V	1.4	V	4.1	V	2.7	V	0.0	E	0.2	V	0.3	V
18-Nov-07	4.3	V	0.8	V	4.0	V	1.6	V	0.0	E	1.1	V	1.0	V
9-Dec-07	2.5	V	0.2	V	1.8	V	2.0	V	Frozen	E	0.4	V	0.1	V
20-Jan-08	1.1	V	Frozen	E	7.8	V	8.0	V	Frozen	E	7.0	V	0.6	V
17-Feb-08	1.2	V	Frozen	E	0.4	V	2.3	V	Frozen	E	3.3	V	2.2	V

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- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- Monthly monitoring of SW22B discontinued commencing January 2005 as no flowing water was observed at location from May 2003 to December 2004.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW21		SW21A		SW21B		SW21C		SW21D		SW22		SW22A	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	2.7	V	Frozen	E	Frozen	E	0.7	V	Frozen	E	1.2	V	1.5	V
30-Mar-08	68.8	V	Frozen	V	Frozen	E	23.4	V	Frozen	E	7.4	V	2.9	V
20-Apr-08	3.5	V	1.7	V	1.4	V	9.9	V	1.0	V	2.0	V	2.5	V
18-May-08	1.8	V	0.3	V	1.5	V	6.7	V	0.0	E	7.9	V	2.2	V
15-Jun-08	0.5	B	0.2	V	1.2	V	2.3	V	0.0	E	4.3	V	0.4	V
13-Jul-08	0.1	V	<0.1	V	0.4	V	2.2	V	0.0	E	3.2	V	0.7	V
17-Aug-08	0.2	B	<0.1	V	0.4	V	4.5	V	0.0	E	1.8	V	0.9	V
14-Sep-08	1.2	V	<0.1	E	0.2	V	1.9	V	0.0	E	2.7	V	0.5	V
19-Oct-08	1.4	V	0.7	V	1.3	V	1.5	V	0.0	E	0.6	V	0.6	V
23-Nov-08	3.0	V	0.8	V	0.8	V	4.6	V	Frozen	E	Frozen	E	0.3	V
14-Dec-08	0.5	V	0.2	V	1.4	V	8.8	V	Frozen	E	1.9	V	1.8	V
18-Jan-09	0.8	V	Frozen	E	Frozen	E	5.2	V	Frozen	E	2.8	V	1.3	V
8-Feb-09	2.2	V	Buried	E	Buried	E	2.2	V	Buried	E	0.7	V	2.7	V
15-Mar-09	2.8	V	0.8	V	Frozen	E	7.4	V	Dry	E	3.9	V	3.2	V
12-Apr-09	2.5	V	0.4	V	0.2	V	3.7	V	0.2	V	3.4	V	1.8	V
17-May-09	1.6	V	0.1	V	0.2	V	3.7	V	0.1	V	3.7	V	2.3	V
14-Jun-09	0.7	V	Dry	E	0.1	V	2.2	V	Dry	E	1.8	V	0.7	V
12-Jul-09	0.8	V	Dry	E	0.4	V	1.8	V	Dry	E	0.4	V	0.4	V
9-Aug-09	8.1	V	Dry	E	0.1	V	2.2	V	Dry	E	0.5	V	0.9	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW21		SW21A		SW21B		SW21C		SW21D		SW22		SW22A	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	0.6	V	0.3	V	1.0	V	1.6	V	Dry	E	0.3	V	<0.1	V
11-Oct-09	1.4	V	0.4	V	0.8	V	1.4	V	Dry	E	1.1	V	0.6	V
15-Nov-09	1.9	V	<0.1	V	0.4	V	2.0	V	Dry	E	0.3	V	3.1	V
13-Dec-09	0.2	V	Frozen	E	Buried	E	0.4	V	Dry	E	2.4	V	0.7	V
17-Jan-10	Buried	E	Buried	E	Buried	E	0.5	V	Buried	E	0.9	V	0.8	V
7-Feb-10	0.2	V	Buried	E	Buried	E	0.7	V	Buried	E	1.2	V	0.7	V
14-Mar-10	7.3	V	0.9	V	Buried	E	4.3	V	Buried	E	6.5	V	5.0	V
4-Apr-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-Apr-10	1.2	V	0.5	V	0.9	V	2.3	V	0.1	V	7.1	V	2.1	V
16-May-10	1.6	V	0.3	V	1.4	V	5.6	V	0.1	V	6.4	V	1.5	V
23-May-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Jun-10	1.1	V	Dry	E	0.0	V	2.2	V	0.3	V	9.5	V	1.5	V
18-Jul-10	2.8	V	0.3	V	<0.1	E	2.2	V	0.5	V	4.4	V	1.5	V
15-Aug-10	0.2	V	Ponded	E	0.6	V	2.1	V	Dry	E	1.9	V	0.7	V
12-Sep-10	0.2	V	0.1	V	0.4	V	2.0	V	Dry	E	1.2	V	0.6	V
17-Oct-10	0.5	V	<0.1	V	0.5	V	1.5	V	Dry	E	1.5	V	0.8	V
14-Nov-10	1.4	V	0.6	V	0.4	V	2.3	V	0.1	V	5.0	V	1.7	V
19-Dec-10	Buried	E	Buried	E	Buried	E	6.2	V	Buried	E	1.9	V	0.6	V

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11		E		E		E	4.5	V		E	5.5	V	0.5	V
20-Feb-11	0.1	V		E		E	1.4	V		E	2.3	V	1.0	V
13-Mar-11	3.6	V	Buried	E	Buried	E	2.7	V	Buried	E	5.9	V	1.7	V
17-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	V
18-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	V
20-Mar-11	-	-	-	-	-	-	-	-	-	-	9.3	V	2.7	V
1-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Apr-11	0.8	V	0.2	V	<0.1	V	3.3	V	0.2	V	6.9	V	2.5	V
20-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11	3.3	V	1.1	V	1.4	V	5.4	V	0.5	V	12.8	V	1.4	V
16-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Jun-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-11	0.8	V	0.5	V	0.7	V	2.4	V	No Flow	E	2.6	V	1.8	V
17-Jul-11	<0.1	V	0.1	V	0.3	V	1.6	V	Dry	E	2.0	V	0.4	V
14-Aug-11	<0.1	V	0.2	V	0.2	V	1.0	V	0.0	E	0.3	V	0.2	V
18-Sep-11	Dry	E	Dry	E	0.2	V	0.8	V	Dry	E	1.2	V	0.3	V
16-Oct-11	0.2	V	<0.1	V	0.2	V	0.8	V	Dry	E	0.3	V	0.3	V
20-Nov-11	0.2	V	0.08	V	0.11	V	0.5	V		E	1.3	V	0.5	V
18-Dec-11	1.5	V	0.2	V	Buried	E	2.8	V	Dry	E	4.4	V	1.3	V
15-Jan-12	Buried	E	Buried	E	Buried	E	2.1	V	Buried	E	1.2	V	4.1	V
19-Feb-12	Buried	E	Buried	E	Buried	E	2.2	V	Buried	E	1.7	V	1.8	V
18-Mar-12	1.6	V	2.5	V	1.2	V	4.5	V	1.2	V	22.6	V	5.1	V
15-Apr-12	0.1	V	0.1	V	0.4	V	1.9	V	0.0	E	4.0	V	1.1	V
13-May-12	0.1	V	0.3	V	0.4	V	2.6	V	0.0	E	1.1	V	0.7	V
17-Jun-12	0.0	E	0.0	E	0.4	V	1.2	V	0.0	E	1.9	V	0.3	V

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15-Jul-12	0.0	E	0.0	E	0.1	V	1.1	V	0.0	E	1.4	V	0.3	V
12-Aug-12	0.7	V	<0.1	V	0.1	V	1.5	V	<0.1	V	1.0	V	1.3	V
16-Sep-12	0.2	V	0.1	V	0.2	V	0.9	V	0.0	E	1.1	V	0.5	V
14-Oct-12	0.6	V	0.5	V	0.4	V	1.4	V	0.0	E	1.1	V	0.7	V
18-Nov-12	0.4	V	0.2	V	0.1	V	2.6	V	0.0	E	0.8	V	1.2	V
16-Dec-12	0.8	V	0.1	V	0.3	V	1.7	V	<0.1	V	4.1	V	0.7	V
13-Jan-13	1.3	V	1.7	V	-	Frozen	8.5	V	0.1	V	3.9	V	1.2	V
17-Feb-13	-	Frozen	-	Frozen	-	Frozen	-	Frozen	-	Frozen	3.9	V	2.1	V
17-Mar-13	-	Frozen	-	Frozen	-	Frozen	1.0	V	-	Frozen	2.8	V	2.2	V
14-Apr-13	1.6	V	0.6	V	-	Frozen	5.6	V	1.6	V	7.9	V	5.0	V
12-May-13	0.7	V	<0.1	V	<0.1	V	7.5	V	0.1	V	2.4	V	0.8	V
16-Jun-13	0.5	V	0.5	V	0.9	V	6.0	V	0.0	E	1.2	V	1.0	V
14-Jul-13	<0.1	V	0	E	0.1	V	1.3	V	0.0	E	0.6	V	0.2	V
18-Aug-13	0.3	V	<0.1	E	0.1	V	0.6	V	0.0	E	0.5	V	0.4	V
15-Sep-13	0.1	V	<0.1	E	0.1	V	3.0	V	0.0	E	0.4	V	0.3	V
13-Oct-13	0.4	V	0.1	V	0.1	V	1.7	V	<0.1	V	1.3	V	2.9	V
17-Nov-13	4.7	V	0.2	V	0.1	V	5.3	V	0.1	V	1.9	V	2.6	V
15-Dec-13	Frozen	E	0.7	V	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E
19-Jan-14	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	0.7	V	Buried	E
16-Feb-14	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E

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16-Mar-14	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	0.7	V	Frozen	E
13-Apr-14	4.9	V	1.1	V	Frozen	E	14.5	V	Frozen	E	24.8	V	2.3	V
11-May-14	0.2	V	0.1	V	0.2	V	3.5	V	0.2	V	0.8	V	1.9	V
15-Jun-14	<0.1	E	DRY	E	0.1	V	1.4	V	DRY	E	1.5	V	0.2	V
13-Jul-14	0.1	V	<0.1	V	0.4	V	1.7	V	0.1	V	0.3	V	0.1	V
17-Aug-14	0.2	V	<0.1	E	0.1	V	0.5	V	Dry	V	0.3	V	0.1	V
7-Sep-14	0.1	V	Ponded	E	0.2	V	0.5	V	DRY	V	0.1	V	0.1	V
19-Oct-14	0.5	V	0.1	V	<0.1	V	1.6	V	0.7	V	0.9	V	0.2	V
16-Nov-14	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E
14-Dec-14	0.4	V	<0.1	V	<0.1	E	1.4	V	1.1	V	4.0	V	2.5	V
18-Jan-15	Buried	E	Buried	E	Buried	E	0.9	V	Buried	E	3.7	V	0.9	V
15-Feb-15	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E
15-Mar-15	Buried	E	Buried	E	Buried	E	1.9	V	Buried	E	0.8	E	0.6	D
19-Apr-15	1.5	V	0.2	B	<0.1	E	5.6	V	1.0	V	4.6	V	2.5	V
17-May-15	<0.1	E	Dry	E	Dry	E	1.9	V	0.3	E	2.5	V	1.7	V
14-Jun-15	0.8	V	DRY	E	Dry	E	4.8	V	0.2	V	1.0	V	1.0	V
19-Jul-15	0.5	E	DRY	E	Dry	E	2.7	V	Dry	E	1.2	V	0.2	V
9-Aug-15	<0.1	E	DRY	E	0.3	V	4.7	V	DRY	E	0.3	V	0.5	V
23-Aug-15	-	-	-	-	-	-	1.1	V	-	-	-	-	-	-
6-Sep-15	<0.1	E	DRY	E	0.1	V	2.7	V	DRY	E	0.5	V	0.4	V

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11-Oct-15	Dry	E	Dry	E	<0.1	E	0.6	V	Dry	E	0.3	V	0.2	V
8-Nov-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Nov-15	0.4	V	Dry	E	0.1	V	0.9	V	Dry	E	0.4	V	1.1	V
6-Dec-15	0.6	V	Dry	E	0.1	V	0.8	V	Dry	E	0.3	V	1.5	V
17-Jan-16	2.2	V	Frozen	E	Buried	E	2.1	V	Frozen	E	2.1	V	2.3	V
14-Feb-16	2.1	V	Frozen	E	Buried	E	1.8	V	Buried	E	1.2	V	1.1	V
13-Mar-16	1.9	V	0.5	V	Buried	E	7.2	V	1.4	V	20.8	V	11.9	V
17-Apr-16	2.0	V	0.1	V	DRY	E	8.1	V	0.5	V	18.3	V	4.3	V
15-May-16	2.2	V	Dry	V	0.1	V	2.3	V	0.4	V	5.7	V	2.3	V
19-Jun-16	<0.1	E	Dry	E	0.1	V	1.9	V	Dry	V	2.8	V	1.2	V
3-Jul-16	-	-	-	-	-	-	1.4	V	-	-	-	-	-	-
17-Jul-16	0.1	V	0.5	V	1.7	V	1.5	V	DRY	V	1.8	V	0.5	V
7-Aug-16	-	-	-	-	-	-	0.3	E	-	-	-	-	-	-
21-Aug-16	0.7	V	0.5	V	1	V	2.3	V	Dry	E	1	V	0.5	V
18-Sep-16	0.7	V	1.3	V	2.0	V	1.5	V	Dry	E	0.8	V	0.6	V
16-Oct-16	0.6	V	2.8	V	0.7	V	3.5	V	Dry	E	0.5	V	1.4	V
18-Nov-16	1.0	V	1.9	V	1.1	V	2.0	V	Dry	E	0.5	V	0.1	V
12-Dec-16	2.4	V	2.8	V	3.8	V	2.4	V	Dry	E	0.2	V	1.5	V
22-Jan-17	3.7	V	3.2	V	6.2	V	4.6	V	<0.1	E	1.3	V	1.9	V
15-Feb-17	Frozen	-	0.4	V	Buried	-	4.6	V	Buried	-	2.8	V	2.6	V
21-Mar-17	3.8	V	1.3	V	0.3	V	5.1	V	Frozen	-	6.6	V	0.9	V
19-Apr-17	2.8	V	1.3	V	1.6	V	5.3	V	0.5	V	16.6	V	1.0	V
14-May-17	4.5	V	2.0	V	1.6	V	3.5	V	0.1	V	3.3	V	12.8	V

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28-Jun-17	1.7	V	2.2	V	1.2	V	1.4	V	0.2	V	6.4	V	2.1	V
7-Jul-17	-	-	-	-	-	-	5.5	V	-	-	-	-	-	-
18-Jul-17	1.4	V	0.4	V	0.5	V	3.8	V	Dry	E	3.7	V	1.0	V
27-Jul-17	-	-	-	-	-	-	2.4	V	-	-	-	-	-	-
13-Aug-17	1.0	V	0.9	V	0.9	V	7.2	V	Dry	E	1.9	V	1.1	V
17-Sep-17	0.9	V	1.5	V	0.8	V	5.7	V	Dry	E	0.8	V	0.6	V
17-Oct-17	2.3	V	1.0	V	0.6	V	1.1	V	Dry	E	0.9	V	1.9	V
14-Nov-17	1.4	V	2.6	V	1.5	V	2.4	V	0.1	E	2.1	V	2.6	V
12-Dec-17	2.5	V	0.8	V	1.3	V	5.6	V	Frozen	E	3.4	V	2.6	V
17-Jan-18	Frozen	E	Frozen	E	Frozen	E	7.4	E	Frozen	E	5.1	V	2.8	V
18-Feb-18	2.6	V	2.4	V	Buried	E	9.0	V	0.8	V	8.5	V	5.2	V
18-Mar-18	1.0	V	Frozen	E	Buried	E	6.5	V	Frozen	E	4.6	V	1.2	V
18-Apr-18	2.2	V	Buried	E	Buried	E	7.4	V	Buried	E	4.8	V	2.4	V
13-May-18	2.2	V	1	V	<0.1	E	5.5	V	1.3	V	11.9	V	3.4	V
19-Jun-18														
20-Jun-18	3.5	V	1.0	V	1.2	V	4.3	V	0.0	V	5.6	V	1.4	V
4-Jul-18							3.3	V						
18-Jul-18														
19-Jul-18	0.0	V	0.8	V	0.0	V	1.7	V	0.0	V	1.4	V	1.3	V
3-Aug-18							2.1	V						
23-Aug-18											0.7	V	1.6	V
24-Aug-18	0.3	V	0.5	V	0.3	V	4.9	V	0	V				
19-Sep-18											0.2	V	0.5	V

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- D indicates doppler flow meter value
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- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- Monthly monitoring of SW22B discontinued commencing January 2005 as no flowing water was observed at location from May 2003 to December 2004.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW21		SW21A		SW21B		SW21C		SW21D		SW22		SW22A	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18	0	V	0.1	V	0.2	V	1.2	V	0	V				
24-Oct-18											0.7	V	0.4	V
25-Oct-18	0.4	V	0.1	V	0.1	V	2.4	V	0	V				
21-Nov-18											0.6	V	0.1	V
22-Nov-18	0	V	0.7	V	0	V	1.9	V	0	V				
12-Dec-18											1.6	V	1.6	V
13-Dec-18	0.8	V	0.5	V	0.3	V	3.1	V	0	V				

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TABLE B-3
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SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23-Jun-03	-	-	-	-	0.5	E	-	-	-	-	-	-	-	-
22-Jul-03	0.0	E	-	-	-	-	0.0	E	0.8	B	-	-	-	-
20-Aug-03	0.0	E	-	-	<0.1	B	0.0	E	0.6	B/E	0.1	B	-	-
25-Sep-03	0.0	E	-	-	0.1	B	0.0	E	0.2	B	0.2	B	-	-
22-Oct-03	0.0	E	-	-	1.4	B	0.4	B	0.4	B	0.4	B	-	-
28-Nov-03	0.0	E	-	-	2.1	B	4.0	M	1.4	B	1.5	B	-	-
19-Dec-03	0.0	E	-	-	1.7	B/E	6.7	M	5.8	B/E	1.2	B	-	-
10-Feb-04	0.0	E	-	-	0.8	B	0.8	M	0.9	B	0.6	B	-	-
18-Mar-04	0.0	E	-	-	1.4	B	6.3	M	2.5	E	1.4	B	-	-
19-Apr-04	0.0	E	-	-	1.4	B	3.7	M	3.3	B	1.7	B	-	-
19-May-04	0.0	E	-	-	1.0	B	1.7	M	1.7	M	1.0	B	-	-
24-Jun-04	0.0	E	-	-	0.1	BE	5.6	M	1.1	BE	0.6	BE	-	-
29-Jul-04	0.0	E	-	-	0.1	B	0.0	E	0.9	B	0.5	B	-	-
23-Aug-04	DRY	E	-	-	<0.1	BE	DRY	E	0.2	BE	0.2	BE	-	-
21-Sep-04	DRY	E	-	-	<0.1	BE	<0.1	E	0.3	BE	0.2	BE	-	-
21-Oct-04	DRY	E	-	-	0.2	BE	<0.1	E	0.5	BE	0.2	BE	-	-
17-Nov-04	DRY	E	-	-	0.2	BE	<0.1	E	0.5	BE	0.3	BE	-	-
15-Dec-04	Frozen	E	-	-	Frozen	E	Frozen	E	0.5	BE	0.3	BE	-	-

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DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	-	-	-	-	Frozen	E	Frozen	E	Frozen	E	Frozen	E	-	-
13-Feb-05	-	-	-	-	Frozen	E	Frozen	E	Frozen	E	Frozen	E	-	-
27-Mar-05	-	-	-	-	0.8	B/E	6.4	B/E	0.2	B/E	0.9	B/E	-	-
10-Apr-05	-	-	-	-	2.1	B/E	17.8	B/E	7.9	B/E	4.5	B/E	-	-
22-May-05	-	-	-	-	0.8	B/E	3.0	M	1.4	B/E	1.4	B/E	-	-
26-Jun-05	-	-	-	-	0.1	B/E	1.6	M	0.5	B/E	0.5	B/E	-	-
10-Jul-05	-	-	-	-	0.0	B/E	0.5	M	0.4	B/E	0.6	B/E	-	-
21-Aug-05	-	-	-	-	0.2	B/E	0.0	E	0.1	B/E	0.4	B/E	-	-
25-Sep-05	-	-	-	-	<0.1	B	0.0	E	0.1	E	0.3	B	-	-
23-Oct-05	-	-	-	-	0.2	B	0.0	E	0.1	E	0.3	B/E	-	-
13-Nov-05	-	-	-	-	0.1	B	0.0	E	0.1	B/E	0.3	B	-	-
11-Dec-05	-	-	-	-	0.9	B/E	Frozen	E	2.1	V	1.2	B/E	-	-
15-Jan-06	-	-	-	-	4.9	B	5.3	V	1.5	B	5.8	V	-	-
19-Feb-06	-	-	-	-	Frozen	E	Frozen	E	Frozen	E	Frozen	E	-	-
19-Mar-06	-	-	-	-	0.8	B	2.9	V	3.0	V	3.6	V	-	-
16-Apr-06	-	-	-	-	0.6	V	2.2	V	3.7	V	4.9	V	-	-
21-May-06	-	-	-	-	0.6	M/V	0.5	V	12.3	V	1.2	V	-	-
18-Jun-06	-	-	-	-	0.2	V	<0.1	E	2.3	V	2.5	V	-	-
9-Jul-06	-	-	-	-	<0.1	M/V	0.0	E	0.5	V	1.4	M/V	-	-

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MONTHLY STATIONS
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DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	-	-	-	-	<0.1	B	0.0	E	0.3	V	0.6	V	-	-
17-Sep-06	-	-	-	-	<0.1	B	0.0	E	0.6	V	0.4	V	-	-
15-Oct-06	-	-	-	-	0.2	V	0.1	E	0.3	V	0.5	V	-	-
19-Nov-06	-	-	-	-	0.6	V	2.9	V	1.3	V	1.9	V	-	-
17-Dec-06	-	-	-	-	0.6	V	2.9	V	1.3	V	2.9	V	-	-
21-Jan-07	-	-	-	-	Frozen	E	0.6	V	2.2	V	1.6	V	-	-
18-Feb-07	-	-	-	-	Frozen	E	Frozen	E	Frozen	E	Frozen	E	-	-
18-Mar-07	-	-	Frozen	E	0.9	V	2.0	V	2.5	V	2.1	V	-	-
15-Apr-07	-	-	11.5	V	0.1	V	1.3	V	5.5	V	1.6	V	-	-
13-May-07	-	-	7.7	V	0.7	V	0.1	V	1.4	V	2.5	V	-	-
17-Jun-07	-	-	9.8	V	0.1	B	0.0	E	0.2	V	0.7	V	-	-
15-Jul-07	-	-	2.7	V	0.2	E	0.0	E	0.4	V	0.3	V	-	-
19-Aug-07	0.0	E	1.6	V	0.0	E	0.0	E	0.4	V	0.1	V	-	-
16-Sep-07	-	-	3.0	V	0.0	E	0.0	E	0.3	V	0.1	V	-	-
14-Oct-07	2.8	V	2.2	V	0.0	E	0.0	E	0.2	V	0.1	V	-	-
18-Nov-07	-	-	4.4	V	0.7	V	Frozen	E	2.1	V	0.1	V	-	-
9-Dec-07	-	-	Frozen	E	1.2	V	Frozen	E	0.5	V	0.2	V	-	-
20-Jan-08	2.6	V	2.6	V	Frozen	E	Frozen	E	1.5	V	1.7	V	-	-
17-Feb-08	Frozen	E	16.9	V	1.8	V	11.0	V	1.6	V	2.7	V	7.7	V

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DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	-	-	5.6	V	Frozen	E	7.8	V	0.8	V	0.9	V	7.6	V
30-Mar-08	-	-	17.6	V	73.5	V	34.6	V	0.8	V	13.1	V	7.6	V
20-Apr-08	-	-	12.4	V	1.4	V	6.8	V	1.9	V	3.9	V	16.2	V
18-May-08	-	-	3.9	V	1.2	V	2.8	V	1.4	V	2.2	V	6.9	V
15-Jun-08	-	-	3.1	V	0.3	B	1.4	V	0.4	V	2.3	V	5.6	V
13-Jul-08	-	-	4.1	V	<0.01	B	0.5	V	0.3	V	0.9	V	0.4	V
17-Aug-08	-	-	3.1	V	0.1	B	0.3	V	1.4	V	1.6	V	3.1	V
14-Sep-08	-	-	3.8	V	0.4	B	0.8	V	0.5	V	0.5	V	3.2	V
19-Oct-08	-	-	3.2	V	0.3	V	3.7	V	0.8	V	0.3	V	2.7	V
23-Nov-08	-	-	8.3	V	Frozen	E	2.6	V	0.6	V	1.4	V	3.0	V
14-Dec-08	-	-	8.6	V	Frozen	E	4.9	V	1.8	V	2.4	V	5.8	V
18-Jan-09	-	-	3.9	V	Frozen	E	1.7	V	3.9	V	1.7	V	4.9	V
8-Feb-09	-	-	13.3	V	Frozen	E	3.0	V	0.7	V	2.1	V	5.4	V
15-Mar-09	-	-	26.9	V	0.6	V	7.8	V	1.5	V	5.3	V	6.9	V
12-Apr-09	-	-	21.6	V	1.3	V	6.0	V	3.4	V	2.4	V	7.0	V
17-May-09	-	-	8.2	V	0.3	V	2.1	V	1.0	V	1.2	V	6.6	V
14-Jun-09	-	-	0.8	V	0.2	V	0.5	V	0.4	V	1.6	V	1.2	V
12-Jul-09	-	-	1.1	V	0.1	V	0.2	V	0.3	V	<0.1	V	1.2	V
9-Aug-09	-	-	1.7	V	2.1	V	0.4	V	0.4	V	0.2	V	0.9	V

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	-	-	0.7	V	<0.1	V	0.1	V	0.4	V	0.3	V	0.6	V
11-Oct-09	-	-	4.3	V	0.7	V	0.4	V	0.4	V	0.1	V	1.4	V
15-Nov-09	-	-	2.5	V	0.8	V	1.0	V	0.3	V	0.5	V	1.6	V
13-Dec-09	-	-	1.2	V	1.1	V	1.2	V	0.1	V	0.1	V	0.8	V
17-Jan-10	-	-	0.3	V	Buried	E	2.7	V	1.2	V	1.4	V	1.6	V
7-Feb-10	-	-	1.7	V	Buried	E	Buried	E	1.2	V	0.8	V	1.4	V
14-Mar-10	-	-	20.8	V	3.3	V	10.8	V	1.5	V	7.5	V	10.1	V
4-Apr-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11-Apr-10	-	-	6.4	V	0.9	V	2.1	V	3.9	V	5.5	V	3.3	V
16-May-10	-	-	7.8	V	1.0	V	3.5	V	1.5	V	6.7	V	8.3	V
23-May-10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-Jun-10	-	-	6.5	V	0.5	V	5.5	V	1.0	V	4.5	V	3.2	V
18-Jul-10	-	-	8.0	V	2.4	V	4.9	V	0.4	V	2.5	V	1.1	V
15-Aug-10	-	-	3.7	V	0.2	V	1.6	V	0.5	V	0.3	V	1.7	V
12-Sep-10	-	-	<0.1	V	<0.1	E	1.1	V	0.3	V	0.3	V	1.3	V
17-Oct-10	-	-	5.0	V	0.2	V	0.2	V	0.5	V	0.5	V	1.6	V
14-Nov-10	-	-	13.2	V	1.1	V	3.7	V	0.6	V	0.8	V	2.6	V
19-Dec-10	-	-	3.0	V	Buried	E	0.4	V	0.8	V	1.2	V	0.7	V

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	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11	-	-	7.6	V		E	2.4	V	1.5	V	3.1	V	2.9	V
20-Feb-11	-	-	5.0	V		E	1.4	V	1.9	V	1.0	V	4.6	V
13-Mar-11	Buried	E	10.2	V	Frozen	E	3.4	V	2.6	V	1.7	V	6.2	V
17-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-Mar-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-Mar-11	-	-	14.0	V	-	-	-	-	-	-	-	-	-	-
1-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Apr-11	-	-	21.2	V	1.2	V	4.6	V	1.3	V	1.5	V	6.7	V
20-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29-Apr-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11	-	-	15.1	V	1.6	V	5.8	V	2.9	V	1.2	V	5.7	V
16-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27-May-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Jun-11	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12-Jun-11	-	-	6.1	V	0.8	V	0.8	V	1.7	V	0.2	V	2.3	V
17-Jul-11	-	-	2.1	V	0.2	V	0.6	V	0.7	V	0.3	V	0.9	V
14-Aug-11	-	-	1.9	V	<0.1	E	0.6	V	0.4	V	0.2	V	0.4	V
18-Sep-11	-	-	1.4	V	0.1	V	0.3	V	0.1	V	0.1	V	0.4	V
16-Oct-11	-	-	2.9	V	0.3	V	0.3	V	1.1	V	0.4	V	1.1	V
20-Nov-11	-	-	2.5	V	0.4	V	0.8	V	0.7	V	0.3	V	0.1	V
18-Dec-11	-	-	6.7	V	1.3	V	0.4	V	0.4	V	1.4	V	3.6	V
15-Jan-12	-	-	5.2	V	Frozen	E	4.6	V	1.4	V	6.0	V	6.2	V
19-Feb-12	-	-	5.1	V	Frozen	E	3.4	V	0.3	V	0.3	V	2.3	V
18-Mar-12	-	-	6.6	V	0.9	V	6.4	V	2.0	V	12.9	V	15.4	V
15-Apr-12	-	-	2.4	V	0.3	V	0.5	V	0.4	V	0.8	V	0.9	V
13-May-12	-	-	3.5	V	0.1	V	1.4	V	1.6	V	0.7	V	2.4	V
17-Jun-12	-	-	1.3	V	<0.1	E	1.3	V	0.3	V	1.5	V	4.5	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-Jul-12	-	-	2.3	V	<0.1	V	0.3	V	0.2	V	0.2	V	0.8	V
12-Aug-12	-	-	3.5	V	0.5	V	2.6	V	0.9	V	2.5	V	5.1	V
16-Sep-12	-	-	2.2	V	1.2	V	0.5	V	0.2	V	0.4	V	1.0	V
14-Oct-12	-	-	2.2	V	0.4	V	0.7	V	0.1	V	0.5	V	0.7	V
18-Nov-12	-	-	8.6	V	0.5	V	2.6	V	4.8	V	1.2	V	3.9	V
16-Dec-12	-	-	3.8	V	0.8	V	3.5	V	1.3	V	1.4	V	4.7	V
13-Jan-13	-	-	12.1	V	0.2	V	5.4	V	1.8	V	3.1	V	4.6	V
17-Feb-13	-	-	6.7	V	-	Frozen	1.3	V	1.4	V	1.9	V	5.0	V
17-Mar-13	-	-	4.8	V	-	Frozen	2.9	V	2.7	V	5.1	V	4.6	V
14-Apr-13	-	-	15.9	V	2.2	V	16.3	V	18.4	V	12.9	V	26.3	V
12-May-13	-	-	2.3	V	1.0	V	0.9	V	0.2	V	0.7	V	1.8	V
16-Jun-13	-	-	2.7	V	0.1	V	0.6	V	0.5	V	2.1	V	2.4	V
14-Jul-13	-	-	1.4	V	<0.1	V	0.2	V	0.3	V	0.3	V	3.3	V
18-Aug-13	-	-	0.0	E	<0.1	V	0.4	V	0.2	V	0.2	V	0.6	V
15-Sep-13	-	-	1.4	V	<0.1	E	0.7	V	1.0	V	0.3	V	1.4	V
13-Oct-13	-	-	4.7	V	0.4	V	1.6	V	0.8	V	0.1	V	4.7	V
17-Nov-13	-	-	4.8	V	0.6	V	1.2	V	0.9	V	1.1	V	4.0	V
15-Dec-13	-	-	Frozen	E	Frozen	E	Frozen	E	1.1	V	0.6	V	1.4	V
19-Jan-14	-	-	1.0	V	Buried	E	Buried	E	1.6	V	0.6	V	2.2	V
16-Feb-14	-	-	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E	Buried	E

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-14	-	-	Frozen	E	Frozen	E	Frozen	E	Frozen	E	Frozen	E	2.3	V
13-Apr-14	-	-	16.5	V	Frozen	E	11.9	V	3.5	V	15.4	V	17.6	V
11-May-14	-	-	12.3	V	0.4	V	3.2	V	1.5	V	2.7	V	5.8	V
15-Jun-14	-	-	4.8	V	0.1	V	2.2	V	0.2	V	0.8	V	3.2	V
13-Jul-14	-	-	1.5	V	4.8	V	2.1	V	0.3	V	0.3	V	2.1	V
17-Aug-14	-	-	0.6	V	0.2	V	0.3	V	<0.1	V	0.2	V	1.2	V
7-Sep-14	-	-	0.6	V	0.1	V	0.1	V	<0.1	V	0.2	V	0.5	V
19-Oct-14	-	-	1.6	V	0.1	V	2.9	V	0.1	V	0.3	V	2.1	V
16-Nov-14	-	-	Buried	E	Frozen	E	Buried	E	Buried	E	Buried	E	Buried	E
14-Dec-14	-	-	4.6	V	1.2	V	2.0	V	1.4	V	0.3	V	1.5	V
18-Jan-15	-	-	16.2	V	Frozen	E	0.1	V	0.2	V	0.1	V	1.7	V
15-Feb-15	-	-	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E
15-Mar-15	-	-	Frozen	E	Frozen	E	2.9	V	0.2	V	1.3	V	6.4	V
19-Apr-15	-	-	11.2	V	2.7	B	3.2	V	2.4	V	10.4	V	14.1	V
17-May-15	-	-	1.6	V	3.0	E	0.6	V	1.2	V	0.2	V	0.9	V
14-Jun-15	-	-	3.6	V	1.1	V	1.7	V	0.1	V	2.1	V	1.8	V
19-Jul-15	-	-	1.4	V	0.8	V	0.6	V	0.2	V	1.2	V	2.0	V
9-Aug-15	-	-	1.6	V	0.3	V	1.0	V	0.1	V	1.1	V	2.7	V
23-Aug-15	-	-	-	-	-	-	-	-	0.3	V	-	-	-	-
6-Sep-15	-	-	1.2	V	<0.1	E	0.6	V	0.1	V	0.1	V	0.5	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
11-Oct-15	-	-	1.6	V	3.5	V	0.6	V	0.1	V	0.1	V	0.5	V
8-Nov-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Nov-15	-	-	3.8	V	0.5	V	2.1	V	0.4	V	0.4	V	0.4	V
6-Dec-15	-	-	2.5	V	0.5	V	2.0	V	1.1	V	0.7	V	1.4	V
17-Jan-16	-	-	5.3	V	Frozen	E	2.4	V	1.0	V	1.9	V	1.6	V
14-Feb-16	-	-	7.0	V	Frozen	E	9.0	V	1.2	V	1.7	V	3.8	V
13-Mar-16	-	-	29.5	V	2.5	V	18.2	V	4.9	V	19.9	V	21.8	V
17-Apr-16	-	-	14.5	V	2.1	V	14.0	V	1.8	V	0.9	V	9.3	V
15-May-16	-	-	6.5	V	1.8	V	2.9	V	0.5	V	1.1	V	6.6	V
19-Jun-16	-	-	2.4	V	0.5	V	1.6	V	2.4	V	1.8	V	1.8	V
3-Jul-16	-	-	-	-	-	-	-	-	0.6	V	-	-	-	-
17-Jul-16	-	-	2.2	V	0.1	V	0.6	V	0.5	V	0.9	V	1.0	V
7-Aug-16	-	-	-	-	-	-	-	-	0.1	V	-	-	-	-
21-Aug-16	-	-	0.9	V	<0.1	V	0.2	V	0.4	V	0.9	V	1.7	V
18-Sep-16	-	-	1.8	V	0.8	V	1.0	V	0.5	V	0.2	V	1.4	V
16-Oct-16	-	-	2.1	V	0.2	V	0.5	V	0.7	V	0.5	V	1.1	V
18-Nov-16	-	-	3.2	V	0.3	V	1.7	V	0.4	V	0.5	V	1.6	V
12-Dec-16	-	-	7.8	V	0.4	V	2.2	V	0.2	V	0.3	V	2.0	V
22-Jan-17	-	-	8.1	V	39.3	V	1.4	V	3.7	V	1.6	V	6.8	V
15-Feb-17	-	-	7.9	V	Frozen	-	1.6	V	0.6	V	3.4	V	5.0	V
21-Mar-17	-	-	13.5	V	2.7	V	4.3	V	0.3	V	3.7	V	5.5	V
19-Apr-17	-	-	12.0	V	2.7	V	4.5	V	3.6	V	3.6	V	14.2	V
14-May-17	-	-	9.0	V	0.9	V	2.3	V	1.5	V	7.0	V	19.2	V

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
28-Jun-17	-	-	6.9	V	0.8	V	6.7	V	1.2	V	3.5	V	7.4	V
7-Jul-17	-	-	-	-	-	-	-	-	0.1	V	1.9	V	-	-
18-Jul-17	-	-	6.6	V	0.3	V	1.0	V	1.1	V	0.7	V	2.1	V
27-Jul-17	-	-	-	-	-	-	-	-	0.6	V	-	-	-	-
13-Aug-17	-	-	2.8	V	0.2	V	0.7	V	0.1	V	0.7	V	2.8	V
17-Sep-17	-	-	6.8	V	0.2	V	0.3	V	0.2	V	1.3	V	2.3	V
17-Oct-17	-	-	5.3	V	0.9	V	1.6	V	0.8	V	1.0	V	3.4	V
14-Nov-17	-	-	5.3	V	1.8	V	1.0	V	0.2	V	0.3	V	3.5	V
12-Dec-17	-	-	7.9	V	Frozen	V	0.6	V	0.5	V	1.9	V	5.7	V
17-Jan-18	-	-	5.1	V	-	-	5.0	V	0.5	V	2.4	V	5.7	V
18-Feb-18	-	-	19.4	V	-	-	8.7	V	1.3	V	15.5	V	15.5	V
18-Mar-18	-	-	5.4	V	-	-	Frozen	E	0.2	V	2.4	V	3.7	V
18-Apr-18	-	-	8.5	V	-	-	Frozen	E	1.5	V	1.9	V	13.6	V
13-May-18	-	-	6.3	V	-	-	4.7	V	2.2	V	4.5	V	6.4	V
19-Jun-18	-	-			-	-								
20-Jun-18	-	-	2.3	V	-	-	0.2	V	1.3	V	1.7	V	4.9	V
4-Jul-18	-	-			-	-			0.5	V				
18-Jul-18	-	-			-	-								
19-Jul-18	-	-	1.8	V	-	-	0.2	V	1.0	V	0.2	V	2.3	V
3-Aug-18	-	-			-	-			0.4	V				
23-Aug-18	-	-	2.6	V	-	-								
24-Aug-18	-	-			-	-	0.2	V	0.4	V	0.2	V	1	V
19-Sep-18	-	-	1.8	V	-	-								

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW22B		SW22C		SW23		SW24		SW24A		SW24B		SW24C	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18	-	-			-	-	0.2	V	0.5	V	0.1	V	0.6	V
24-Oct-18	-	-	3.1	V	-	-								
25-Oct-18	-	-			-	-	0.7	V	0.9	V	0.1	V	0.6	V
21-Nov-18	-	-	2	V	-	-								
22-Nov-18	-	-			-	-	0.3	V	0.5	V	0.8	V	3.5	V
12-Dec-18	-	-	3.8	V	-	-								
13-Dec-18	-	-			-	-	1.3	V	1.9	V	0.7	V	2.7	V

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03	-	-	-	-	-	-	-	-						
23-Jun-03	-	-	-	-	-	-	-	-						
22-Jul-03	-	-	-	-	-	-	-	-						
20-Aug-03	-	-	-	-	-	-	-	-						
25-Sep-03	-	-	-	-	-	-	-	-						
22-Oct-03	12.9 (2)	V	16.0 (3)	V	9.8	V	-	-						
28-Nov-03	30.8	V	17.6	V	4.9	V	-	-						
19-Dec-03	31.4	V	20.8	V	4.3	V	-	-						
10-Feb-04	20.7	V	42.7	V	0.9	V	-	-						
18-Mar-04	35.8	V	24.7	V	7.3	V	-	-						
19-Apr-04	49.6	V	183.7	V	101.6	V	-	-						
19-May-04	23.4	V	18.8	V	3.4	V	-	-						
24-Jun-04	29.6	V	0.6	M	0.2	BE	-	-						
29-Jul-04	22.1	V	1.3	V	0.1	V	-	-						
23-Aug-04	0.5	E	DRY	E	DRY	E	-	-						
21-Sep-04	<0.1	E	DRY	E	DRY	E	-	-						
21-Oct-04	0.1	E	DRY	E	1.5	E	1.5	V						
17-Nov-04	0.9	V	1.7	M	0.9	V	0.9	V						
15-Dec-04	17.7	V	Frozen	E	Frozen	E	0.5	B/E						

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MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E						
13-Feb-05	Frozen	E	Frozen	E	Frozen	E	Frozen	E						
27-Mar-05	17.1	V	10.0	M	3.2	V	5.9	V						
10-Apr-05	80.1	V	111.4	V	59.9	V	39.7	V						
22-May-05	21.8	V	6.0	V	2.6	V	9.5	V						
26-Jun-05	4.9	V	1.2	M	1.6	M	5.2	V						
10-Jul-05	0.4	M	0.0	E	0.0	E	3.3	V						
21-Aug-05	0.2	M	0.0	E	0.0	E	0.9	V						
25-Sep-05	0.0	E	0.0	E	0.0	E	0.7	V						
23-Oct-05	0.0	E	0.0	E	0.0	E	0.3	V						
13-Nov-05	0.2	V	0.0	E	0.0	E	0.4	V						
11-Dec-05	16.1	V	2.9	V	2.0	V	2.8	V						
15-Jan-06	Frozen	E	Frozen	E	6.1	V	3.9	V						
19-Feb-06	Frozen	E	Frozen	E	Frozen	E	Frozen	E						
19-Mar-06	90.1	V	42.1	V	27.2	V	18.7	V						
16-Apr-06	2.7	V	58.7	V	60.0	V	20.4	V						
21-May-06	0.7	V	14.8	V	6.2	V	30.5	V						
18-Jun-06	0.0	E	0.6	V	0.5	V	1.2	V						
9-Jul-06	0.0	E	0.0	E	0.0	E	1.5	V						

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- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
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- (3) indicates measurement taken on November 9, 2003.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06	0.0	E	0.0	E	0.0	E	0.8	V						
17-Sep-06	0.0	E	0.0	E	0.0	E	1.7	V						
15-Oct-06	3.1	V	1.4	V	0.9	V	0.5	V						
19-Nov-06	24.7	V	9.3	V	8.9	V	5.2	V						
17-Dec-06	40.1	V	16.2	V	11.9	V	7.5	V						
21-Jan-07	18.6	V	Frozen	E	5.3	V	9.0	V						
18-Feb-07	Frozen	E	Frozen	E	Frozen	E	Frozen	E						
18-Mar-07	Frozen	E	Frozen	E	Frozen	E	7.5	V						
15-Apr-07	36.5	V	22.7	V	14.9	V	14.2	V						
13-May-07	23.1	V	9.8	V	6.7	V	9.4	V						
17-Jun-07	4.1	V	0.1	V	1.6	V	6.2	V						
15-Jul-07	0.0	E	0.0	E	0.0	E	1.5	V						
19-Aug-07	0.0	E	0.0	E	0.0	E	1.2	V						
16-Sep-07	0.0	E	0.0	E	0.0	E	0.6	V						
14-Oct-07	0.0	E	0.0	E	0.0	E	0.3	V						
18-Nov-07	0.2	E	0.0	E	0.0	E	0.9	V						
9-Dec-07	12.0	V	1.3	V	Frozen	E	Frozen	E						
20-Jan-08	163.7	V	Frozen	E	Frozen	E	10.9	V						
17-Feb-08	39.0	V	17.1	V	24.0	V	10.4	V						

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- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08	20.3	V	8.9	V	14.8	V	7.6	V						
30-Mar-08	58.1	V	135.0	V	74.0	V	97.1	V						
20-Apr-08	48.0	V	156.0	V	165.4	V	42.9	V						
18-May-08	20.4	V	9.8	V	10.1	V	15.0	V						
15-Jun-08	8.9	V	6.2	V	2.6	V	6.6	V						
13-Jul-08	0.2	V	<0.1	V	0.1	V	8.2	V						
17-Aug-08	0.0	E	3.2	V	2.4	V	22.2	V						
14-Sep-08	13.2	V	19.3	V	23.1	V	3.1	V						
19-Oct-08	10.7	V	3.9	V	3.1	V	11.1	V						
23-Nov-08	32.0	V	Frozen	E	Frozen	E	10.9	V						
14-Dec-08	42.4	V	Frozen	E	Frozen	E	13.7	V						
18-Jan-09	33.5	V	Frozen	E	Frozen	E	17.8	V						
8-Feb-09	18.2	V	7.8	V	Buried	E	10.1	V						
15-Mar-09	40.4	V	5.3	V	44.2	V	23.0	V						
12-Apr-09	36.2	V	51.0	V	47.4	V	18.8	V						
17-May-09	18.5	V	6.0	V	5.7	V	16.9	V						
14-Jun-09	7.1	V	1.7	V	1.6	V	6.3	V						
12-Jul-09	0.5	V	0.2	V	0.2	V	6.5	V						
9-Aug-09	12.0	V	2.3	V	10.6	V	2.4	V						

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09	0.2	V	Dry	E	Dry	E	1.9	V						
11-Oct-09	17.8	V	7.7	V	8.0	V	1.4	V	0.4	V				
15-Nov-09	10.8	V	3.3	V	3.5	V	4.3	V	<0.1	V				
13-Dec-09	38.8	V	Buried	E	Buried	E	0.8	V	Buried	E				
17-Jan-10	35.3	V	Buried	E	Buried	E	3.1	V	0.2	V				
7-Feb-10	37.5	V	Buried	E	Buried	E	1.3	V	0.2	V				
14-Mar-10	54.0	V	73.5	V	51.7	V	5.5	V	0.7	V				
4-Apr-10	-	-	-	-	-	-	-	-	-	-				
11-Apr-10	36.5	V	24.0	V	23.0	V	24.3	V	0.5	V				
16-May-10	21.2	V	31.6	V	27.4	V	11.1	V	0.2	V				
23-May-10	-	-	-	-	-	-	-	-	-	-				
13-Jun-10	15.1	V	9.5	V	7.6	V	28.3	V	0.3	V				
18-Jul-10	31.6	V	34.2	V	53.3	V	8.5	V	0.6	V				
15-Aug-10	9.0	V	1.7	V	1.8	V	3.9	V	0.2	V				
12-Sep-10	2.5	V	0.1	V	0.3	V	3.3	V	0.1	V				
17-Oct-10	7.0	V	1.0	V	1.7	V	2.7	V	<0.1	V				
14-Nov-10	12.3	V	24.1	V	15.1	V	6.6	V	0.2	V				
19-Dec-10	16.3	V	Buried	E	Buried	E	9.2	V	Buried	E				

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11	53.0	V		E		E	3.9	V	Buried	E				
20-Feb-11	36.2	V		E		E	13.5	V	Buried	E				
13-Mar-11	42.2	V	26.3	V	17.9	V	36.5	V	Buried	E				
17-Mar-11	-	-	-	-	-	-	-	-	-	-				
18-Mar-11	-	-	-	-	-	-	-	-	-	-				
20-Mar-11	-	-	-	-	-	-	-	-	-	-				
1-Apr-11	-	-	-	-	-	-	-	-	-	-				
5-Apr-11	-	-	-	-	-	-	-	-	-	-				
8-Apr-11	-	-	-	-	-	-	-	-	-	-				
12-Apr-11	-	-	-	-	-	-	-	-	-	-				
15-Apr-11	-	-	-	-	-	-	-	-	-	-				
17-Apr-11	86.3	V	54.5	V	36.6	V	43.1	V	0.8	V				
20-Apr-11	-	-	-	-	-	-	-	-	-	-				
21-Apr-11	-	-	-	-	-	-	-	-	-	-				
26-Apr-11	-	-	-	-	-	-	-	-	-	-				
29-Apr-11	-	-	-	-	-	-	-	-	-	-				
3-May-11	-	-	-	-	-	-	-	-	-	-				
6-May-11	-	-	-	-	-	-	-	-	-	-				
10-May-11	-	-	-	-	-	-	-	-	-	-				
13-May-11	-	-	-	-	-	-	-	-	-	-				

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- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11	39.4	V	53.8	V	61.7	V	45.5	V	0.5	V				
16-May-11	-	-	-	-	-	-	-	-	-	-				
18-May-11	-	-	-	-	-	-	-	-	-	-				
19-May-11	-	-	-	-	-	-	-	-	-	-				
20-May-11	-	-	-	-	-	-	-	-	-	-				
27-May-11	-	-	-	-	-	-	-	-	-	-				
3-Jun-11	-	-	-	-	-	-	-	-	-	-				
12-Jun-11	25.4	V	15.1	V	10.1	V	12.9	V	0.2	V				
17-Jul-11	0.6	V	Dry	E	Dry	E	5.5	V	0.2	V				
14-Aug-11	0.4	V	Dry	E	Dry	E	1.9	V	0.2	V				
18-Sep-11	0.2	V	Dry	E	Dry	E	1.4	V	0.1	V				
16-Oct-11	12.4	V	3.7	V	4.5	V	2.4	V	0.1	V				
20-Nov-11	13.1	V	2.2	V	2.5	V	1.95	V	0.13	V				
18-Dec-11	36.5	V	Frozen	E	Frozen	V	12.8	V	0.2	V				
15-Jan-12	19.8	V	Frozen	E	Frozen	E	15.5	V	0.4	V				
19-Feb-12	18.6	V	Frozen	E	Frozen	E	10.5	V	0.3	V				
18-Mar-12	64.5	V	97.4	V	65.7	V	46.5	V	1.0	V				
15-Apr-12	16.0	V	4.1	V	3.7	V	11.4	V	0.3	V				
13-May-12	16.5	V	4.8	V	6.8	V	7.3	V	0.2	V				
17-Jun-12	0.8	V	0.8	V	0.4	V	5.9	V	0.2	V				

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-Jul-12	0.3	V	0.0	E	0.0	E	2.2	V	0.1	V				
12-Aug-12	25.0	V	0.0	E	0.0	E	1.9	V	0.1	V				
16-Sep-12	5.7	V	2.1	V	0.8	V	3.6	V	0.1	V				
14-Oct-12	9.9	V	1.6	V	2.6	V	3.5	V	0.2	V				
18-Nov-12	44.2	V	21.2	V	10.8	V	10.2	V	0.3	V				
16-Dec-12	36.0	V	15.4	V	24.0	V	19.9	V	0.8	V				
13-Jan-13	33.0	V	43.4	V	52.0	V	30.0	V	0.2	V				
17-Feb-13	23.6	V	-	Frozen	-	Frozen	14.9	V	0.3	V				
17-Mar-13	34.4	V	-	Frozen	-	Frozen	15.4	V	0.3	V				
14-Apr-13	59.6	V	138.1	V	120.2	V	42.9	V	1.3	V				
12-May-13	34.1	V	21.7	V	38.0	V	14.0	V	0.3	V				
16-Jun-13	21.1	V	5.8	V	4.8	V	5.3	V	0.1	V				
14-Jul-13	22.6	V	4.5	V	2.8	V	5.5	V	<0.1	V				
18-Aug-13	9.9	V	0.9	V	0.4	V	6.3	V	<0.1	V				
15-Sep-13	1.3	V	2.5	V	0.5	V	2.0	V	<0.1	E				
13-Oct-13	16.5	V	5.4	V	2.7	V	8.2	V	0.1	V				
17-Nov-13	10.0	V	15.1	V	21.8	V	15.6	V	0.8	V				
15-Dec-13	28.9	V	Frozen	E	Frozen	E	10.8	V	0.4	V				
19-Jan-14	Buried	E	Buried	E	Buried	E	11.0	V	0.3	V				
16-Feb-14	Buried	E	Buried	E	Buried	E	1.4	V	0.1	V				

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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-14	Frozen	E	Frozen	E	Frozen	E	8.5	V	0.2	V				
13-Apr-14	96.3	V	227.8	V	Frozen	E	92.7	V	1.4	V				
11-May-14	26.7	V	22.6	V	17.4	V	40.2	V	0.6	V				
15-Jun-14	5.2	V	10.2	V	13.1	V	25.9	V	0.1	V				
13-Jul-14	8.1	V	5.4	V	6.1	V	4.9	V	<0.1	V				
17-Aug-14	4.9	V	5.4	V	1.8	V	4.1	V	<0.1	V				
7-Sep-14	2.3	V	0.4	V	0.5	V	1.1	V	<0.1	V				
19-Oct-14	15.6	V	1.1	V	4.3	V	4.5	V	<0.1	V				
16-Nov-14	9.5	V	Buried	E	Buried	E	0.4	V	0.1	V				
14-Dec-14	16.8	V	Frozen	E	Frozen	E	3.9	V	Buried	E				
18-Jan-15	Buried	E	Frozen	E	Frozen	E	1.4	V	Buried	E				
15-Feb-15	N/A	E	N/A	E	N/A	E	N/A	E	N/A	E				
15-Mar-15	Buried	E	Buried	E	Buried	E	13.9	M	0.1	V				
19-Apr-15	24.0	V	67.4	V	39.2	V	17.5	V	0.9	V				
17-May-15	7.9	V	3.0	V	4.5	V	3.2	V	0.1	V				
14-Jun-15	13.4	V	8.5	V	8.5	V	3.2	V	1.3	V				
19-Jul-15	4.0	V	7.2	V	1.1	V	0.4	V	0.1	V				
9-Aug-15	3.0	V	1.8	V	0.7	V	2.2	V	0.1	V				
23-Aug-15	-	-	-	-	-	-	-	-	<0.1	V	DRY	E	DRY	E
6-Sep-15	0.3	V	1.1	V	2.2	V	0.9	V	<0.1	V	DRY	E	DRY	E

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- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- D indicates doppler flow meter value
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- 0.0 indicates no flow, surface water location dry.
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TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
11-Oct-15	0.1	V	Dry	V	Dry	V	1.1	V	<0.1	V	DRY	E	DRY	E
8-Nov-15	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-Nov-15	7.5	V	8.1	V	8.2	V	2.7	V	0.1	V	0.7	V	0.1	V
6-Dec-15	8.6	V	4.3	V	1.8	V	3.0	V	0.1	V	0.9	V	0.3	V
17-Jan-16	32.0	V	Frozen	E	5.8	V	6.3	V	0.3	V	8.3	V	0.8	V
14-Feb-16	31.0	V	Frozen	E	6.7	V	6.0	V	1.0	V	6.5	V	1.5	V
13-Mar-16	68.6	V	125.0	V	128.1	V	28.9	V	2.5	V	16.2	V	6.2	V
17-Apr-16	38.7	V	49.5	V	37.5	V	24.6	V/E	1.4	V	10.5	V	3.3	V
15-May-16	15.6	V	10.1	V	14.7	V	13.5	V	0.7	V	20.3	V	6.2	V
19-Jun-16	1.1	V	0.9	V	0.1	V	2.9	V	0.2	V	0.8	V	0.3	V
3-Jul-16	-	-	-	-	-	-	-	-	0.5	V	-	-	-	-
17-Jul-16	PONDED	E	DRY	E	DRY	E	2.6	V	0.1	V	DRY	E	DRY	E
7-Aug-16	-	-	-	-	-	-	-	-	0.5	E	-	-	-	-
21-Aug-16	DRY	E	DRY	E	DRY	E	2.3	V	0.1	V	DRY	E	DRY	E
18-Sep-16	DRY	E	DRY	E	DRY	E	2.9	V	0.1	V	DRY	E	DRY	E
16-Oct-16	DRY	E	DRY	E	DRY	E	1.5	V	0.1	V	DRY	E	DRY	E
18-Nov-16	0.7	V	2.4	V	0.2	V	2.1	V	0.5	V	DRY	E	DRY	E
12-Dec-16	14.4	V	0.8	V	0.3	V	1.7	V	0.3	V	DRY	E	DRY	E
22-Jan-17	29.9	V	79.2	V	21.1	V	6.2	V	0.4	V	6.0	V	0.7	V
15-Feb-17	13.4	V	Frozen	-	7.1	V	5.3	V	0.9	V	0.9	V	1.8	V
21-Mar-17	34.2	V	54.6	V	18.0	V	21.7	V	0.9	V	1.7	V	2.6	V
19-Apr-17	94.0	V	28.4	V	33.2	V	15.4	V	1.4	V	14.3	V	2.7	V
14-May-17	77.1	V	12.8	V	15.3	V	18.7	V	0.9	V	1.3	V	0.9	V

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- D indicates doppler flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- (2) indicates measurement taken on October 31, 2003.
- (3) indicates measurement taken on November 9, 2003.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
28-Jun-17	61.2	V	19.1	V	18.7	V	14.5	V	0.8	V	9.9	V	1.0	V
7-Jul-17	-	-	-	-	-	-	-	-	0.9	V	-	-	-	-
18-Jul-17	25.0	V	10.7	V	8.6	V	5.4	V	0.4	V	11.8	V	0.7	V
27-Jul-17	-	-	-	-	-	-	-	-	0.3	V	-	-	-	-
13-Aug-17	23.1	V	3.2	V	4.4	V	3.8	V	0.3	V	0.5	V	0.5	V
17-Sep-17	9.9	V	1.4	V	3.1	V	3.1	V	0.2	V	0.6	V	<0.1	V
17-Oct-17	20.2	V	18.1	V	12.5	V	3.1	V	0.2	V	5.4	V	0.8	V
14-Nov-17	15.4	V	9.8	V	7.5	V	4.1	V	0.3	V	1.2	V	0.2	V
12-Dec-17	12.2	V	Frozen	V	5.6	V	6.4	V	0.6	V	4.7	V	1.6	V
17-Jan-18	-	-	-	-	-	-	-	-	0.2	V	10.8	V	1.4	V
18-Feb-18	-	-	-	-	-	-	-	-	1.5	V	10.8	V	4.7	V
18-Mar-18	-	-	-	-	-	-	-	-	0.5	V	5.5	V	1.5	V
18-Apr-18	-	-	-	-	-	-	-	-	0.9	V	16.1	V	3.0	V
13-May-18	-	-	-	-	-	-	-	-	1.4	V				
19-Jun-18	-	-	-	-	-	-	-	-					0	V
20-Jun-18	-	-	-	-	-	-	-	-	0.1	V	0.0	V		
4-Jul-18	-	-	-	-	-	-	-	-	0.4	V				
18-Jul-18	-	-	-	-	-	-	-	-					0.0	V
19-Jul-18	-	-	-	-	-	-	-	-	0.2	V	0.0	V		
3-Aug-18	-	-	-	-	-	-	-	-	0.2	V				
23-Aug-18	-	-	-	-	-	-	-	-			0.0	V	0.0	V
24-Aug-18	-	-	-	-	-	-	-	-	0.7	V				
19-Sep-18	-	-	-	-	-	-	-	-			0	V	0	V

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- D indicates doppler flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- (2) indicates measurement taken on October 31, 2003.
- (3) indicates measurement taken on November 9, 2003.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	SW25		SW26		SW26A		SW27		SW77		RR3 OUT		RR3 KARST	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18	-	-	-	-	-	-	-	-	0.2	V				
24-Oct-18	-	-	-	-	-	-	-	-	0.2	V	0	V	0	V
25-Oct-18	-	-	-	-	-	-	-	-						
21-Nov-18	-	-	-	-	-	-	-	-	0	V	0.4	V	0	V
22-Nov-18	-	-	-	-	-	-	-	-						
12-Dec-18	-	-	-	-	-	-	-	-	1.1	V	4.2	V	0.6	V
13-Dec-18	-	-	-	-	-	-	-	-						

NOTE:
- - indicates measurement not available
- E indicates estimated flow value
- B indicates bucket flow value
- M indicates manual flow value
- V indicates valeport electromagnetic flow meter value
- D indicates doppler flow meter value
- Frozen indicates surface water frozen or snow covered
- <0.1 indicates flow measured to be less than 0.1 L/s, or water present at monitoring location and flow is immeasureable
- 0.0 indicates no flow, surface water location dry.
- (2) indicates measurement taken on October 31, 2003.
- (3) indicates measurement taken on November 9, 2003.

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
22-May-03				
23-Jun-03				
22-Jul-03				
20-Aug-03				
25-Sep-03				
22-Oct-03				
28-Nov-03				
19-Dec-03				
10-Feb-04				
18-Mar-04				
19-Apr-04				
19-May-04				
24-Jun-04				
29-Jul-04				
23-Aug-04				
21-Sep-04				
21-Oct-04				
17-Nov-04				
15-Dec-04				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-05				
13-Feb-05				
27-Mar-05				
10-Apr-05				
22-May-05				
26-Jun-05				
10-Jul-05				
21-Aug-05				
25-Sep-05				
23-Oct-05				
13-Nov-05				
11-Dec-05				
15-Jan-06				
19-Feb-06				
19-Mar-06				
16-Apr-06				
21-May-06				
18-Jun-06				
9-Jul-06				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Aug-06				
17-Sep-06				
15-Oct-06				
19-Nov-06				
17-Dec-06				
21-Jan-07				
18-Feb-07				
18-Mar-07				
15-Apr-07				
13-May-07				
17-Jun-07				
15-Jul-07				
19-Aug-07				
16-Sep-07				
14-Oct-07				
18-Nov-07				
9-Dec-07				
20-Jan-08				
17-Feb-08				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-08				
30-Mar-08				
20-Apr-08				
18-May-08				
15-Jun-08				
13-Jul-08				
17-Aug-08				
14-Sep-08				
19-Oct-08				
23-Nov-08				
14-Dec-08				
18-Jan-09				
8-Feb-09				
15-Mar-09				
12-Apr-09				
17-May-09				
14-Jun-09				
12-Jul-09				
9-Aug-09				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
13-Sep-09				
11-Oct-09				
15-Nov-09				
13-Dec-09				
17-Jan-10				
7-Feb-10				
14-Mar-10				
4-Apr-10				
11-Apr-10				
16-May-10				
23-May-10				
13-Jun-10				
18-Jul-10				
15-Aug-10				
12-Sep-10				
17-Oct-10				
14-Nov-10				
19-Dec-10				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Jan-11				
20-Feb-11				
13-Mar-11				
17-Mar-11				
18-Mar-11				
20-Mar-11				
1-Apr-11				
5-Apr-11				
8-Apr-11				
12-Apr-11				
15-Apr-11				
17-Apr-11				
20-Apr-11				
21-Apr-11				
26-Apr-11				
29-Apr-11				
3-May-11				
6-May-11				
10-May-11				
13-May-11				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-May-11				
16-May-11				
18-May-11				
19-May-11				
20-May-11				
27-May-11				
3-Jun-11				
12-Jun-11				
17-Jul-11				
14-Aug-11				
18-Sep-11				
16-Oct-11				
20-Nov-11				
18-Dec-11				
15-Jan-12				
19-Feb-12				
18-Mar-12				
15-Apr-12				
13-May-12				
17-Jun-12				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
15-Jul-12				
12-Aug-12				
16-Sep-12				
14-Oct-12				
18-Nov-12				
16-Dec-12				
13-Jan-13				
17-Feb-13				
17-Mar-13				
14-Apr-13				
12-May-13				
16-Jun-13				
14-Jul-13				
18-Aug-13				
15-Sep-13				
13-Oct-13				
17-Nov-13				
15-Dec-13				
19-Jan-14				
16-Feb-14				

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
16-Mar-14				
13-Apr-14				
11-May-14				
15-Jun-14				
13-Jul-14				
17-Aug-14				
7-Sep-14				
19-Oct-14				
16-Nov-14				
14-Dec-14				
18-Jan-15				
15-Feb-15				
15-Mar-15				
19-Apr-15				
17-May-15				
14-Jun-15				
19-Jul-15				
9-Aug-15				
23-Aug-15	7.4	V	0.4	V
6-Sep-15	8.3	V	7.5	V

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
11-Oct-15	0.2	V	6.0	V
8-Nov-15	-	-	-	-
15-Nov-15	13.3	V	6.4	V
6-Dec-15	9.2	V	1.8	V
17-Jan-16	30.8	V	Frozen	E
14-Feb-16	18.7	V	Frozen	E
13-Mar-16	148.4	V	192.0	V
17-Apr-16	86.0	V	41.5	V
15-May-16	59.4	V	17.3	V
19-Jun-16	25.5	V	1.4	V
3-Jul-16	-	-	-	-
17-Jul-16	11.5	V	0.4	V
7-Aug-16	-	-	-	-
21-Aug-16	6.3	V	0.2	V
18-Sep-16	8.5	V	0.3	V
16-Oct-16	6.1	V	0.2	V
18-Nov-16	11.1	V	0.4	V
12-Dec-16	10.5	V	1.2	V
22-Jan-17	44.6	V	37.3	V
15-Feb-17	18.3	V	Frozen	-
21-Mar-17	40.3	V	14.6	V
19-Apr-17	93.8	V	35.1	V
14-May-17	77.2	V	17.1	V

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
28-Jun-17	60.3	V	25.1	V
7-Jul-17	-	-	-	-
18-Jul-17	25.9	V	5.3	V
27-Jul-17	-	-	-	-
13-Aug-17	24.8	V	2.3	V
17-Sep-17	9.9	V	1.1	V
17-Oct-17	27.3	V	8.8	V
14-Nov-17	40.1	V	21.4	V
12-Dec-17	37.5	V	11.2	V
17-Jan-18	51.3	V	25.8	V
18-Feb-18	140.9	V	55.0	V
18-Mar-18	57.5	V	Frozen	E
18-Apr-18	89.2	V	44.4	V
13-May-18	50.4	V	18	V
19-Jun-18	38.195	V	1.662	V
20-Jun-18				
4-Jul-18				
18-Jul-18	11.2	V	0.2	V
19-Jul-18				
3-Aug-18				
23-Aug-18	26.5	V	0.8	V
24-Aug-18				
19-Sep-18	25.9	V	0.2	V

NOTE:

TABLE B-3
MONTHLY STATIONS
SURFACE WATER FLOW SUMMARY SW3 TO SW27

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312-00 A52.1

DATE	PR CONTROL		BC CONTROL	
	SW Flow (L/s)	Measurement Type	SW Flow (L/s)	Measurement Type
20-Sep-18				
24-Oct-18	13	V	0.7	V
25-Oct-18				
21-Nov-18	19.2	V	6.7	V
22-Nov-18				
12-Dec-18	43.8	V	18.7	V
13-Dec-18				

NOTE:

FIGURE B-7

SURFACE WATER HYDROGRAPH
SW3

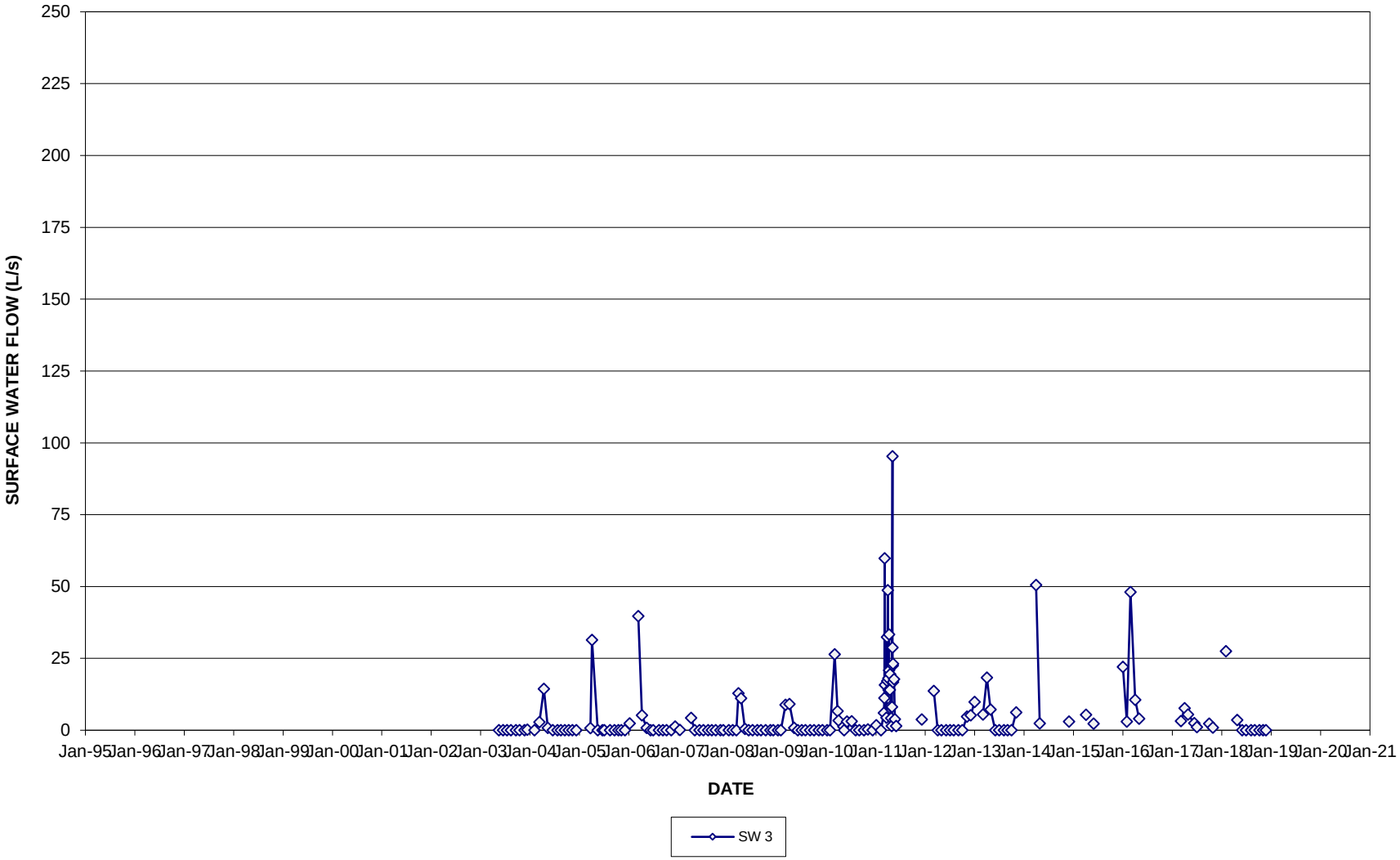

FIGURE B-7 (a)

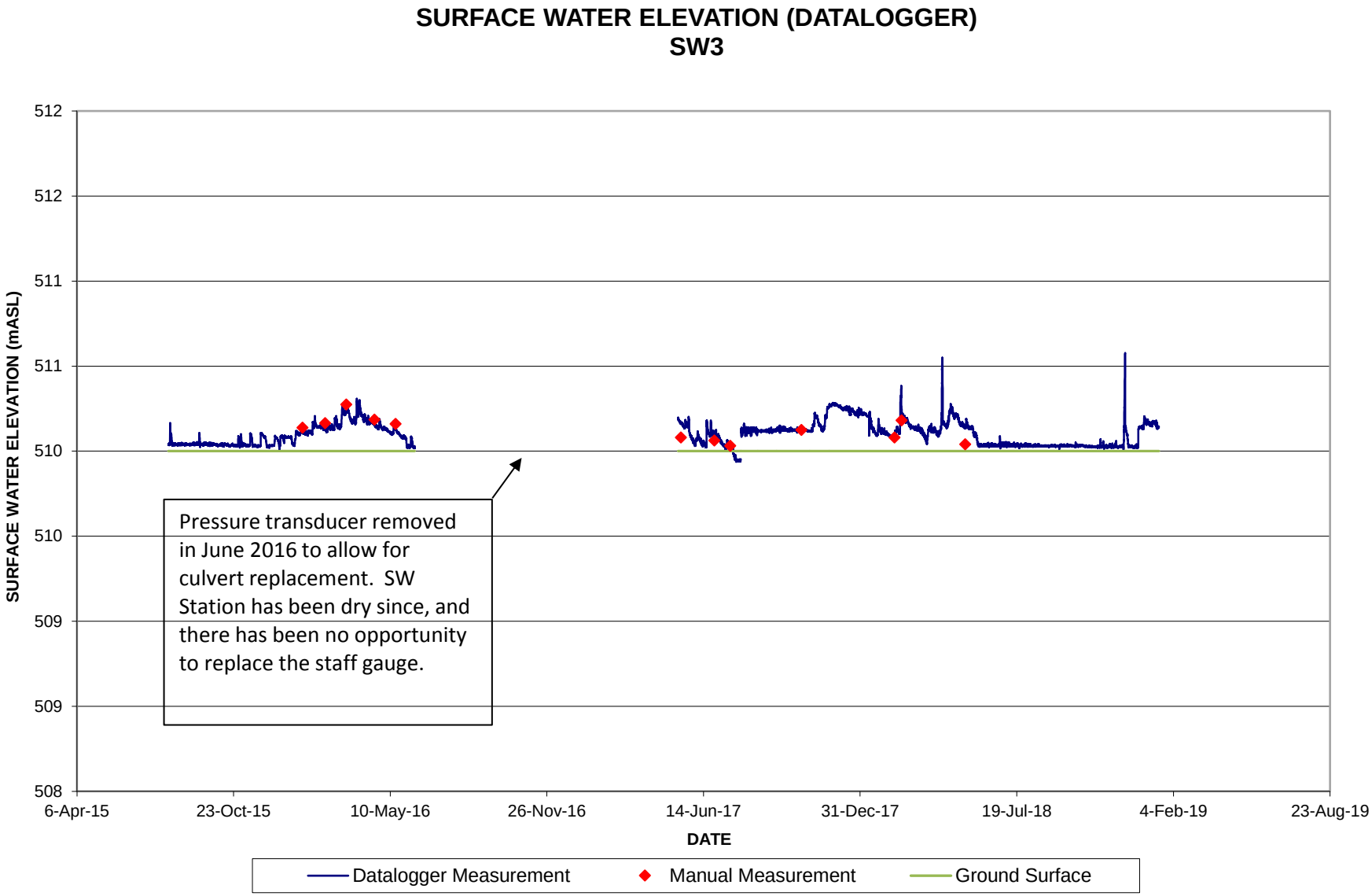
SURFACE WATER ELEVATION (DATALOGGER)
SW3
SURFACE WATER ELEVATION (mASL)
512
512
511
511
510
510
509
509
508
6-Apr-15
23-Oct-15
10-May-16
26-Nov-16
14-Jun-17
31-Dec-17
19-Jul-18
4-Feb-19
23-Aug-19
DATE
Pressure transducer removed in June 2016 to allow for culvert replacement. SW Station has been dry since, and there has been no opportunity to replace the staff gauge.
Datalogger Measurement
Manual Measurement
Ground Surface

FIGURE B-7 (b)

SURFACE WATER TEMPERATURE (DATALOGGER)
SW3

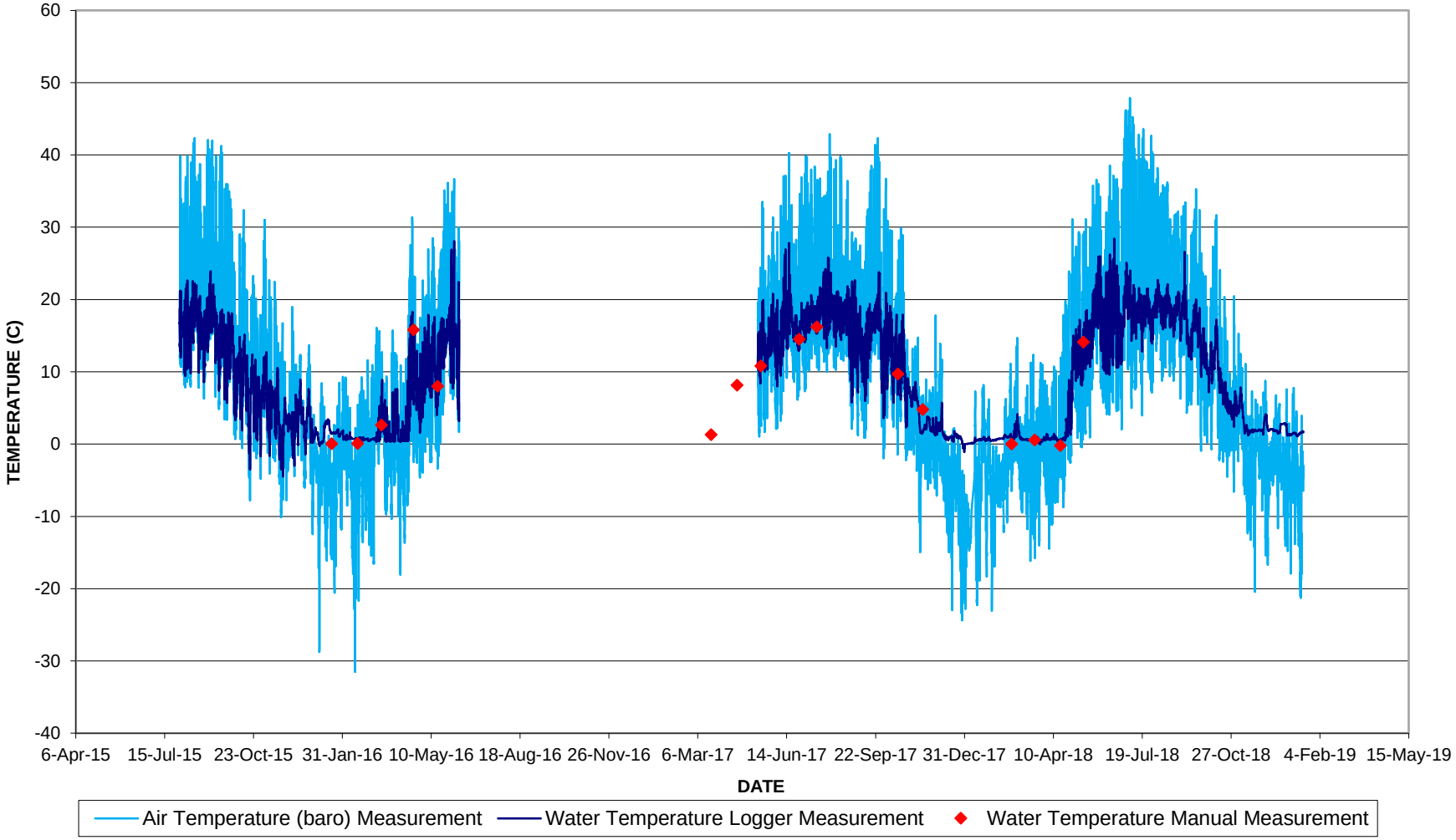

FIGURE B-8

SURFACE WATER HYDROGRAPH
SW3A

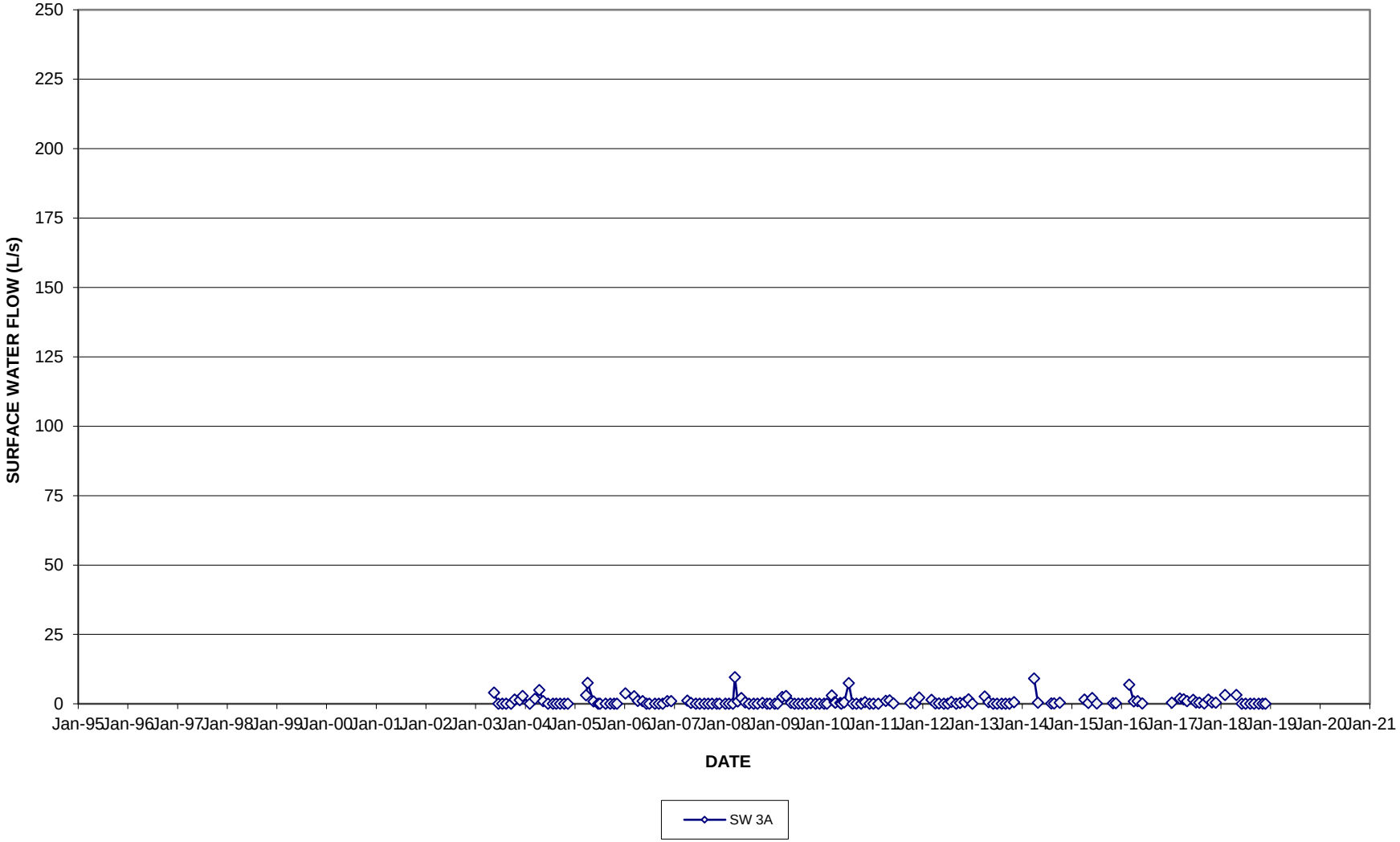

FIGURE B-9

SURFACE WATER HYDROGRAPH
SW4

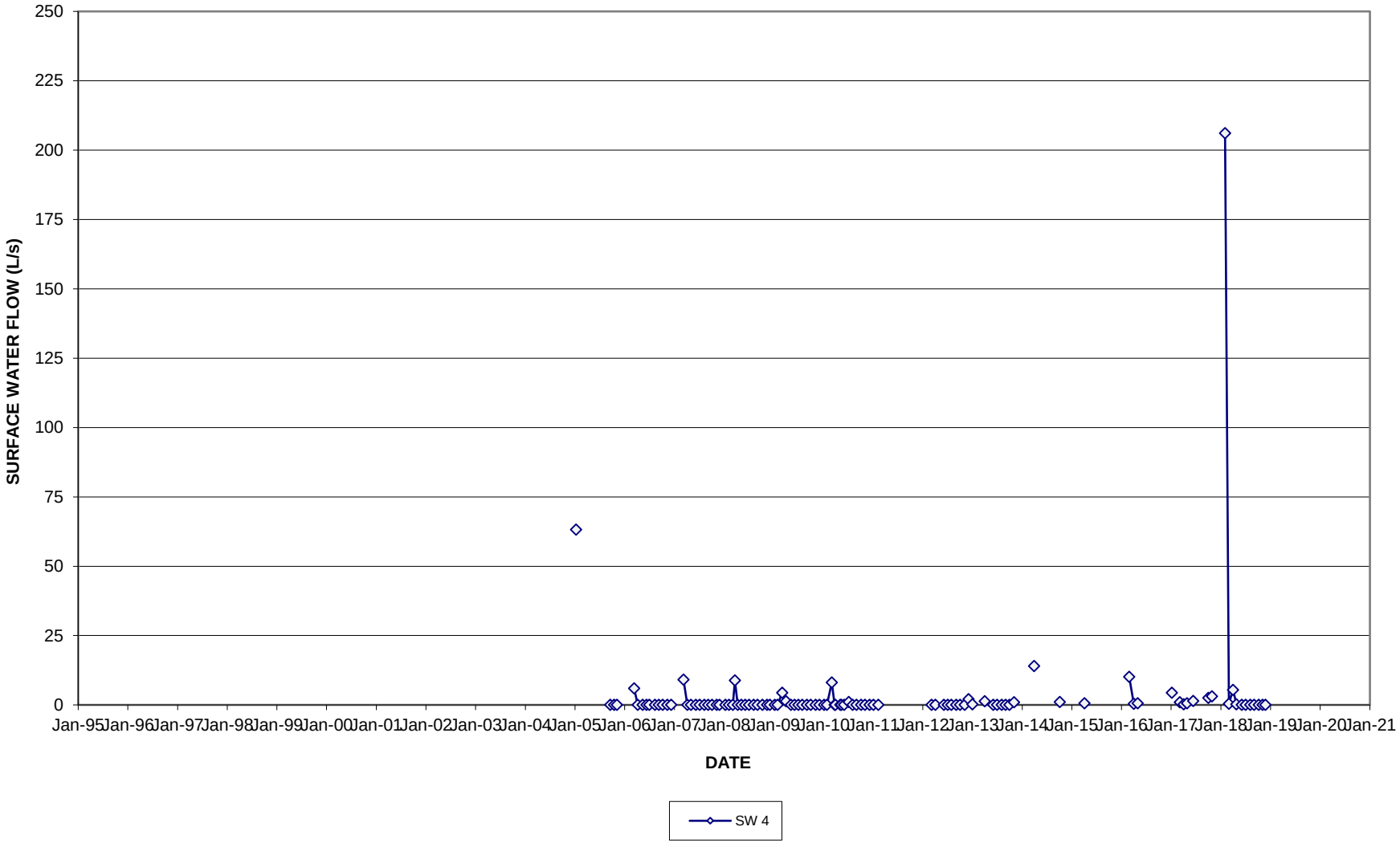

FIGURE B-10

SURFACE WATER HYDROGRAPH
SW5

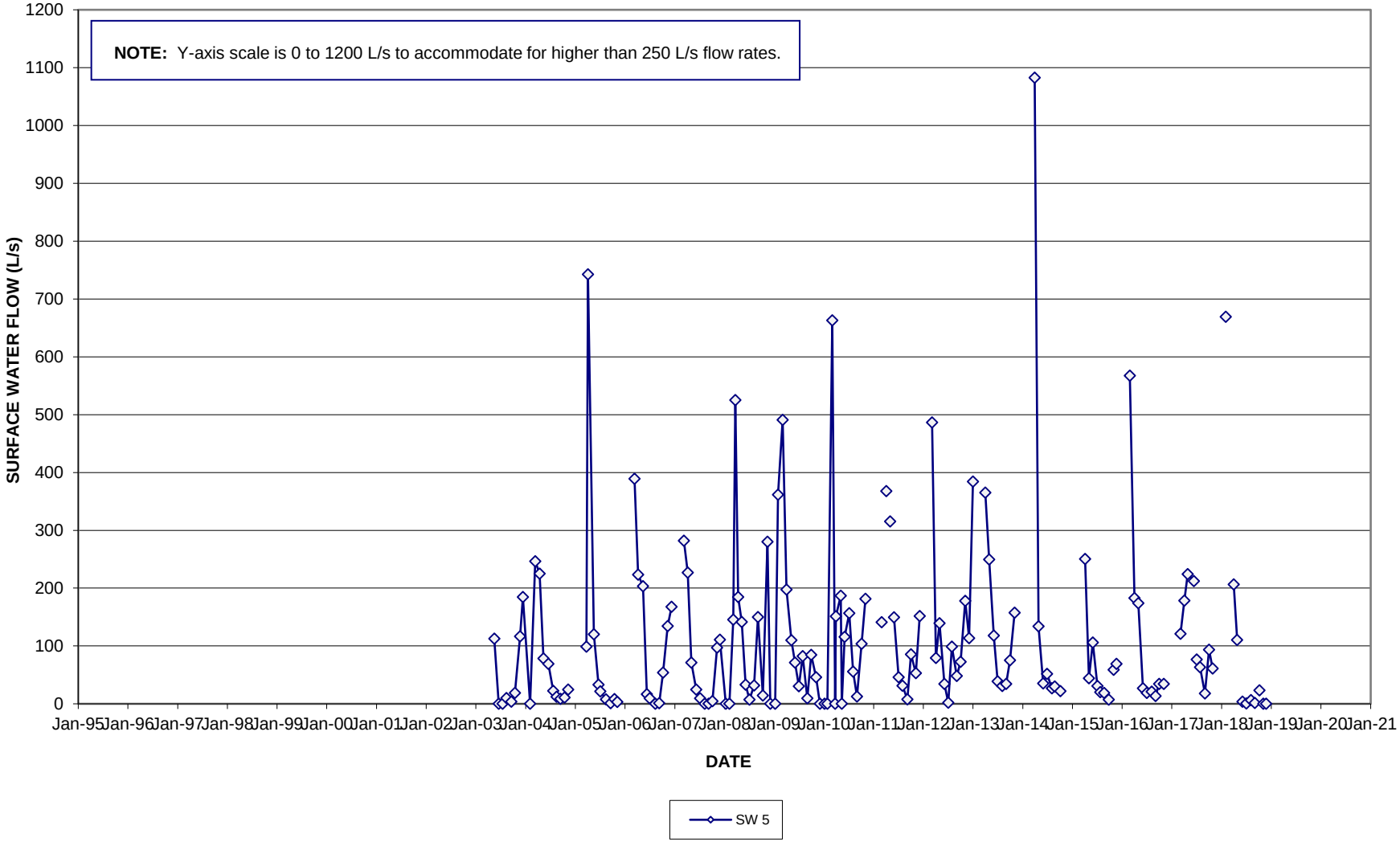

FIGURE B-11

SURFACE WATER HYDROGRAPH
SW6

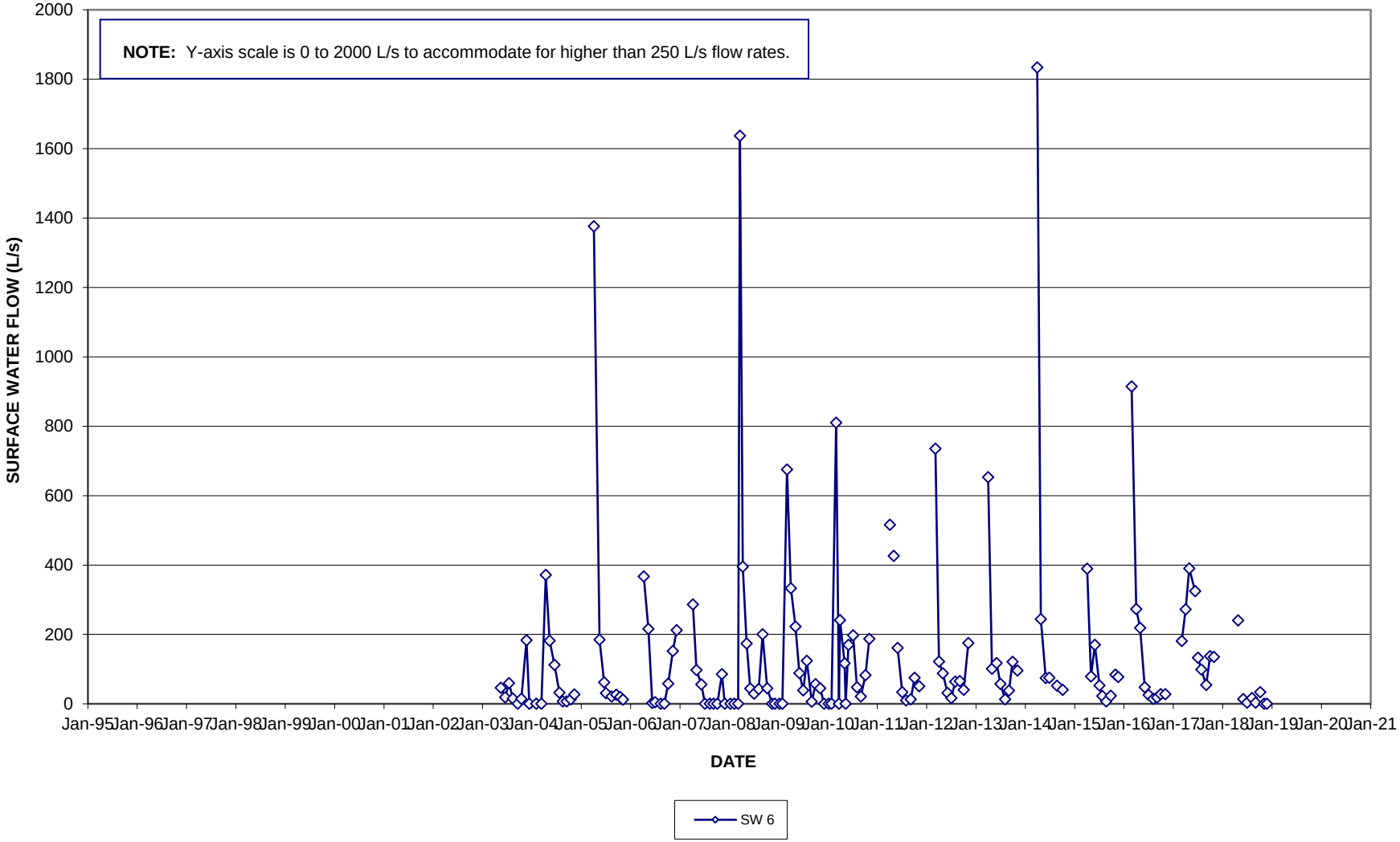

FIGURE B-12

SURFACE WATER HYDROGRAPH
SW6A

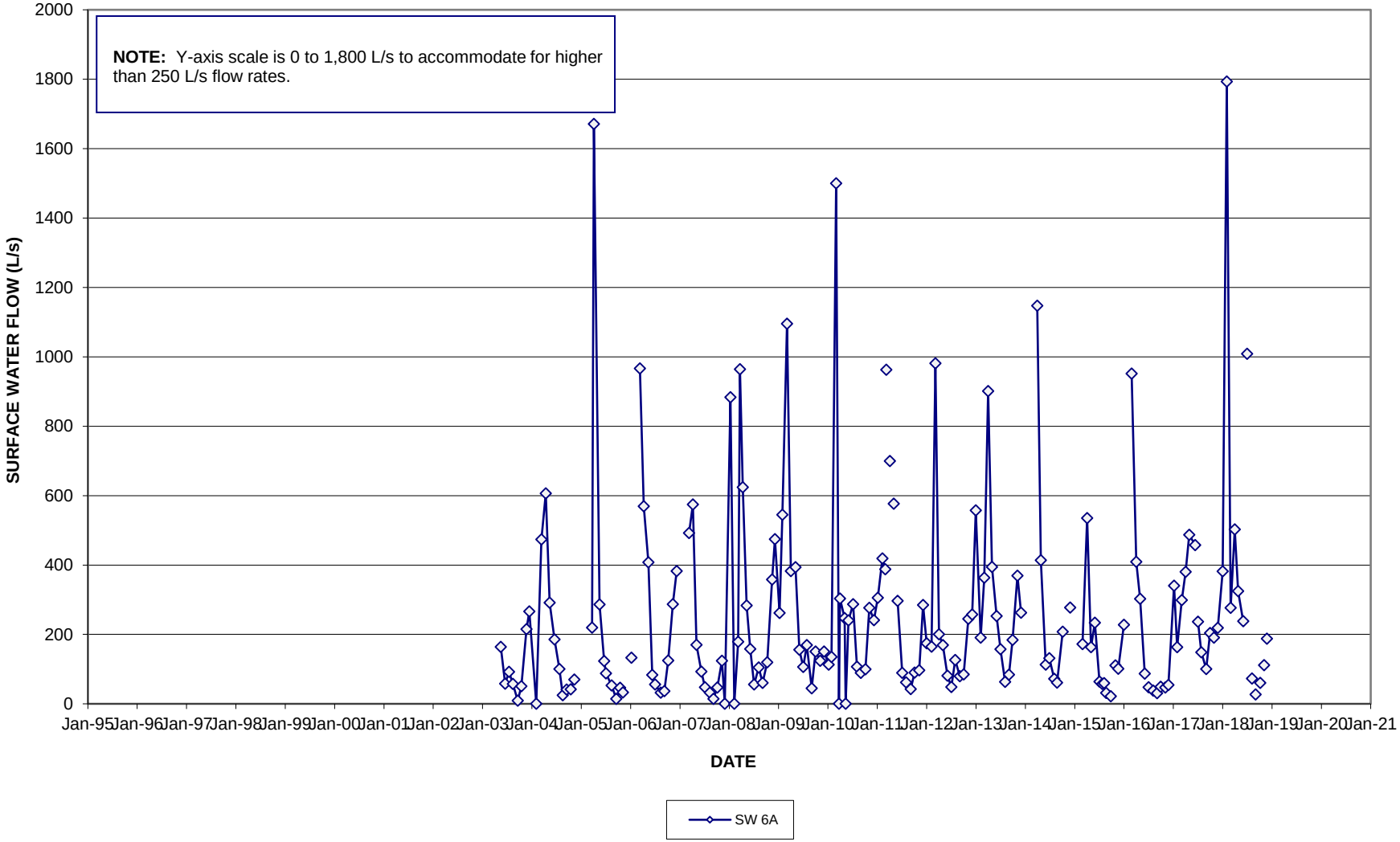

FIGURE B-12 (a)

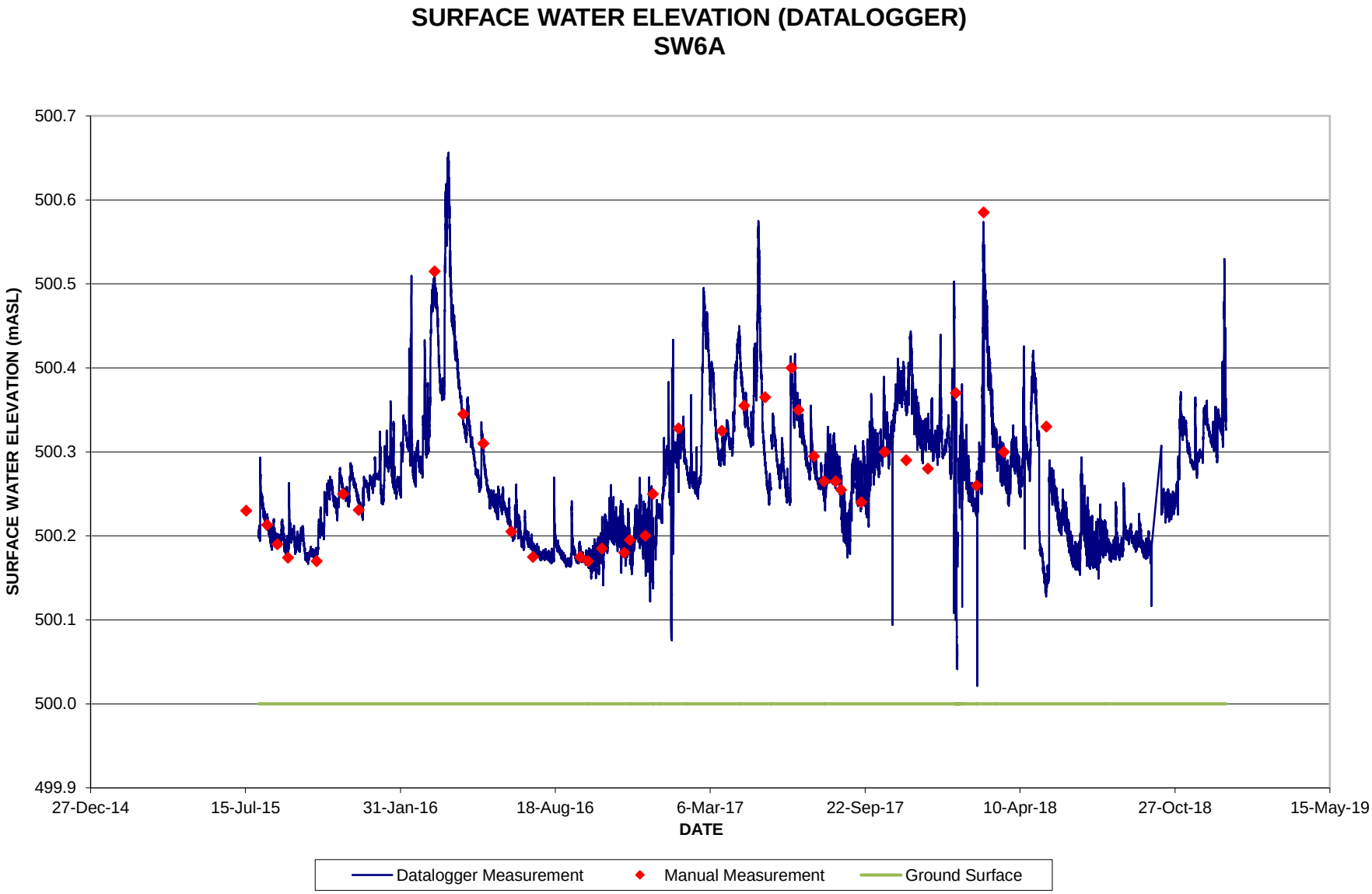
SURFACE WATER ELEVATION (DATALOGGER)
SW6A
SURFACE WATER ELEVATION (mASL)
500.7
500.6
500.5
500.4
500.3
500.2
500.1
500.0
499.9
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Datalogger Measurement
Manual Measurement
Ground Surface

FIGURE B-12 (b)

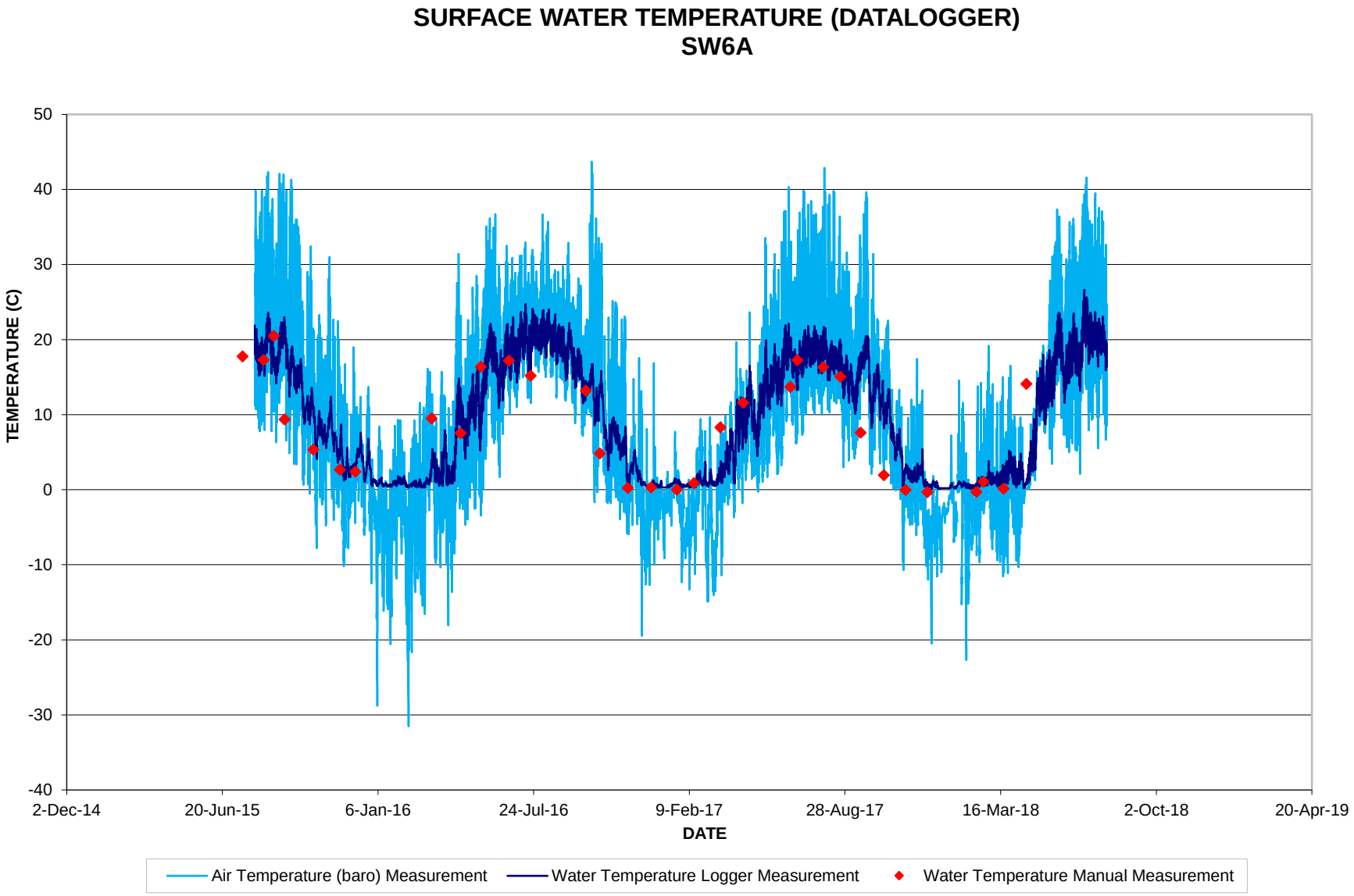
SURFACE WATER TEMPERATURE (DATALOGGER)
SW6A
TEMPERATURE (C)
50
40
30
20
10
0
-10
-20
-30
-40
2-Dec-14
20-Jun-15
6-Jan-16
24-Jul-16
9-Feb-17
28-Aug-17
16-Mar-18
2-Oct-18
20-Apr-19
DATE
Air Temperature (baro) Measurement
Water Temperature Logger Measurement
Water Temperature Manual Measurement

FIGURE B-13

SURFACE WATER HYDROGRAPH
SW7

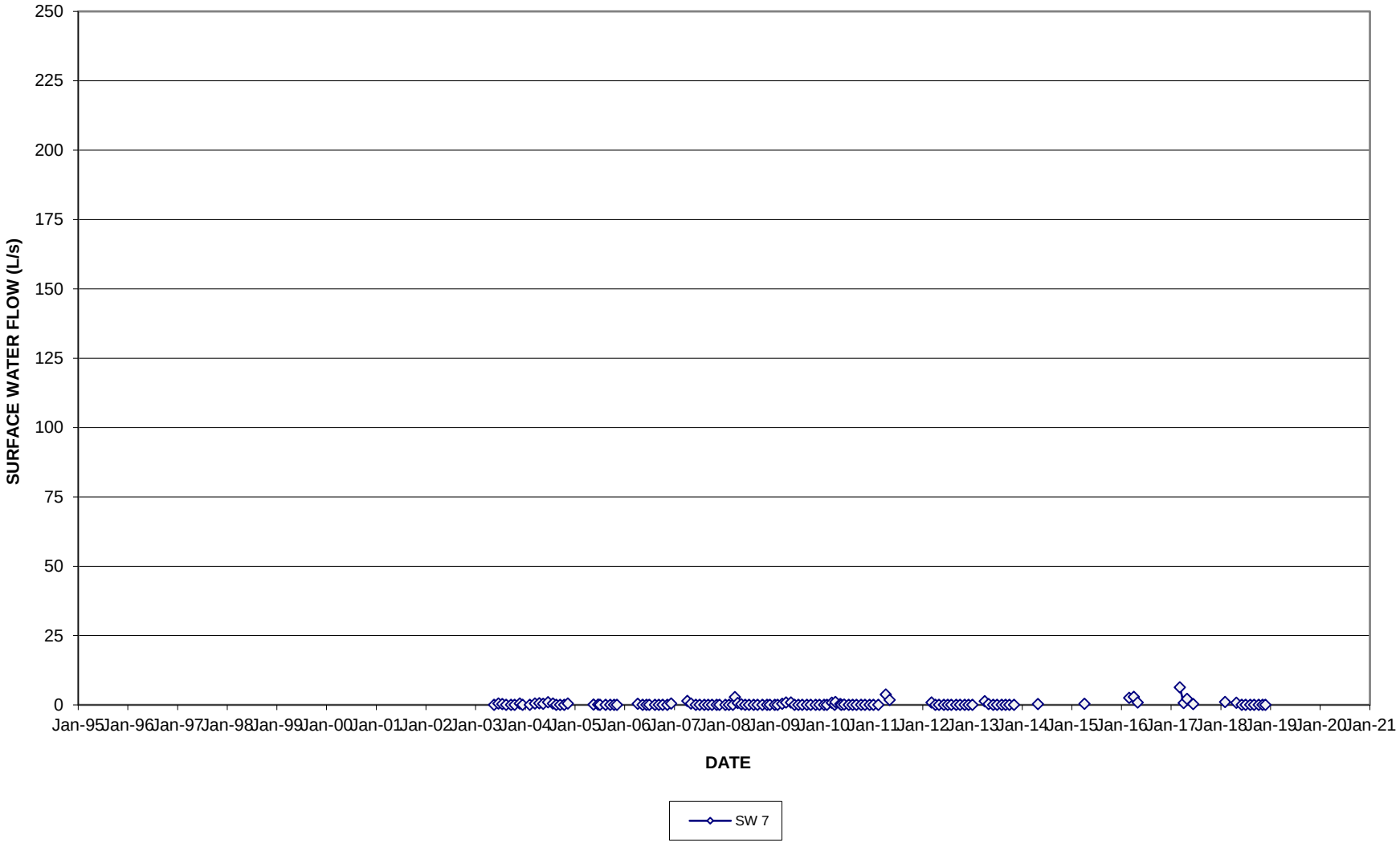

FIGURE B-14

SURFACE WATER HYDROGRAPH
SW8

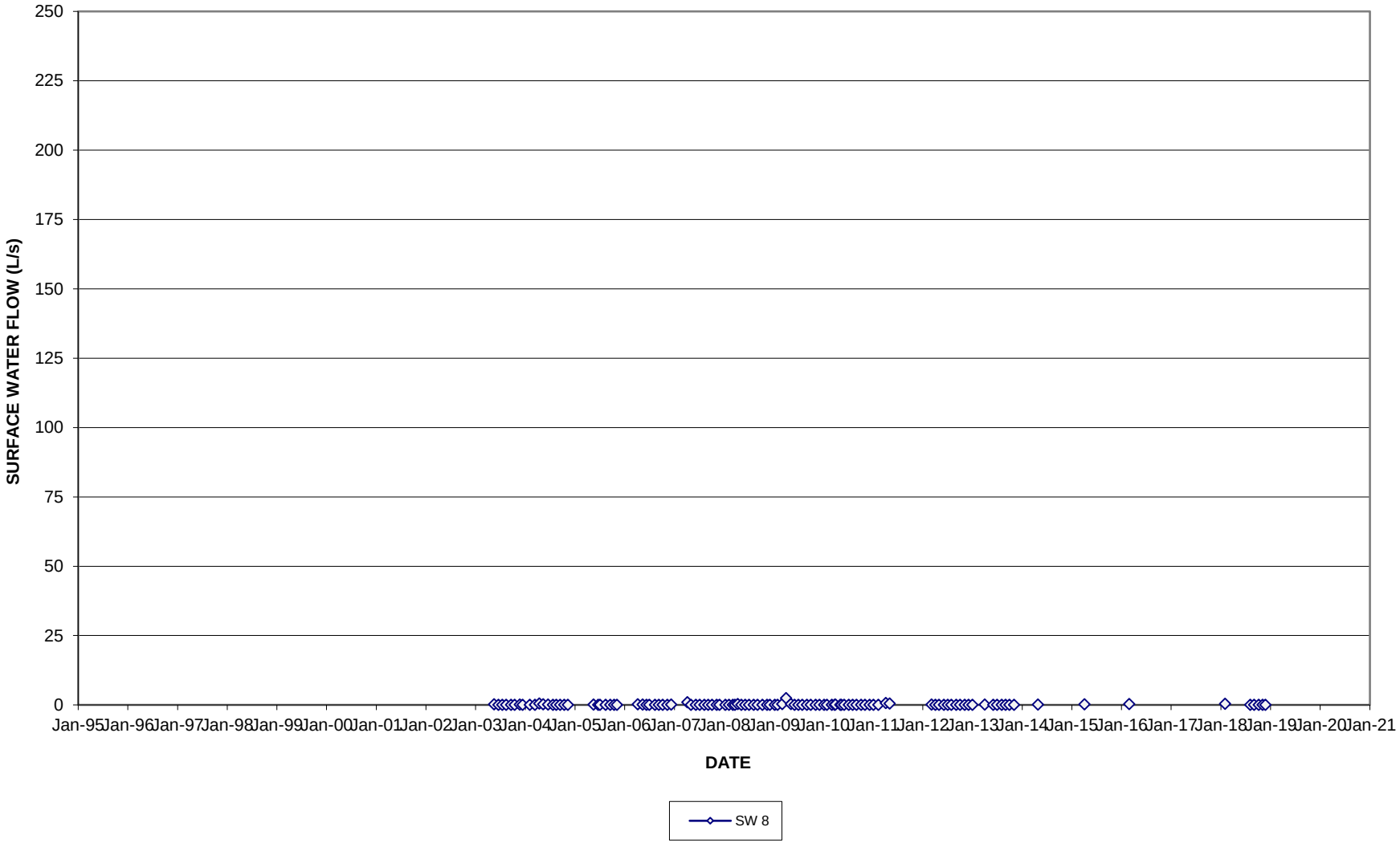

FIGURE B-15

SURFACE WATER HYDROGRAPH
SW9

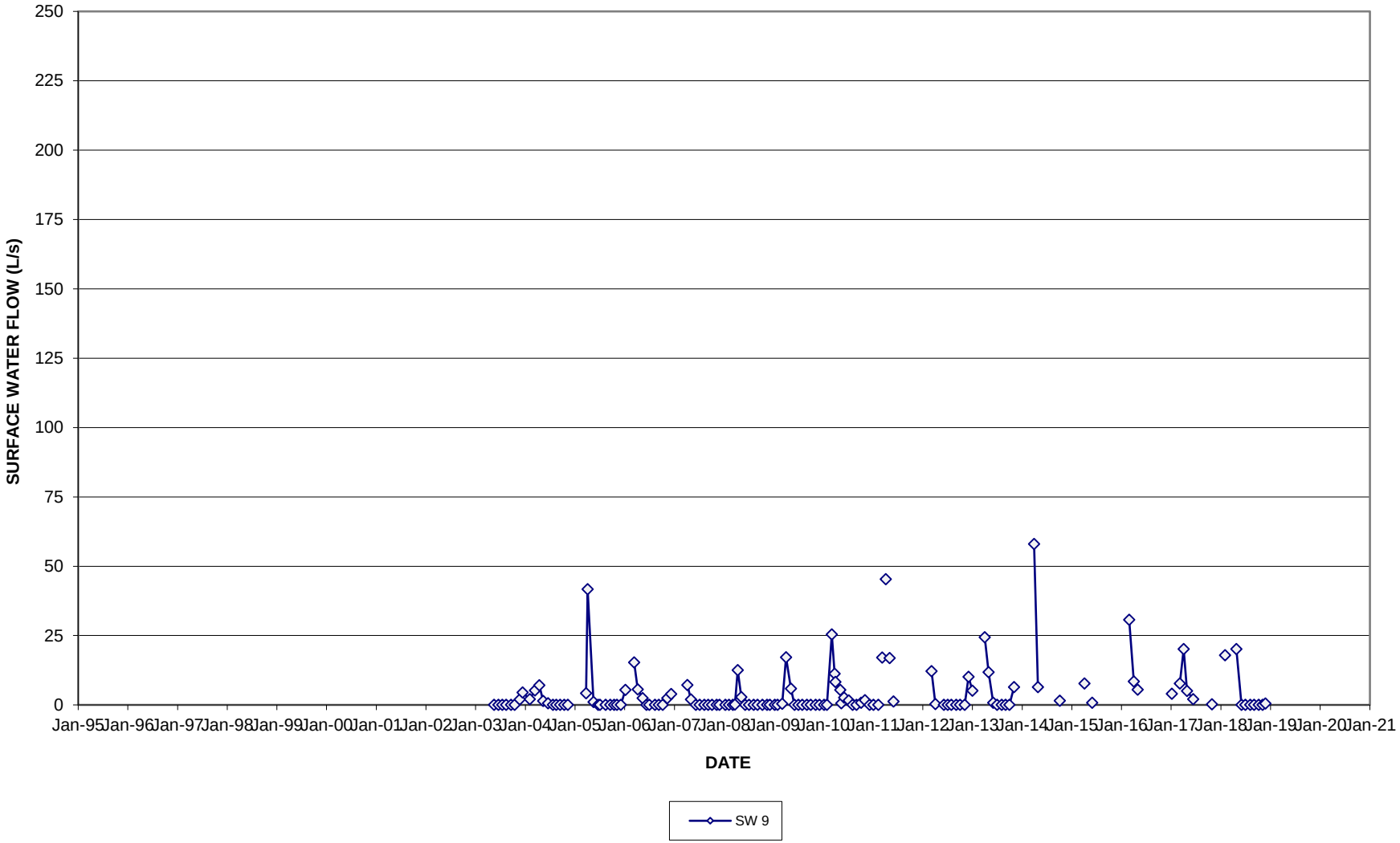

FIGURE B-15 (a)

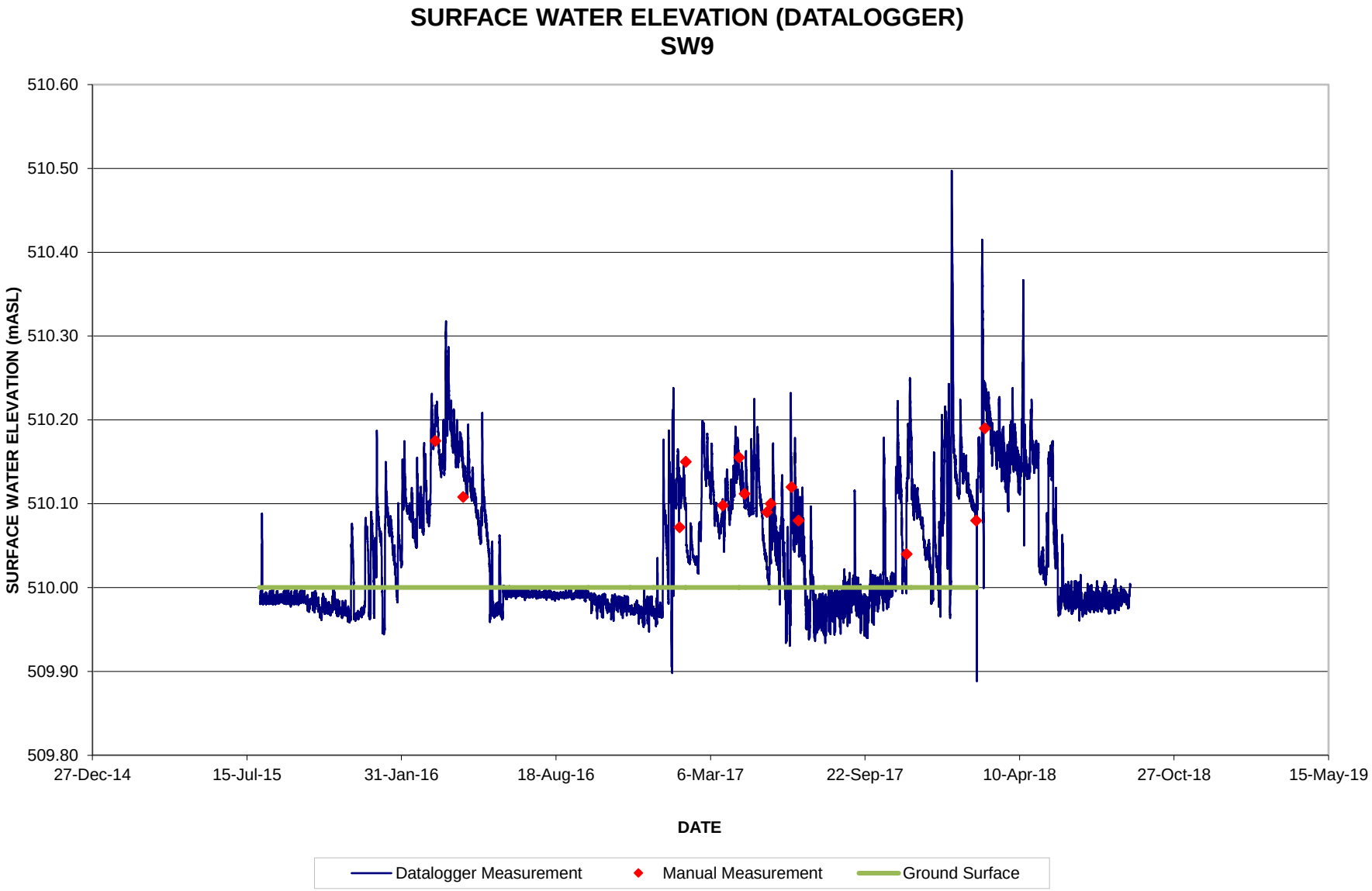
SURFACE WATER ELEVATION (DATALOGGER)
SW9
510.60
510.50
510.40
510.30
510.20
510.10
510.00
509.90
509.80
SURFACE WATER ELEVATION (mASL)
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Datalogger Measurement
Manual Measurement
Ground Surface

FIGURE B-15 (b)

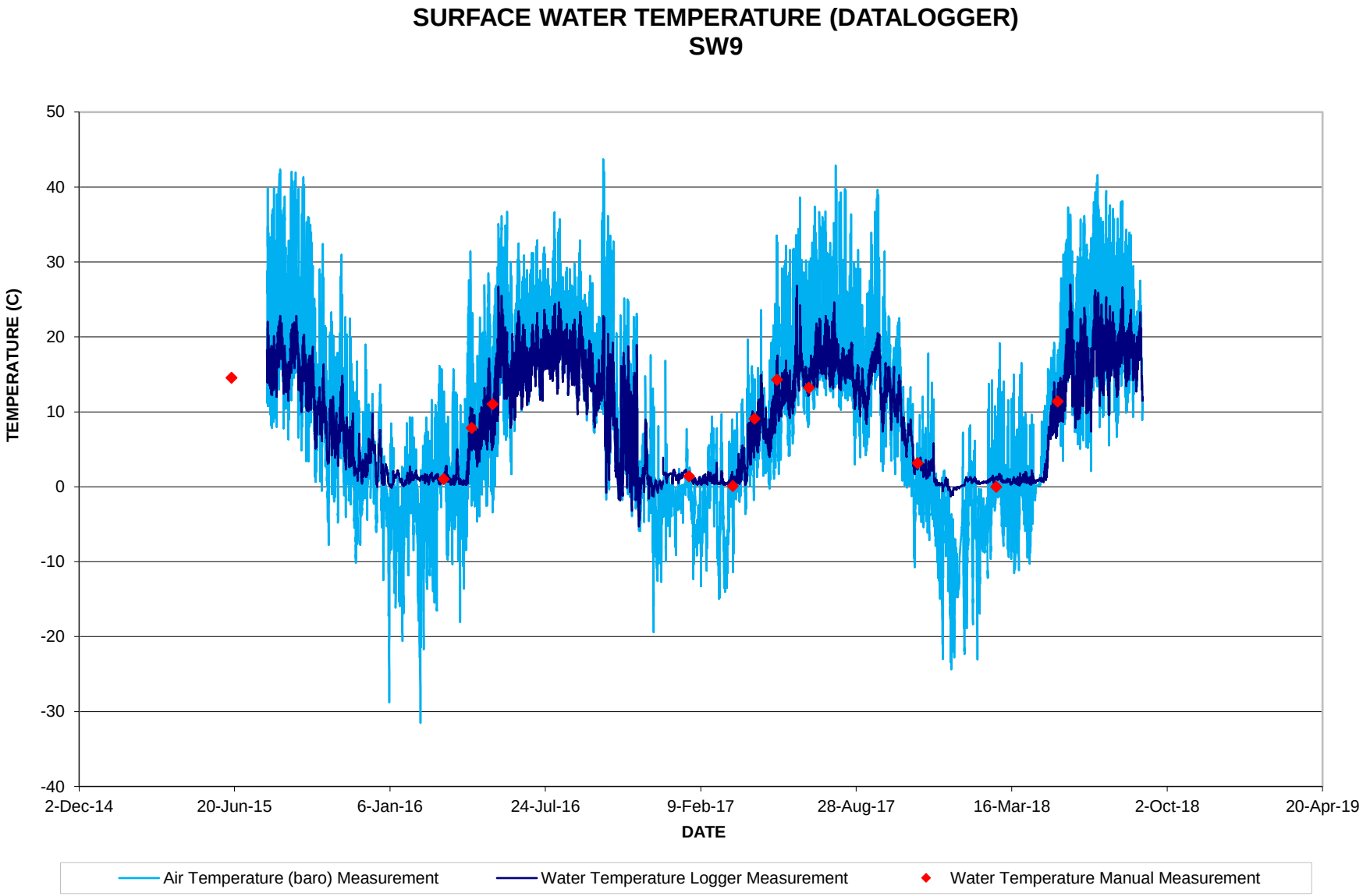
SURFACE WATER TEMPERATURE (DATALOGGER)
SW9
TEMPERATURE (C)
50
40
30
20
10
0
-10
-20
-30
-40
2-Dec-14
20-Jun-15
6-Jan-16
24-Jul-16
9-Feb-17
28-Aug-17
16-Mar-18
2-Oct-18
20-Apr-19
DATE
Air Temperature (baro) Measurement
Water Temperature Logger Measurement
Water Temperature Manual Measurement

FIGURE B-16

SURFACE WATER HYDROGRAPH
SW10

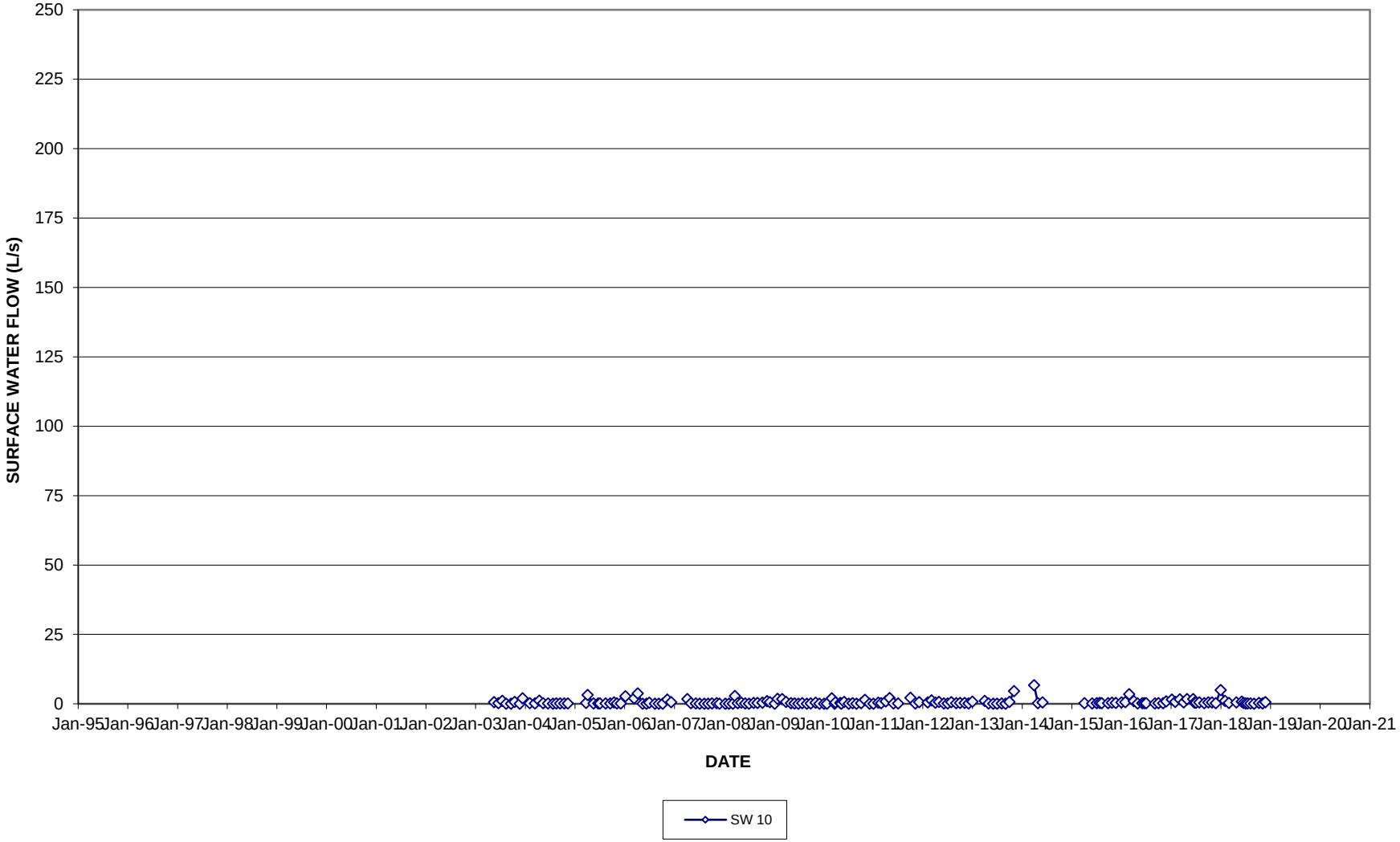

FIGURE B-17

SURFACE WATER HYDROGRAPH
SW11

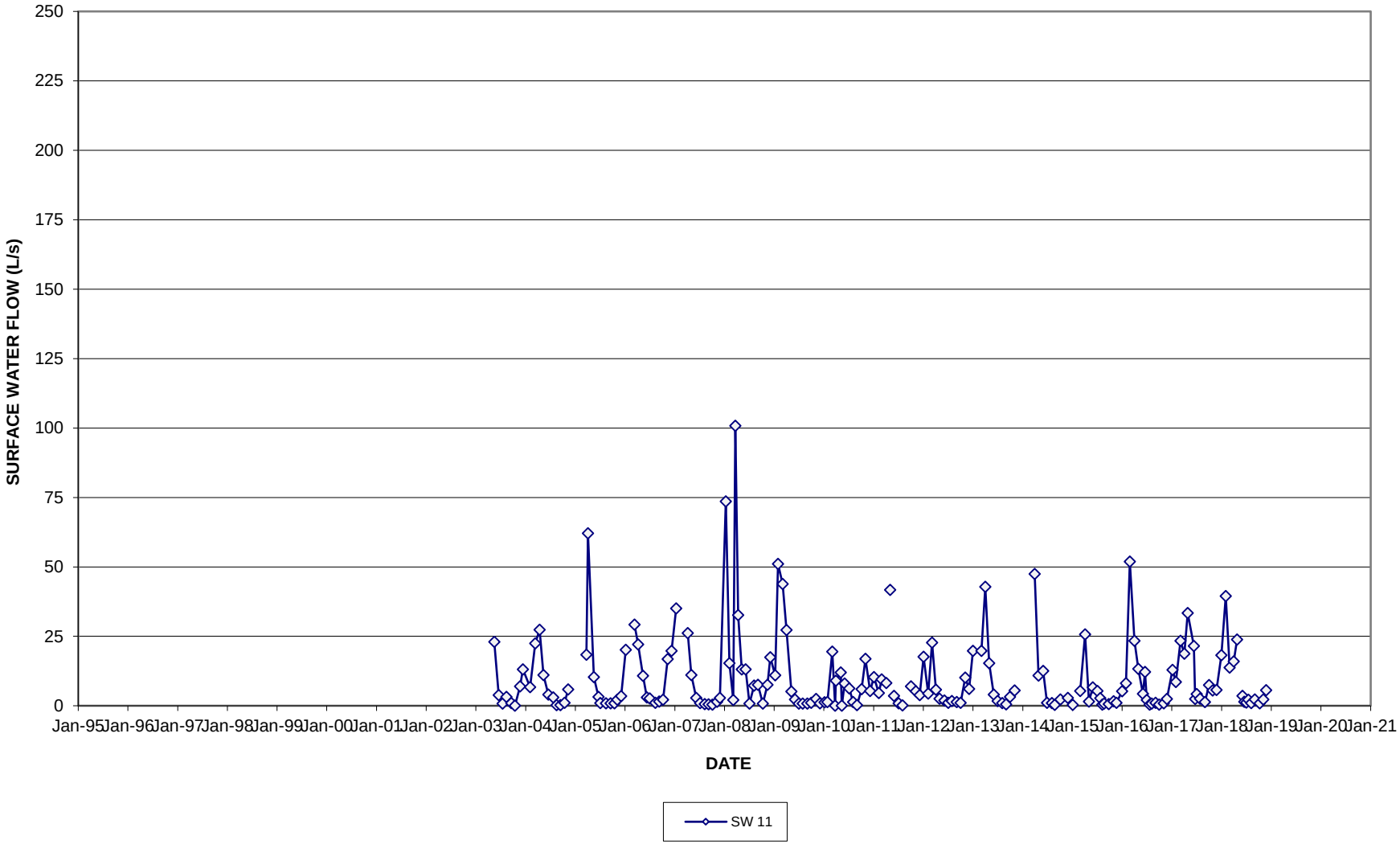

FIGURE B-18

SURFACE WATER HYDROGRAPH
SW11A

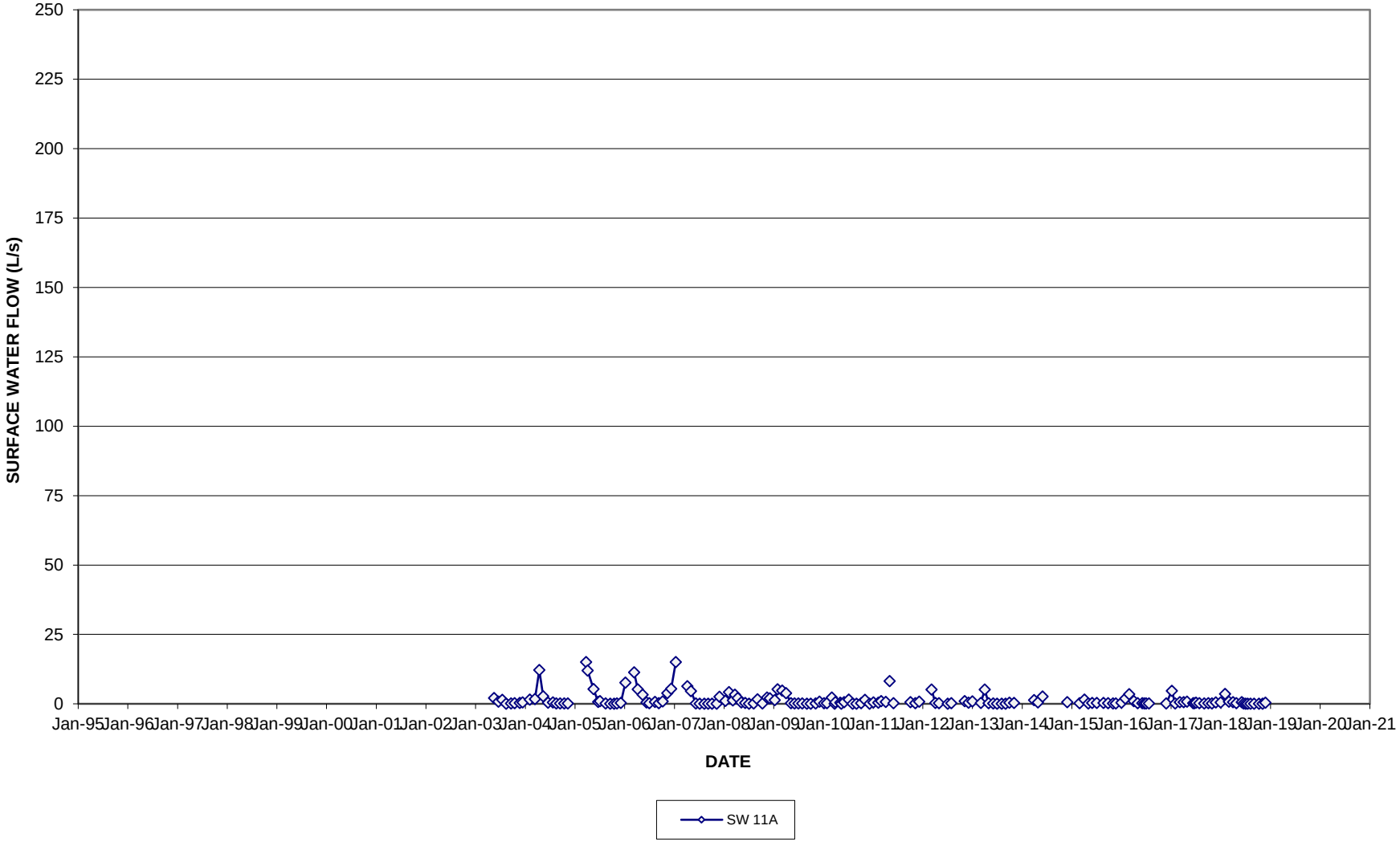

FIGURE B-19

SURFACE WATER HYDROGRAPH
SW11B

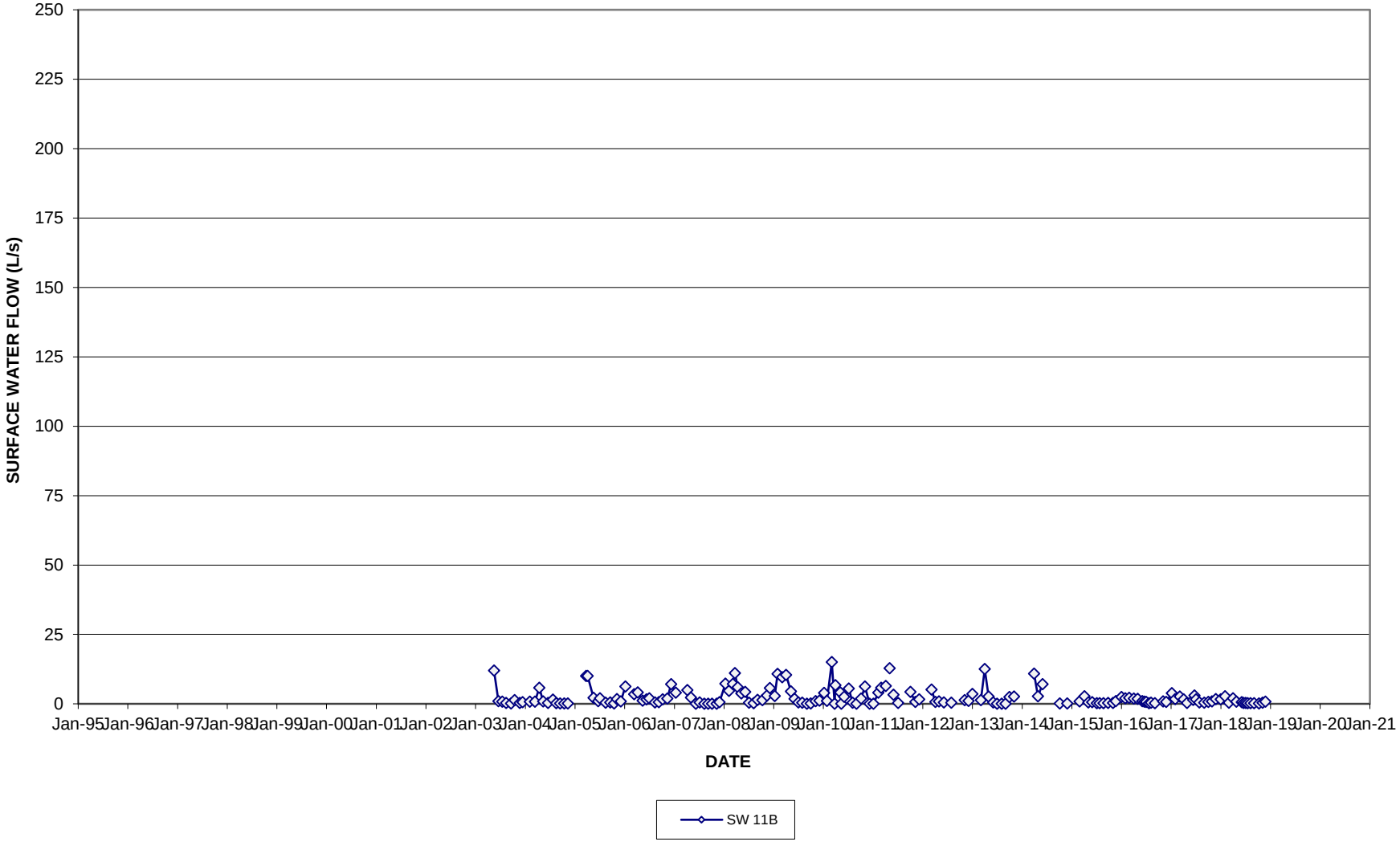

FIGURE B-20

SURFACE WATER HYDROGRAPH
SW11C

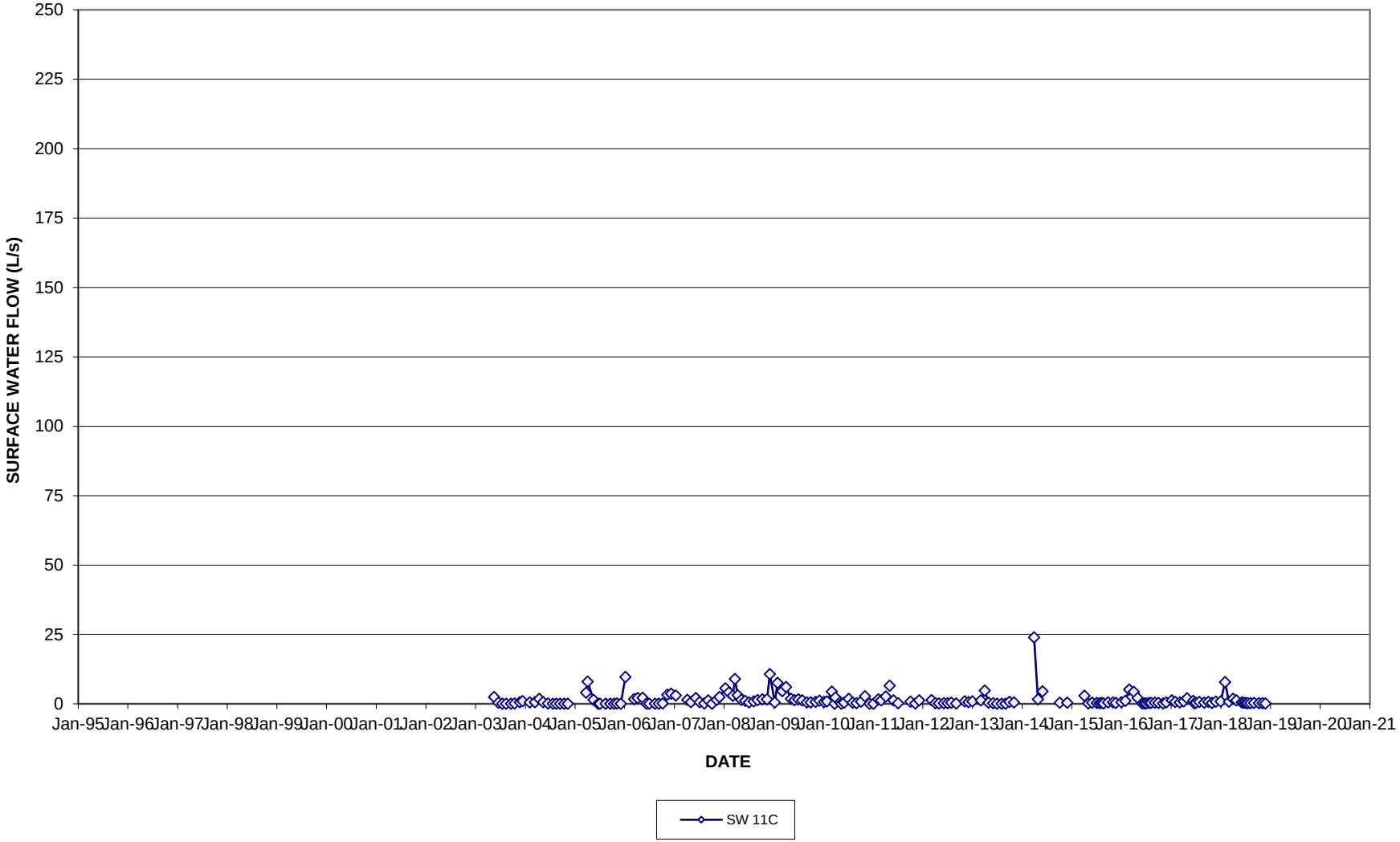

FIGURE B-21

SURFACE WATER HYDROGRAPH
SW11D

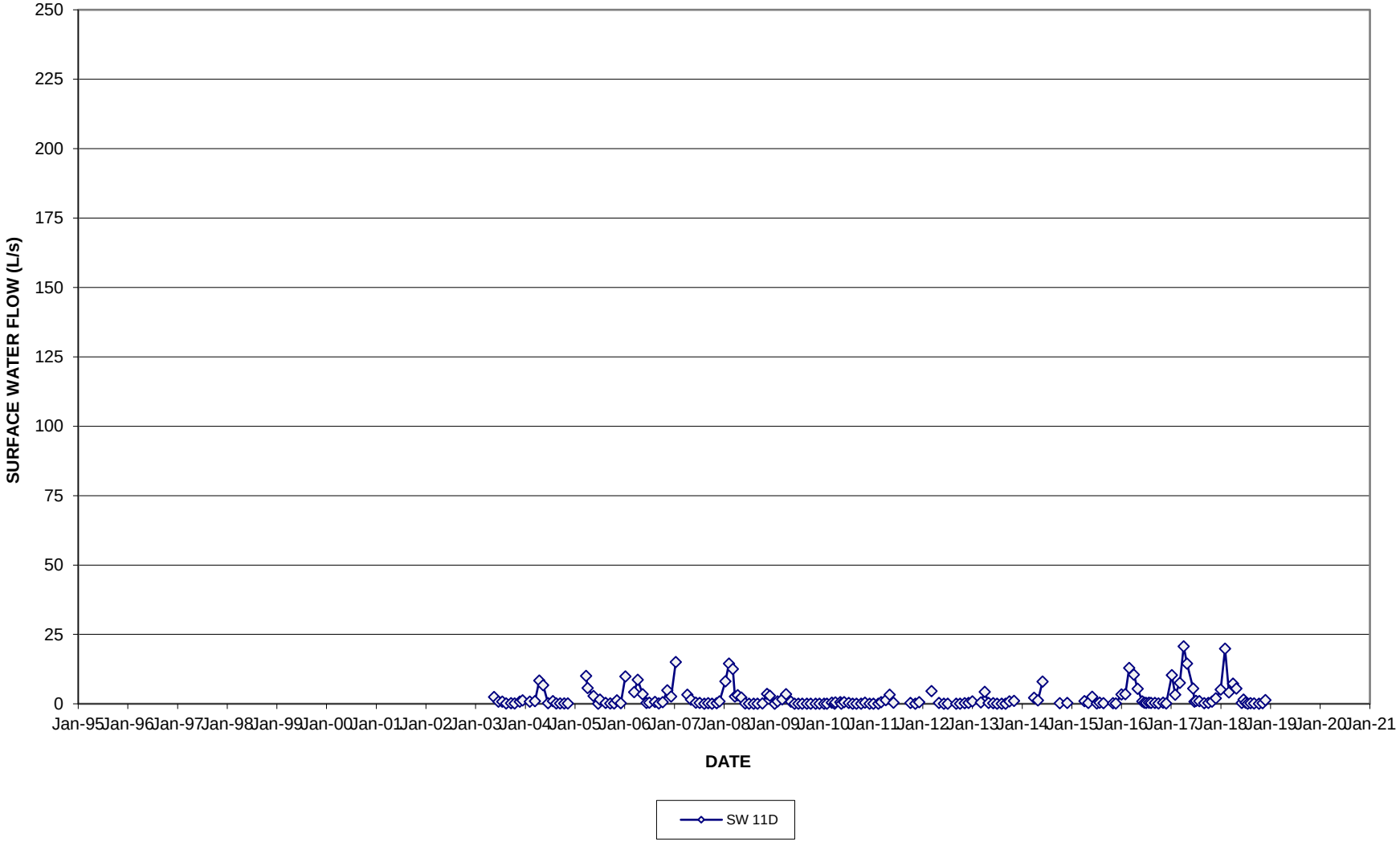

FIGURE B-22

SURFACE WATER HYDROGRAPH
SW11E

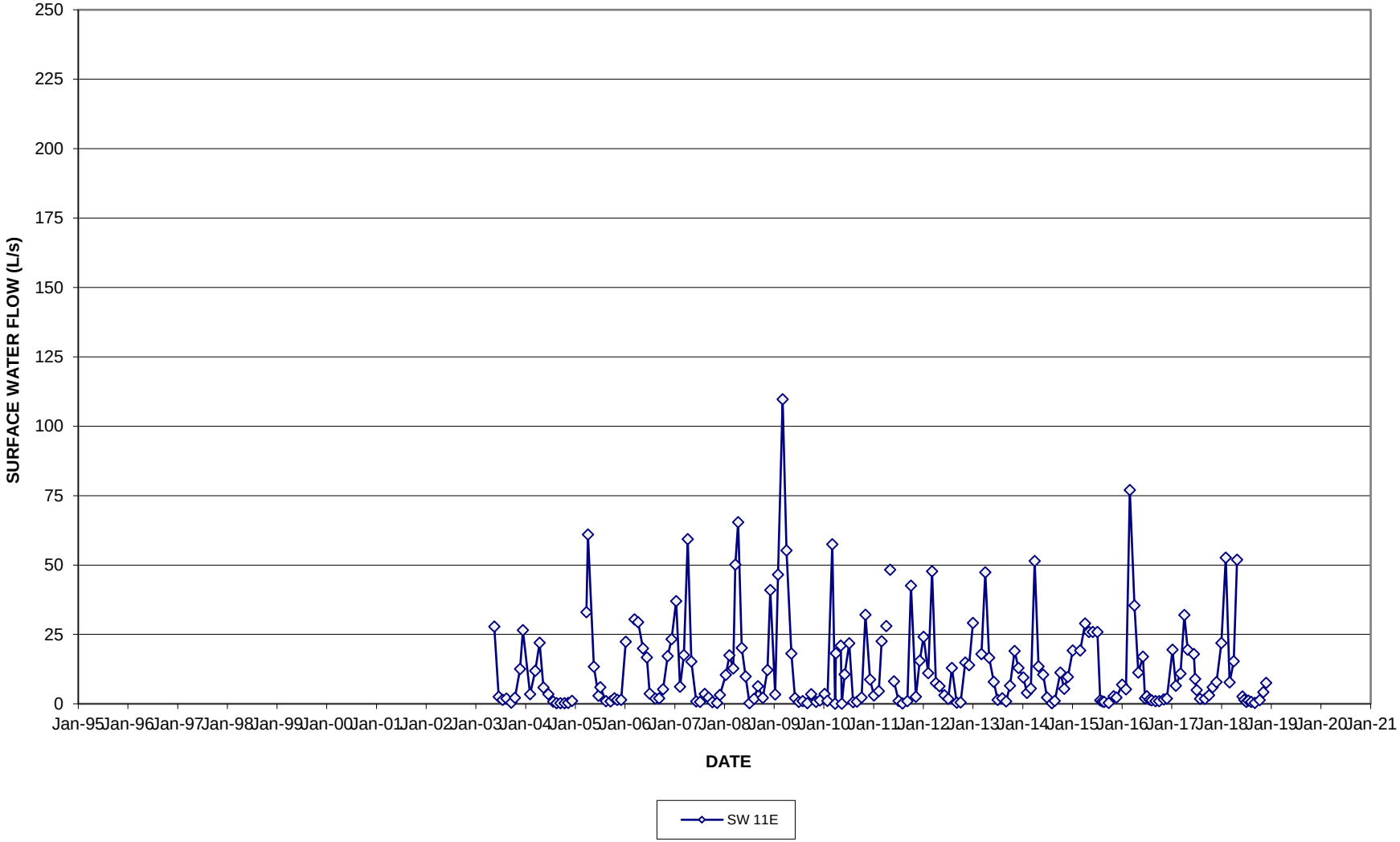

FIGURE B-23

SURFACE WATER HYDROGRAPH
SW12

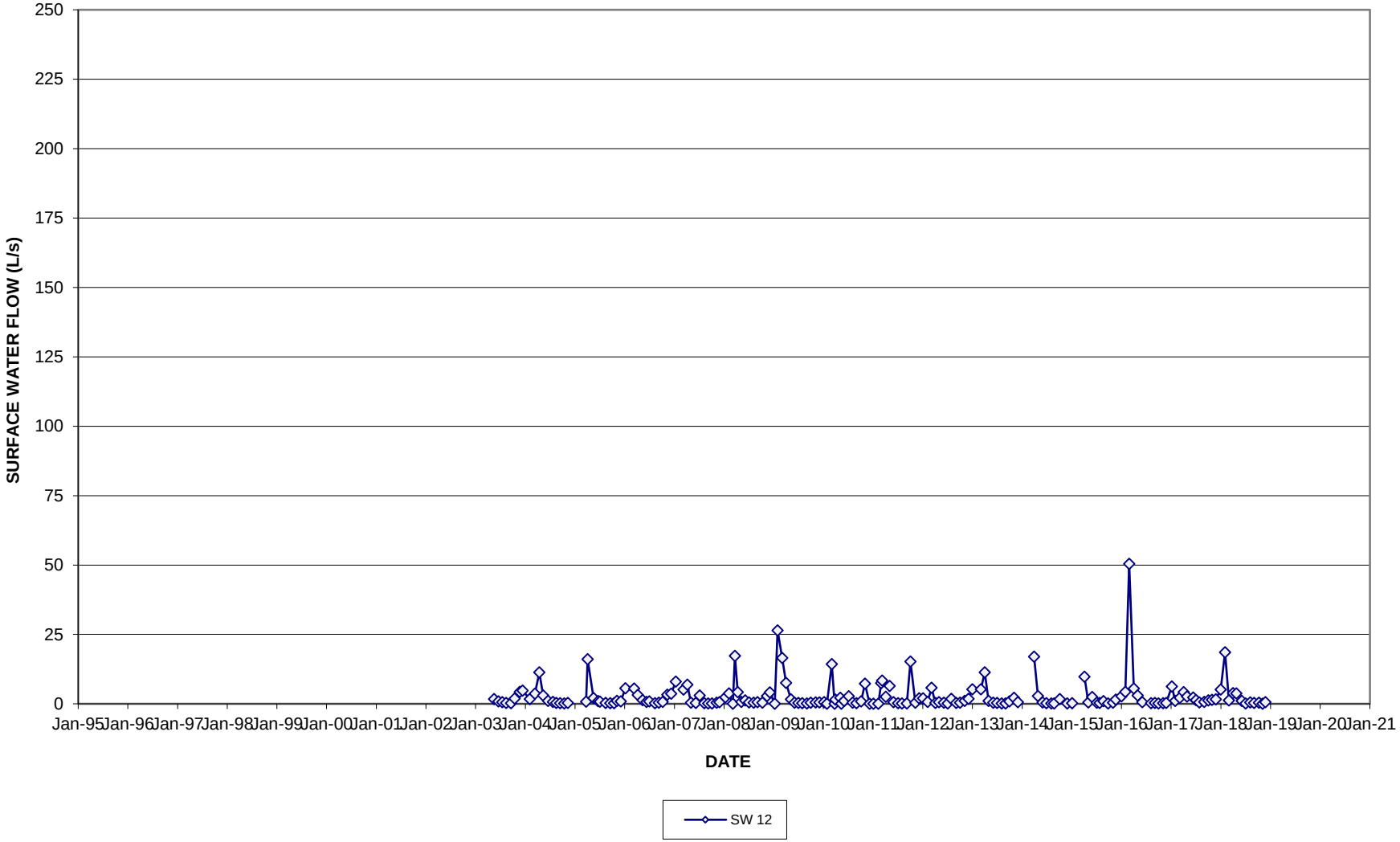

FIGURE B-24

SURFACE WATER HYDROGRAPH
SW12A

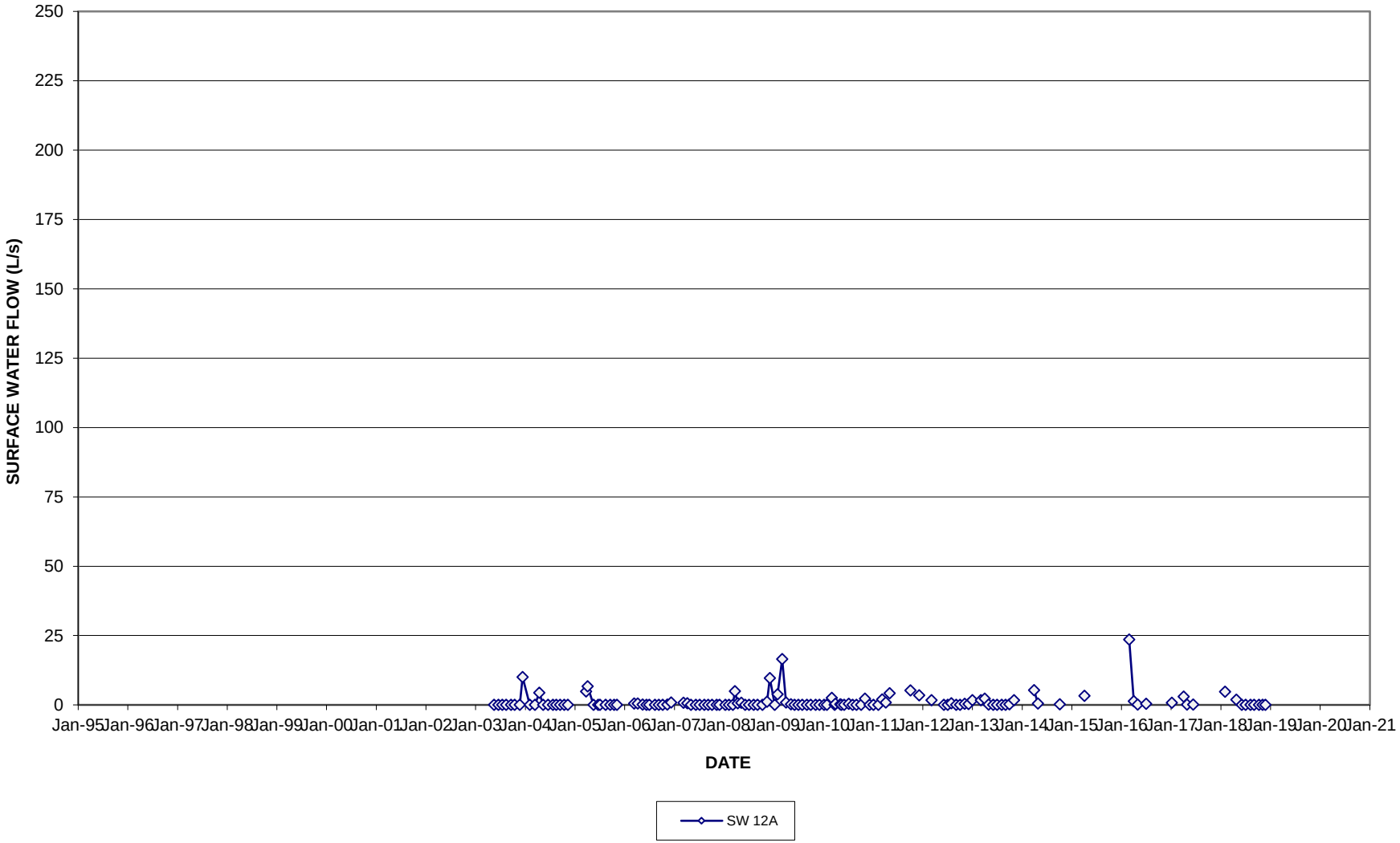

FIGURE B-25

SURFACE WATER HYDROGRAPH
SW13

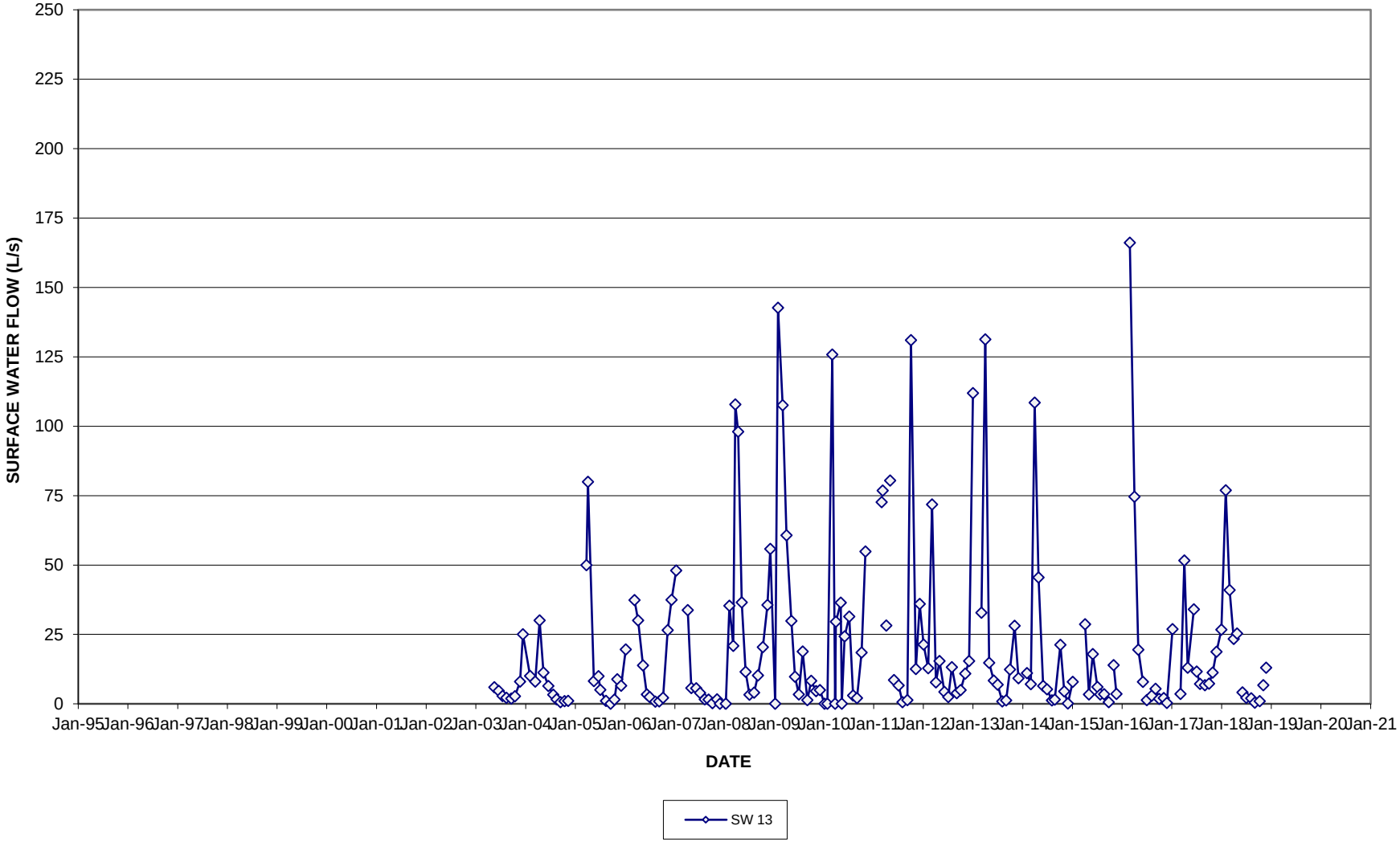

FIGURE B-26

SURFACE WATER HYDROGRAPH
SW14

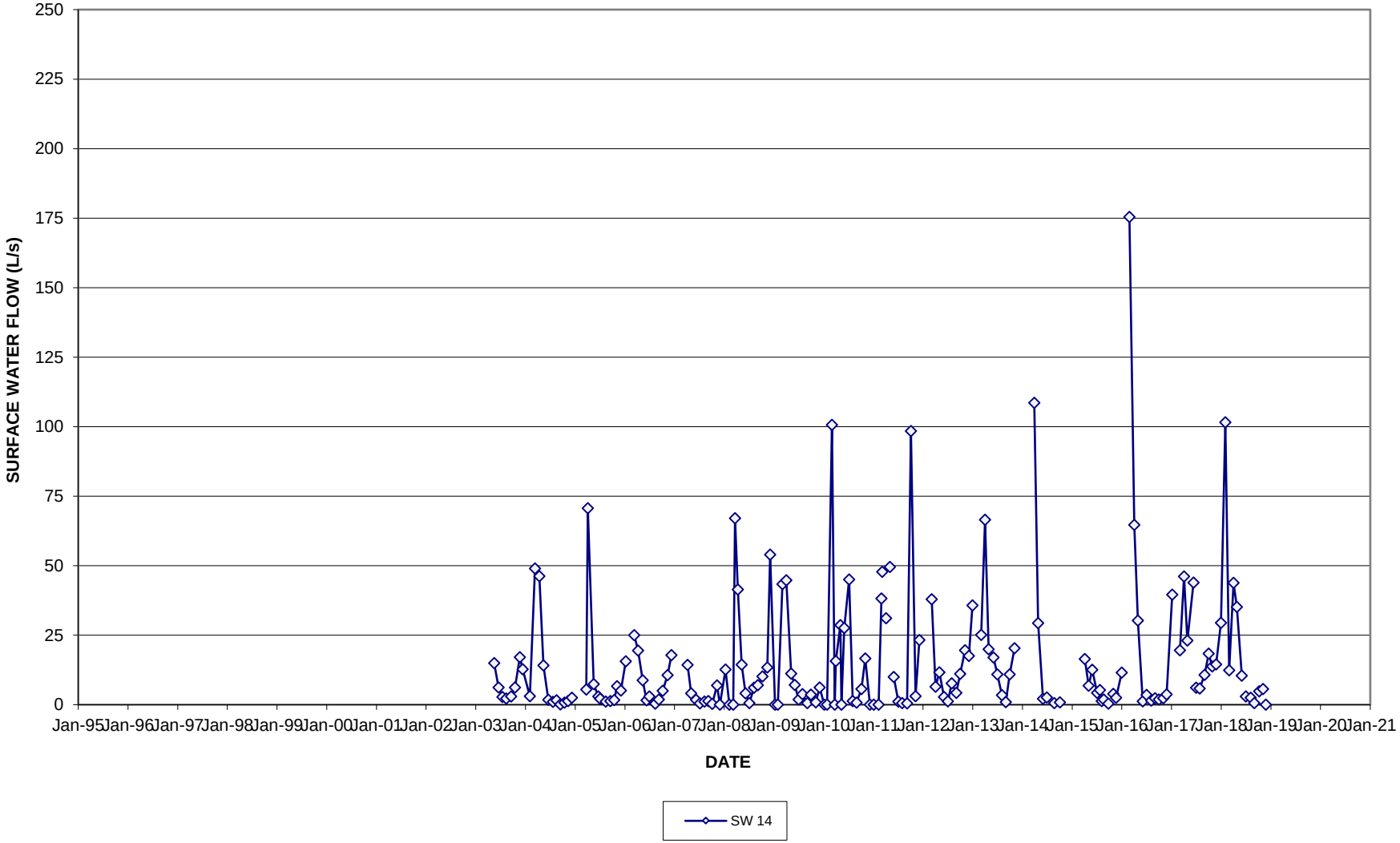

FIGURE B-27

SURFACE WATER HYDROGRAPH
SW15

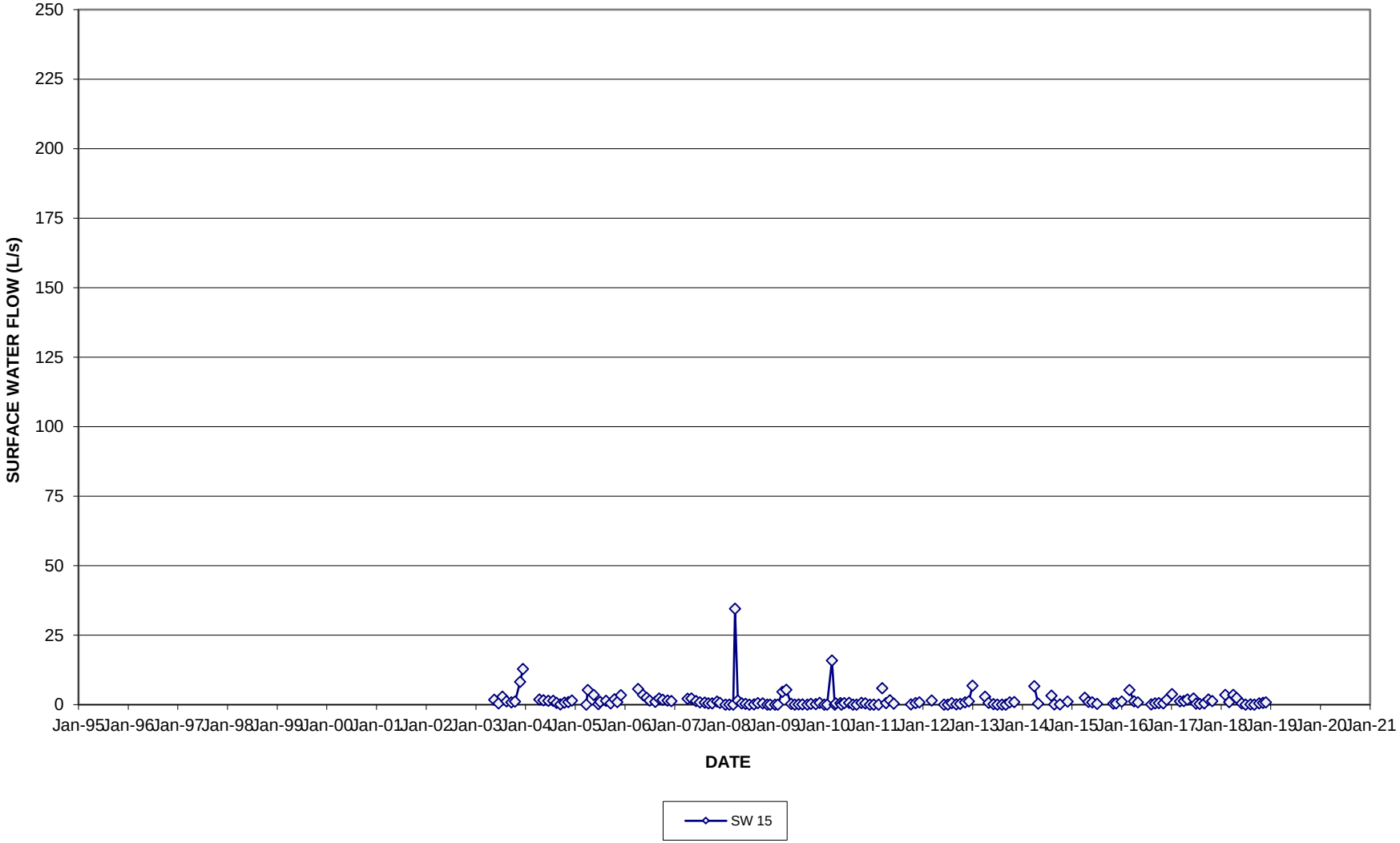

FIGURE B-27 (a)

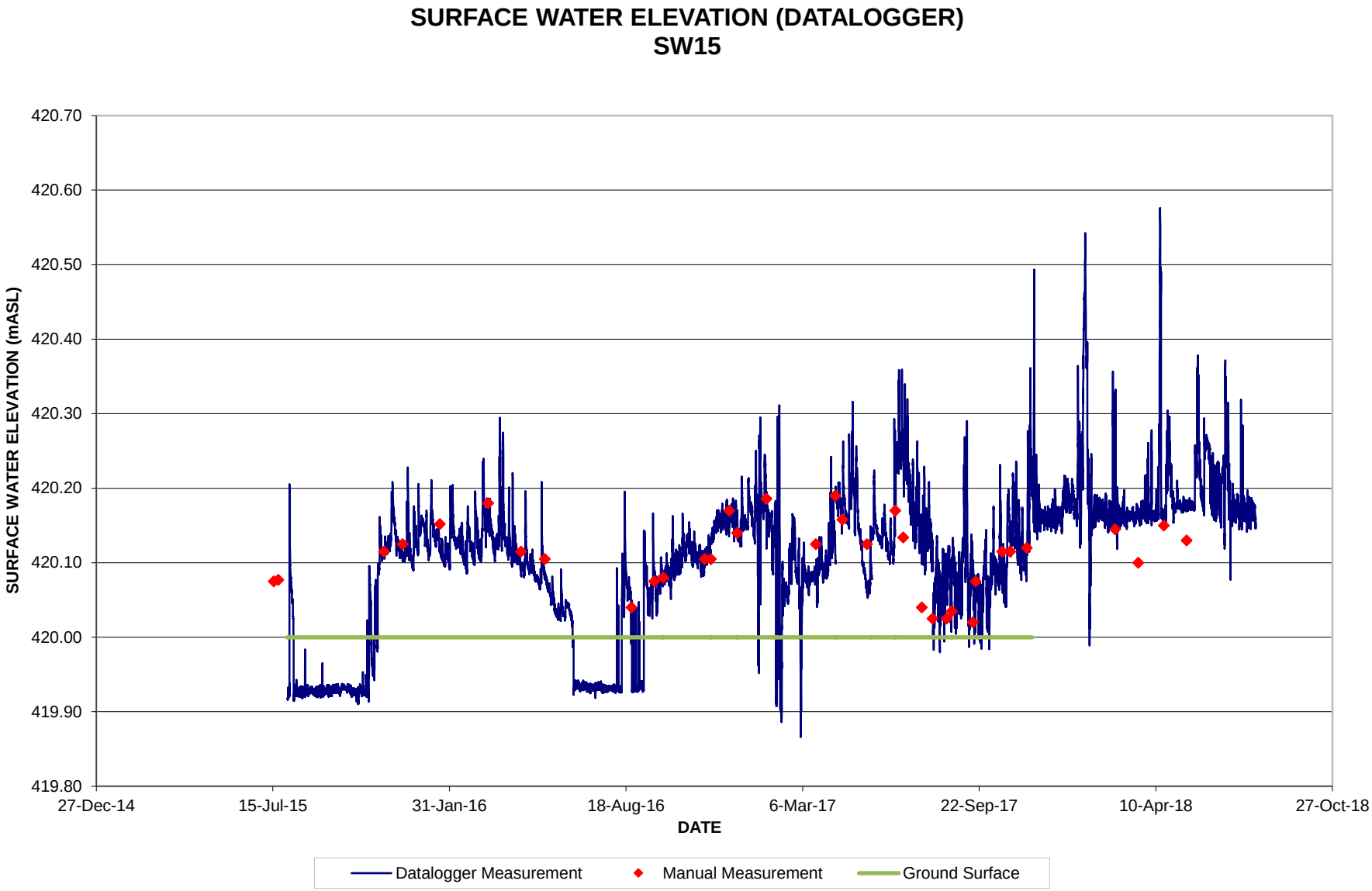
SURFACE WATER ELEVATION (DATALOGGER)
SW15
SURFACE WATER ELEVATION (mASL)
420.70
420.60
420.50
420.40
420.30
420.20
420.10
420.00
419.90
419.80
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
DATE
Datalogger Measurement
Manual Measurement
Ground Surface

FIGURE B-27 (b)

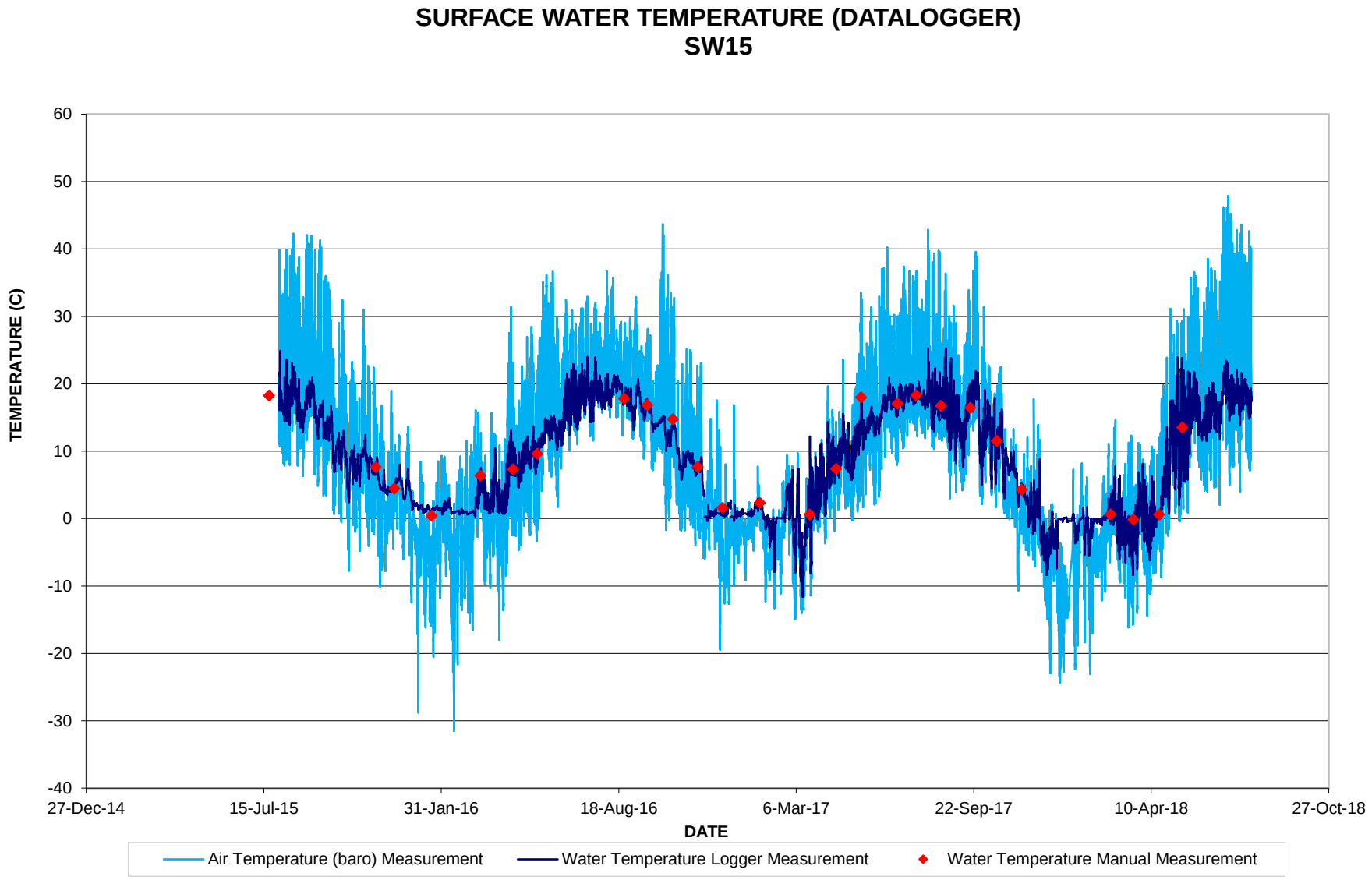
SURFACE WATER TEMPERATURE (DATALOGGER)
SW15
TEMPERATURE (C)
60
50
40
30
20
10
0
-10
-20
-30
-40
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
DATE
Air Temperature (baro) Measurement
Water Temperature Logger Measurement
Water Temperature Manual Measurement

FIGURE B-28

SURFACE WATER HYDROGRAPH
SW16

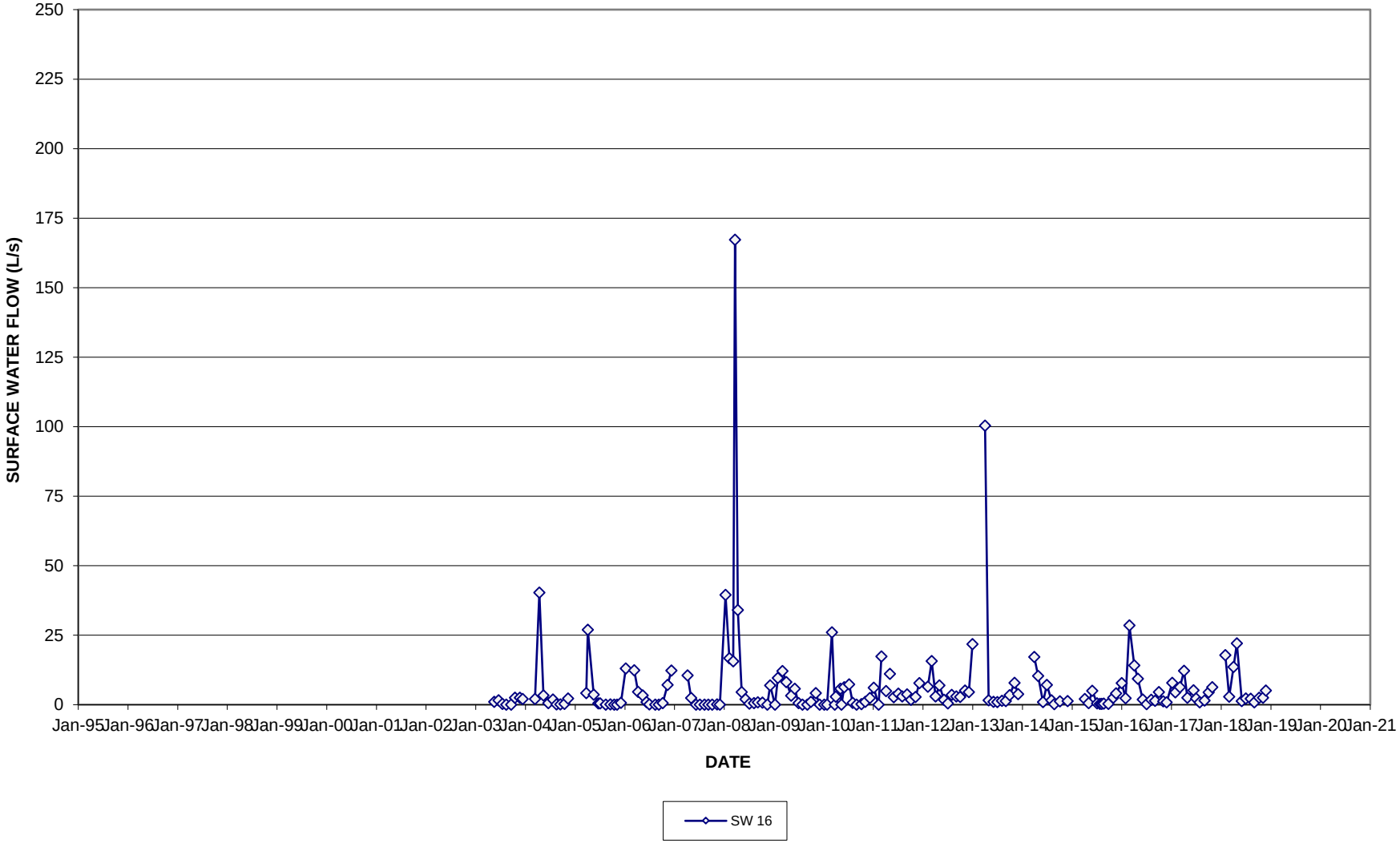

FIGURE B-28 (a)

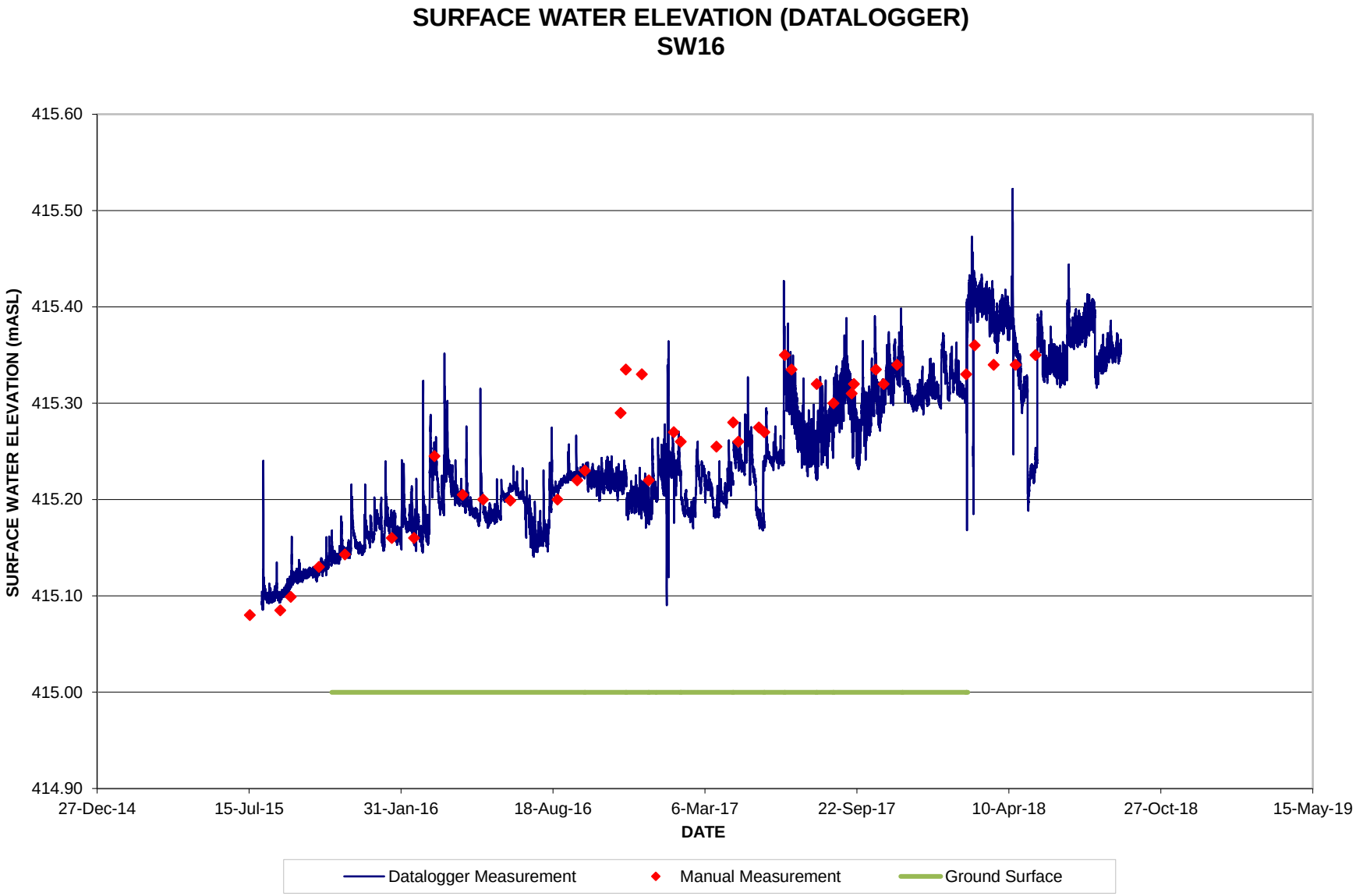
SURFACE WATER ELEVATION (DATALOGGER)
SW16
SURFACE WATER ELEVATION (mASL)
415.60
415.50
415.40
415.30
415.20
415.10
415.00
414.90
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Datalogger Measurement
Manual Measurement
Ground Surface

FIGURE B-28 (b)

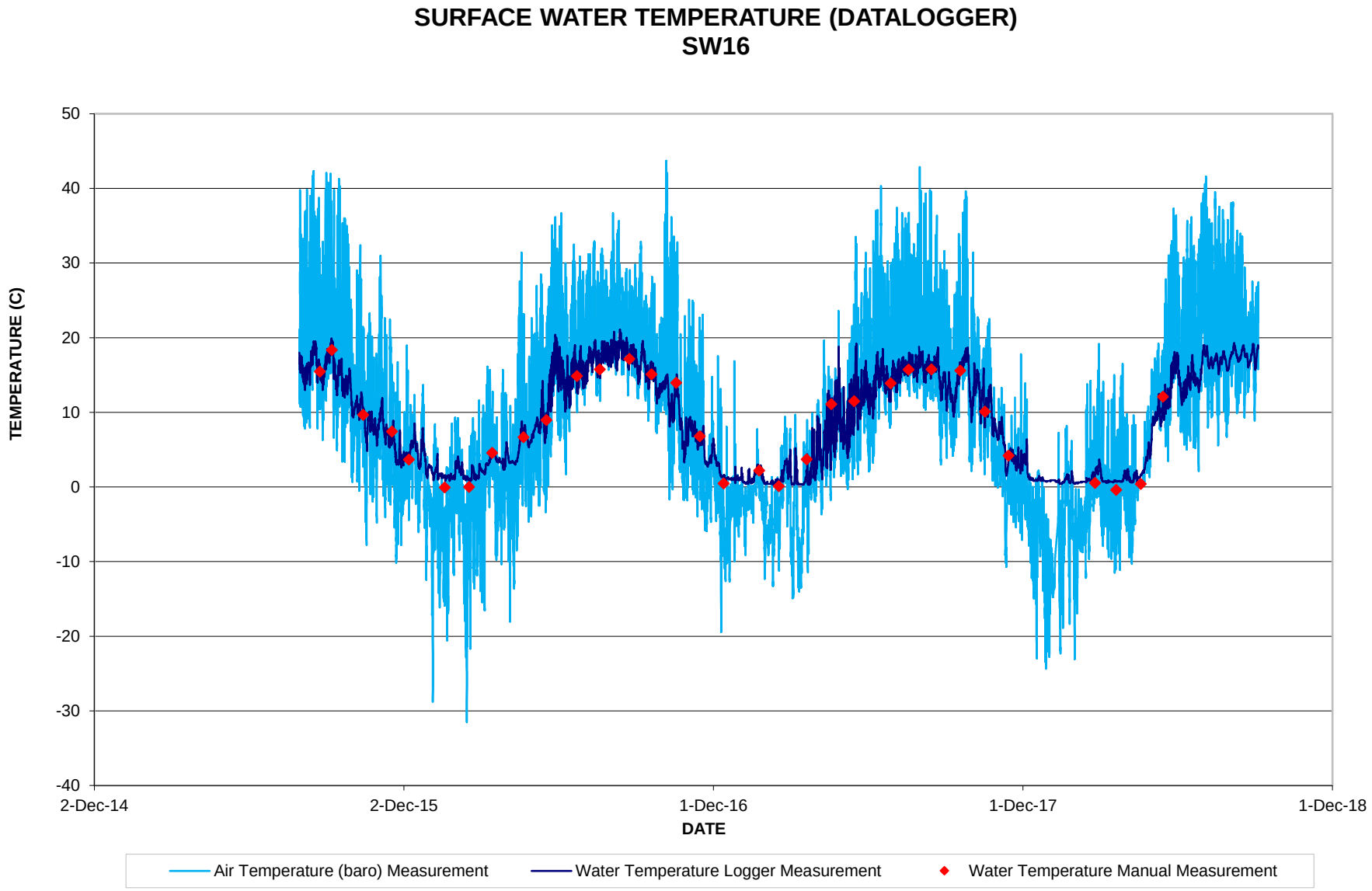
SURFACE WATER TEMPERATURE (DATALOGGER)
SW16
TEMPERATURE (C)
50
40
30
20
10
0
-10
-20
-30
-40
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
DATE
Air Temperature (baro) Measurement
Water Temperature Logger Measurement
Water Temperature Manual Measurement

FIGURE B-29

SURFACE WATER HYDROGRAPH
SW17

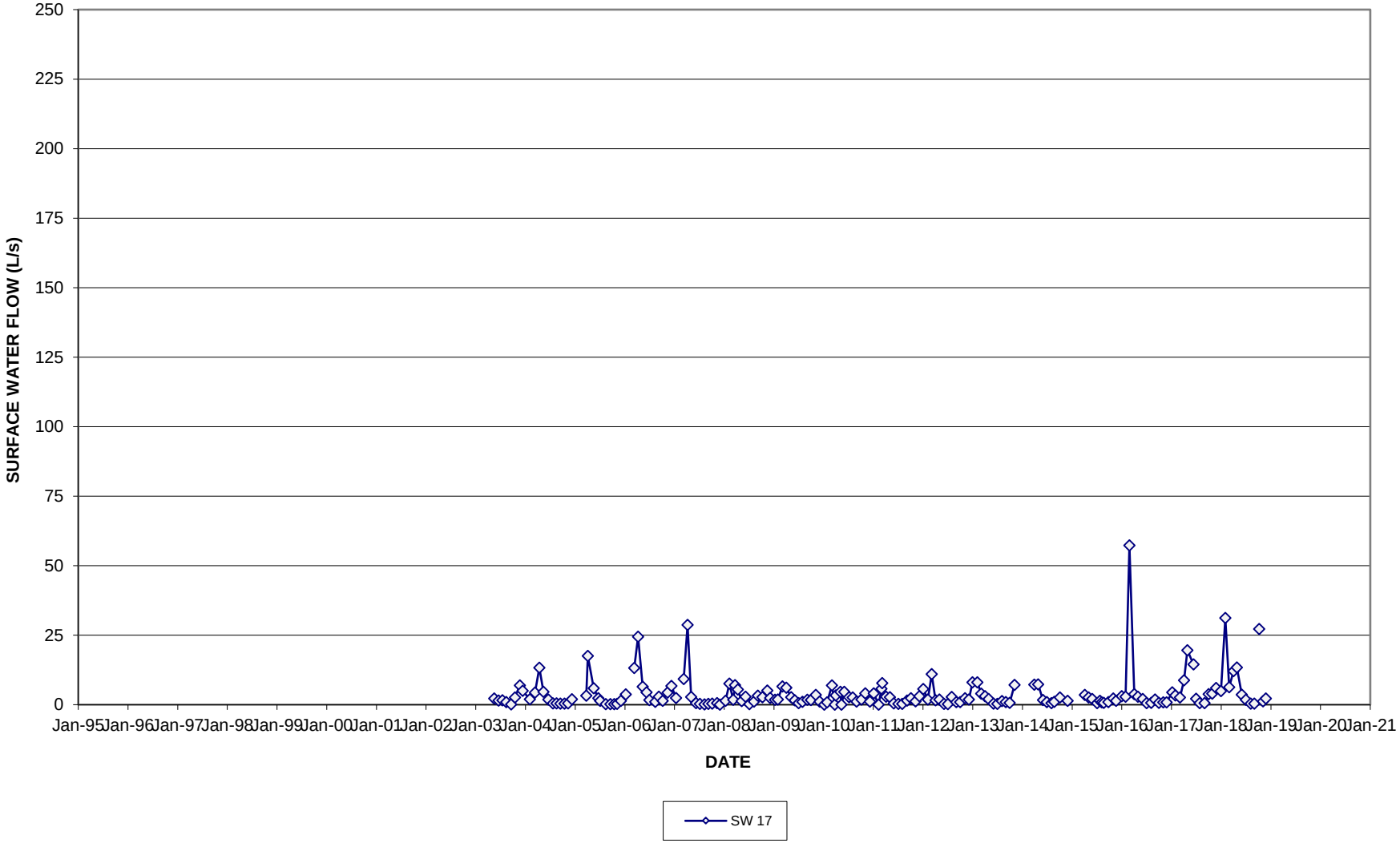

FIGURE B-30

SURFACE WATER HYDROGRAPH
SW17A

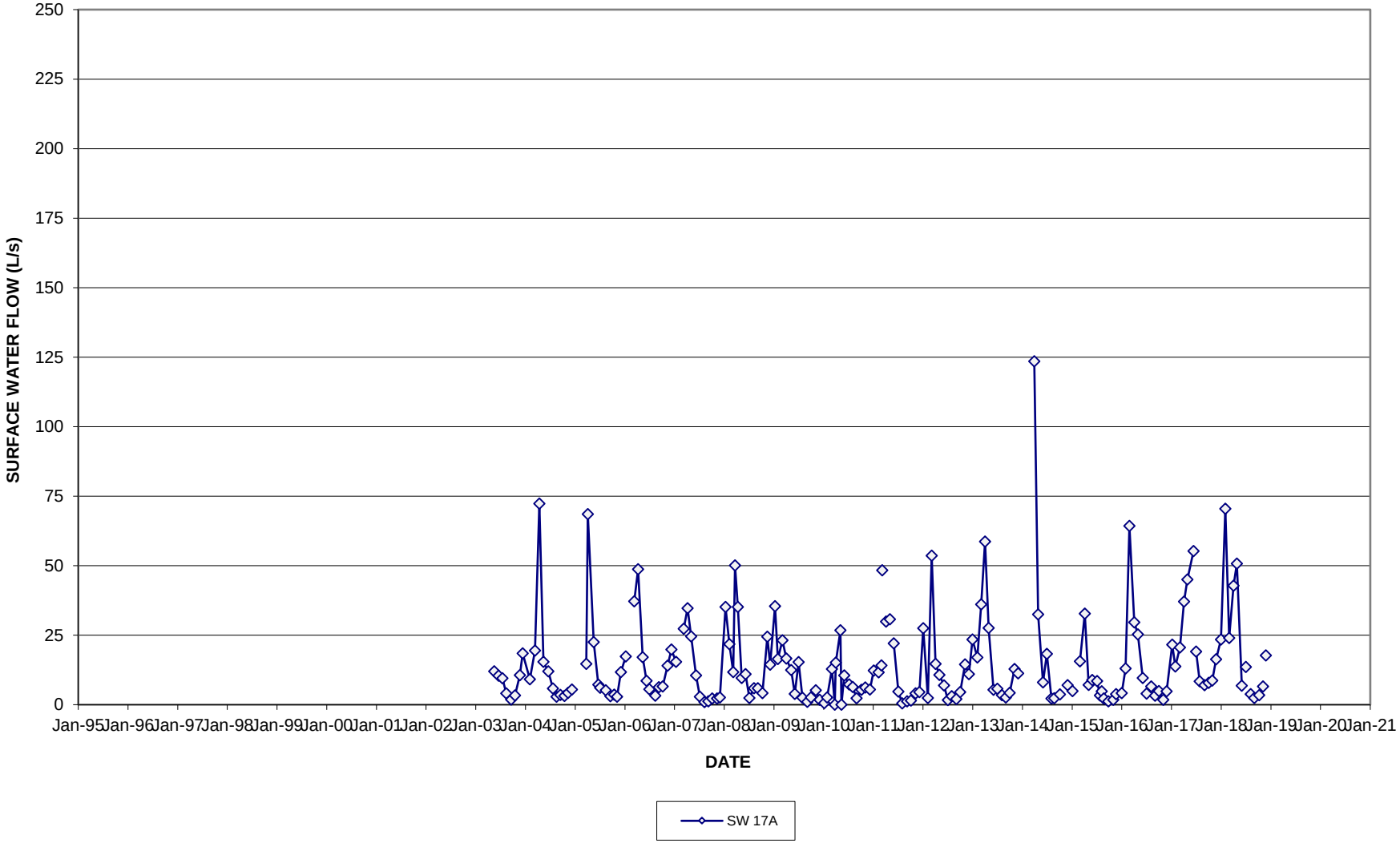

FIGURE B-31

SURFACE WATER HYDROGRAPH
SW17B

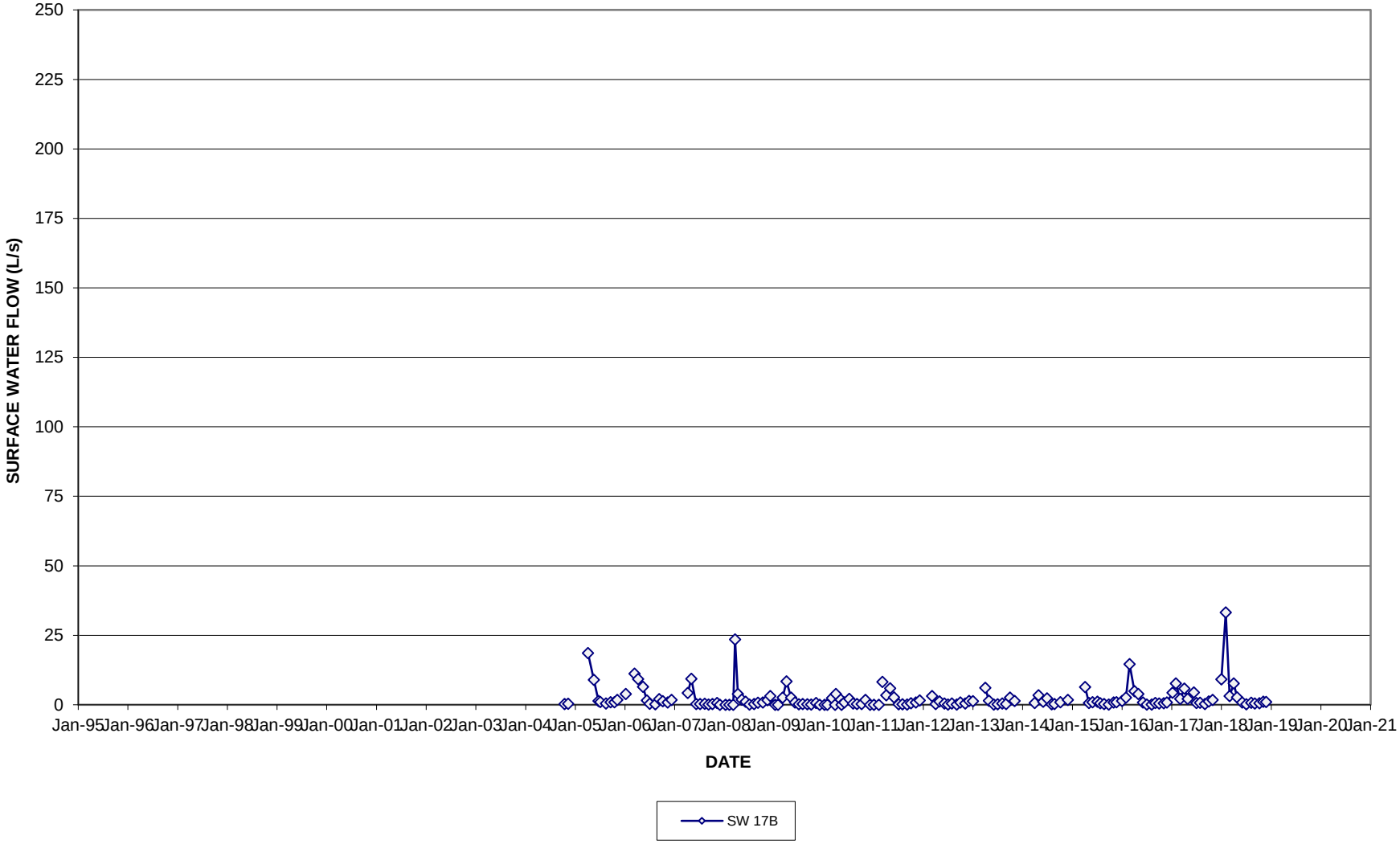

FIGURE B-32

SURFACE WATER HYDROGRAPH
SW18

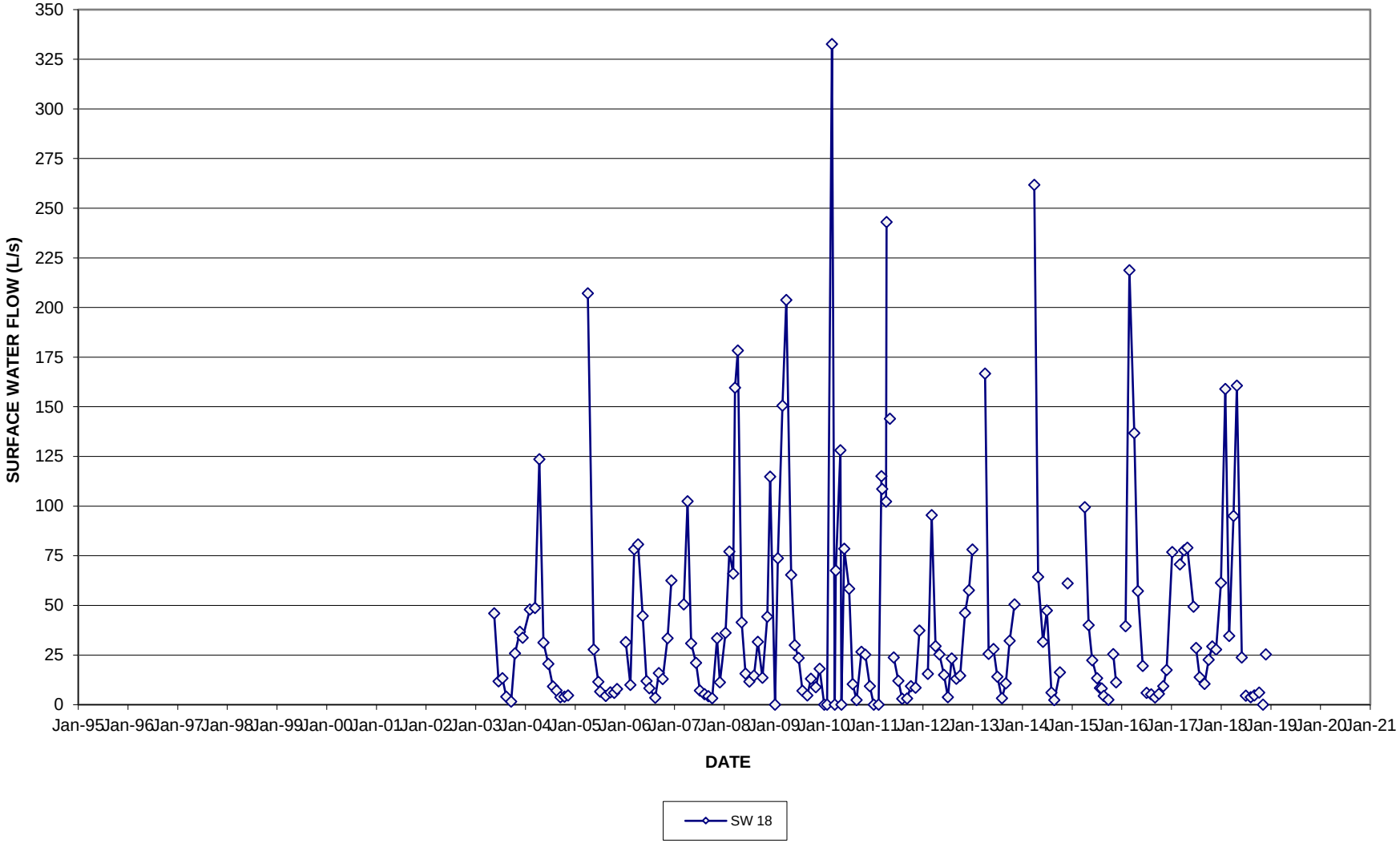

FIGURE B-33

SURFACE WATER HYDROGRAPH
SW19

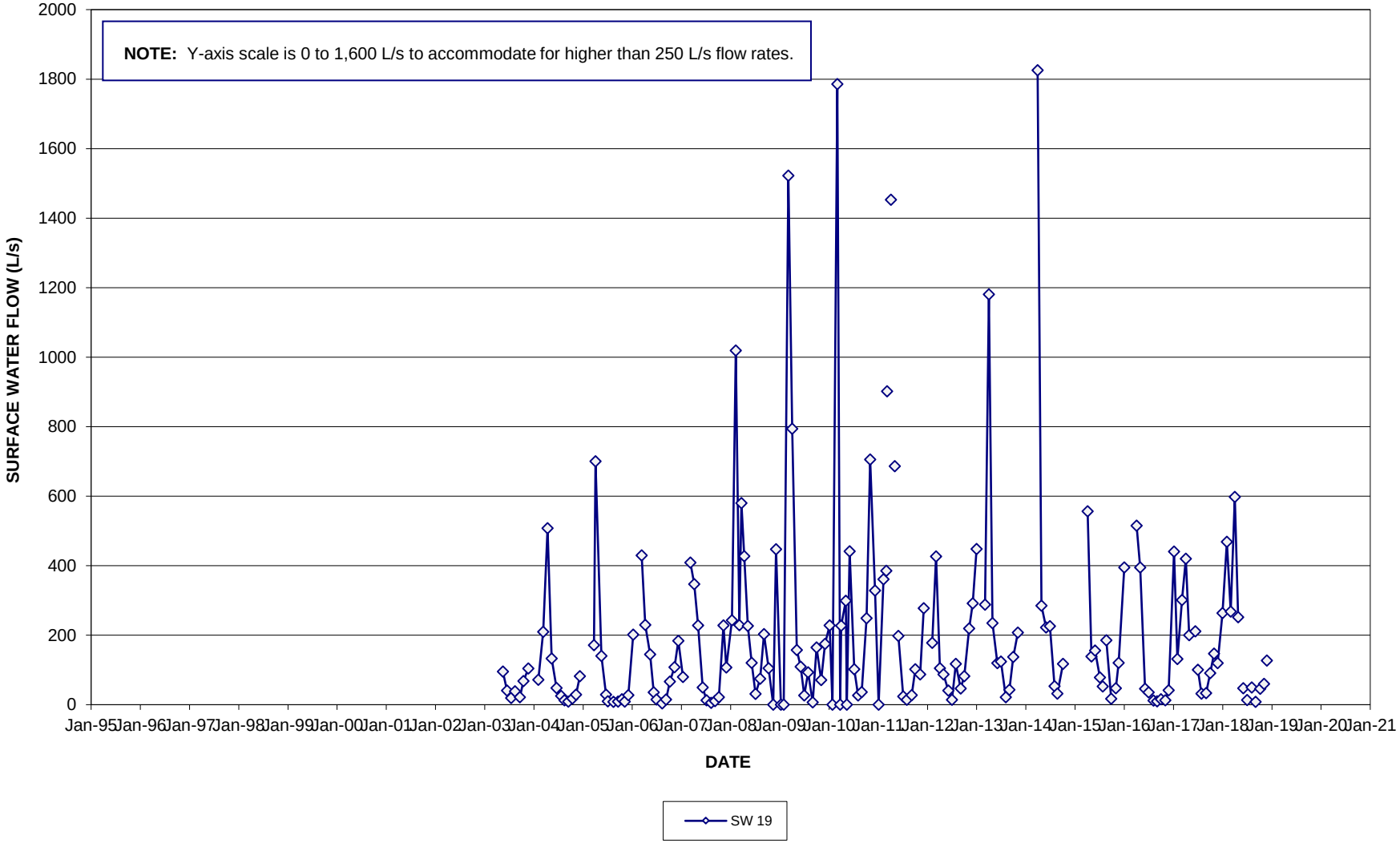

FIGURE B-34

SURFACE WATER HYDROGRAPH
SW20

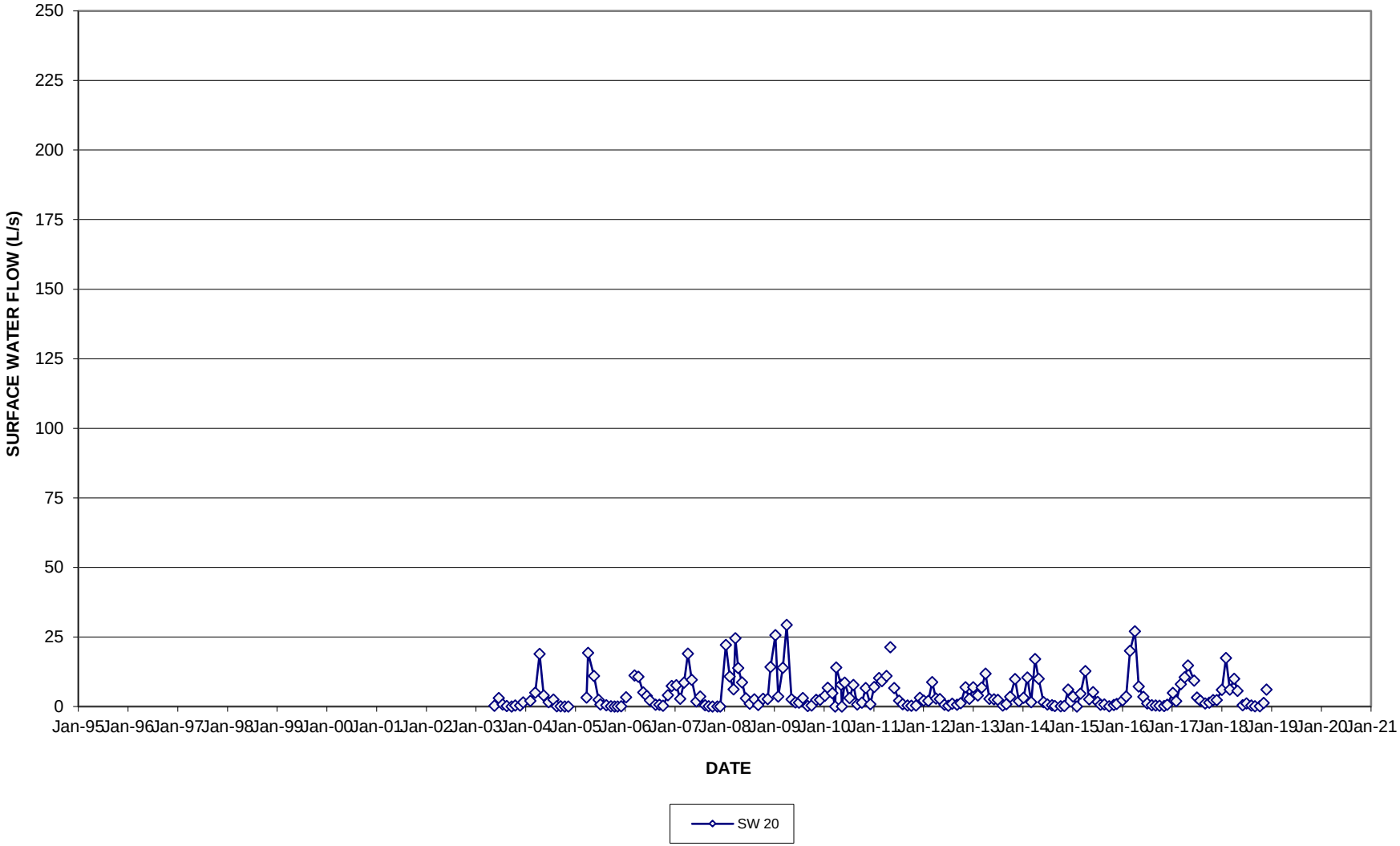

FIGURE B-35

SURFACE WATER HYDROGRAPH
SW21

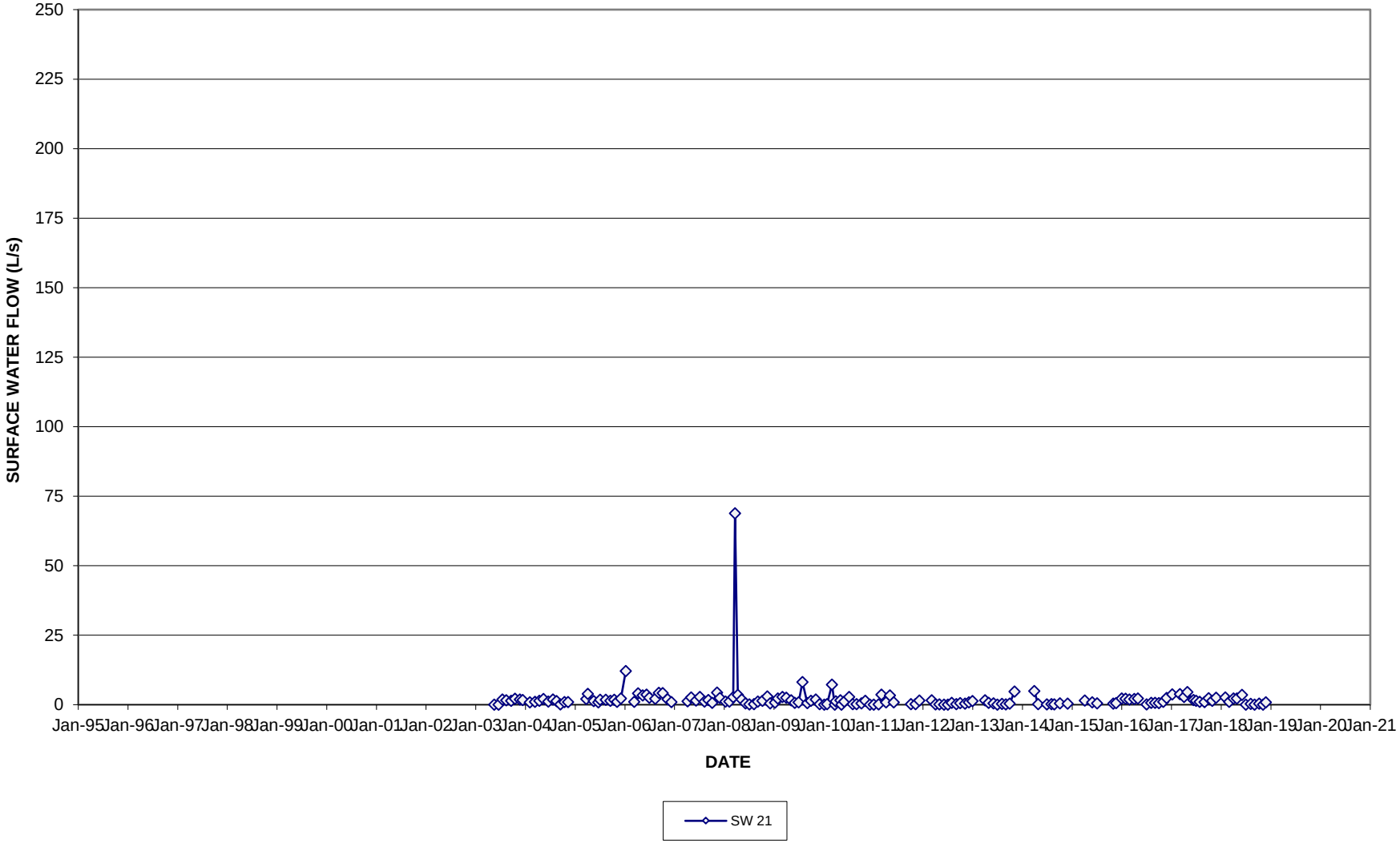

FIGURE B-36

SURFACE WATER HYDROGRAPH
SW21A

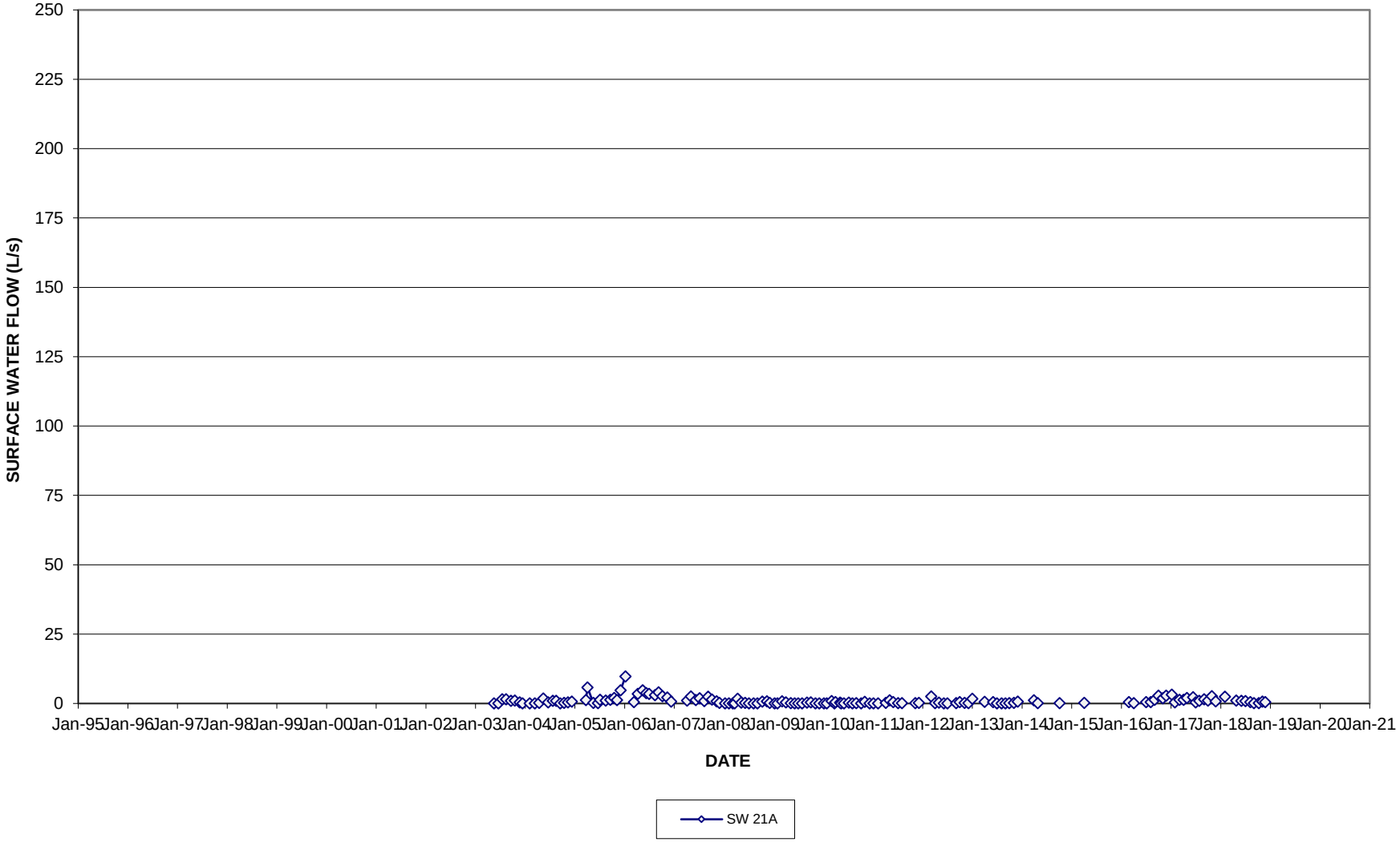

FIGURE B-37

SURFACE WATER HYDROGRAPH
SW21B

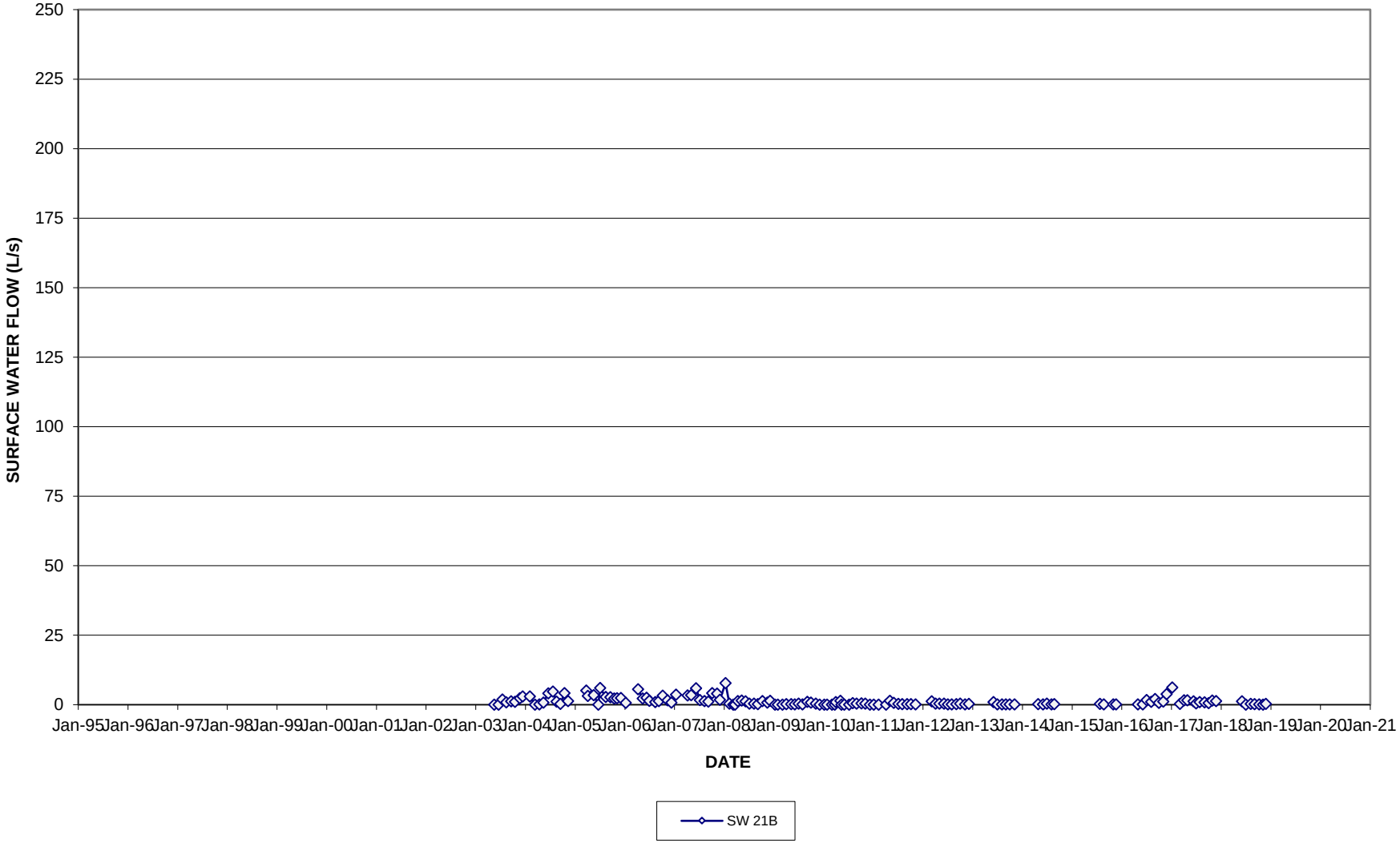

FIGURE B-38

SURFACE WATER HYDROGRAPH
SW21C

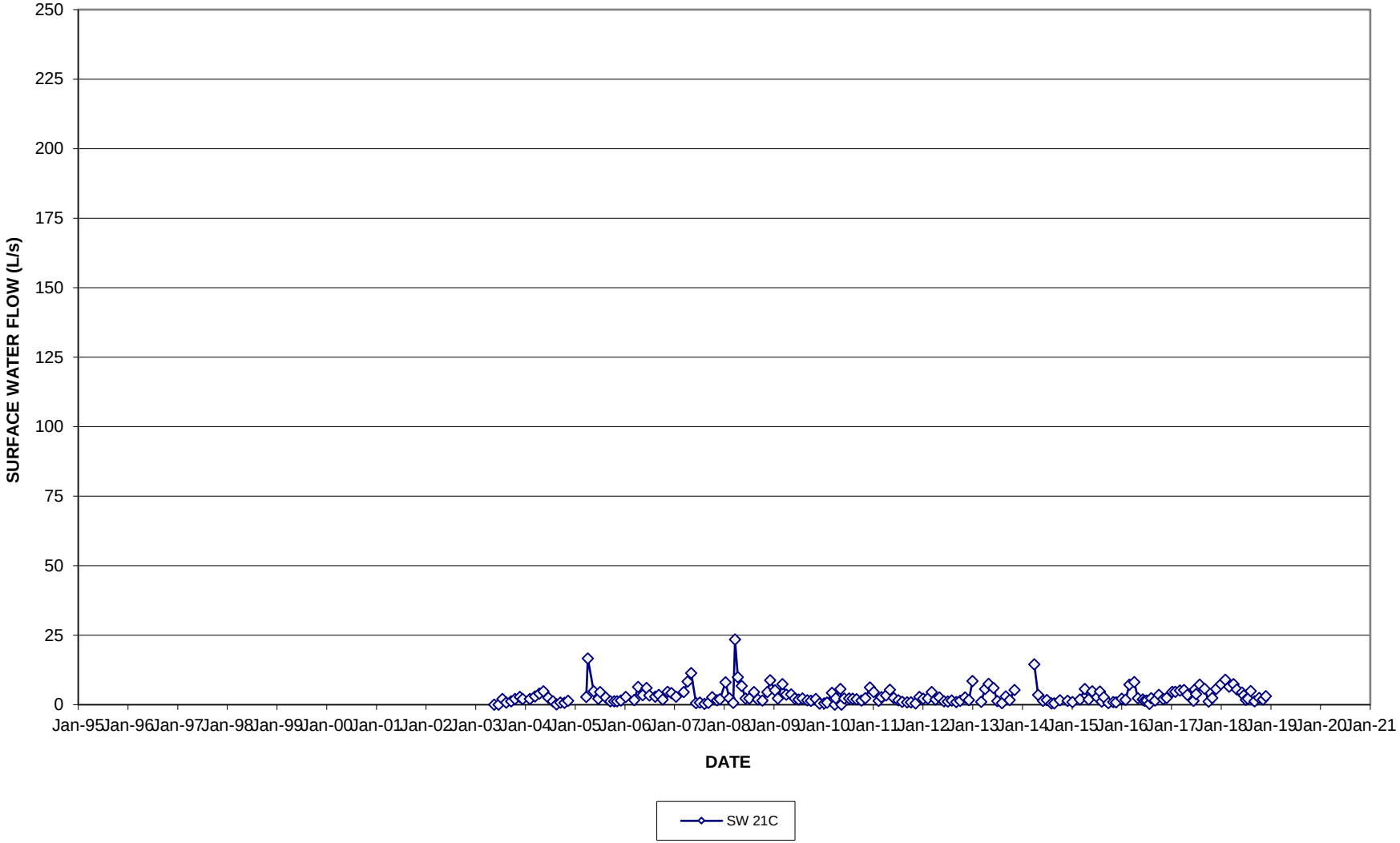

FIGURE B-39

SURFACE WATER HYDROGRAPH
SW21D

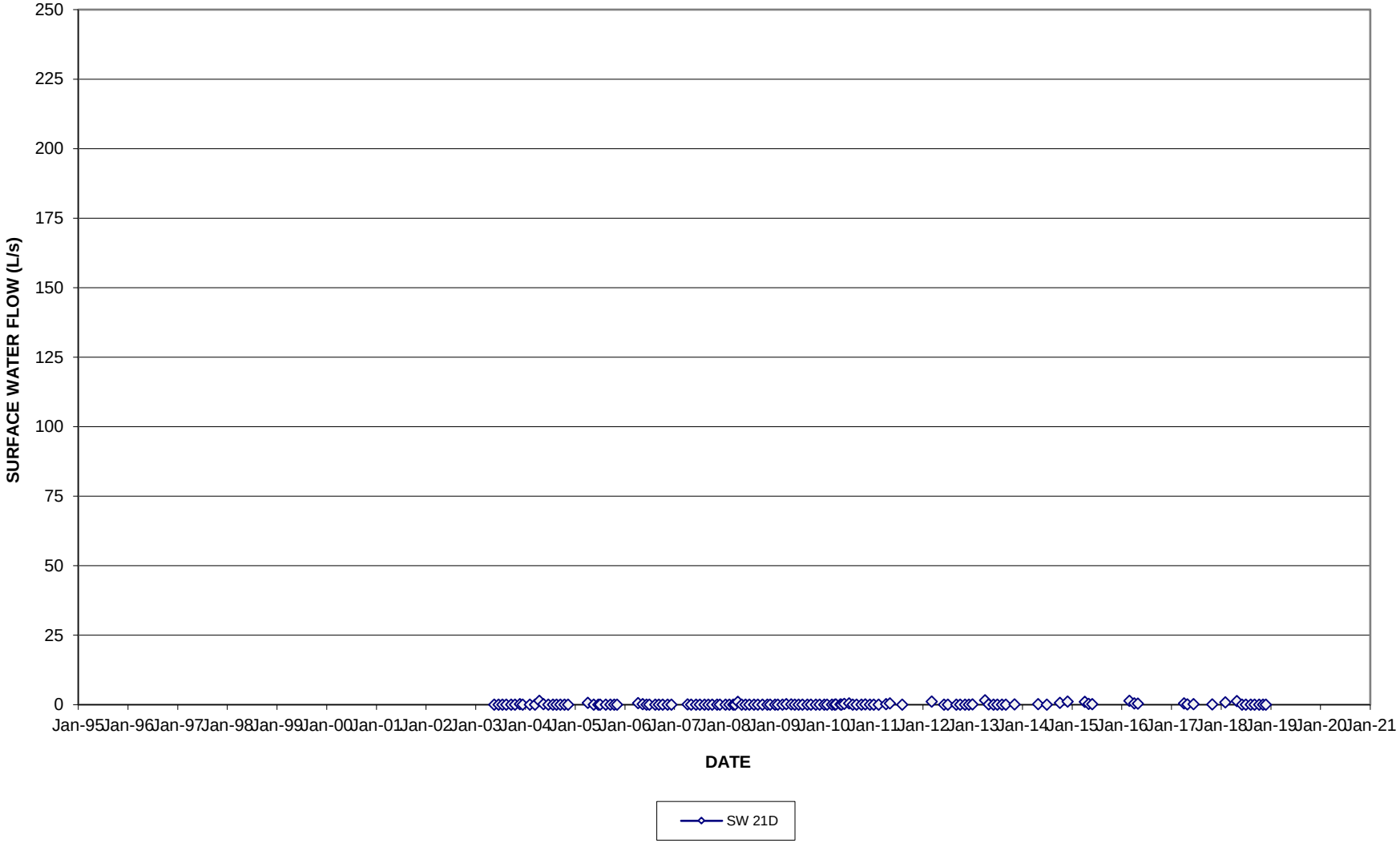

FIGURE B-40

SURFACE WATER HYDROGRAPH
SW22

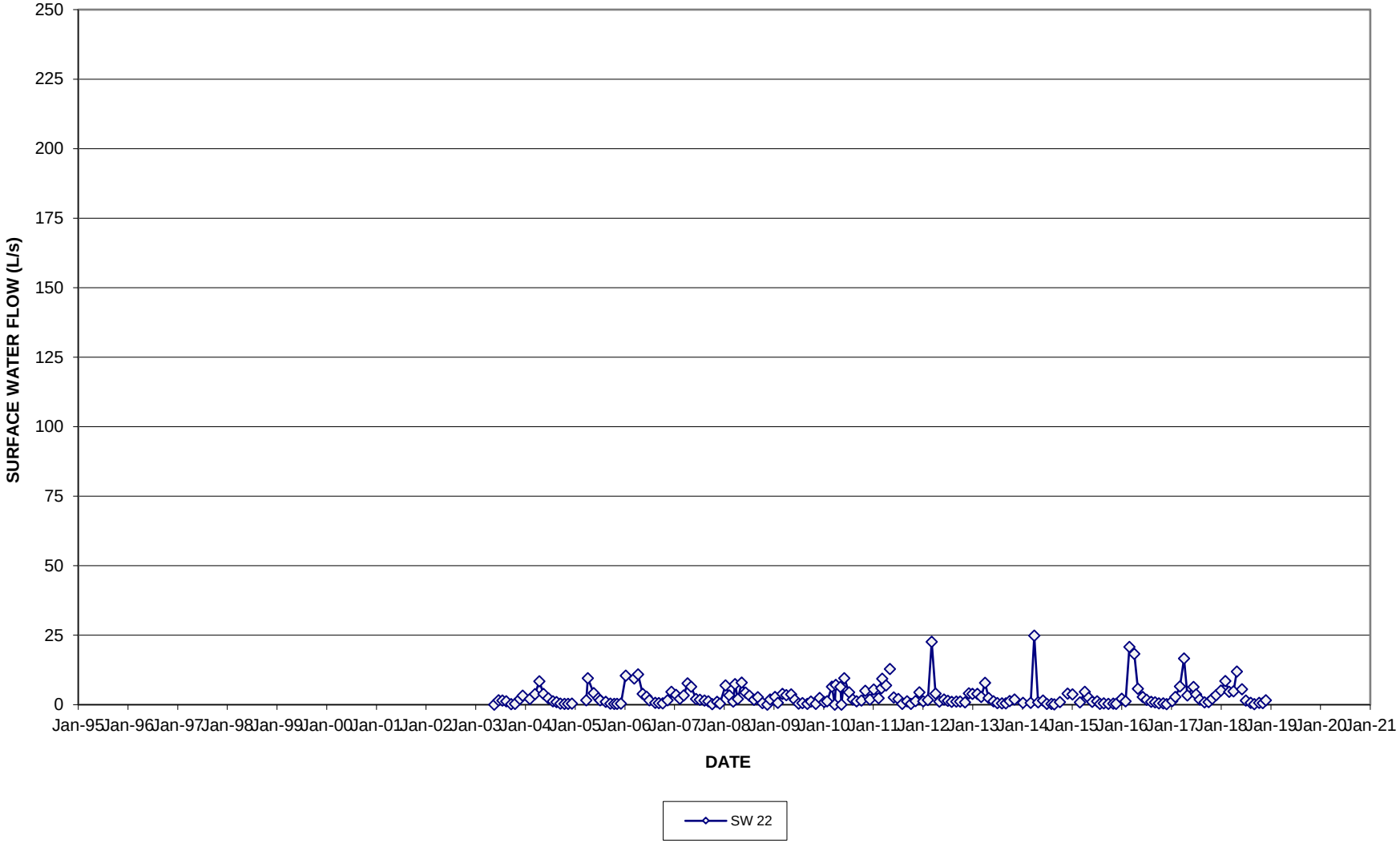

FIGURE B-41

SURFACE WATER HYDROGRAPH
SW22A

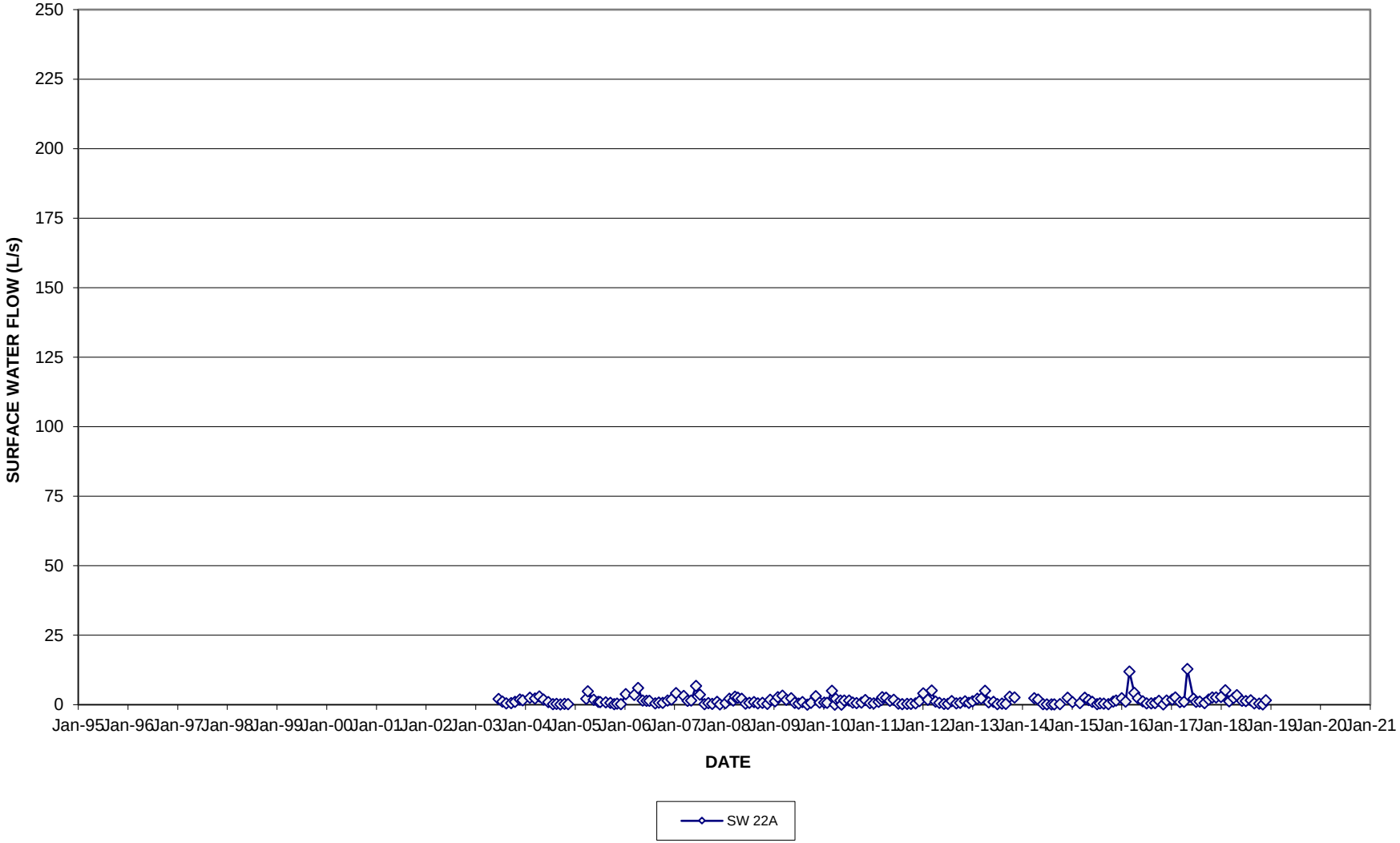

FIGURE B-42

SURFACE WATER HYDROGRAPH
SW22B

FIGURE B-43

SURFACE WATER HYDROGRAPH
SW22C

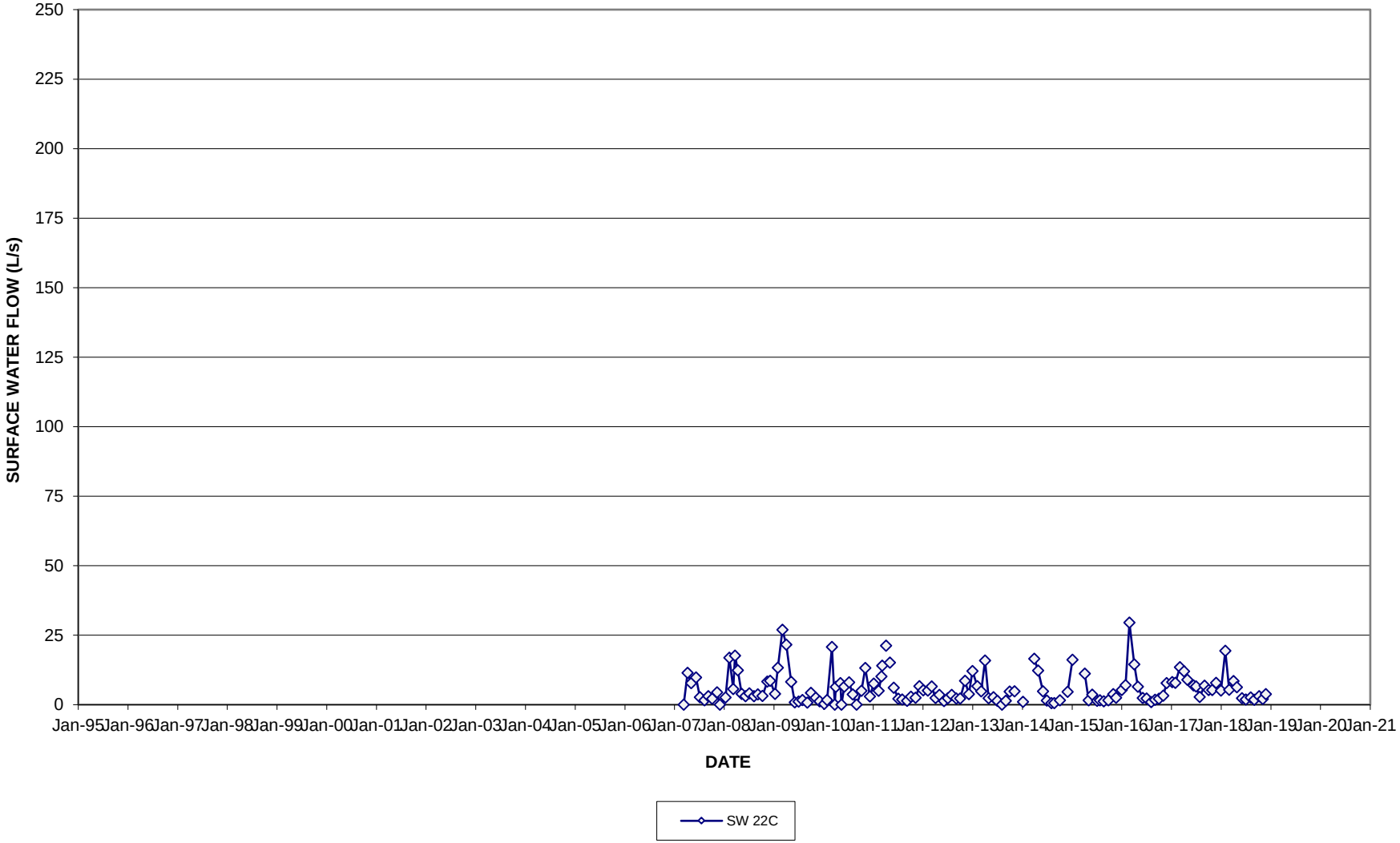

FIGURE B-44

SURFACE WATER HYDROGRAPH
SW23

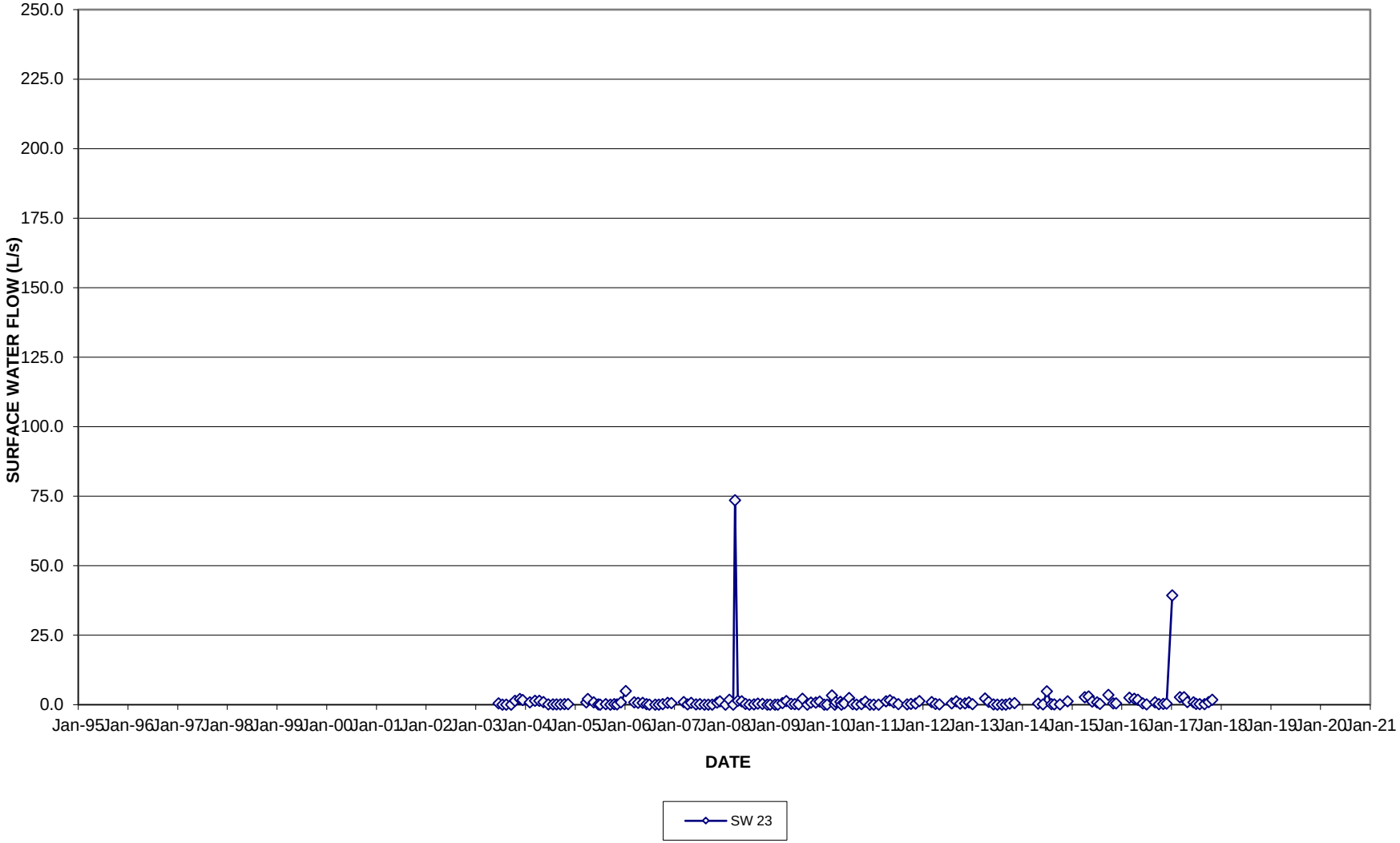

FIGURE B-45

SURFACE WATER HYDROGRAPH
SW24

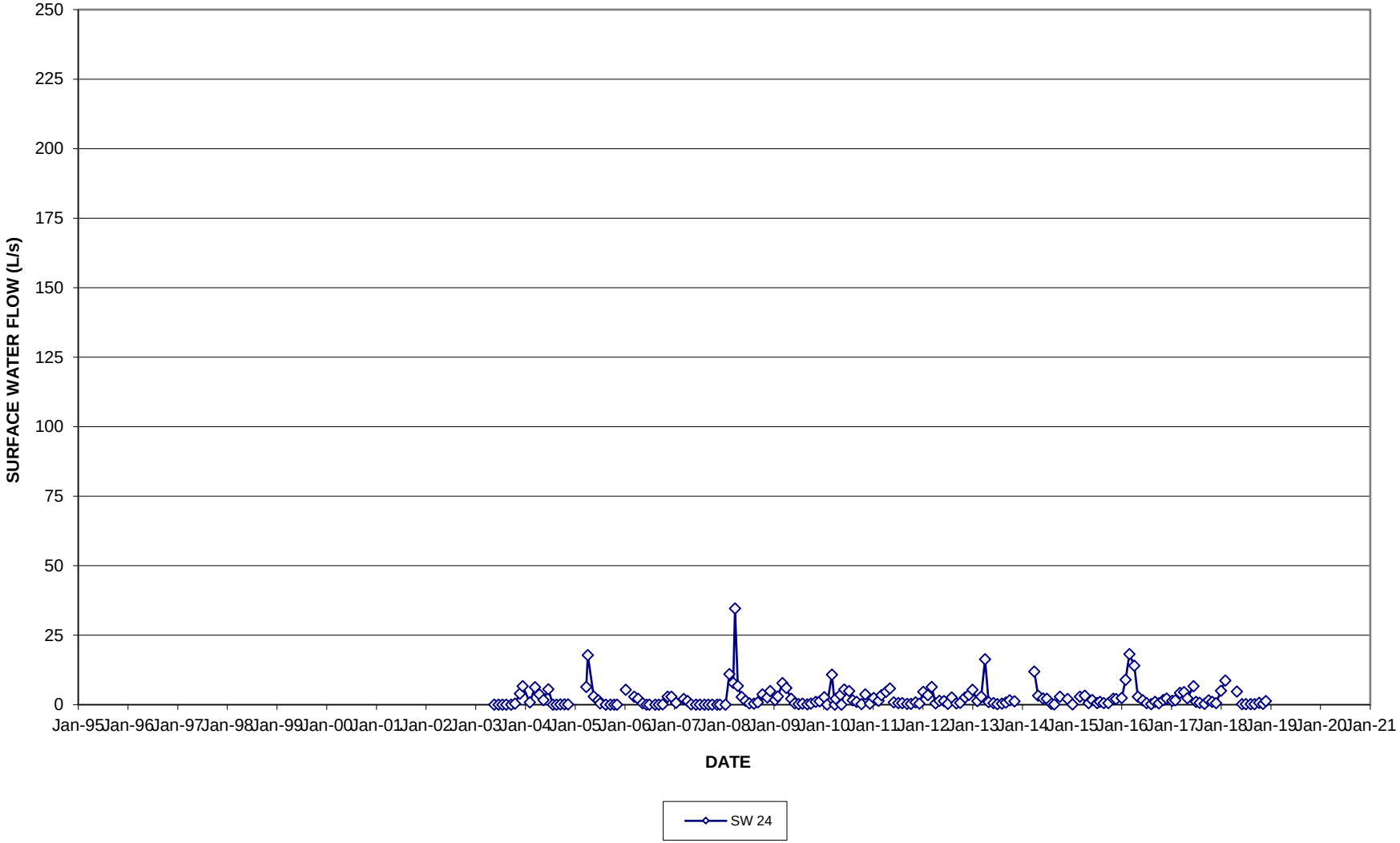

FIGURE B-46

SURFACE WATER HYDROGRPAH
SW24A

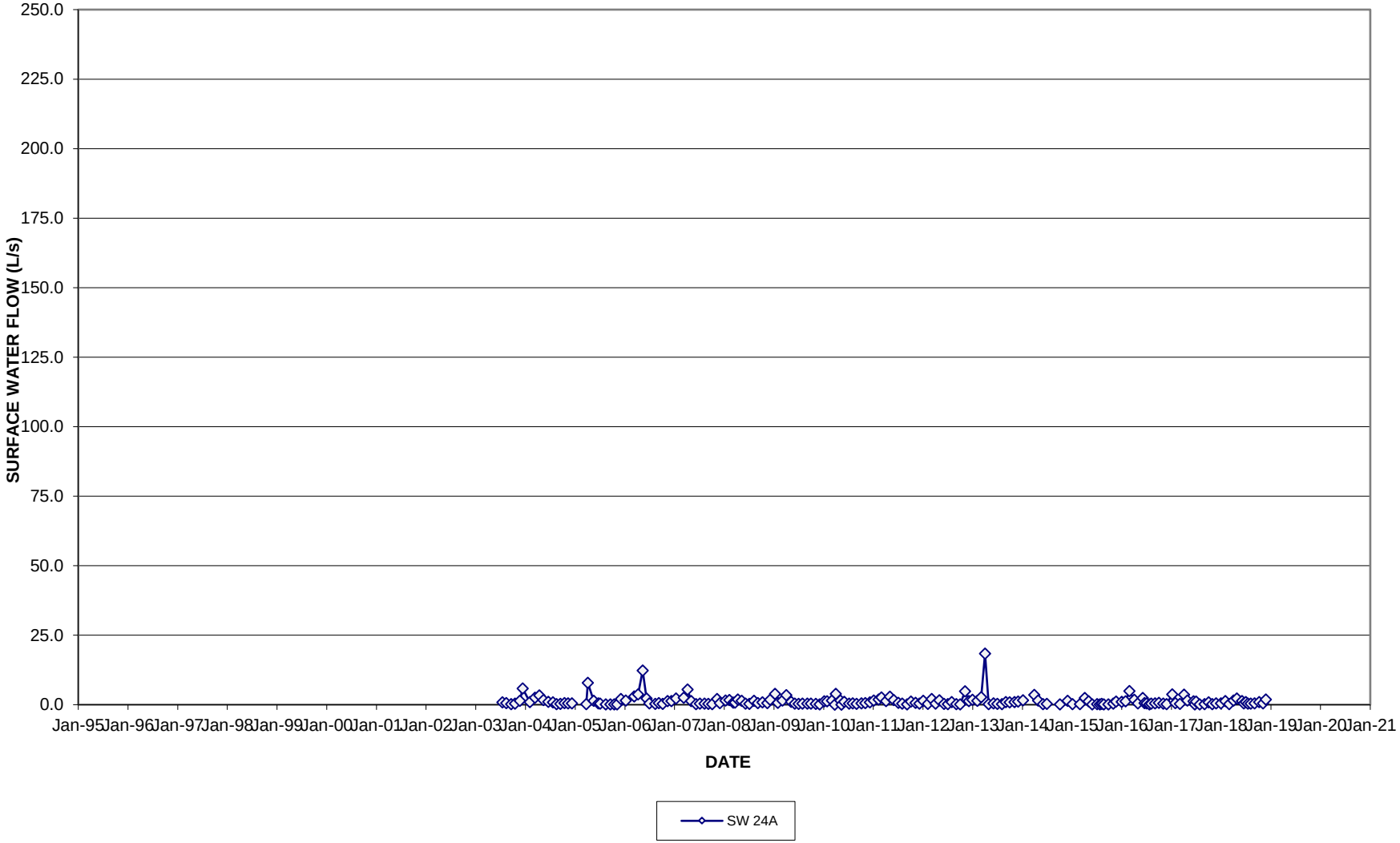

FIGURE B-47

SURFACE WATER HYDROGRAPH
SW24B

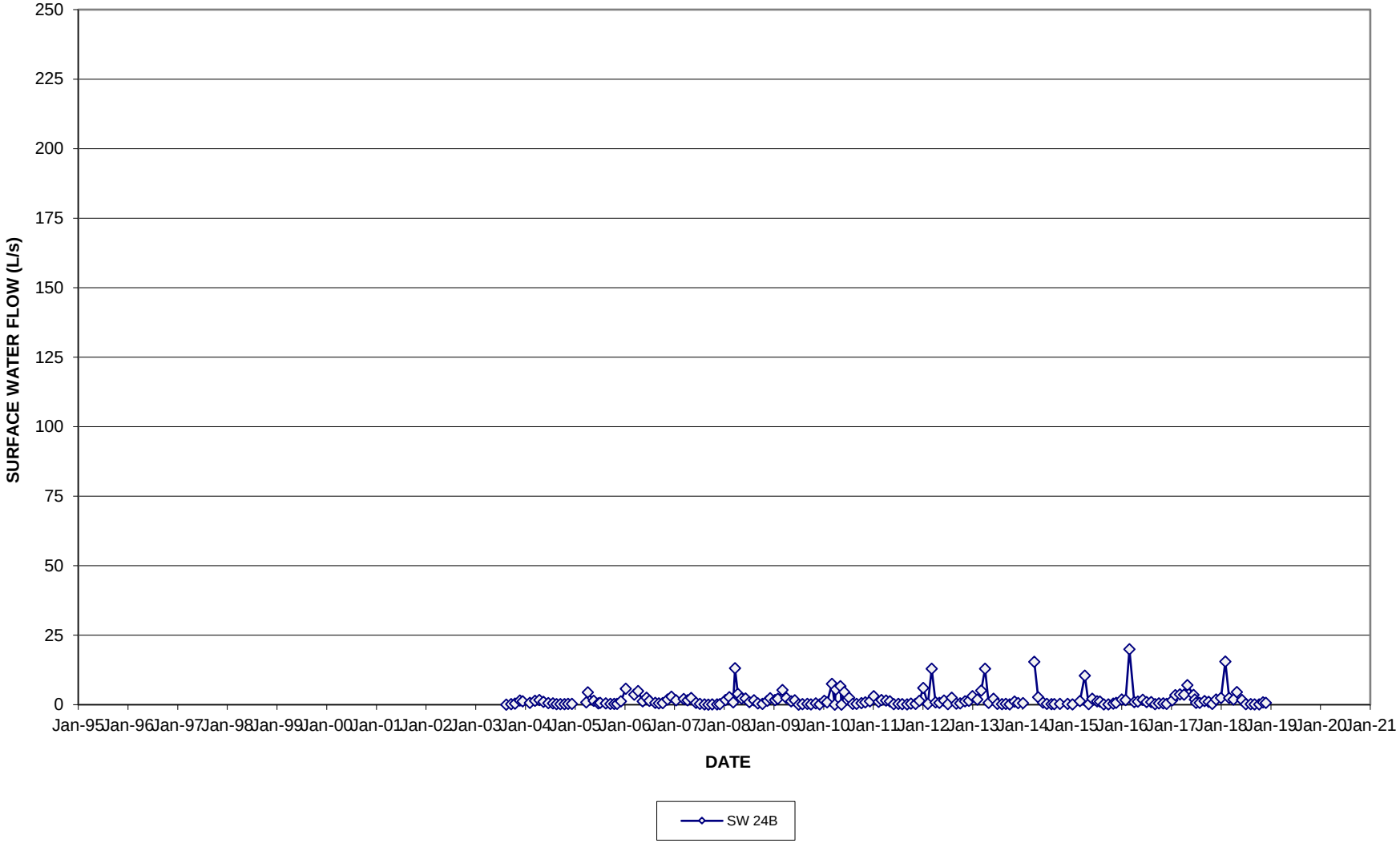

FIGURE B-48

SURFACE WATER HYDROGRAPH
SW24C

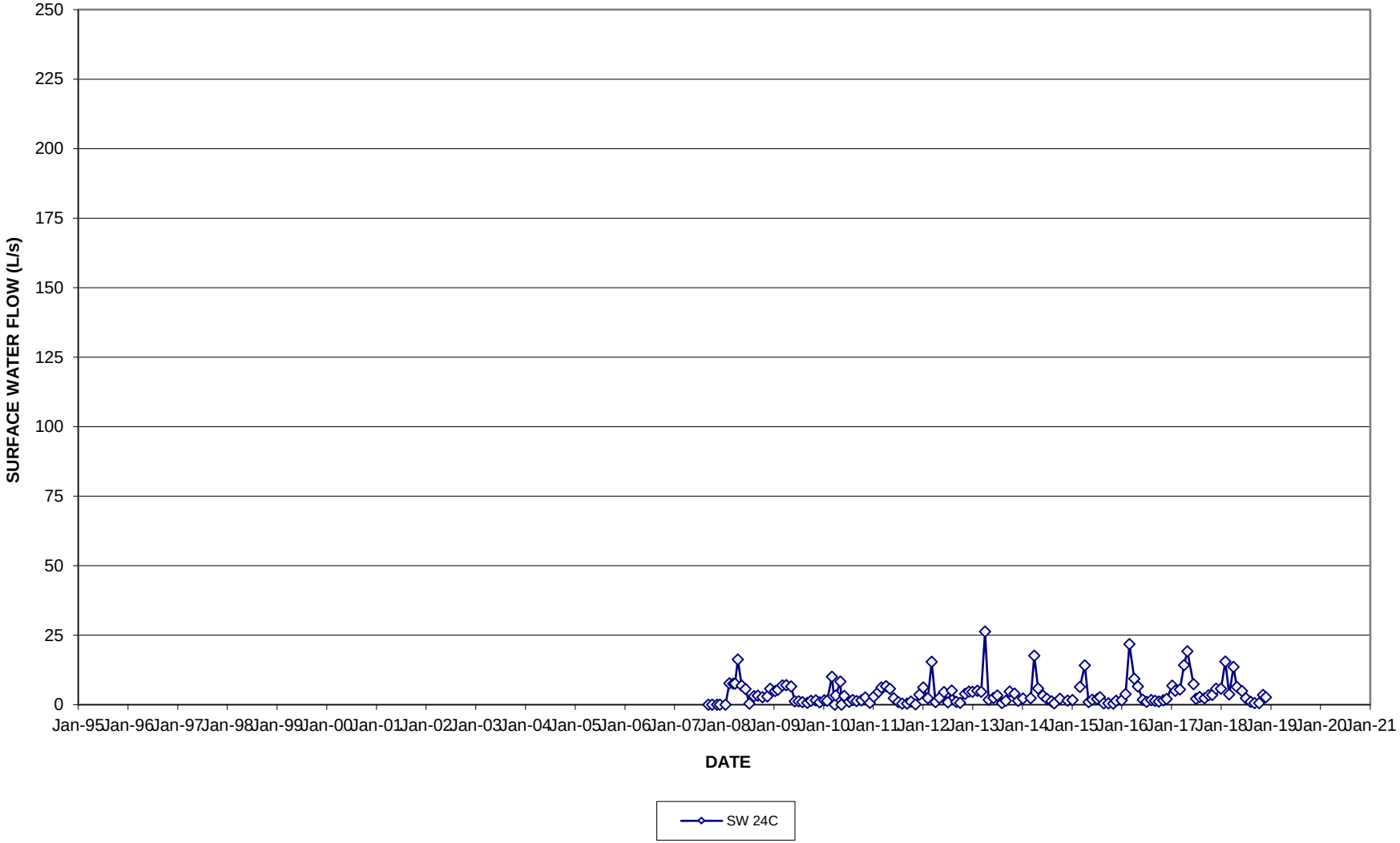

FIGURE B-49

SURFACE WATER HYDROGRAPH
SW25

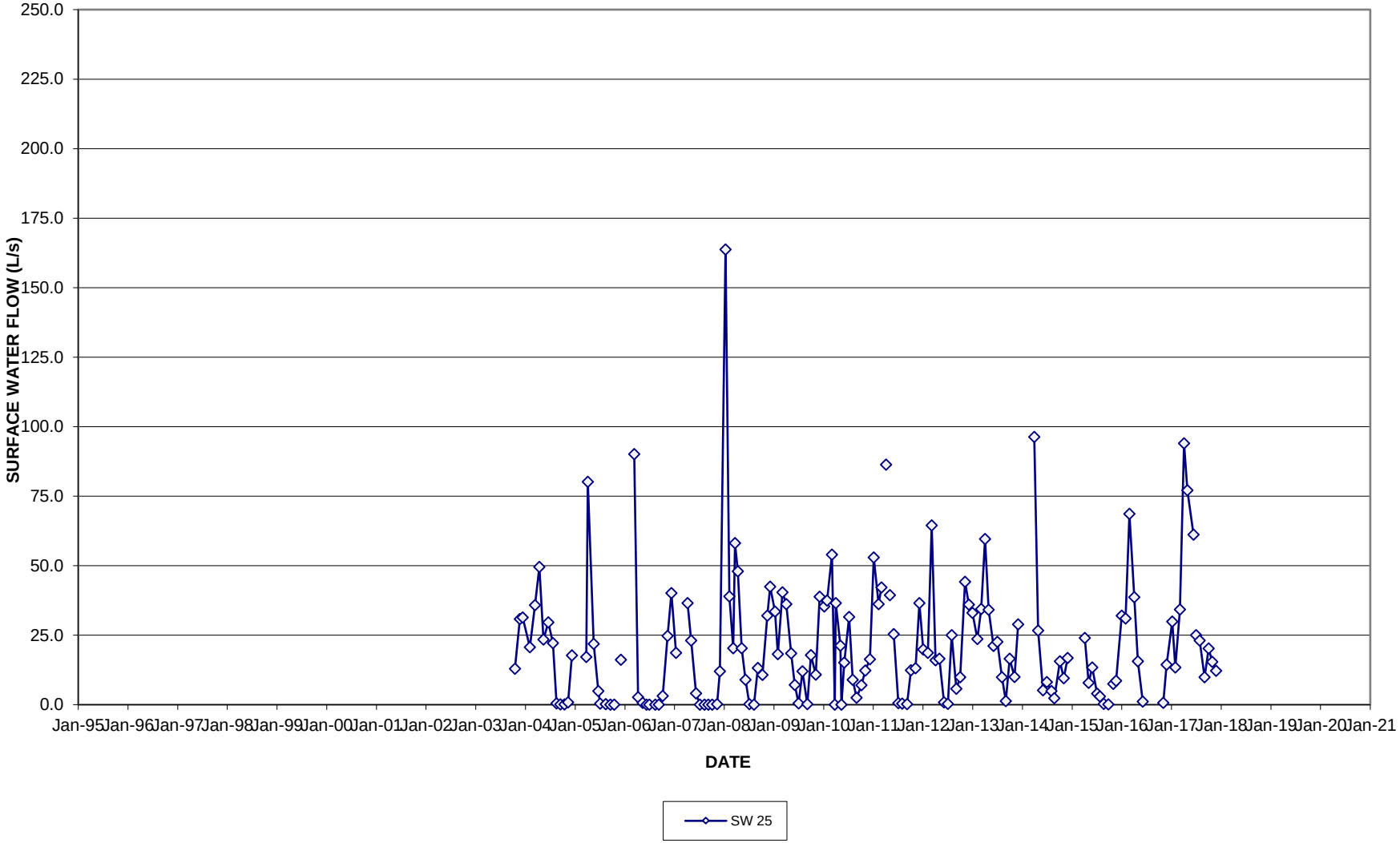

FIGURE B-50

SURFACE WATER HYDROGRAPH
SW26

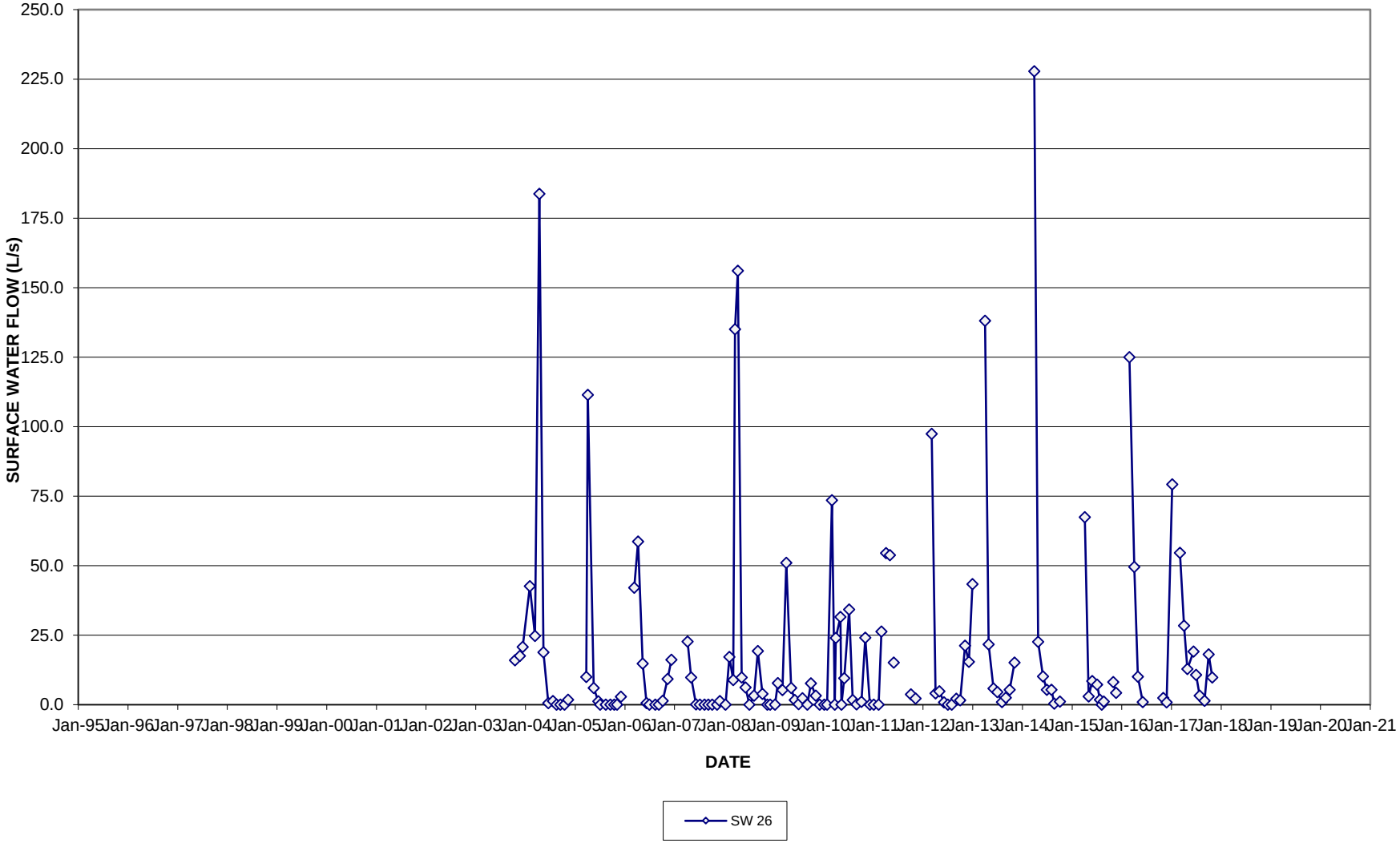

FIGURE B-51

SURFACE WATER HYDROGRAPH
SW26A

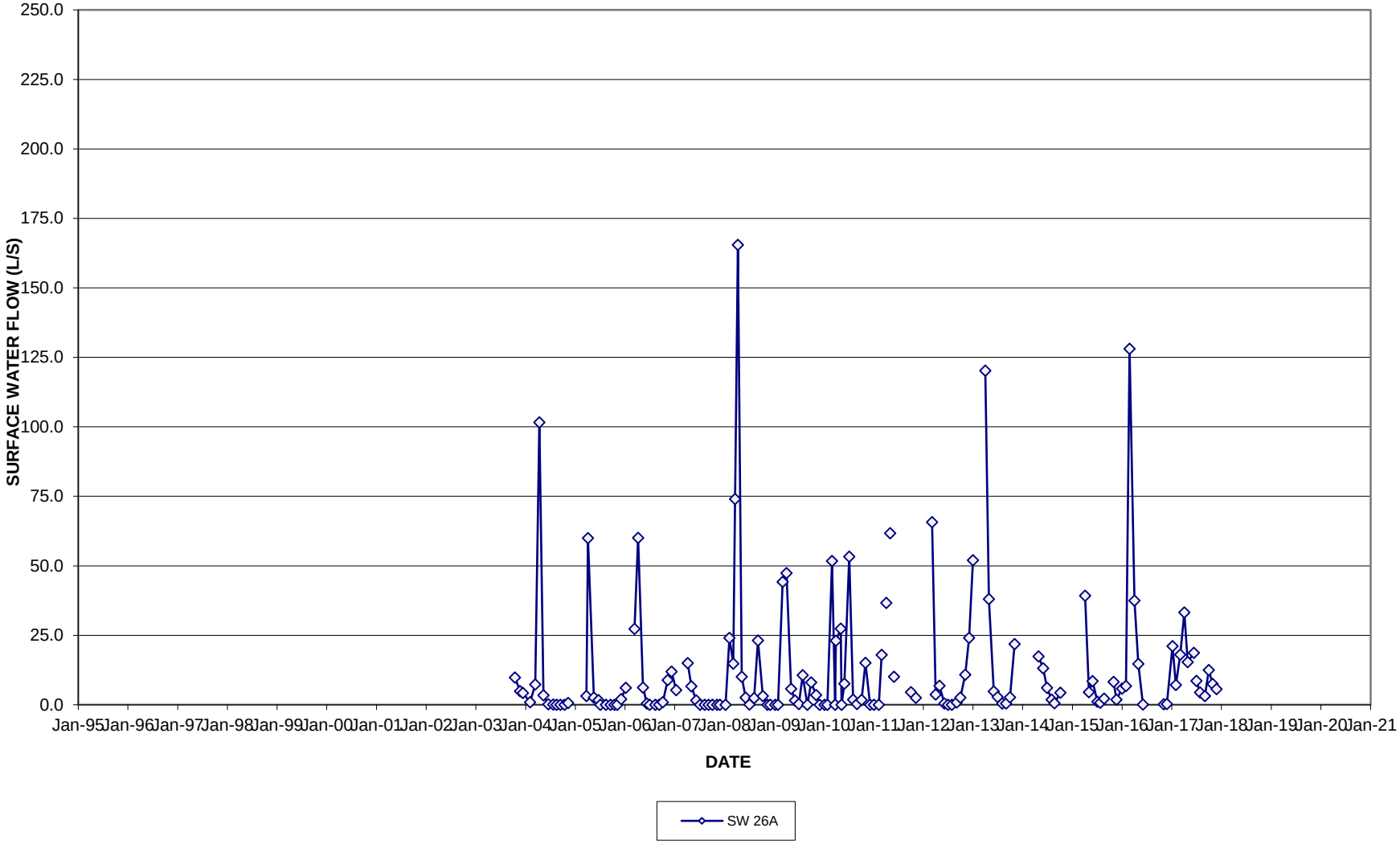

FIGURE B-52

SURFACE WATER HYDROGRAPH
SW27

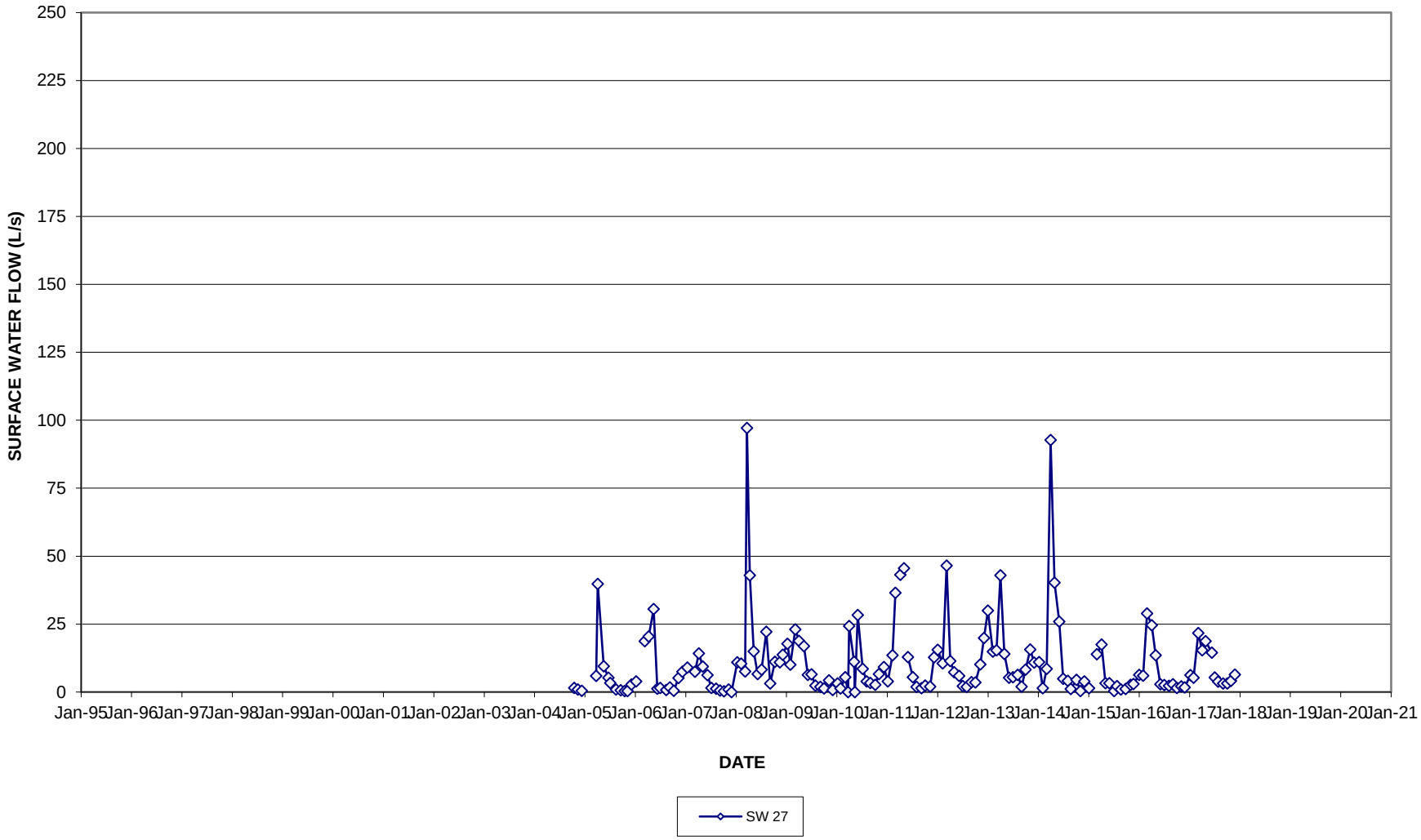

FIGURE B-53

SURFACE WATER HYDROGRAPH
SW77

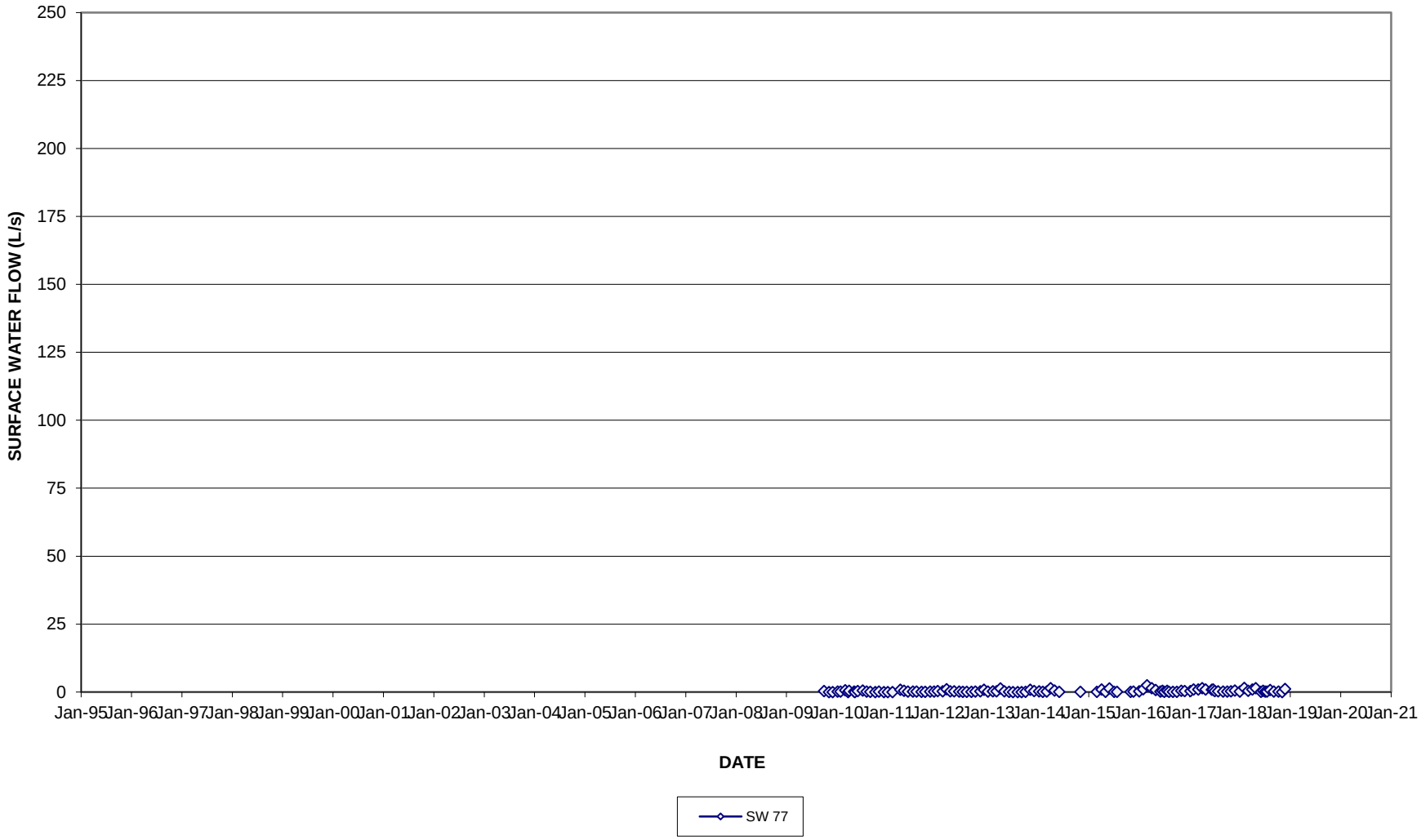

FIGURE B-54

SURFACE WATER HYDROGRAPH
SW3C "RR3 OUT"

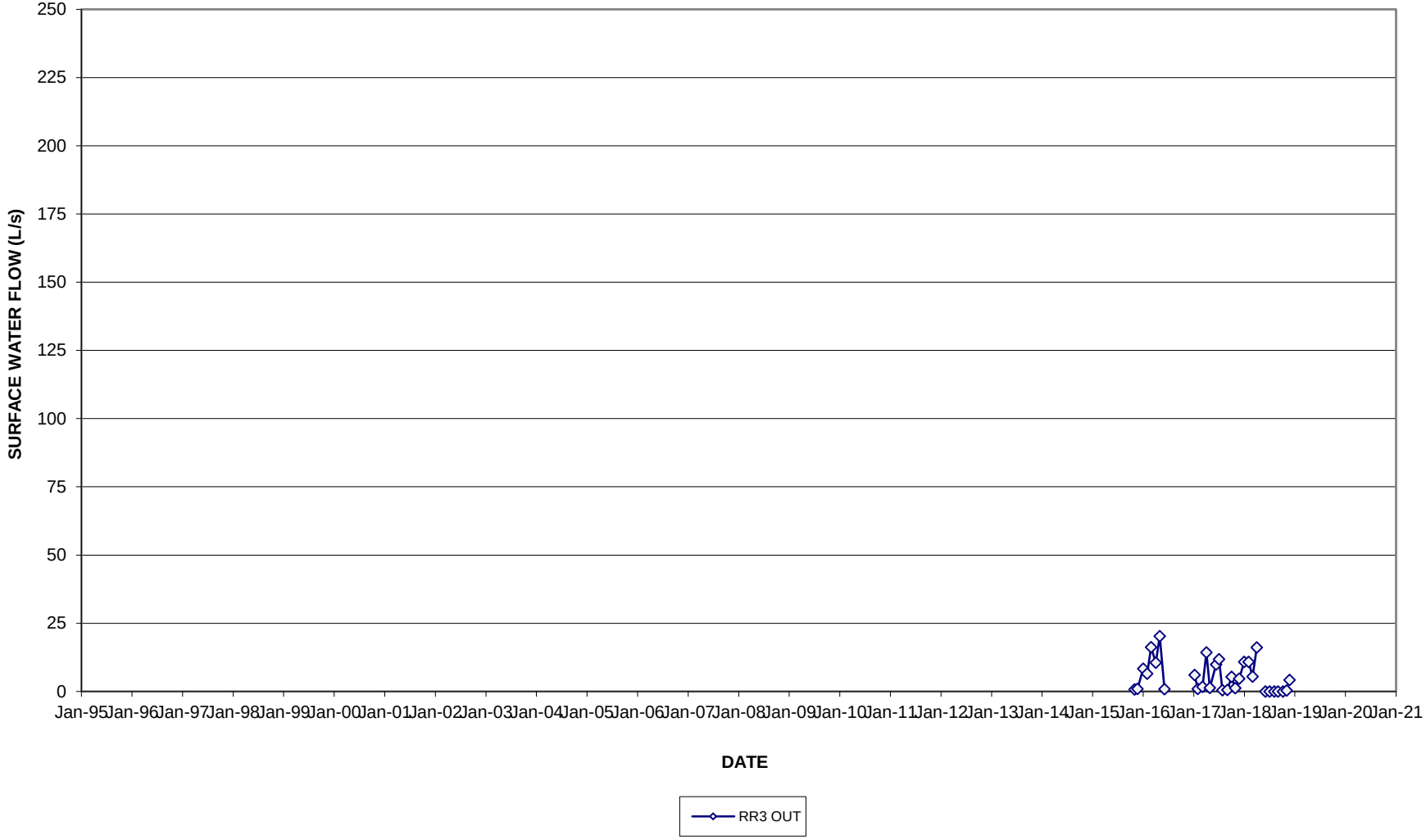

FIGURE B-55

SURFACE WATER HYDROGRAPH
SW3B "RR3 KARST"

FIGURE B-55 (a)

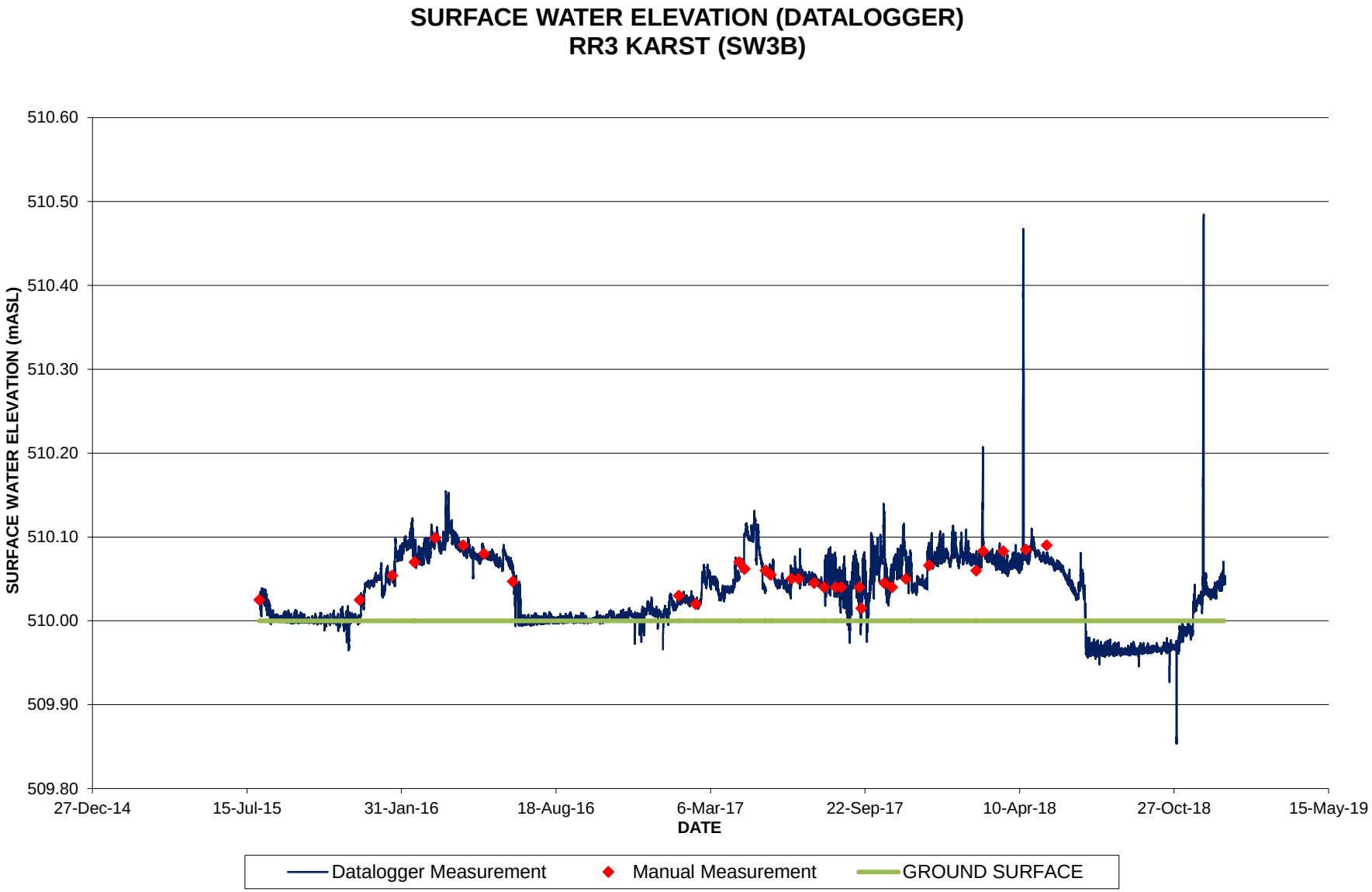
SURFACE WATER ELEVATION (DATALOGGER)
RR3 KARST (SW3B)
SURFACE WATER ELEVATION (mASL)
510.60
510.50
510.40
510.30
510.20
510.10
510.00
509.90
509.80
27-Dec-14
15-Jul-15
31-Jan-16
18-Aug-16
6-Mar-17
22-Sep-17
10-Apr-18
27-Oct-18
15-May-19
DATE
Datalogger Measurement
Manual Measurement
GROUND SURFACE

FIGURE B-55 (b)

SURFACE WATER TEMPERATURE (DATALOGGER)
RR3 KARST (SW3B)

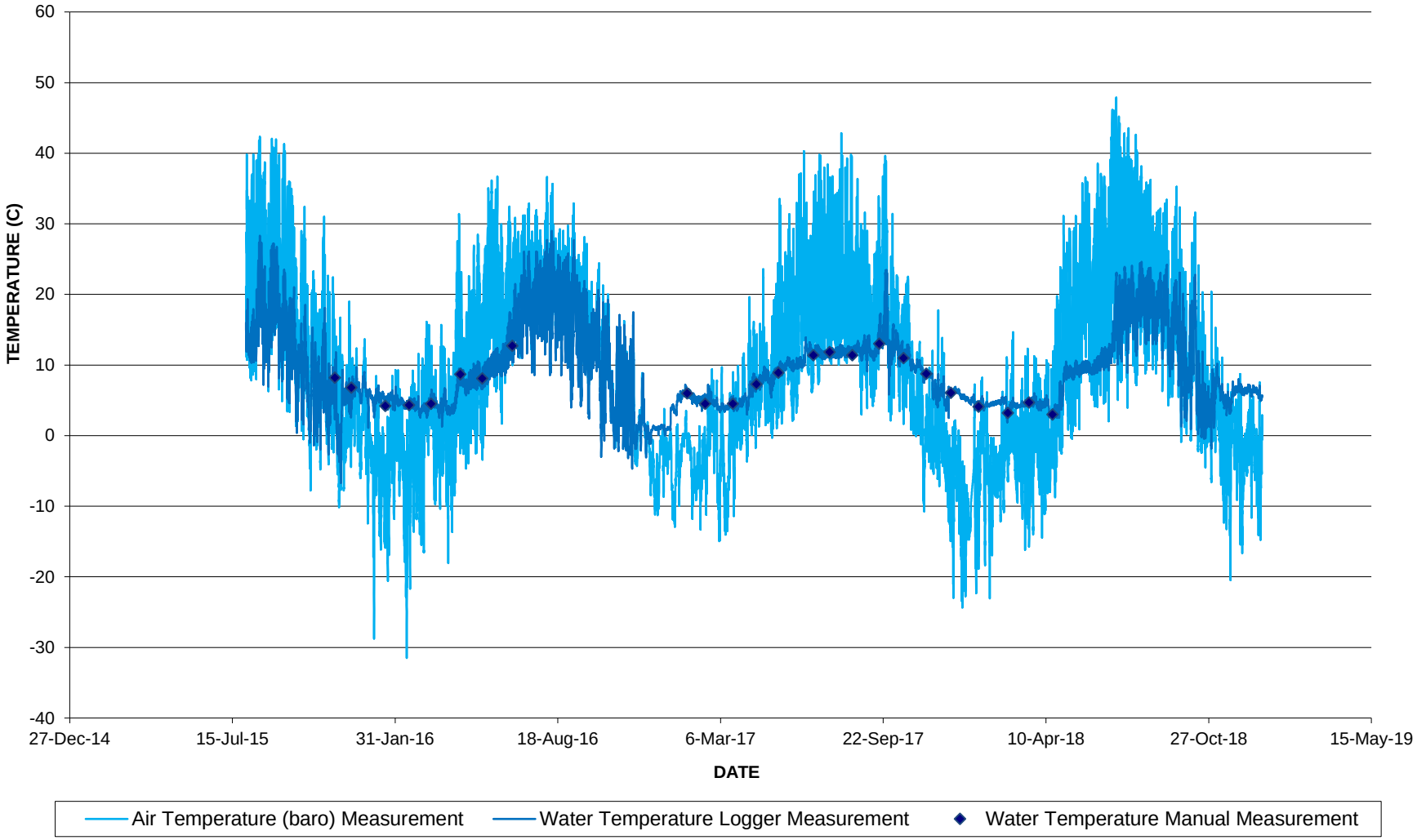

FIGURE B-56

SURFACE WATER HYDROGRAPH
Pretty River Control

FIGURE B-57

SURFACE WATER HYDROGRAPH
Batteaux Creek Control

TABLE B-4
SURFACE WATER FLOW HIGH, LOW AND SEASONAL FLOW SUMMARY
DUNTROON QUARRY - 2017 AMP SUMMARY REPORT
111-53312.00 A61

Flow (L/s)	QFSW 2														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	308.7	436.8	274.4	223.9	593.7	370.2	302.9	328.9	457.5	341.3	244.9	219.4	258.2	160.6	93.8
Low	0.0	0.0	0.0	0.0	0.0	18.7	71.9	57.7	59.0	59.9	48.4	44.2	38.0	30.5	28.3
Winter Average	-	73.3	190.4	122.7	226.6	135.5	89.7	103.4	100.6	134.6	88.1	55.6	78.8	59.5	55.1
Spring Average	182.7	227.0	207.3	114.4	130.1	159.8	166.5	193.9	176.1	170.2	151.9	150.3	150.7	140.3	63.2
Summer Average	150.0	290.3	213.4	111.6	191.9	176.3	173.1	120.1	194.1	145.9	140.5	98.9	100.4	75.1	72.3
Fall Average	86.1	219.6	159.0	120.4	212.5	200.8	167.7	152.0	149.7	156.2	83.8	90.2	73.1	91.6	44.6

Flow (L/s)	SW 1														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	136.1	121.8	162.9	108.9	145.7	109.7	80.3	86.0	136.7	123.1	177.9	83.3	233.3	95.5	128.6
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	8.9	0.0
Winter Average	63.8	34.6	45.4	53.3	50.5	30.8	39.6	39.9	39.4	50.2	22.9	24.3	26.6	34.3	128.6
Spring Average	72.5	34.0	58.7	56.9	63.8	67.5	43.6	34.6	29.4	50.5	39.7	17.1	59.4	61.1	39.8
Summer Average	22.8	3.3	8.1	7.9	12.7	0.6	7.0	0.6	2.9	8.6	3.2	11.7	5.6	15.0	19.0
Fall Average	14.8	26.3	51.5	29.0	35.0	40.1	12.7	31.5	18.8	37.5	26.5	16.2	15.3	35.3	9.1

Flow (L/s)	SW 2														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	58.8	49.9	41.8	41.1	93.3	35.0	68.9	42.0	70.3	57.8	104.1	32.3	93.3	8.5	29.3
Low	0.0	0.2	0.0	<0.1	0.6	0.4	2.2	0.9	1.1	2.2	0.1	0.3	0.2	0.6	0.9
Winter Average	8.6	13.3	10.8	7.4	24.3	11.9	5.7	11.7	9.5	13.2	5.7	2.1	4.0	2.8	17.8
Spring Average	19.3	16.6	16.7	13.0	26.0	15.0	15.2	17.9	13.8	14.8	23.7	7.4	15.4	5.3	5.9
Summer Average	3.3	1.4	1.1	1.4	4.5	2.0	6.6	3.6	4.2	3.9	0.9	3.0	1.7	1.5	3.2
Fall Average	1.5	1.1	8.9	1.2	18.5	3.5	9.0	7.0	11.7	10.4	3.1	1.3	0.7	1.9	1.4

Flow (L/s)	SW 0-2														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	60.8	348.6	238.5	177.2	295.2	185.3	156.8	158.7	529.8	405.3	469.4	99.4	576.7	99.4	280.5
Low	0.0	0.0	0.0	0.0	1.7	3.3	1.4	4.4	10.1	25.8	10.1	4.8	1.1	26.8	0.0
Winter Average	-	183.7	91.6	Frozen	194.5	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	30.4	94.6	280.5
Spring Average	7.7	86.3	93.7	73.2	107.4	83.5	64.9	109.5	158.1	101.4	151.2	31.8	114.9	70.5	36.7
Summer Average	13.2	0.8	9.7	6.9	28.7	21.9	35.1	17.2	31.0	45.0	17.3	14.1	3.1	34.6	15.1
Fall Average	19.9	19.7	46.1	33.0	43.3	27.2	55.1	49.6	63.9	157.1	41.0	32.5	21.5	51.5	6.3

NOTE:

- Season averages were determined as follows: Winter (Jan-Feb), Spring (Mar-Jun), Summer (Jul-Aug), Fall (Oct-Dec).
- Seasonal averages are the average of the measured data for that period.

TABLE B-4
SURFACE WATER FLOW HIGH, LOW AND SEASONAL FLOW SUMMARY
DUNTROON QUARRY - 2017 AMP SUMMARY REPORT
111-53312.00 A61

Flow (L/s)	SW 3														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	14.4	31.4	39.7	4.3	12.9	9.1	26.4	95.3	13.7	18.3	50.5	5.4	48.1	7.7	27.5
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.3	1.5	0.0	0.0	2.4	0.0	0.0	0.9	0.0
Winter Average	Frozen	Frozen	2.4	<0.1	Frozen	Frozen	Frozen	1.7	Frozen	9.8	Frozen	Buried	12.5	0.0	27.5
Spring Average	4.5	8.0	11.4	1.4	6.1	4.7	8.2	21.0	3.4	7.8	26.5	5.4	20.9	4.7	1.8
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	3.1	0.0	0.0	0.0	Dry	2.3	0.0	1.1	0.0
Fall Average	0.0	0.0	0.4	0.0	0.0	0.0	0.3	3.7	3.3	3.1	3.0	0.0	0.0	1.6	0.0

Flow (L/s)	SW 3A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	4.9	7.5	3.8	1.2	9.6	2.8	7.4	2.3	1.6	2.6	9.1	2.1	6.9	1.9	3.2
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Winter Average	Frozen	Frozen	3.8	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Buried	Frozen	0.4	3.2
Spring Average	2.0	2.8	1.2	0.5	3.3	1.4	1.0	0.8	0.4	1.1	4.8	0.9	2.2	1.5	1.6
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	7.4	0.0	0.2	0.0	0.1	1.1	0.0	0.3	0.0
Fall Average	0.0	0.0	0.6	0.0	0.3	0.2	0.6	0.9	0.9	0.6	0.4	0.0	0.0	0.8	0.0

Flow (L/s)	SW 4														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	0.0	63.2	0.0	9.1	8.8	4.4	8.1	0.0	2.1	1.3	14.0	0.6	10.1	4.4	206.1
Low	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.1	0.0	0.0	0.2	0.0
Winter Average	0.0	63.2	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.2	Frozen	Buried	Buried	4.4	206.1
Spring Average	0.0	0.0	0.0	2.3	2.2	1.4	8.1	0.0	0.0	1.3	14.0	0.6	3.7	0.8	1.5
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	Dry	Dry	0.0	0.0	0.0
Fall Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	1.0	1.1	0.0	0.0	2.8	0.0

Flow (L/s)	SW 5														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	246.5	742.4	389.2	281.9	525.3	491.0	662.8	368.0	486.3	384.3	1,082.8	250.6	567.6	224.3	669.2
Low	8.5	1.0	<0.1	0.0	7.3	9.4	12.5	7.9	2.1	30.9	22.1	7.2	13.5	18.0	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	361.4	Frozen	Frozen	Frozen	384.3	Frozen	Frozen	Frozen	0.0	669.2
Spring Average	154.7	248.7	208.1	151.3	206.0	217.4	279.3	243.5	184.8	244.3	417.5	147.5	237.8	183.9	106.8
Summer Average	14.5	10.0	3.6	3.2	63.0	40.7	74.9	28.4	49.6	34.7	36.1	44.0	17.7	52.6	2.9
Fall Average	17.9	5.9	118.8	70.8	147.3	65.3	142.6	96.8	121.4	116.6	22.1	45.0	34.5	77.3	7.8

NOTE:

- Season averages were determined as follows: Winter (Jan-Feb), Spring (Mar-Jun), Summer (Jul-Aug), Fall (Oct-Dec).
- Seasonal averages are the average of the measured data for that period.

TABLE B-4
SURFACE WATER FLOW HIGH, LOW AND SEASONAL FLOW SUMMARY
DUNTROON QUARRY - 2017 AMP SUMMARY REPORT
111-53312.00 A61

Flow (L/s)	SW 6														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	371.1	1,376.5	366.7	286.4	1,637.1	675.0	810.2	515.8	735.1	653.3	1,833.9	389.3	914.5	389.9	240.6
Low	7.0	12.3	<0.1	0.0	28.9	6.2	21.1	9.7	16.7	12.9	40.1	7.3	14.5	54.2	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.0	0.0
Spring Average	221.7	541.0	194.9	146.7	562.4	329.7	334.3	367.5	244.1	290.4	717.5	234.0	363.7	292.0	127.3
Summer Average	15.5	25.9	1.6	0.0	90.5	56.4	88.8	18.7	48.7	36.1	63.8	63.0	19.2	95.3	7.8
Fall Average	19.8	16.1	140.7	42.6	44.9	50.7	134.8	62.8	107.7	108.5	40.1	61.8	27.6	136.3	11.2

Flow (L/s)	SW 6A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	606.6	1,671.0	966.1	574.2	964.1	1,095.0	1,499.6	962.9	981.3	901.3	1,147.5	535.0	951.7	487.2	1,793.4
Low	24.9	14.7	32.0	14.2	56.2	44.4	89.1	42.5	48.1	63.0	61.0	21.7	30.9	100.2	26.9
Winter Average	Frozen	Frozen	133.0	Frozen	883.4	403.5	124.0	362.0	169.8	374.2	Frozen	Frozen	227.6	251.9	1,087.7
Spring Average	389.3	575.1	506.6	332.3	441.8	506.8	572.5	584.7	357.8	478.1	558.2	290.2	437.7	405.9	335.5
Summer Average	55.6	51.8	41.3	31.3	74.0	106.8	161.0	64.5	84.7	101.5	88.4	89.1	39.0	161.9	369.5
Fall Average	55.7	81.9	264.8	85.5	317.3	141.9	205.8	157.2	195.9	271.9	242.8	77.8	50.1	204.6	119.8

Flow (L/s)	SW 7														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.0	<0.1	0.5	1.4	2.8	0.9	1.1	3.7	0.9	1.3	0.3	0.4	2.9	6.3	1.1
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.1	1.8	0.0	0.0	0.3	0.0	0.0	0.3	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Buried	Buried	0.0	1.1
Spring Average	0.6	<0.1	0.2	0.6	0.9	0.6	0.6	2.8	0.2	0.5	0.3	0.4	2.1	2.4	0.4
Summer Average	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Dry	0.0	0.0	0.0	0.0
Fall Average	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Buried	0.0	0.0	0.0	0.0

Flow (L/s)	SW 8														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	0.5	<0.1	0.3	1.0	0.3	2.4	0.1	0.7	0.1	0.1	0.1	0.2	0.3	0.0	0.4
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.5	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.0	Frozen	Buried	Buried	0.0	0.4
Spring Average	0.3	<0.1	<0.1	0.4	<0.1	0.8	0.1	0.6	0.0	0.1	0.1	0.2	0.3	0.0	0.0
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Dry	0.0	0.0	0.0	0.0
Fall Average	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	Buried	0.0	0.0	0.0	0.0

NOTE:
- Season averages were determined as follows: Winter (Jan-Feb), Spring (Mar-Jun), Summer (Jul-Aug), Fall (Oct-Dec).
- Seasonal averages are the average of the measured data for that period.

TABLE B-4
SURFACE WATER FLOW HIGH, LOW AND SEASONAL FLOW SUMMARY
DUNTROON QUARRY - 2017 AMP SUMMARY REPORT
111-53312.00 A61

Flow (L/s)	SW 9														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	7.0	41.7	15.3	7.2	12.5	17.2	25.4	45.3	12.2	24.4	58.0	7.7	30.7	20.1	20.1
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.6	1.2	0.0	0.0	1.5	0.8	5.5	0.2	0.0
Winter Average	2.1	Frozen	5.5	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	5.1	Frozen	Buried	Buried	4.0	17.9
Spring Average	3.6	11.7	5.8	3.1	3.9	5.9	8.9	20.1	4.2	12.3	32.2	7.7	14.9	8.7	10.1
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0	Dry	0.8	0.0	0.0	0.0
Fall Average	0.0	0.0	2.1	0.0	0.0	0.0	1.3	0.0	3.4	0.0	1.5	0.0	0.0	0.2	0.2

Flow (L/s)	SW 10														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.1	3.2	3.8	1.7	2.8	1.8	2.0	2.2	1.2	4.6	6.7	0.4	3.5	1.7	4.9
Low	0.0	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.1	0.0	0.1	0.2	<0.1	<0.1	0.2	0.0
Winter Average	0.3	Frozen	2.7	Frozen	Frozen	1.8	Frozen	0.4	0.5	0.8	Buried	Buried	0.6	1.1	3.0
Spring Average	0.4	0.9	1.5	0.7	0.9	0.7	0.9	0.8	0.6	0.6	2.5	0.2	1.2	1.4	0.5
Summer Average	<0.1	<0.1	0.2	<0.1	0.2	0.1	0.2	0.1	0.3	0.1	<0.1	0.2	0.2	0.4	0.1
Fall Average	<0.1	0.2	0.7	0.2	0.6	0.2	0.8	1.0	0.2	2.7	Buried	0.3	0.4	0.4	0.3

Flow (L/s)	SW 11														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	27.4	62.1	29.2	35.0	100.8	51.1	19.5	41.7	22.7	42.8	47.5	25.7	51.9	33.4	39.5
Low	0.2	0.8	1.0	0.4	0.8	0.8	0.2	0.1	1.1	0.5	0.3	0.3	0.4	1.3	0.9
Winter Average	6.7	Frozen	20.2	35.0	44.5	31.1	1.3	7.5	11.0	19.8	Buried	0.3	6.7	10.7	28.9
Spring Average	16.2	23.5	16.3	13.4	32.3	19.6	12.1	15.8	8.2	20.5	23.6	10.8	23.2	24.3	14.3
Summer Average	1.1	0.9	1.7	0.7	5.2	0.8	2.6	0.5	1.4	1.1	0.8	3.2	1.1	2.6	1.6
Fall Average	3.5	2.2	12.9	1.5	8.6	1.5	9.4	5.3	5.8	4.4	2.6	1.1	1.3	6.2	2.9

Flow (L/s)	SW 11A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	12.2	15.0	11.4	15.0	4.3	5.3	2.3	8.2	5.1	5.1	2.6	1.5	3.5	4.7	3.6
Low	<0.1	0.0	0.3	0.0	<0.1	<0.1	0.2	0.2	0.0	0.1	0.5	<0.1	<0.1	0.1	0.0
Winter Average	1.5	Frozen	7.6	15.0	2.7	3.3	0.2	0.5	Frozen	0.9	Buried	Buried	1.2	2.4	2.0
Spring Average	4.3	8.3	5.1	3.7	1.5	2.2	1.0	2.5	1.9	1.4	1.5	0.6	1.2	0.6	0.5
Summer Average	0.2	0.4	0.4	0.0	0.6	0.1	1.5	0.1	0.1	<0.1	<0.1	0.3	0.1	0.2	0.0
Fall Average	<0.1	0.2	3.4	0.8	1.4	0.3	0.8	0.5	0.7	0.4	0.6	0.2	0.1	0.3	0.1

NOTE:
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Flow (L/s)	SW 11B														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	5.8	10.0	7.0	4.9	11.1	10.8	15.0	12.8	5.1	12.5	10.9	2.7	2.4	3.8	2.7
Low	<0.1	<0.1	0.5	0.0	0.2	<0.1	0.4	0.3	0.4	0.5	0.1	<0.1	<0.1	0.3	0.1
Winter Average	0.8	Frozen	6.3	4.0	6.0	6.8	2.5	4.0	Frozen	3.6	Buried	Buried	2.2	2.8	2.2
Spring Average	1.9	5.8	2.6	2.4	6.5	6.6	7.1	7.1	1.8	4.2	6.9	1.4	1.7	1.5	1.0
Summer Average	0.6	1.0	1.0	0.2	0.7	0.4	3.0	0.3	0.4	<0.1	<0.1	0.3	0.4	1.4	0.3
Fall Average	0.1	0.9	3.5	0.2	3.3	0.8	4.1	2.2	1.2	2.5	0.1	0.5	0.8	1.1	0.4

Flow (L/s)	SW 11C														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.8	8.0	9.7	3.0	10.7	7.5	4.4	6.5	1.3	4.8	23.9	2.9	5.1	2.0	7.8
Low	0.0	0.0	0.0	0.0	0.5	0.5	0.3	0.1	0.1	0.2	0.4	<0.1	0.1	0.1	0.1
Winter Average	0.5	Frozen	9.7	3.0	4.9	4.0	0.8	1.6	Frozen	0.9	Buried	Buried	0.9	1.0	4.3
Spring Average	0.8	3.4	1.5	1.4	3.5	3.5	1.9	2.9	0.5	1.7	10.0	1.5	2.9	1.1	1.1
Summer Average	0.0	0.0	0.0	0.7	0.9	1.1	0.8	0.2	0.2	<0.1	<0.1	0.3	0.3	0.4	0.3
Fall Average	0.0	0.0	2.3	1.3	4.6	0.8	1.8	0.7	0.8	0.6	0.4	0.4	0.3	0.6	0.2

Flow (L/s)	SW 11D														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	8.4	10.0	9.8	15.0	14.5	3.4	0.6	3.3	4.6	4.3	8.0	2.5	12.9	20.7	19.9
Low	<0.1	0.0	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.2	0.2	<0.1	0.1	0.2	0.0
Winter Average	0.8	Frozen	9.8	15.0	11.3	0.9	Frozen	Frozen	Frozen	0.9	Buried	Buried	3.5	6.8	12.5
Spring Average	4.1	4.6	4.2	1.8	4.1	1.9	0.5	1.4	1.6	1.3	3.8	0.7	7.4	12.1	4.3
Summer Average	0.4	0.6	0.4	0.2	0.0	0.0	0.3	0.0	0.0	<0.1	<0.1	0.8	0.3	0.8	0.5
Fall Average	<0.1	0.5	2.7	0.4	2.2	0.0	0.4	0.3	0.2	1.0	0.3	0.2	0.2	1.0	0.5

Flow (L/s)	SW 11E														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	22.0	61.0	30.4	59.3	65.4	109.7	57.5	48.3	47.7	47.4	51.4	28.9	77.0	32.0	52.6
Low	0.2	0.9	1.9	0.3	0.2	0.2	0.6	0.1	0.4	0.9	0.2	0.3	1.0	1.8	0.3
Winter Average	3.5	Frozen	22.4	21.6	13.9	25.0	2.3	3.8	17.6	29.1	6.7	19.2	6.1	13.0	37.3
Spring Average	10.8	27.6	24.1	23.2	31.7	46.3	26.8	26.7	16.1	22.5	20.2	24.7	35.2	20.1	19.4
Summer Average	0.4	2.6	2.5	2.2	2.8	0.6	7.7	0.7	5.0	1.4	1.2	10.9	1.6	4.3	0.8
Fall Average	0.5	1.6	15.2	1.4	18.5	1.8	14.4	20.2	9.8	12.8	8.8	1.8	1.5	5.6	4.3

NOTE:
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Flow (L/s)	SW 12														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	11.4	16.1	5.6	8.0	17.2	26.4	14.3	15.2	5.8	11.3	17.0	9.8	50.4	6.2	18.6
Low	0.2	0.2	0.2	<0.1	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.5	0.0
Winter Average	1.7	Frozen	5.6	8.0	3.0	26.4	0.6	Frozen	1.4	5.2	Buried	0.2	3.5	3.7	11.9
Spring Average	4.8	5.0	2.7	3.2	5.8	6.5	4.8	5.1	1.8	4.5	6.8	5.2	14.9	2.8	2.4
Summer Average	0.4	0.4	0.5	1.1	0.5	0.2	1.1	0.1	0.7	0.2	0.1	1.0	0.3	0.8	0.3
Fall Average	0.2	0.7	2.5	0.3	2.5	0.5	4.1	5.9	1.1	1.2	0.9	0.7	0.2	1.4	0.3

Flow (L/s)	SW 12A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	4.4	6.7	0.9	0.8	9.7	16.5	2.5	5.2	1.7	2.3	5.3	3.3	23.6	3.0	4.8
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.9	0.0	0.0	0.2	0.0	0.0	0.1	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	3.8	Frozen	Frozen	Frozen	1.7	Buried	Buried	Buried	0.8	4.8
Spring Average	2.2	2.9	0.3	0.4	1.6	4.4	0.8	2.4	0.9	1.0	2.9	3.3	8.3	1.1	0.9
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.2	0.0	Dry	0.0	0.4	0.0	0.0
Fall Average	0.0	0.0	0.3	0.0	3.6	0.0	2.3	4.4	0.2	1.0	0.2	0.0	0.0	0.0	0.0

Flow (L/s)	SW 13														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	30.0	80.0	37.4	48.0	107.8	142.7	125.8	131.0	71.8	131.3	108.5	28.7	166.1	51.6	76.9
Low	0.6	0.0	0.8	0.2	3.3	1.3	2.1	0.6	2.4	0.9	0.1	0.6	0.3	3.6	0.4
Winter Average	10.0	Frozen	19.6	48.0	35.3	142.7	Frozen	Frozen	17.1	111.9	Buried	7.9	Frozen	26.9	51.8
Spring Average	13.9	37.0	21.1	15.0	55.0	52.0	54.0	53.3	24.8	46.8	41.9	16.1	67.0	25.5	23.5
Summer Average	1.8	2.0	1.4	2.3	5.8	7.8	12.2	2.8	6.5	3.0	2.6	7.7	3.2	8.5	1.5
Fall Average	1.0	5.6	22.0	0.9	37.3	5.9	36.7	59.8	10.4	16.6	8.6	6.0	1.4	12.4	6.9

Flow (L/s)	SW 14														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	49.0	70.7	25.1	14.3	67.1	44.7	100.6	98.4	37.9	66.5	108.6	16.4	175.4	46.1	101.6
Low	<0.1	1.1	0.4	0.3	0.6	0.5	0.8	0.5	1.2	0.9	0.6	0.4	1.2	5.8	0.0
Winter Average	3.0	Frozen	15.6	Frozen	12.6	Frozen	Frozen	Frozen	Frozen	35.7	Buried	Buried	11.5	39.6	65.5
Spring Average	27.8	21.6	13.7	6.7	31.7	26.6	43.1	35.3	14.7	32.1	46.7	11.6	67.9	33.2	25.5
Summer Average	0.9	1.5	1.7	1.0	4.6	2.1	15.7	0.7	4.4	5.1	1.6	5.1	2.4	7.5	2.0
Fall Average	1.5	4.5	11.1	3.6	25.9	3.6	11.1	41.6	16.1	15.6	0.8	2.3	2.6	15.6	3.5

NOTE:
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Flow (L/s)	SW 15														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.9	5.3	5.7	2.2	34.5	5.4	15.9	5.9	1.5	6.8	6.7	2.5	5.3	3.8	3.5
Low	<0.1	0.2	1.0	0.4	0.0	<0.1	0.5	0.1	0.0	0.0	0.1	0.0	0.0	0.3	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	6.8	Buried	Buried	1.1	3.8	3.5
Spring Average	1.6	3.0	3.9	1.9	9.2	2.6	4.4	2.1	0.8	1.3	3.6	1.8	2.4	1.6	1.8
Summer Average	0.7	1.0	1.6	0.7	0.2	0.1	0.7	0.0	0.2	0.0	1.7	0.6	0.3	0.4	0.0
Fall Average	1.1	2.1	1.5	0.8	0.5	0.4	0.6	0.5	0.8	0.9	0.6	0.5	1.0	1.6	0.7

Flow (L/s)	SW 16														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	40.4	27.0	13.0	10.5	167.3	12.1	26.0	17.4	15.7	100.4	17.2	5.0	28.5	12.2	22.1
Low	<0.1	0.0	0.0	0.0	0.4	0.0	0.2	1.8	0.5	0.9	0.2	0.3	0.2	0.8	0.8
Winter Average	Frozen	Frozen	13.0	Frozen	28.1	9.7	Frozen	6.1	6.5	21.8	Buried	Buried	5.1	6.2	17.8
Spring Average	11.6	8.8	5.3	4.3	44.7	7.3	10.2	9.0	6.9	34.3	9.5	1.3	13.5	6.6	10.0
Summer Average	0.7	0.2	0.0	0.0	0.6	0.2	4.0	3.6	2.3	1.2	3.0	1.3	1.1	1.5	1.7
Fall Average	1.3	0.2	6.7	0.1	3.9	2.6	1.2	4.1	4.1	5.0	1.3	2.3	2.2	5.3	3.4

Flow (L/s)	SW 17														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	13.3	17.5	24.5	28.7	7.6	6.6	6.9	7.8	11.0	8.0	7.3	3.5	57.3	19.6	31.2
Low	0.4	0.2	1.0	<0.1	0.2	0.5	0.9	0.3	0.2	0.3	0.6	0.6	0.6	0.6	0.4
Winter Average	1.9	Frozen	3.7	2.4	4.5	1.8	0.9	4.1	3.8	8.0	Buried	Buried	3.0	3.8	18.0
Spring Average	6.0	7.2	12.1	10.3	3.7	4.3	4.9	3.9	3.7	2.4	5.4	3.1	16.5	11.4	8.9
Summer Average	0.5	0.6	1.9	0.2	1.5	1.1	2.1	0.7	1.3	0.8	0.8	1.1	1.1	1.1	0.9
Fall Average	0.9	0.6	4.2	0.5	3.4	2.1	2.4	2.2	1.7	3.9	2.0	1.5	0.8	4.6	10.2

Flow (L/s)	SW 17A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	72.4	68.6	48.8	34.7	65.8	35.4	26.8	48.3	53.6	58.7	123.5	32.8	64.3	55.3	70.5
Low	2.9	2.9	3.3	0.9	2.4	1.1	0.6	0.5	1.7	2.6	2.2	1.2	1.8	7.0	2.4
Winter Average	9.2	Frozen	17.3	15.5	28.5	25.9	1.6	12.0	15.0	20.2	Buried	4.9	8.6	17.7	47.0
Spring Average	29.8	28.3	27.9	24.3	26.7	14.1	16.3	29.0	21.5	32.0	54.7	18.5	32.2	39.5	31.1
Summer Average	4.1	4.8	5.0	1.7	4.7	6.3	5.3	2.1	2.3	3.9	7.6	5.5	4.6	11.5	6.6
Fall Average	4.3	6.1	13.5	2.4	14.3	3.2	5.7	3.4	10.0	9.5	5.4	2.3	3.8	11.0	9.2

NOTE:
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Flow (L/s)	SW 17B														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	0.2	18.6	11.2	9.4	23.5	8.4	3.9	8.2	3.1	6.1	3.4	6.4	14.6	7.7	33.2
Low	0.2	0.5	<0.1	<0.1	<0.1	0.1	0.3	0.1	0.1	0.1	0.2	0.1	0.1	0.3	0.2
Winter Average	-	Frozen	3.9	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	1.3	Buried	Buried	2.0	6.0	21.1
Spring Average	-	9.7	7.1	4.6	7.6	3.6	2.2	5.1	1.2	2.6	1.7	3.5	6.1	3.6	3.6
Summer Average	-	0.8	0.8	0.2	0.4	0.2	0.9	0.1	0.2	0.3	0.9	0.7	0.3	0.5	0.4
Fall Average	0.2	1.4	1.3	0.4	1.9	0.4	1.0	1.0	0.9	2.0	1.3	0.6	0.6	1.5	0.9

Flow (L/s)	SW 18														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	123.6	207.2	80.7	102.5	178.3	203.8	332.6	243.0	95.4	166.7	261.7	99.4	218.8	79.0	160.6
Low	3.8	4.4	3.5	3.3	11.7	4.6	2.4	3.0	3.8	3.3	2.3	2.5	3.6	10.5	0.0
Winter Average	47.9	Frozen	20.8	Frozen	56.6	73.7	Frozen	Frozen	15.5	78.1	Buried	Frozen	39.5	76.8	110.2
Spring Average	56.0	82.1	53.9	51.2	92.2	112.4	151.7	122.8	41.3	73.4	119.2	69.7	108.1	69.2	78.5
Summer Average	6.7	5.8	9.2	5.6	19.3	11.7	23.7	6.0	13.4	9.4	18.6	11.3	4.9	17.6	4.3
Fall Average	4.3	6.9	36.3	16.0	57.6	13.3	20.4	18.4	39.5	41.4	38.7	13.1	10.7	26.6	10.5

Flow (L/s)	SW 19														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	507.9	700.0	429.2	408.9	1,019.2	1,522.2	1,785.5	1,452.8	426.3	1,180.9	1,825.7	556.5	514.8	440.5	598.0
Low	9.3	8.1	3.8	5.3	31.0	6.7	26.4	14.5	14.4	21.3	31.5	17.4	9.4	32.1	8.6
Winter Average	71.6	Frozen	201.8	79.9	631.2	Frozen	227.8	361.0	178.0	447.7	Frozen	Frozen	395.1	285.8	366.3
Spring Average	224.7	260.1	209.9	258.3	316.6	645.7	688.3	724.9	164.8	455.9	777.5	347.7	318.6	283.1	291.1
Summer Average	15.6	9.0	11.3	9.4	102.8	42.1	54.7	21.8	59.3	62.9	103.3	117.7	19.0	55.2	23.8
Fall Average	42.9	17.4	119.4	119.0	275.9	136.8	427.7	155.6	197.8	172.4	117.1	61.9	23.2	119.1	77.6

Flow (L/s)	SW 20														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	18.9	19.3	11.2	19.0	24.5	29.3	14.0	21.3	8.8	11.8	17.1	12.7	27.0	14.8	17.4
Low	0.0	0.0	0.3	0.0	0.6	0.2	0.7	0.3	0.3	0.4	0.1	0.1	0.2	1.1	0.1
Winter Average	2.0	Frozen	3.4	5.2	16.5	14.6	5.3	8.6	2.1	5.5	6.8	3.6	2.9	3.4	11.7
Spring Average	7.4	9.0	7.7	9.8	11.2	11.8	8.8	12.0	3.7	6.0	7.6	6.6	14.4	10.6	5.5
Summer Average	0.9	0.4	1.2	1.4	1.4	1.5	3.8	1.1	0.6	1.2	0.5	2.1	0.7	2.1	0.5
Fall Average	0.0	0.0	3.9	0.0	6.5	1.7	2.9	1.2	3.6	5.1	2.1	0.5	0.4	2.0	2.5

NOTE:
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Flow (L/s)	SW 21														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	2.1	3.9	12.1	4.3	68.8	8.1	7.3	3.6	1.6	4.7	4.9	1.5	2.4	4.5	3.5
Low	0.2	0.8	1.0	0.7	<0.1	0.2	0.2	0.1	0.0	0.1	0.1	<0.1	<0.1	0.9	0.0
Winter Average	0.9	Frozen	12.1	Frozen	1.1	1.5	0.2	0.1	Frozen	1.3	Buried	Buried	2.2	3.7	2.6
Spring Average	1.4	2.0	3.0	1.8	15.5	1.9	2.8	2.1	0.5	0.9	2.6	1.5	2.0	3.2	2.2
Summer Average	1.1	1.7	3.0	1.9	0.5	3.2	1.1	0.0	0.3	0.2	0.1	7.0	0.5	1.1	0.1
Fall Average	1.0	1.7	2.4	2.5	1.6	1.2	1.0	0.6	0.6	2.6	0.5	0.5	1.3	2.1	0.4

Flow (L/s)	SW 21A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.8	5.8	9.8	2.5	1.7	0.8	0.9	1.1	2.5	1.7	1.1	0.2	2.8	3.2	2.4
Low	0.0	<0.1	0.5	0.2	<0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.0	0.0	0.4	0.1
Winter Average	Frozen	Frozen	9.8	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	1.7	Buried	Buried	Frozen	1.8	2.4
Spring Average	0.8	1.8	3.1	1.6	0.7	0.3	0.6	0.6	0.7	0.6	0.6	0.2	0.3	1.7	1.0
Summer Average	0.6	1.2	3.5	1.7	<0.1	0.1	0.2	0.1	0.1	0.0	<0.1	0.0	0.8	0.9	0.5
Fall Average	0.4	2.6	1.8	0.8	0.6	0.2	0.6	0.1	0.3	0.3	0.1	0.0	2.5	1.5	0.4

Flow (L/s)	SW 21B														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	4.7	6.0	5.6	6.0	7.8	1.0	1.4	1.4	1.2	0.9	0.4	0.3	3.8	6.2	1.2
Low	<0.1	0.0	0.7	1.2	0.2	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.3	0.0
Winter Average	3.0	Frozen	0.7	3.6	4.1	Frozen	Frozen	Frozen	Frozen	Frozen	Buried	Buried	Buried	6.2	0.0
Spring Average	1.6	2.9	3.4	4.2	1.3	0.2	0.8	1.0	0.6	0.9	0.2	<0.1	0.1	1.2	1.2
Summer Average	2.0	3.8	1.2	1.4	0.3	0.5	0.5	0.2	0.1	0.1	0.2	0.2	1.6	0.7	0.2
Fall Average	2.8	2.3	1.9	3.3	1.2	0.6	0.4	0.2	0.3	0.1	<0.1	0.1	1.9	1.1	0.1

Flow (L/s)	SW 21C														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	4.8	16.6	6.4	11.4	23.4	7.4	6.2	5.4	4.5	8.5	14.5	5.6	8.1	7.2	9.0
Low	<0.1	1.2	1.7	0.3	0.7	0.4	0.5	0.5	0.9	0.6	0.5	0.6	0.3	1.1	1.2
Winter Average	2.0	Frozen	2.8	2.9	5.2	3.7	0.6	3.0	2.2	8.5	Buried	0.9	2.0	4.6	8.2
Spring Average	3.6	6.6	4.4	6.2	8.6	4.2	3.6	3.5	2.6	5.0	6.5	3.1	4.9	3.8	5.9
Summer Average	0.7	2.8	3.2	0.6	2.9	1.9	2.1	1.1	1.2	1.6	0.9	3.2	1.4	5.6	2.7
Fall Average	1.0	1.3	3.6	2.1	5.0	1.3	3.3	1.4	1.9	3.5	1.5	0.8	2.6	3.0	2.5

NOTE:
- Season averages were determined as follows: Winter (Jan-Feb), Spring (Mar-Jun), Summer (Jul-Aug), Fall (Oct-Dec).
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Flow (L/s)	SW 21D														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.4	<0.1	0.6	<0.1	1.0	0.2	0.5	0.5	1.2	1.6	1.1	1.0	1.4	0.5	1.3
Low	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Winter Average	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	0.1	Buried	Buried	Frozen	0.0	0.8
Spring Average	0.5	<0.1	0.2	<0.1	0.3	0.1	0.2	0.4	0.3	0.6	0.2	0.7	0.8	0.3	0.6
Summer Average	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0
Fall Average	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.9	0.0	0.0	0.1	0.0

Flow (L/s)	SW 22														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	8.4	9.5	10.9	7.7	7.9	3.9	9.5	12.8	22.6	7.9	24.8	4.6	20.8	16.6	11.9
Low	0.3	0.3	0.5	0.2	0.6	0.3	0.9	0.3	0.8	0.4	0.1	0.3	0.2	0.8	0.2
Winter Average	2.1	Frozen	10.4	2.9	5.1	1.7	1.1	3.9	1.5	3.9	0.7	3.7	1.7	2.0	6.8
Spring Average	4.6	4.4	6.8	4.9	4.6	3.2	7.4	7.5	7.4	3.6	7.0	2.6	11.9	8.2	6.7
Summer Average	0.8	1.0	0.9	1.5	2.6	0.4	2.5	1.2	1.2	0.5	0.2	0.8	1.2	2.1	0.8
Fall Average	0.4	0.3	2.2	0.6	1.2	1.3	2.8	2.0	2.0	1.6	2.5	0.3	0.4	2.1	1.0

Flow (L/s)	SW 22A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	3.0	4.9	6.0	6.8	2.9	3.2	5.0	2.7	5.1	5.0	2.5	2.5	11.9	12.8	5.2
Low	<0.1	0.2	0.5	<0.1	0.3	<0.1	0.6	0.2	0.3	0.2	0.1	0.2	0.1	0.6	0.1
Winter Average	2.5	Frozen	3.8	4.2	1.4	2.0	0.7	0.8	3.0	1.7	Buried	0.9	1.7	2.3	4.0
Spring Average	2.0	2.4	3.1	3.2	1.9	2.0	2.5	2.0	1.8	2.3	1.5	1.6	4.9	4.2	2.1
Summer Average	0.2	0.8	0.9	1.5	0.7	0.5	0.9	0.3	0.7	0.3	0.1	0.5	0.5	0.9	1.1
Fall Average	0.2	0.3	1.3	0.5	0.9	1.5	1.0	0.7	0.9	2.8	1.4	0.9	1.0	2.4	0.7

Flow (L/s)	SW 22C														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	11.5	17.6	26.9	20.8	21.2	8.6	15.9	16.5	16.2	29.5	13.5	19.4
Low	-	-	-	1.6	2.6	0.7	0.3	1.4	1.3	0.0	0.6	1.2	0.9	2.8	1.8
Winter Average	-	-	-	Frozen	9.8	8.6	1.0	6.3	5.2	9.4	1.0	16.2	6.2	8.0	12.3
Spring Average	-	-	-	9.7	8.5	14.4	10.4	13.3	3.5	6.4	11.2	6.4	13.2	10.4	5.6
Summer Average	-	-	-	2.4	3.7	1.2	5.9	1.8	2.7	0.9	0.9	2.0	1.6	5.4	2.1
Fall Average	-	-	-	3.3	6.7	2.7	7.1	4.0	4.9	4.8	3.1	2.6	4.4	6.2	3.0

NOTE:
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Flow (L/s)	SW 24														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	6.3	17.8	5.3	2.0	34.6	7.8	10.8	5.8	6.4	16.3	11.9	3.2	18.2	6.7	8.7
Low	0.0	0.0	0.0	0.0	0.3	0.1	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.3	0.2
Winter Average	0.8	Frozen	5.3	0.6	11.0	2.4	2.7	1.9	4.0	3.4	Buried	0.1	5.7	1.5	6.8
Spring Average	4.3	7.2	1.4	0.9	10.7	4.1	5.5	3.7	2.4	5.2	5.8	2.2	9.2	4.4	2.4
Summer Average	0.0	0.2	0.0	0.0	0.6	0.2	2.5	0.5	1.1	0.4	0.8	1.0	0.6	0.7	0.2
Fall Average	<0.1	0.0	2.0	0.0	3.7	0.9	1.4	0.5	2.3	1.4	2.5	1.6	1.5	1.1	0.8

Flow (L/s)	SW 24A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	3.3	7.9	12.3	5.5	1.9	3.9	3.9	2.9	4.8	16.3	3.5	2.4	4.9	3.7	2.2
Low	0.2	<0.1	0.3	0.2	0.3	0.1	0.3	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2
Winter Average	0.9	Frozen	1.5	2.2	1.6	2.3	1.2	1.7	0.9	3.4	1.6	1.7	1.1	2.2	0.9
Spring Average	2.1	2.5	5.3	2.4	1.0	1.6	2.0	2.1	1.1	5.2	1.7	1.3	2.4	1.6	1.3
Summer Average	0.5	0.2	0.4	0.3	0.7	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.4	0.4	0.5
Fall Average	0.4	0.8	1.0	0.9	1.1	0.3	0.6	0.7	2.1	1.4	0.8	0.5	0.4	0.5	1.1

Flow (L/s)	SW 24B														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	1.7	4.5	5.8	2.5	13.1	5.3	7.5	3.1	12.9	12.9	15.4	10.4	19.9	7.0	15.5
Low	0.2	0.3	0.4	<0.1	0.3	<0.1	0.3	0.1	0.2	0.1	0.2	0.1	0.2	0.3	0.1
Winter Average	0.6	Frozen	5.8	1.6	2.2	1.9	1.1	2.1	3.2	2.5	0.6	0.1	1.8	2.5	8.9
Spring Average	1.2	1.8	3.0	1.7	4.5	2.6	6.1	1.2	4.0	5.2	6.3	4.0	5.9	4.4	2.6
Summer Average	0.3	0.4	0.8	<0.1	1.0	0.2	1.0	0.2	1.0	0.3	0.2	1.1	0.7	1.1	0.2
Fall Average	0.3	0.6	1.8	<0.1	1.4	0.3	0.8	0.7	1.0	0.6	0.3	0.4	0.4	1.1	0.5

Flow (L/s)	SW 24C														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	-	16.2	7.0	10.1	6.7	15.4	26.3	17.6	14.1	21.8	19.2	15.5
Low	-	-	-	-	0.4	0.6	0.7	0.1	0.7	0.6	0.5	0.4	1.0	2.1	0.6
Winter Average	-	-	-	-	7.7	5.2	1.5	3.8	4.3	4.8	2.2	1.7	2.7	5.9	10.6
Spring Average	-	-	-	-	8.8	5.4	6.2	5.2	5.8	8.8	7.2	7.1	9.9	11.6	7.1
Summer Average	-	-	-	-	2.2	0.9	1.4	0.6	2.3	1.8	1.3	1.8	1.4	2.4	1.3
Fall Average	-	-	-	-	3.8	1.3	1.6	1.6	3.1	3.4	1.8	0.8	1.6	4.2	2.3

NOTE:

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- Seasonal averages are the average of the measured data for that period.

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Flow (L/s)	SW 25														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2017
High	49.6	80.1	90.1	36.5	163.7	40.4	54.0	86.3	64.5	59.6	96.3	24.0	68.6	94.0	94.0
Low	<0.1	0.0	0.0	0.0	0.0	0.2	2.5	0.2	0.3	1.3	2.3	0.1	0.0	9.9	9.9
Winter Average	20.7	Frozen	Frozen	18.6	101.3	25.9	36.4	44.6	19.2	28.3	Buried	Buried	31.5	21.6	21.6
Spring Average	34.6	31.0	23.4	21.2	31.2	25.6	31.7	48.3	24.5	37.3	42.7	16.0	31.0	66.6	66.6
Summer Average	7.6	0.2	0.0	0.0	4.5	4.2	14.4	0.4	10.3	11.3	5.1	5.2	0.0	19.3	19.3
Fall Average	6.2	5.4	22.7	4.1	28.4	22.5	11.9	20.7	30.0	18.5	14.0	5.4	7.6	15.9	15.9

Flow (L/s)	SW 26														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2017
High	183.7	111.4	58.7	22.7	156.0	51.0	73.5	54.5	97.4	138.1	227.8	67.4	125.0	79.2	79.2
Low	0.0	0.0	0.0	0.0	<0.1	0.0	0.1	2.2	0.0	0.9	0.4	0.0	0.0	1.4	1.4
Winter Average	42.7	Frozen	Frozen	Frozen	17.1	7.8	Frozen	Frozen	Frozen	43.4	Buried	Frozen	Frozen	79.2	79.2
Spring Average	57.0	32.1	29.0	10.9	63.2	16.0	34.7	37.4	26.8	55.2	86.9	35.2	46.4	28.7	28.7
Summer Average	0.4	0.0	0.0	0.0	7.5	0.9	12.0	0.0	0.7	2.6	3.7	4.7	0.0	5.1	5.1
Fall Average	0.9	1.0	8.9	0.4	3.9	5.5	12.6	3.0	12.7	10.3	1.1	6.2	1.6	13.9	13.9

Flow (L/s)	SW 26A														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2017
High	101.6	59.9	60.0	14.9	165.4	47.4	53.3	61.7	65.7	120.2	17.4	39.2	128.1	33.2	33.2
Low	0.0	0.0	0.0	0.0	<0.1	0.0	0.3	2.5	0.0	0.4	0.5	0.0	0.0	3.1	3.1
Winter Average	0.9	Frozen	6.1	5.3	24.0	Frozen	Frozen	Frozen	Frozen	52.0	Buried	Frozen	6.7	14.1	14.1
Spring Average	28.1	16.8	23.5	7.7	53.4	24.7	27.4	31.6	19.2	54.3	15.3	21.9	45.1	21.3	21.3
Summer Average	0.0	0.0	0.0	0.0	8.5	3.6	18.5	0.0	0.3	1.2	2.8	3.1	0.0	5.4	5.4
Fall Average	1.2	0.7	7.2	0.0	3.1	5.8	8.4	3.5	12.5	12.3	4.3	5.0	0.3	8.5	8.5

Flow (L/s)	SW 27														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2017
High	1.5	39.7	30.5	14.2	97.1	23.0	28.3	45.5	46.5	42.9	92.7	17.5	28.9	21.7	21.7
Low	0.5	0.3	0.5	0.3	3.1	0.8	1.3	1.4	1.9	2.0	0.4	0.4	1.5	3.1	3.1
Winter Average	-	Frozen	3.9	9.0	10.7	14.0	2.2	8.7	13.0	22.5	6.2	1.4	6.2	5.8	5.8
Spring Average	-	15.1	17.7	9.3	33.8	16.3	17.3	34.5	17.8	19.4	41.8	11.5	17.5	17.6	17.6
Summer Average	-	1.6	1.3	1.1	11.2	3.6	5.2	2.9	2.6	4.6	3.4	1.7	2.6	4.1	4.1
Fall Average	1.0	1.2	4.4	0.6	11.9	2.1	6.2	5.7	11.2	11.5	2.9	2.3	1.8	4.5	4.5

NOTE:

- Season averages were determined as follows: Winter (Jan-Feb), Spring (Mar-Jun), Summer (Jul-Sep), Fall (Oct-Dec).
- Seasonal averages are the average of the measured data for that period.

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Flow (L/s)	SW 77														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	-	-	-	0.7	0.8	1.0	1.3	1.4	1.3	2.5	1.4	1.5
Low	-	-	-	-	-	-	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0
Winter Average	-	-	-	-	-	-	0.2	-	0.4	0.3	0.2	Buried	0.7	0.6	0.9
Spring Average	-	-	-	-	-	-	0.4	0.5	0.4	0.5	0.6	0.4	1.2	1.0	0.7
Summer Average	-	-	-	-	-	-	0.3	0.2	0.1	<0.1	<0.1	0.5	0.2	0.4	0.3
Fall Average	-	-	-	-	-	-	0.2	0.1	0.4	0.4	0.1	0.1	0.3	0.4	0.4

Flow (L/s)	RR3 OUT														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	-	-	-	-	-	-	-	-	0.9	20.3	14.3	16.1
Low	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.5	0.0
Winter Average	-	-	-	-	-	-	-	-	-	-	-	-	7.4	3.5	10.8
Spring Average	-	-	-	-	-	-	-	-	-	-	-	-	12.0	6.8	7.2
Summer Average	-	-	-	-	-	-	-	-	-	-	-	Dry	0.0	4.3	0.0
Fall Average	-	-	-	-	-	-	-	-	-	-	-	0.8	0.0	3.8	1.5

Flow (L/s)	RR3 KARST														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	-	-	-	-	-	-	-	-	0.3	6.2	2.7	4.7
Low	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.0	0.0
Winter Average	-	-	-	-	-	-	-	-	-	-	-	-	1.2	1.3	3.0
Spring Average	-	-	-	-	-	-	-	-	-	-	-	-	4.0	1.8	1.5
Summer Average	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0	0.4	0.0
Fall Average	-	-	-	-	-	-	-	-	-	-	-	0.2	0.0	0.9	0.2

Flow (L/s)	PR CONTROL														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	-	-	-	-	-	-	-	-	13.3	148.4	93.8	140.9
Low	-	-	-	-	-	-	-	-	-	-	-	0.2	6.1	9.9	11.2
Winter Average	-	-	-	-	-	-	-	-	-	-	-	-	24.8	31.5	96.1
Spring Average	-	-	-	-	-	-	-	-	-	-	-	-	79.8	67.9	58.8
Summer Average	-	-	-	-	-	-	-	-	-	-	-	7.9	8.8	20.2	21.2
Fall Average	-	-	-	-	-	-	-	-	-	-	-	7.6	9.2	35.0	25.3

NOTE:
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Flow (L/s)	BC CONTROL														
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
High	-	-	-	-	-	-	-	-	-	-	-	7.5	192.0	37.3	55.0
Low	-	-	-	-	-	-	-	-	-	-	-	0.4	0.2	1.1	0.2
Winter Average	-	-	-	-	-	-	-	-	-	-	-	-	Frozen	37.3	40.4
Spring Average	-	-	-	-	-	-	-	-	-	-	-	-	63.1	23.0	21.4
Summer Average	-	-	-	-	-	-	-	-	-	-	-	4.0	0.3	2.9	0.4
Fall Average	-	-	-	-	-	-	-	-	-	-	-	4.7	0.6	13.8	8.7

NOTE:
- Season averages were determined as follows: Winter (Jan-Feb), Spring (Mar-Jun), Summer (Jul-Sep), Fall (Oct-Dec).
- Seasonal averages are the average of the measured data for that period.

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
SW 1					
	22-May-03	10.0			
	23-Jun-03	16.8			
	12-Feb-04	2.4		436	
	4-Mar-04	3.5		652	
	19-Mar-04	3.5		629	10.6
	2-Apr-04	4.8	7.8	281	
	8-Apr-04	4.3	7.7	286	
	7-May-04	11.4	8.1	521	
	14-May-04	17.7	7.9	609	
	20-May-04	13.3	8.0	592	
	28-May-04	10.4	7.9	497	11.0
	4-Jun-04	12.3	7.8	555	
	11-Jun-04	14.6	7.8	630	
	17-Jun-04	14.6	7.7	666	
	1-Jul-04	15.1	7.9	717	8.7
	16-Jul-04	15.7	7.8	644	9.2
	22-Jul-04	20.4	7.9		8.5
	29-Jul-04	15.8	7.7	647	
	19-Aug-04	15.8	7.7	731	
	26-Aug-04	17.8	7.8	713	
	9-Sep-04	14.7	8.1	705	7.9
	17-Sep-04	14.7	7.7	764	7.7
	7-Nov-04	7.1	7.8	604	11.4
	17-Dec-04	1.1	7.8	472	
	29-Dec-04	3.4	7.6	600	
	5-Jan-05	3.0	7.7	467	12.7
	20-Jan-05	1.0	7.5	409	
	28-Jan-05	0.7	7.5	422	
	3-Feb-05	2.7	7.5	450	
	16-Feb-05	3.3	7.8	454	12.3
	24-Feb-05	1.1	8.0	440	
	3-Mar-05	0.4	7.6	415	12.9
	24-Mar-05	3.9	7.4	448	12.4
	30-Mar-05	6.2	7.7	470	
	7-Apr-05	3.3	7.5	356	12.1
	15-Apr-05	1.5	6.9	330	9.1
	21-Apr-05	10.4	7.5	451	11.1
	28-Apr-05	7.0	7.5	398	
	6-May-05	14.6	7.7	610	
	13-May-05	11.0	8.2	514	
	20-May-05	10.1	7.2	522	7.8
	27-May-05	18.6	7.7	653	
	3-Jun-05	18.0	7.3	662	7.5
	17-Jun-05	15.2	7.2	601	7.7
	24-Jun-05	22.7	7.7	776	
	30-Jun-05	23.4	7.5	835	7.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	7-Jul-05	20.4	6.6	731	
	15-Jul-05	23.6	7.1	1148	6.4
	21-Jul-05	24.1	7.6	1524	
	18-Nov-05	4.1	8.5	943	
	25-Nov-05	2.5	8.3	524	12.0
	2-Dec-05	4.1	8.9	545	10.9
	9-Dec-05	3.8	9.4	538	11.0
	16-Dec-05	3.6	8.3	602	11.8
	22-Dec-05	2.8	8.2	592	12.8
	6-Jan-06	2.3	8.4	929	
	20-Jan-06	3.3	7.5	507	11.8
	27-Jan-06	3.5	6.9	547	13.3
	3-Feb-06	3.7	8.2	503	
	10-Feb-06	2.9	8.3	495	13.4
	20-Feb-06	2.4	8.3	493	
	24-Feb-06	2.3	8.2	485	
	3-Mar-06	2.7	8.1	534	
	10-Mar-06	3.3	8.1	483	13.1
	17-Mar-06	2.8	8.2	471	12.9
	24-Mar-06	4.3	8.2	440	
	31-Mar-06	7.5	8.2	601	
	7-Apr-06	5.3	8.1	596	
	10-Apr-06	9.1	8.1	591	
	13-Apr-06	10.7	8.2	594	
	21-Apr-06	11.3	8.3	602	
	26-Apr-06	9.5	8.6	627	
	5-May-06	10.8	8.2	655	
	12-May-06	10.6	8.5	735	
	19-May-06	10.1	8.0	705	
	25-May-06	11.1	7.8	732	
	2-Jun-06	12.5	7.8	754	
	9-Jun-06	12.3	7.9	604	
	16-Jun-06	14.6	8.0	805	
	23-Jun-06	15.2	8.0	794	
	4-Aug-06	19.7	7.8	736	
	25-Aug-06	16.2	7.5	896	
	1-Sep-06	19.0	7.6	871	
	8-Sep-06	18.2	7.7	877	
	15-Sep-06	15.3	7.4	897	
	21-Sep-06	12.3	7.5	895	
	28-Sep-06	11.6	7.5	924	
	20-Oct-06	9.3	7.6	908	
	3-Nov-06	6.7	7.7	898	10.9
	10-Nov-06	8.0	7.8	874	
	17-Nov-06	6.7	7.8	867	10.7
	24-Nov-06	6.1	7.9	867	10.8
	4-Dec-06	3.9	7.7	853	11.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	8-Dec-06	4.1	7.7	841	12.7
	14-Dec-06	5.5	7.8	886	
	21-Dec-06	4.8	7.9	852	12.0
	28-Dec-06	4.8	7.9	862	11.9
	5-Jan-07	5.6	7.9	853	10.7
	12-Jan-07	4.6	7.8	783	10.7
	19-Jan-07	3.0	8.1	791	12.2
	26-Jan-07	1.9	8.2	797	13.0
	2-Feb-07	3.4	8.0	768	11.7
	9-Feb-07	3.5	8.1	707	12.2
	16-Feb-07	3.2	8.1	808	11.9
	22-Feb-07	3.6	8.0	805	11.2
	2-Mar-07	3.4	8.1	800	12.0
	9-Mar-07	4.4	8.0	668	12.4
	16-Mar-07	3.6	7.9	709	12.0
	23-Mar-07	5.2	7.9	719	11.6
	30-Mar-07	5.7	8.0	669	12.4
	5-Apr-07	3.1	7.6	328	
	13-Apr-07	4.0	8.1	652	13.1
	20-Apr-07	9.0	8.2	613	
	28-Apr-07	9.6	8.1	598	10.9
	4-May-07	11.0	8.2	582	
	11-May-07	10.7	8.0	677	
	18-May-07	10.6	8.1	667	11.1
	25-May-07	11.7	7.9	645	10.6
	1-Jun-07	14.6	8.0	676	7.3
	8-Jun-07	15.4	8.1	757	9.4
	14-Jun-07	14.0	8.2	768	9.2
	29-Jun-07	15.9	8.0	706	8.2
	6-Jul-07	15.5	7.9	745	9.4
	20-Jul-07	15.0	7.6	751	9.0
	27-Jul-07	14.6	7.5	694	7.6
	17-Aug-07	14.4	7.5	797	7.3
	24-Aug-07	17.4	7.9	810	6.2
	30-Aug-07	15.4	7.9	813	7.5
	7-Sep-07	16.3	7.5	822	7.6
	14-Sep-07	13.9	7.5	782	7.3
	21-Sep-07	15.4	7.8	793	8.1
	28-Sep-07	13.6	8.5	820	8.2
	5-Oct-07	13.6	7.5	884	8.1
	19-Oct-07	13.9	7.7	803	7.7
	26-Oct-07	11.9	7.2	801	7.6
	2-Nov-07	10.1	7.6	836	8.7
	9-Nov-07	8.4	7.5	819	9.0
	16-Nov-07	6.9	7.4	862	9.7
	23-Nov-07	4.7	7.9	863	10.0
	7-Dec-07	3.9	7.9	784	10.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Dec-07	4.0	7.8	781	10.9
	20-Dec-07	3.8	7.7	769	10.8
	28-Dec-07	5.3	6.8		7.7
	4-Jan-08	2.3	7.0	832	11.4
	11-Jan-08	3.5	7.3	719	10.3
	18-Jan-08	1.2	6.9	684	12.4
	25-Jan-08	1.2	8.0	689	12.6
	1-Feb-08	1.3	7.2	706	12.2
	8-Feb-08	2.6	6.9	735	12.1
	15-Feb-08	1.7	6.6	728	12.5
	22-Feb-08	2.0	6.9	731	
	29-Feb-08	1.9	7.0	738	
	7-Mar-08	2.3	7.0	721	13.2
	14-Mar-08	2.4	6.6	713	
	20-Mar-08	2.4	7.6	711	13.4
	28-Mar-08	3.4	7.3	592	
	4-Apr-08	3.9	7.1	629	12.5
	11-Apr-08	3.0	7.2	496	11.5
	15-Apr-08	6.5	7.1	563	
	18-Apr-08	6.0	6.8	374	
	25-Apr-08	9.2	7.7	581	8.8
	2-May-08	7.8	6.7	607	8.8
	8-May-08	8.7	7.1	651	11.4
	15-May-08	13.1	7.7	663	10.4
	23-May-08	10.4	7.5	610	9.4
	30-May-08	10.8	7.1	723	8.1
	6-Jun-08	17.0	7.1	748	6.8
	13-Jun-08	13.9	6.7	693	6.5
	27-Jun-08	14.4	7.1	815	7.9
	18-Jul-08	16.5	7.2	857	5.4
	25-Jul-08	16.2	7.5	891	5.1
	1-Aug-08	17.2	7.5	845	4.9
	15-Aug-08	16.3	6.8	949	5.2
	28-Aug-08	16.4	7.6		6.2
	5-Sep-08	17.2	7.8	864	6.2
	12-Sep-08	15.3	7.8	869	4.9
	26-Sep-08	14.0	7.6	870	5.1
	3-Oct-08	10.4	7.5	863	6.7
	10-Oct-08	11.2	7.2	864	7.0
	17-Oct-08	9.6	7.2	800	5.6
	24-Oct-08	7.7	7.8	804	5.9
	31-Oct-08	7.5	7.8	815	5.4
	2-Nov-08	9.2	6.7	478	7.0
	9-Nov-08	8.3	7.8	678	7.1
	16-Nov-08	1.2	7.4	828	10.7
	23-Nov-08	3.4		647	7.5
	30-Nov-08	1.2		487	12.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	7-Dec-08	3.1		738	9.1
	19-Dec-08	1.2	7.4	639	8.7
	23-Dec-08	2.5	8.1	649	9.5
	29-Dec-08	0.5	8.3	549	12.2
	9-Jan-09	1.3		616	9.7
	16-Jan-09	0.7	8.1	684	10.0
	23-Jan-09	1.3	8.1	657	7.4
	30-Jan-09	2.1	8.1	663	8.8
	13-Feb-09	1.1	8.2	578	7.6
	20-Feb-09	2.0	8.3	606	
	27-Feb-09	2.9	8.1	570	
	6-Mar-09	4.7		556	12.1
	13-Mar-09	0.6	8.5	557	
	20-Mar-09	2.5	8.4	540	
	27-Mar-09	4.2	7.4	624	
	3-Apr-09	5.7	7.7	588	
	9-Apr-09	3.1	7.8	535	
	17-Apr-09	6.4	8.3	590	
	24-Apr-09	7.4	8.2	585	
	1-May-09	10.9	8.5	435	10.8
	8-May-09	11.8	7.9	564	9.4
	15-May-09	11.5	8.1	483	10.5
	22-May-09	10.9	8.1	511	9.0
	29-May-09	11.0	7.4	621	9.9
	5-Jun-09	11.6	7.9	582	10.1
	12-Jun-09	12.5	8.0	556	9.5
	19-Jun-09	12.7	7.7	1277	9.8
	26-Jun-09	16.0	8.3	707	10.0
	2-Jul-09	13.9	7.6	621	8.8
	10-Jul-09	14.0		1179	8.5
	17-Jul-09	13.2	8.9	713	8.0
	24-Jul-09	14.8	7.9	738	9.4
	31-Jul-09	14.7	7.6	760	6.8
	7-Aug-09	14.4	7.7	776	6.5
	14-Aug-09	15.7	8.3	729	7.8
	21-Aug-09	16.6	8.4	820	4.6
	28-Aug-09	14.5	8.4	746	8.3
	2-Oct-09	10.8	8.1	858	
	9-Oct-09	11.0	6.4	881	10.6
	16-Oct-09	6.1	7.8	861	11.5
	23-Oct-09	7.8	6.7	776	11.1
	30-Oct-09	9.0	7.5	795	10.5
	6-Nov-09	7.1	6.4	793	
	13-Nov-09	7.1	7.3	860	
	20-Nov-09	7.0	7.3	731	11.9
	27-Nov-09	6.4	7.6	747	11.5
	11-Dec-09	1.4	7.7	632	11.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Dec-09	2.4	7.4	765	12.3
	22-Dec-09	3.0	7.9	734	13.6
	28-Dec-09	2.8	7.6	793	11.5
	8-Jan-10	2.2	7.8	694	12.1
	15-Jan-10	3.8	7.7	744	10.8
	22-Jan-10	2.3	8.1	768	12.2
	29-Jan-10	0.5	7.8	781	12.2
	5-Feb-10	3.1	6.5	494	11.6
	12-Feb-10	3.2	7.0	486	11.6
	19-Feb-10	2.0	8.2	586	11.8
	1-Mar-10	3.2	7.3	647	11.8
	5-Mar-10	5.6	7.4	631	11.4
	12-Mar-10	5.0	7.3	707	12.2
	19-Mar-10	8.8	7.5	667	12.5
	26-Mar-10	3.1	7.1	565	12.6
	2-Apr-10	8.4	6.9	569	12.0
	9-Apr-10	6.7	7.4	659	12.8
	16-Apr-10	10.2	8.0	500	11.2
	23-Apr-10	9.0	8.0	471	11.5
	30-Apr-10	9.9	7.9	464	10.7
	7-May-10	10.2	8.0	456	11.4
	14-May-10	10.2	7.8	389	9.1
	21-May-10	11.9	7.9	513	10.0
	28-May-10	15.4	7.9	503	8.8
	4-Jun-10	13.7	7.8	549	6.5
	11-Jun-10	13.4	7.9	476	6.7
	18-Jun-10	14.4	7.9	587	11.2
	25-Jun-10	14.4	7.9	560	9.4
	1-Jul-10	13.4	7.8	508	8.7
	9-Jul-10	18.4	7.6	545	8.3
	15-Jul-10	19.3	7.8	689	7.7
	23-Jul-10	17.8	7.1	606	8.4
	30-Jul-10	16.7	7.8	530	8.3
	24-Sep-10	16.2	7.9	-	7.2
	1-Oct-10	12.1	7.7	611	7.1
	8-Oct-10	11.2	7.7	599	7.6
	15-Oct-10	11.2	7.6	569	7.6
	22-Oct-10	6.9	7.8	566	9.4
	29-Oct-10	7.8	7.8	490	9.1
	5-Nov-10	4.1	7.9	453	9.4
	12-Nov-10	6.3	7.8	588	9.6
	19-Nov-10	4.8	8.0	474	11.4
	26-Nov-10	3.1	7.9	428	11.4
	3-Dec-10	2.8	7.8	428	10.2
	9-Dec-10	0.5	7.8	352	15.4
	17-Dec-10	0.5	7.6	335	12.0
	23-Dec-10	1.9	8.1	380	11.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	30-Dec-10	3.3	7.9	431	10.9
	7-Jan-11	1.8	7.8	369	12.1
	14-Jan-11	2.7	7.8	356	11.8
	21-Jan-11	1.3	7.7	355	11.0
	28-Jan-11	3.1	8.0	392	11.2
	4-Feb-11	0.4	7.9	335	11.6
	11-Feb-11	2.1	7.7	411	11.5
	18-Feb-11	3.0	7.7	379	12.3
	25-Feb-11	3.0	7.8	388	12.1
	4-Mar-11	2.5	7.7	371	12.3
	11-Mar-11	0.7	7.7	304	12.6
	18-Mar-11	2.7	7.8	266	15.1
	25-Mar-11	4.8	7.9	398	13.2
	1-Apr-11	4.3	7.8	359	12.0
	8-Apr-11	4.2	7.6	359	12.4
	15-Apr-11	4.4	7.7	288	10.4
	21-Apr-11	4.2	8.1	366	12.3
	29-Apr-11	5.7	7.2	372	-
	6-May-11	7.7	8.2	318	10.4
	13-May-11	10.6	8.0	485	11.9
	20-May-11	11.5	8.0	399	10.1
	27-May-11	10.3	8.0	387	8.4
	3-Jun-11	13.9	7.9	459	8.0
	10-Jun-11	14.5	7.8	534	8.5
	17-Jun-11	13.8	7.9	483	9.6
	24-Jun-11	15.1	7.8	571	7.2
	30-Jun-11	14.9	7.7	507	10.0
	16-Sep-11	12.0	8.1	529	8.3
	6-Oct-11	10.6	8.0	692	9.0
	21-Oct-11	9.4	8.0	593	9.6
	28-Oct-11	8.6	8.3	492	9.9
	4-Nov-11	7.9	8.1	518	10.1
	11-Nov-11	5.9	7.6	558	4.8
	18-Nov-11	5.7	7.5	547	11.0
	25-Nov-11	6.8	7.5	557	9.6
	2-Dec-11	5.1	8.1	484	11.6
	9-Dec-11	4.8	7.4	424	9.8
	16-Dec-11	4.0	7.6	396	12.8
	23-Dec-11	3.5	7.5	369	4.8
	30-Dec-11	3.5	9.2	355	11.3
	6-Jan-12	4.0	7.5	432	13.7
	13-Jan-12	2.9	8.1	344	-
	20-Jan-12	2.2	8.0	344	10.5
	27-Jan-12	8.4	8.1	309	12.8
	3-Feb-12	3.6	7.9	274	11.2
	10-Feb-12	2.6	7.9	308	13.7
	17-Feb-12	3.5	7.7	370	14.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	24-Feb-12	1.0	8.1	320	14.2
	1-Mar-12	2.6	7.8	359	-
	9-Mar-12	1.4	8.0	212	12.9
	16-Mar-12	4.4	7.5	300	10.9
	23-Mar-12	10.5	7.6	-	6.3
	30-Mar-12	5.2	8.0	369	12.4
	6-Apr-12	7.7	8.3	420	6.1
	13-Apr-12	6.4	8.0	408	9.0
	20-Apr-12	8.5	8.0	452	7.9
	27-Apr-12	4.5	8.4	350	12.4
	4-May-12	12.4	8.0	482	6.9
	11-May-12	9.2	7.8	285	9.5
	18-May-12	10.8	7.9	492	7.5
	25-May-12	14.8	7.3	570	6.7
	1-Jun-12	11.0	7.8	4.93	6.1
	8-Jun-12	14.0	8.2	547	7.8
	15-Jun-12	14.7	8.0	633	5.9
	22-Jun-12	16.2	7.9	664	6.4
	28-Jun-12	16.6	8.1	660	6.4
	6-Jul-12	17.9	8.0	769	5.6
	10-Aug-12	16.2	8.1	542	5.8
	17-Aug-12	16.3	8.2	520	5.7
	31-Aug-12	18.0	7.6	749	6.7
	14-Sep-12	14.8	7.4	661	5.5
	28-Sep-12	10.6	6.8	723	8.3
	5-Oct-12	13.5	7.3	808	8.6
	12-Oct-12	7.4	7.8	638	10.0
	19-Oct-12	10.8	8.5	613	7.2
	26-Oct-12	10.7	7.0	615	9.2
	2-Nov-12	4.2	5.8	567	6.6
	9-Nov-12	5.0	6.3	444	9.8
	16-Nov-12	5.4	7.2	541	9.1
	23-Nov-12	7.5	7.6	511	7.5
	30-Nov-12	5.3	8.7	515	5.0
	7-Dec-12	5.3	7.6	536	6.6
	14-Dec-12	3.8	8.3	462	9.1
	21-Dec-12	4.2	7.6	494	10.2
	28-Dec-12	3.8	7.5	434	12.1
	4-Jan-13	2.1	7.6	4.65	9.9
	11-Jan-13	3.7	7.7	547	9.1
	17-Jan-13	2.3	7.7	463	10.6
	25-Jan-13	1.6	7.7	458	4.5
	1-Feb-13	0.4	7.9	308	11.7
	8-Feb-13	0.7	7.6	322	13.4
	15-Feb-13	2.4	7.6	653	12.2
	22-Feb-13	2.0	7.3	335	8.6
	1-Mar-13	1.9	7.6	484	9.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	8-Mar-13	5.2	7.9	381	12.1
	15-Mar-13	2.0	-	-	-
	22-Mar-13	2.1	7.8	405	12.5
	28-Mar-13	4.8	7.9	370	11.5
	5-Apr-13	3.0	7.9	358	6.5
	12-Apr-13	2.9	7.4	382	3.8
	19-Apr-13	7.5	7.5	219	6.7
	26-Apr-13	4.8	7.6	288	9.3
	3-May-13	13.4	7.6	389	8.3
	9-May-13	10.4	7.8	439	9.5
	16-May-13	10.0	7.9	408	7.3
	24-May-13	8.2	7.7	439	8.2
	31-May-13	15.2	7.9	490	8.4
	7-Jun-13	10.2	-	411	6.5
	14-Jun-13	15.1	7.9	497	6.4
	21-Jun-13	13.1	7.9	530	7.7
	27-Jun-13	15.8	7.9	486	8.2
	5-Jul-13	14.9	7.7	584	7.8
	12-Jul-13	16.4	7.7	621	5.2
	19-Jul-13	19.7	7.7	621	5.2
	25-Jul-13	14.4	7.6	570	7.9
	2-Aug-13	16.3	8.1	587	9.0
	8-Aug-13	16.4	7.5	538	8.4
	16-Aug-13	13.8	7.9	621	4.9
	23-Aug-13	-	-	-	-
	30-Aug-13	14.3	7.9	613	4.8
	6-Sep-13	13.4	7.8	598	5.0
	13-Sep-13	12.5	8.4	530	8.1
	20-Sep-13	15.1	8.3	556	4.1
	27-Sep-13	11.8	7.9	491	6.9
	4-Oct-13	10.2	7.8	483	5.9
	11-Oct-13	9.2	7.6	458	3.9
	18-Oct-13	9.2	7.5	426	4.0
	25-Oct-13	7.3	7.6	438	4.3
	31-Oct-13	9.7	7.6	421	4.3
	8-Nov-13	7.0	7.4	403	4.5
	14-Nov-13	2.9	7.4	415	4.1
	22-Nov-13	3.5	7.4	405	4.1
	29-Nov-13	3.9	8.4	393	7.5
	6-Dec-13	3.0	7.8	340	5.4
	13-Dec-13	7.6	8.3	256	4.6
	19-Dec-13	3.5	8.8	386	6.3
	27-Dec-13	2.9	8.6	382	5.2
	3-Jan-14	0.9	8.5	360	3.2
	10-Jan-14	-0.9	7.5	360	4.1
	17-Jan-14	1.5	8.1	356	4.3
	24-Jan-14	0.8	7.5	369	11.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	31-Jan-14	1.7	7.1	398	4.0
	7-Feb-14	0.6	7.1	382	3.9
	14-Feb-14	1.9	7.4	254	4.4
	21-Feb-14	2.0	7.1	399	9.1
	7-Mar-14	0.1	7.4	389	7.8
	14-Mar-14	1.5	6.5	408	11.9
	21-Mar-14	1.4	7.3	408	3.8
	28-Mar-14	3.7	7.4	421	11.5
	4-Apr-14	3.2	7.8	403	11.2
	11-Apr-14	1.7	7.8	297	9.7
	17-Apr-14	3.8	7.7	485	9.0
	25-Apr-14	3.6	7.6	480	7.0
	1-May-14	4.2	7.5	473	5.8
	9-May-14	11.1	7.8	425	10.4
	16-May-14	10.2	7.2	328	10.3
	23-May-14	11.0	7.2	382	10.1
	30-May-14	11.0	7.3	375	10.0
	6-Jun-14	11.0	7.2	392	8.0
	13-Jun-14	11.2	7.2	402	8.1
	20-Jun-14	12.5	7.2	412	8.1
	27-Jun-14	12.5	7.2	423	8.1
	4-Jul-14	12.7	7.5	481	7.4
	11-Jul-14	14.3	7.3	424	6.9
	18-Jul-14	13.2	8.4	598	-
	25-Jul-14	13.1	8.7	603	-
	1-Aug-14	13.9	8.5	485	6.2
	8-Aug-14	13.8	8.5	460	6.2
	15-Aug-14	12.2	8.5	423	6.2
	22-Aug-14	14.3	8.8	693	-
	29-Aug-14	14.0	8.7	682	-
	5-Sep-14	16.3	8.9	717	-
	12-Sep-14	11.8	7.5	645	6.9
	19-Sep-14	9.2	7.9	422	6.1
	26-Sep-14	10.7	7.9	429	6.4
	3-Oct-14	13.8	7.7	473	6.0
	10-Oct-14	10.1	7.5	470	6.3
	16-Oct-14	12.8	7.9	666	6.3
	24-Oct-14	7.2	8.0	571	6.5
	31-Oct-14	6.0	7.9	423	6.0
	7-Nov-14	0.5	7.3	456	6.9
	14-Nov-14	-1.9	7.3	446	6.6
	20-Nov-14	-2.6	7.2	420	6.2
	28-Nov-14	-1.0	7.3	423	7.0
	5-Dec-14	0.3	7.3	425	4.3
	12-Dec-14	0.9	7.2	467	6.9
	19-Dec-14	-1.0	7.2	453	6.9
	26-Dec-14	1.9	7.3	413	6.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	2-Jan-15	-0.9	7.2	418	7.0
	14-Jan-15	-0.4	7.2	428	6.3
	23-Jan-15	-0.3	7.1	420	6.3
	30-Jan-15	0.0	8.1	283	11.9
	6-Feb-15	1.0	8.1	570	12.5
	12-Feb-15	0.0	7.9	545	11.9
	27-Feb-15	1.5	8.0	577	120.1
	6-Mar-15	1.4	8.1	576	12.6
	13-Mar-15	6.4	8.1	569	11.9
	20-Mar-15	7.2	8.0	364	11.9
	26-Mar-15	4.4	8.1	331	12.3
	2-Apr-15	8.3	7.9	369	10.8
	10-Apr-15	5.2	7.8	260	9.5
	17-Apr-15	7.8	8.4	353	-
	23-Apr-15	3.6	8.1	369	14.2
	1-May-15	9.8	7.7	482	7.5
	8-May-15	18.5	9.1	555	-
	15-May-15	11.9	7.6	437	7.7
	21-May-15	11.0	7.7	432	9.4
	28-May-15	16.1	7.7	519	7.3
	4-Jun-15	15.2	7.6	519	7.3
	12-Jun-15	13.1	7.5	551	5.1
	18-Jun-15	18.4	7.5	517	5.7
	26-Jun-15	26.0	8.1	617	-
	1-Jul-15	15.2	7.8	463	-
	10-Jul-15	18.5	7.7	595	-
	17-Jul-15	12.7	8.1	558	-
	22-Jul-15	14.5	7.8	665	-
	30-Jul-15	23.9	8.1	749	-
	5-Aug-15	15.4	7.4	564	6.0
	13-Aug-15	13.2	7.6	647	5.7
	21-Aug-15	17.4	7.3	608	4.7
	28-Aug-15	-	8.2	598	-
	3-Sep-15	16.5	7.6	741	5.9
	10-Sep-15	18.2	7.6	705	5.6
	25-Sep-15	14.0	7.6	640	7.6
	2-Oct-15	7.6	7.5	522	8.2
	9-Oct-15	10.7	7.3	558	6.2
	16-Oct-15	8.5	7.7	514	8.6
	23-Oct-15	7.1	7.6	523	9.4
	30-Oct-15	7.1	7.5	480	10.8
	5-Nov-15	10.9	7.8	572	7.6
	10-Nov-15	4.3	7.5	468	9.3
	13-Nov-15	5.2	7.3	432	6.7
	19-Nov-15	9.1	7.7	586	13.0
	26-Nov-15	0.8	7.3	443	11.1
	4-Dec-15	2.3	7.6	482	15.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	10-Dec-15	5.7	7.6	538	12.8
	17-Dec-15	3.7	7.8	420	11.5
	23-Dec-15	5.1	7.6	445	13.9
	30-Dec-15	0.5	7.4	391	10.4
	8-Jan-16	1.5	7.4	410	11.9
	14-Jan-16	0.2	7.2	383	10.8
	22-Jan-16	-0.1	7.3	431	9.8
	29-Jan-16	-0.1	7.2	401	8.8
	5-Feb-16	0.5	7.4	392	11.5
	11-Feb-16	-0.1	7.3	416	8.7
	18-Feb-16	0.2	7.3	407	11.0
	25-Feb-16	-0.2	7.5	255	6.4
	4-Mar-16	0.1	7.1	376	9.1
	10-Mar-16	0.5	7.3	244	9.4
	18-Mar-16	1.3	7.7	299	10.6
	28-Mar-16	4.4	7.3	189	9.4
	7-Apr-16	1.2	7.3	254	10.1
	15-Apr-16	2.9	7.4	265	11.9
	22-Apr-16	10.8	7.9	434	6.7
	29-Apr-16	5.5	8.0	380	10.8
	6-May-16	10.1	8.0	460	7.0
	13-May-16	14.5	7.7	598	-
	20-May-16	14.8	7.8	616	9.0
	27-May-16	17.3	7.5	602	2.7
	2-Jun-16	16.9	7.5	593	2.3
	10-Jun-16	10.6	7.6	696	4.6
	17-Jun-16	14.8	7.5	655	3.9
	24-Jun-16	13.2	7.4	521	4.1
	28-Jun-16	16.6	7.5	667	3.8
	5-Jul-16	17.4	7.6	665	6.6
	8-Jul-16	19.2	7.6	648	4.3
	15-Jul-16	18.7	7.6	623	4.1
	22-Jul-16	20.0	7.4	820	3.7
	29-Jul-16	17.9	7.6	744	4.2
	5-Aug-16	20.6	7.5	747	2.4
	19-Aug-16	17.4	7.6	595	2.7
	26-Aug-16	18.3	7.4	781	2.7
	2-Sep-16	15.3	7.1	653	3.8
	9-Sep-16	17.7	7.4	619	3.0
	16-Sep-16	10.9	7.7	618	5.6
	21-Sep-16	15.7	7.1	635	5.8
	30-Sep-16	11.9	7.4	620	4.8
	7-Oct-16	14.0	7.4	657	5.5
	13-Oct-16	10.4	7.0	506	6.1
	19-Oct-16	13.6	7.6	676	9.0
	27-Oct-16	1.5	7.2	418	10.4
	3-Nov-16	8.0	7.7	556	8.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-Nov-16	4.8	7.3	450	10.2
	18-Nov-16	5.7	7.3	789	8.0
	24-Nov-16	0.1	7.2	412	10.8
	2-Dec-16	1.9	7.9	373	7.9
	7-Dec-16	0.1	7.6	364	7.9
	16-Dec-16	0.0	7.5	518	8.7
	20-Jan-17	0.1	7.4	405	8.1
	26-Jan-17	-0.9	7.5	400	6.7
	19-Apr-17	11.5	7.4	457	12.8
	16-May-17	11.4	7.9	636	7.9
	28-Jun-17	17.3	7.6	620	3.2
	18-Jul-17	20.2	7.4	737	2.5
	15-Aug-17	16.1	7.8	557	1.2
	18-Sep-17	16.3	6.6	735	2.2
	18-Oct-17	8.3	7.7	525	4.3
	15-Nov-17	0.7	7.7	447	10.4
	22-Feb-18	-0.2	7.3	220	8.7
	20-Mar-18	7.0	7.6	361	10.7
	18-Apr-18	-0.5	7.9	518	4.8
	15-May-18	13.2	7.5	570	4.9
	18-Jun-18	18.4	7.3	660	2.3
	19-Jul-18	17.5	7.2	735	1.8
	23-Aug-18	15.5	7.4	606	1.9
	19-Sep-18	14.9	7.5		4.0
	24-Oct-18	2.4	7.5	694	7.5
SW 2					
	22-May-03	8.0			
	12-Feb-04	5.4		394	11.6
	19-Mar-04	5.1		571	9.3
	7-May-04	8.8	7.5	406	
	14-May-04	8.6	7.6	419	
	20-May-04	7.3	7.6	409	
	28-May-04	7.1	7.5	358	
	4-Jun-04	9.0	7.5	393	
	11-Jun-04	9.3	7.6	425	
	17-Jun-04	8.2	7.4	410	
	24-Jun-04	9.9	7.7	442	11.2
	1-Jul-04	9.8	7.6	439	10.5
	16-Jul-04	10.0	7.5	458	10.2
	22-Jul-04	14.6	7.6		8.5
	29-Jul-04	10.3	7.6	422	
	6-Aug-04	13.6	7.8	491	10.1
	12-Aug-04	10.2	7.6	445	
	19-Aug-04	10.8	7.5	463	10.8
	26-Aug-04	13.7		478	
	3-Sep-04	13.7	7.6	426	7.7
	9-Sep-04	11.7	8.0	460	9.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Sep-04	10.9	7.4	450	8.1
	23-Sep-04	13.2	7.4	481	6.8
	1-Oct-04	11.6	7.4	469	7.3
	7-Oct-04	12.2	7.3	468	7.2
	14-Oct-04	10.6	7.4	446	8.0
	20-Oct-04	9.7	7.4	447	7.4
	28-Oct-04	9.8	7.3	509	6.9
	4-Nov-04	7.5	7.5	390	10.0
	11-Nov-04	8.2	7.3	435	7.8
	19-Nov-04	8.5	7.2	460	7.6
	25-Nov-04	6.0	7.3	454	7.7
	2-Dec-04	4.5	7.3	419	10.1
	9-Dec-04	6.0	7.6	427	10.8
	5-Jan-05	6.3	7.4	404	11.5
	13-Jan-05	6.1	7.2	375	11.5
	10-Feb-05	6.1	7.4	411	
	16-Feb-05	6.4	7.8	406	12.2
	24-Feb-05	4.4	8.0	398	
	3-Mar-05	4.4	7.6	392	
	10-Mar-05	6.9	7.5	430	12.0
	17-Mar-05	6.5	7.5	404	12.4
	24-Mar-05	7.4	7.5	449	11.8
	30-Mar-05	7.7	7.6	521	11.9
	7-Apr-05	4.8	7.3	406	12.3
	15-Apr-05	5.8	7.1	341	12.5
	21-Apr-05	7.0	7.0	323	11.7
	29-Apr-05	6.0	7.3	329	12.1
	6-May-05	8.1	6.8	506	
	13-May-05	6.4	8.6	377	12.1
	20-May-05	7.1	7.7	392	12.1
	27-May-05	8.9	6.6	420	
	3-Jun-05	9.7	6.9	443	
	10-Jun-05	10.3	7.1	449	
	17-Jun-05	8.6	6.8	472	10.9
	24-Jun-05	13.1	7.1	511	
	30-Jun-05	11.2	7.0	487	
	7-Jul-05	10.7	5.0	454	9.9
	15-Jul-05	12.8	6.9	674	9.7
	21-Jul-05	14.8	6.3	959	9.3
	28-Jul-05	11.1	7.3	874	9.4
	2-Aug-05	12.4	8.8	511	9.4
	12-Aug-05	12.5	7.7	798	
	19-Aug-05	12.2	7.6	488	9.5
	24-Aug-05	11.1	7.4	480	9.3
	1-Sep-05	12.0		475	8.9
	9-Sep-05	11.8	6.7	473	8.0
	16-Sep-05	13.1	7.3	555	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Sep-05	12.4	7.5	505	7.5
	30-Sep-05	12.2	7.5	520	7.9
	7-Oct-05	11.5	7.6	657	
	14-Oct-05	12.0	7.6	535	7.9
	21-Oct-05	10.5	8.4	510	8.4
	28-Oct-05	9.5	7.5	541	8.4
	4-Nov-05	10.6	7.5	552	7.9
	11-Nov-05	9.5	7.6	549	7.3
	18-Nov-05	5.4	7.6	777	
	25-Nov-05	6.8	7.5	506	7.2
	2-Dec-05	5.9	8.6	467	10.0
	9-Dec-05	5.3	8.7	447	10.0
	16-Dec-05	5.0	7.8	484	10.9
	22-Dec-05	4.0	8.0	469	11.6
	6-Jan-06	5.3	7.8	426	
	13-Jan-06	7.4	7.7	443	10.9
	20-Jan-06	6.7	7.5	428	11.4
	27-Jan-06	6.3	6.9	441	12.0
	3-Feb-06	6.4	7.7	421	11.6
	10-Feb-06	6.1	7.9	419	
	20-Feb-06	6.2	8.8	422	
	24-Feb-06	4.4	7.9	397	
	3-Mar-06	4.3	8.3	410	
	10-Mar-06	5.5	6.9	419	11.6
	17-Mar-06	4.8	7.4	364	12.2
	24-Mar-06	5.9	7.9	378	
	31-Mar-06	7.3	7.7	517	
	7-Apr-06	5.3	7.7	461	
	10-Apr-06	7.5	7.8	460	
	13-Apr-06	7.4	7.7	439	
	21-Apr-06	7.6	7.8	466	
	26-Apr-06	6.6	8.4	493	
	5-May-06	8.2	7.8	507	
	12-May-06	8.9	8.1	605	
	19-May-06	8.4	7.6	572	
	25-May-06	7.9	7.8	594	
	2-Jun-06	7.9	8.0	591	
	9-Jun-06	9.3	7.8	480	
	16-Jun-06	9.6	7.7	570	
	23-Jun-06	9.8	7.6	613	
	30-Jun-06	11.2	8.7	623	
	7-Jul-06	13.9	8.2	554	
	14-Jul-06	12.0	7.8	546	
	21-Jul-06	15.9	7.8	563	
	28-Jul-06	17.4	7.7	598	
	4-Aug-06	17.3	7.9	551	
	11-Aug-06	11.7	8.2	526	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Aug-06	13.9	7.3	549	
	25-Aug-06	12.8	7.3	542	
	1-Sep-06	14.2	7.2	542	
	8-Sep-06	14.1	7.4	563	
	15-Sep-06	12.3	7.1	575	
	21-Sep-06	11.2	7.4	595	
	28-Sep-06	10.5	7.2	617	
	6-Oct-06	11.5	7.3	634	
	13-Oct-06	7.3	7.1	643	
	20-Oct-06	9.0	7.3	668	
	26-Oct-06	9.0	7.7	711	
	3-Nov-06	8.1	7.6	634	11.0
	10-Nov-06	9.2	7.3	588	
	17-Nov-06	8.3	7.5	595	10.4
	24-Nov-06	7.6	7.7	582	11.6
	4-Dec-06	7.1	7.6	588	11.9
	8-Dec-06	6.8	7.4	588	12.1
	14-Dec-06	7.8	7.5	602	
	21-Dec-06	7.2	7.6	604	11.9
	28-Dec-06	7.4	7.6	619	11.5
	5-Jan-07	7.5	7.6	620	11.0
	12-Jan-07	6.8	7.6	587	11.1
	19-Jan-07	5.2	7.8	580	12.1
	26-Jan-07	4.4	8.1	584	11.1
	2-Feb-07	5.5	8.0	559	
	9-Feb-07	5.7	8.0	510	
	16-Feb-07	4.3	8.0	576	12.6
	22-Feb-07	5.4	8.1	575	11.8
	2-Mar-07	5.3	8.7	568	
	9-Mar-07	4.4	8.0	479	12.7
	16-Mar-07	6.0	7.0	521	11.9
	23-Mar-07	5.6	7.6	532	
	30-Mar-07	5.6	7.7	492	12.6
	5-Apr-07	5.1	7.1	520	12.5
	13-Apr-07	5.2	7.8	549	
	20-Apr-07	7.1	7.8	493	
	28-Apr-07	6.5	8.0	517	
	4-May-07	7.1	7.6	470	
	11-May-07	7.4	7.6	549	
	18-May-07	8.0	8.2	555	
	25-May-07	8.8	7.9	510	
	1-Jun-07	9.5	7.9	524	
	8-Jun-07	9.7	7.6	603	10.7
	14-Jun-07	8.6	7.6	597	11.0
	22-Jun-07	8.2	7.6	554	10.6
	29-Jun-07	13.5	8.4	547	9.4
	6-Jul-07	11.5	8.0	584	10.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	13-Jul-07	10.9	8.9	575	9.6
	20-Jul-07	11.0	8.4	629	10.4
	27-Jul-07	11.1	7.4	530	9.3
	3-Aug-07	13.1	7.6	562	8.3
	10-Aug-07	11.7	7.3	556	8.9
	17-Aug-07	11.2	7.3	615	8.5
	24-Aug-07	13.4	7.9	598	7.8
	30-Aug-07	12.7	7.7	624	7.4
	7-Sep-07	12.9	7.4	629	6.4
	14-Sep-07	11.9	7.2	630	7.6
	21-Sep-07	12.1	8.4	619	7.4
	28-Sep-07	12.3	8.5	615	6.4
	5-Oct-07	12.2	7.1	671	2.5
	12-Oct-07	10.6	7.1	687	7.4
	19-Oct-07	12.4	7.7	669	6.2
	26-Oct-07	12.0	7.7	670	6.4
	2-Nov-07	10.9	7.3	732	5.8
	9-Nov-07	9.1	7.3	752	7.0
	16-Nov-07	8.0	7.1	852	7.7
	23-Nov-07	3.8	8.2	781	10.5
	7-Dec-07	5.2	8.2	640	11.1
	14-Dec-07	4.6	8.0	646	11.6
	28-Dec-07	6.6	6.4		9.7
	4-Jan-08	4.8	7.0	612	12.5
	11-Jan-08	5.6	7.1	418	12.0
	18-Jan-08	5.0	7.1	525	12.2
	25-Jan-08	5.2	7.7	517	11.9
	1-Feb-08	5.0	7.3	533	11.7
	8-Feb-08	5.7	6.8	563	11.9
	15-Feb-08	4.9	7.3	564	
	22-Feb-08	5.5	7.2	535	
	29-Feb-08	4.1	7.0	511	
	7-Mar-08	5.3	6.8	454	
	14-Mar-08	5.1	6.0	552	
	20-Mar-08	5.1	7.7	578	11.9
	28-Mar-08	5.3	7.3	485	
	4-Apr-08	4.7	6.9	476	12.5
	11-Apr-08	4.4	6.9	412	12.9
	15-Apr-08	5.5	7.7	427	12.2
	15-Apr-08	5.5	7.7	427	12.2
	18-Apr-08	6.1	6.5	434	10.1
	25-Apr-08	6.5	8.3	463	11.1
	2-May-08	6.3	7.3	560	11.4
	8-May-08	6.4	6.7	544	
	15-May-08	9.8	7.4	551	10.5
	23-May-08	7.6	8.0	497	9.4
	30-May-08	13.7	6.7	700	7.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	6-Jun-08	11.9	6.7	611	7.6
	13-Jun-08	9.0	6.2	518	9.2
	20-Jun-08	8.7	8.2	540	8.6
	27-Jun-08	9.3	6.7	587	8.1
	4-Jul-08	9.2	7.4	609	7.5
	11-Jul-08	9.9	6.9	565	8.9
	18-Jul-08	10.7	7.2	593	6.8
	25-Jul-08	9.4	7.9	628	7.1
	1-Aug-08	10.2	7.8	580	7.0
	8-Aug-08	10.8	7.3	599	6.2
	15-Aug-08	9.6	7.1	657	7.0
	22-Aug-08	12.9	6.1	651	5.2
	28-Aug-08	10.5	6.9		8.8
	5-Sep-08	11.6	7.5	570	7.8
	12-Sep-08	11.0	7.6	575	6.2
	19-Sep-08	9.8	7.9	401	5.6
	26-Sep-08	10.0	7.5	585	5.8
	3-Oct-08	9.0	7.2	604	8.6
	10-Oct-08	9.2	7.3	598	8.7
	17-Oct-08	8.7	7.4	536	6.0
	24-Oct-08	7.9	7.7	549	6.2
	31-Oct-08	8.6	8.4	520	7.1
	7-Nov-08	9.5	6.6	526	9.2
	14-Nov-08	9.2	7.3	475	9.0
	12-Dec-08	6.7	8.7	548	9.4
	23-Dec-08	4.5	7.8	475	7.9
	29-Dec-08	5.1	7.6	449	9.9
	16-Jan-09	4.7	7.8	542	9.7
	23-Jan-09	5.5	7.8	530	8.9
	30-Jan-09	4.9	8.0	526	9.1
	6-Feb-09	4.8		477	9.6
	13-Feb-09	5.0	7.8	444	6.2
	20-Feb-09	5.1	8.0	476	
	27-Feb-09	4.5	7.9	515	
	6-Mar-09	6.0		503	
	13-Mar-09	4.3	7.9	441	
	20-Mar-09	4.5	7.8	442	
	27-Mar-09			544	
	3-Apr-09	5.5	7.4	493	
	9-Apr-09	4.7	7.6	458	
	17-Apr-09	5.2	7.8	513	
	24-Apr-09	5.8	7.7	507	
	1-May-09	8.2	7.3	396	11.6
	8-May-09	7.4	7.4	509	
	15-May-09	7.7	7.7	440	11.5
	22-May-09	7.0	8.1	344	11.6
	29-May-09	7.3	7.7	556	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	5-Jun-09	7.5	7.0	496	11.9
	12-Jun-09	8.5	8.2	564	11.6
	19-Jun-09	8.9	7.5	1022	11.7
	26-Jun-09	13.0	7.6	565	10.0
	2-Jul-09	8.8	7.6	490	11.3
	10-Jul-09	9.1			11.6
	17-Jul-09	9.1	9.4	544	10.2
	24-Jul-09	10.7	8.1	551	9.9
	31-Jul-09	10.1	7.7	545	10.8
	7-Aug-09	10.1	8.0	597	8.5
	14-Aug-09	10.4	9.0	554	10.4
	21-Aug-09	12.1	8.2	621	9.6
	28-Aug-09	10.7	8.5	559	9.2
	4-Sep-09	10.5	8.3	580	9.0
	11-Sep-09	11.4	8.8	538	9.0
	18-Sep-09	11.2	8.1	611	8.1
	25-Sep-09	11.3	7.4	542	9.3
	2-Oct-09	9.4	8.8	676	
	9-Oct-09	9.9	7.8	659	11.0
	16-Oct-09	6.5	8.1	636	12.2
	23-Oct-09	7.3	8.0	587	10.9
	30-Oct-09	9.2	7.9	595	11.5
	6-Nov-09	7.3	7.2	623	
	13-Nov-09	7.8	7.7	634	
	20-Nov-09	7.7	7.7	544	
	27-Nov-09	7.0	7.8	523	
	4-Dec-09	6.5	7.5	524	11.7
	11-Dec-09	4.8	7.9	483	
	18-Dec-09	4.2	7.9	561	12.1
	22-Dec-09	4.5	8.7	557	
	28-Dec-09	5.0	7.6	585	
	8-Jan-10	2.4	8.5	512	12.1
	15-Jan-10	5.5	8.8	487	12.7
	22-Jan-10	3.8	8.3	548	12.7
	29-Jan-10	3.7	8.2	581	12.7
	5-Feb-10	5.2	6.4	553	12.6
	12-Feb-10	5.3	6.6	562	12.6
	19-Feb-10	4.9	7.6	504	11.3
	1-Mar-10	4.7	8.2	377	12.4
	5-Mar-10	5.6	7.4	522	11.7
	12-Mar-10	6.2	7.9	659	12.1
	19-Mar-10	5.4	7.6	464	12.8
	26-Mar-10	4.6	7.5	423	12.6
	2-Apr-10	6.0	7.0	440	
	9-Apr-10	5.6	7.2	543	12.2
	16-Apr-10	6.5	7.6	370	12.4
	23-Apr-10	6.1	7.7	344	12.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	30-Apr-10	7.0	7.6	346	12.1
	7-May-10	7.2	7.7	348	
	14-May-10	10.0	7.7	345	11.4
	21-May-10	7.9	7.6	357	11.8
	28-May-10	9.0	7.6	339	11.8
	4-Jun-10	7.9	7.7	395	7.8
	11-Jun-10	8.1	7.6	337	8.3
	18-Jun-10	8.3	7.6	407	13.8
	25-Jun-10	8.7	7.7	391	11.5
	1-Jul-10	8.6	7.7	362	11.4
	9-Jul-10	9.8	7.7	441	10.8
	15-Jul-10	10.9	7.6	434	10.4
	23-Jul-10	10.2	7.6	449	13.5
	30-Jul-10	9.9	7.6	366	10.5
	6-Aug-10	10.3	7.7	423	
	13-Aug-10	10.5	7.6	436	7.8
	20-Aug-10	10.4	7.5	435	9.5
	27-Aug-10	10.9	7.5	306	9.6
	3-Sep-10	12.4	7.7	452	9.3
	10-Sep-10	11.3	7.6	367	9.8
	17-Sep-10	10.3	7.6	385	9.5
	24-Sep-10	12.4	7.6		9.1
	1-Oct-10	10.2	7.6	443	9.9
	8-Oct-10	10.1	7.4	446	9.1
	15-Oct-10	10.1	7.4	436	9.2
	22-Oct-10	7.8	7.6	429	10.3
	29-Oct-10	8.9	7.5	376	9.3
	5-Nov-10	7.9	7.6	477	10.3
	12-Nov-10	9.1	7.5	484	10.5
	19-Nov-10	8.6	7.7	385	10.9
	26-Nov-10	7.7	7.5	377	10.8
	3-Dec-10	7.8	7.5	399	10.1
	9-Dec-10	6.8	7.5	337	10.8
	17-Dec-10	7.1	7.7	406	11.3
	23-Dec-10	5.0	8.0	339	11.0
	30-Dec-10	7.0	7.9	385	10.5
	7-Jan-11	6.1	7.7	307	12.2
	14-Jan-11	6.3	7.5	321	11.5
	21-Jan-11	5.0	7.6	318	10.4
	28-Jan-11	5.9	7.8	333	11.3
	4-Feb-11	2.3	7.8	290	10.4
	11-Feb-11	2.3	7.8	310	10.6
	18-Feb-11	2.5	7.8	329	11.3
	25-Feb-11	4.2	7.6	316	12.3
	4-Mar-11	5.9	7.5	332	12.1
	11-Mar-11	5.0	7.5	341	12.5
	18-Mar-11	5.6	7.6	298	-

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Mar-11	5.3	7.7	356	10.8
	25-Mar-11	5.8	7.7	342	12.3
	1-Apr-11	5.4	7.4	327	12.4
	8-Apr-11	5.2	7.4	320	12.8
	15-Apr-11	5.4	7.4	249	10.8
	21-Apr-11	5.3	7.8	338	10.6
	29-Apr-11	5.5	-	328	13.2
	6-May-11	6.4	8.0	265	11.6
	13-May-11	7.6	8.0	274	11.8
	20-May-11	7.1	7.6	298	12.0
	27-May-11	7.1	-	299	12.1
	3-Jun-11	7.9	7.6	309	13.6
	10-Jun-11	7.7	8.4	362	11.3
	17-Jun-11	8.7	6.7	321	11.3
	24-Jun-11	8.7	7.6	386	12.4
	30-Jun-11	9.0	7.6	289	11.9
	8-Jul-11	10.1	7.5	400	12.0
	14-Jul-11	9.3	6.3	403	10.8
	22-Jul-11	11.3	7.8	415	13.0
	29-Jul-11	11.4	6.7	385	10.2
	5-Aug-11	12.0	6.9	416	10.5
	12-Aug-11	10.9	7.9	435	9.1
	19-Aug-11	11.4	8.0	246	8.6
	26-Aug-11	12.2	7.7	388	8.2
	2-Sep-11	3.3	7.8	398	8.7
	9-Sep-11	11.7	7.7	421	7.8
	16-Sep-11	10.5	7.6	374	7.8
	23-Sep-11	11.7	7.9	396	5.9
	30-Sep-11	11.6	8.0	416	9.6
	6-Oct-11	10.0	7.8	490	8.7
	14-Oct-11	11.9	7.8	402	7.9
	21-Oct-11	9.9	7.8	461	9.5
	28-Oct-11	9.7	9.8	433	9.6
	4-Nov-11	8.7	7.8	365	9.8
	11-Nov-11	7.9	7.6	409	4.5
	18-Nov-11	6.8	8.3	401	10.8
	25-Nov-11	7.7	7.8	410	9.8
	2-Dec-11	8.0	8.2	373	12.1
	9-Dec-11	7.9	7.6	309	9.3
	16-Dec-11	7.6	7.4	327	11.9
	23-Dec-11	6.8	8.2	299	5.1
	30-Dec-11	7.0	8.4	280	11.1
	6-Jan-12	7.4	7.4	357	12.4
	20-Jan-12	5.5	8.0	293	10.1
	27-Jan-12	6.5	8.1	265	11.9
	3-Feb-12	6.5	7.8	233	11.3
	10-Feb-12	6.0	8.1	292	11.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Feb-12	6.2	7.7	320	13.3
	24-Feb-12	4.0	8.3	273	12.4
	1-Mar-12	5.6	8.0	323	-
	9-Mar-12	6.7	7.8	283	11.3
	16-Mar-12	6.7	7.8	283	11.3
	23-Mar-12	6.3	7.3	268	12.4
	30-Mar-12	6.2	8.4	328	12.8
	6-Apr-12	7.5	8.6	363	5.6
	13-Apr-12	6.6	8.0	358	10.5
	20-Apr-12	7.4	8.1	367	9.1
	27-Apr-12	6.4	7.9	349	12.4
	4-May-12	8.3	7.9	416	9.0
	11-May-12	7.4	7.6	232	12.0
	18-May-12	8.7	7.7	356	10.0
	25-May-12	10.0	6.5	383	8.6
	1-Jun-12	7.9	7.6	334	8.3
	8-Jun-12	9.1	8.1	354	9.5
	15-Jun-12	9.6	7.6	346	8.0
	22-Jun-12	7.0	7.9	486	9.1
	28-Jun-12	10.6	7.8	547	6.8
	6-Jul-12	11.1	7.7	345	6.2
	13-Jul-12	10.7	8.3	409	6.1
	20-Jul-12	11.3	7.9	440	6.9
	27-Jul-12	11.4	7.8	465	6.5
	3-Aug-12	12.0	7.5	460	7.4
	10-Aug-12	13.1	7.7	480	7.5
	17-Aug-12	11.0	7.9	414	6.6
	24-Aug-12	11.4	7.9	430	9.6
	31-Aug-12	12.2	7.3	468	6.7
	7-Sep-12	11.7	6.9	456	6.7
	14-Sep-12	11.7	7.0	466	8.5
	21-Sep-12	10.9	7.1	486	8.8
	28-Sep-12	9.8	6.6	497	9.3
	5-Oct-12	12.0	7.1	535	7.7
	12-Oct-12	8.4	8.3	487	9.8
	19-Oct-12	9.6	8.4	5.26	9.9
	26-Oct-12	10.0	7.4	460	10.2
	2-Nov-12	8.7	6.5	410	6.9
	9-Nov-12	8.9	8.2	378	9.8
	16-Nov-12	8.9	8.3	403	10.1
	23-Nov-12	8.7	7.6	388	7.1
	30-Nov-12	8.4	7.5	363	6.0
	7-Dec-12	7.9	7.4	452	6.8
	14-Dec-12	7.8	7.7	384	10.6
	21-Dec-12	6.7	7.3	424	11.7
	28-Dec-12	6.8	7.4	381	11.4
	4-Jan-13	5.9	7.6	422	10.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-Jan-13	5.4	7.5	623	9.9
	17-Jan-13	6.0	7.7	400	10.4
	25-Jan-13	6.2	7.7	416	4.0
	1-Feb-13	5.5	7.9	298	12.0
	8-Feb-13	4.9	7.6	314	13.1
	15-Feb-13	5.0	7.5	509	11.7
	22-Feb-13	4.6	7.5	331	9.4
	1-Mar-13	5.8	7.7	413	9.0
	8-Mar-13	6.7	7.7	362	11.8
	15-Mar-13	5.4	-	342	9.5
	22-Mar-13	4.9	7.6	411	12.5
	28-Mar-13	6.1	7.7	340	11.8
	5-Apr-13	5.3	7.7	389	10.0
	12-Apr-13	5.3	7.7	373	10.0
	19-Apr-13	6.8	7.3	311	5.9
	26-Apr-13	5.8	7.4	309	10.1
	3-May-13	7.8	7.9	312	9.9
	9-May-13	7.0	7.6	358	-
	16-May-13	7.4	7.6	342	11.3
	24-May-13	6.3	7.7	393	10.4
	31-May-13	8.4	7.7	364	8.5
	7-Jun-13	7.5	-	330	9.5
	14-Jun-13	10.3	7.7	393	8.5
	21-Jun-13	8.6	7.9	409	12.6
	27-Jun-13	8.6	7.9	423	11.1
	5-Jul-13	9.5	7.6	427	10.7
	12-Jul-13	9.6	7.5	447	10.6
	19-Jul-13	9.5	7.5	456	10.0
	25-Jul-13	9.4	7.5	451	8.5
	2-Aug-13	9.3	7.5	502	9.1
	8-Aug-13	9.2	7.6	508	8.6
	16-Aug-13	9.3	7.7	512	8.3
	23-Aug-13	9.2	7.6	523	8.3
	30-Aug-13	9.3	7.6	546	8.1
	6-Sep-13	9.2	7.5	523	8.0
	13-Sep-13	7.6	7.5	506	8.1
	20-Sep-13	9.3	7.6	523	8.1
	27-Sep-13	9.4	7.6	523	7.9
	4-Oct-13	9.0	7.5	521	7.6
	11-Oct-13	9.5	7.6	530	8.0
	18-Oct-13	9.2	7.5	525	7.0
	25-Oct-13	8.0	7.4	521	3.9
	31-Oct-13	7.6	7.3	516	3.8
	8-Nov-13	7.6	7.2	510	5.3
	14-Nov-13	6.7	7.2	503	5.1
	22-Nov-13	6.8	7.1	510	4.9
	29-Nov-13	7.1	8.3	389	2.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	6-Dec-13	7.3	7.6	396	3.7
	10-Jan-14	4.3	8.2	350	4.1
	17-Jan-14	5.4	7.8	276	7.1
	31-Jan-14	2.7	7.1	380	4.3
	7-Feb-14	4.6	7.0	394	3.3
	7-Mar-14	2.0	7.3	370	7.0
	14-Mar-14	3.6	6.3	402	9.3
	21-Mar-14	4.1	7.3	276	5.4
	28-Mar-14	4.6	6.8	591	11.6
	4-Apr-14	4.8	7.6	387	10.8
	11-Apr-14	5.2	7.5	429	11.5
	17-Apr-14	5.4	7.6	533	9.9
	25-Apr-14	5.3	7.5	530	9.9
	1-May-14	5.6	7.5	486	10.0
	9-May-14	7.6	7.2	473	6.9
	16-May-14	7.5	7.2	456	6.2
	23-May-14	7.6	7.2	463	6.3
	30-May-14	7.8	7.6	450	6.8
	6-Jun-14	9.0	7.2	461	6.2
	13-Jun-14	8.9	7.2	460	6.4
	20-Jun-14	8.9	7.2	456	7.0
	28-Jun-14	9.8	7.1	450	7.6
	4-Jul-14	9.8	7.1	448	7.8
	11-Jul-14	9.9	7.1	426	7.9
	18-Jul-14	9.7	8.4	535	-
	25-Jul-14	10.2	8.7	532	-
	1-Aug-14	10.2	8.6	478	7.9
	8-Aug-14	10.2	8.5	463	7.6
	15-Aug-14	10.0	8.2	456	7.5
	22-Aug-14	11.1	8.7	598	-
	29-Aug-14	11.1	8.5	608	-
	5-Sep-14	12.7	8.8	635	-
	12-Sep-14	10.5	8.1	625	6.2
	19-Sep-14	10.0	8.0	420	6.2
	26-Sep-14	10.0	8.1	427	6.9
	3-Oct-14	9.9	7.6	463	4.9
	10-Oct-14	10.2	7.5	460	5.6
	16-Oct-14	9.9	7.5	456	5.9
	24-Oct-14	7.9	7.6	416	6.9
	31-Oct-14	7.6	7.4	423	6.0
	7-Nov-14	0.5	7.2	428	4.0
	14-Nov-14	1.0	7.3	431	4.2
	20-Nov-14	0.2	7.2	420	4.1
	28-Nov-14	0.1	7.2	416	5.3
	5-Dec-14	4.4	7.3	425	7.0
	12-Dec-14	3.3	7.2	431	6.9
	19-Dec-14	3.5	7.2	425	6.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	26-Dec-14	4.5	7.2	469	7.9
	2-Jan-15	1.4	7.2	432	7.9
	8-Jan-15	1.3	7.3	432	6.9
	14-Jan-15	2.3	7.2	416	7.1
	23-Jan-15	3.4	7.2	402	7.1
	30-Jan-15	2.7	8.0	503	12.5
	6-Feb-15	4.0	7.9	513	11.7
	12-Feb-15	2.0	7.6	508	11.5
	27-Feb-15	3.2	7.8	379	13.0
	6-Mar-15	2.3	7.7	509	11.9
	13-Mar-15	6.1	7.7	361	10.3
	20-Mar-15	7.1	7.8	431	10.1
	26-Mar-15	5.9	7.9	409	10.8
	2-Apr-15	5.8	7.8	406	11.4
	10-Apr-15	6.2	7.6	270	11.5
	17-Apr-15	5.7	8.5	299	-
	23-Apr-15	5.0	7.8	386	13.9
	1-May-15	6.1	7.6	257	12.8
	8-May-15	8.5	8.9	400	-
	15-May-15	7.9	7.7	358	12.6
	21-May-15	7.2	7.8	355	14.4
	28-May-15	9.0	7.7	390	11.5
	4-Jun-15	8.8	7.8	389	11.3
	12-Jun-15	8.8	7.6	440	9.5
	18-Jun-15	10.2	7.7	494	9.4
	26-Jun-15	13.5	7.5	495	-
	1-Jul-15	9.0	7.6	420	-
	10-Jul-15	9.1	7.7	409	-
	17-Jul-15	9.2	7.9	401	-
	22-Jul-15	12.2	7.5	478	-
	30-Jul-15	14.3	7.9	463	-
	5-Aug-15	10.4	7.6	492	9.0
	13-Aug-15	11.4	8.0	497	9.1
	21-Aug-15	11.9	7.6	431	8.8
	28-Aug-15	-	8.4	444	-
	3-Sep-15	12.0	8.1	487	11.6
	10-Sep-15	12.5	7.5	513	9.4
	18-Sep-15	11.5	7.5	484	9.7
	25-Sep-15	11.4	7.5	487	9.0
	2-Oct-15	10.8	7.1	461	8.0
	9-Oct-15	11.0	7.1	457	7.0
	16-Oct-15	10.7	7.5	454	7.8
	23-Oct-15	10.5	7.3	467	8.0
	30-Oct-15	10.0	7.1	556	7.7
	5-Nov-15	10.3	7.9	518	7.5
	13-Nov-15	8.2	7.3	230	8.0
	19-Nov-15	9.6	7.4	563	10.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	26-Nov-15	6.5	7.2	523	12.5
	4-Dec-15	7.2	7.3	460	12.2
	10-Dec-15	7.8	7.1	526	9.9
	17-Dec-15	7.3	7.6	460	10.9
	23-Dec-15	8.2	7.5	470	11.3
	30-Dec-15	6.5	7.5	439	12.1
	8-Jan-16	6.0	7.3	427	12.3
	14-Jan-16	5.6	7.2	360	12.2
	22-Jan-16	1.1	7.5	443	13.0
	29-Jan-16	3.5	7.3	430	12.1
	5-Feb-16	6.0	7.2	458	12.0
	11-Feb-16	4.0	7.4	438	12.9
	18-Feb-16	5.8	7.7	474	13.0
	25-Feb-16	4.5	7.6	450	12.4
	4-Mar-16	3.4	7.1	430	12.7
	10-Mar-16	6.0	7.2	243	12.4
	18-Mar-16	5.5	7.5	379	13.1
	28-Mar-16	4.2	6.9	229	11.8
	1-Apr-16	5.5	7.2	234	11.5
	7-Apr-16	5.1	7.2	313	10.9
	15-Apr-16	6.1	7.2	314	11.9
	22-Apr-16	6.5	7.8	344	12.1
	29-Apr-16	6.2	7.9	397	13.6
	6-May-16	7.3	7.9	397	11.9
	13-May-16	9.0	7.8	546	-
	20-May-16	9.0	7.8	546	n/a
	27-May-16	9.0	7.8	423	10.1
	2-Jun-16	9.1	7.8	427	9.6
	10-Jun-16	7.9	7.7	587	10.5
	17-Jun-16	12.1	7.6	486	9.1
	24-Jun-16	8.8	7.5	445	9.3
	28-Jun-16	9.6	7.6	460	14.0
	8-Jul-16	9.3	7.5	491	12.0
	15-Jul-16	9.7	7.7	405	9.7
	22-Jul-16	10.1	7.4	475	9.5
	29-Jul-16	10.3	7.4	453	9.2
	5-Aug-16	12.0	7.9	209	9.9
	12-Aug-16	11.1	7.6	489	9.0
	19-Aug-16	11.2	7.6	486	7.9
	26-Aug-16	11.5	7.6	468	8.5
	2-Sep-16	12.1	7.1	126	4.0
	9-Sep-16	11.8	7.6	444	8.0
	16-Sep-16	11.6	7.6	436	8.5
	21-Sep-16	11.9	7.3	346	9.5
	30-Sep-16	11.8	7.5	437	8.2
	7-Oct-16	11.9	7.5	439	8.9
	13-Oct-16	11.5	7.5	400	9.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Oct-16	11.6	7.7	486	11.8
	27-Oct-16	10.4	7.8	433	8.3
	3-Nov-16	10.7	7.6	595	10.4
	11-Nov-16	9.7	6.1	421	11.2
	18-Nov-16	10.1	7.6	616	9.3
	24-Nov-16	9.2	7.6	448	9.7
	2-Dec-16	9.2	7.7	540	5.9
	7-Dec-16	8.8	7.7	520	6.2
	16-Dec-16	8.3	7.6	719	10.5
	22-Dec-16	7.9	7.2	7.4	10.9
	30-Dec-16	7.5	7.1	600	10.4
	6-Jan-17	4.3	7.6	256	11.7
	13-Jan-17	5.6	7.5	498	11.6
	20-Jan-17	4.7	7.8	520	12.6
	26-Jan-17	6.3	7.8	544	11.8
	3-Feb-17	3.8	7.9	460	12.5
	10-Feb-17	4.0	7.8	424	13.5
	17-Feb-17	3.3	7.9	510	12.8
	19-Apr-17	8.6	7.0	461	15.2
	16-May-17	8.3	7.9	612	11.6
	28-Jun-17	9.4	7.6	456	10.1
	18-Jul-17	11.8	7.7	496	12.3
	15-Aug-17	10.6	8.2	403	9.7
	18-Sep-17	10.8	6.5	513	8.9
	18-Oct-17	9.8	7.7	509	9.1
	15-Nov-17	7.7	7.6	498	8.9
	17-Jan-18	4.6	7.7	410	10.5
	22-Feb-18	6.2	7.6	350	10.7
	20-Mar-18	3.1	7.6	418	15.7
	18-Apr-18	4.9	8.1	695	12.1
	14-May-18	7.9	7.5	633	10.6
	18-Jun-18	9.2	7.5	649	9.2
	19-Jul-18	9.6	7.3	643	9.2
	23-Aug-18	11.2	7.4	704	7.8
	19-Sep-18	11.7	7.5	622	8.4
	24-Oct-18	10.1	7.6	655	8.4
	21-Nov-18	5.8	7.4		9.5
	12-Dec-18	6.3	7.8	696	10.2
	18-Jan-19	4.2	7.7	662	11.3
SW B-1					
	22-May-03	9.0			
	12-Feb-04	4.4		364	12.6
	19-Mar-04	4.0		545	12.6
	14-May-04	12.8	7.9	536	
	20-May-04	10.9	7.9	558	
	28-May-04	10.9	8.0	501	
	4-Jun-04	13.2	7.9	560	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Jul-04	15.3	7.7	621	9.0
	22-Jul-04	19.8	8.0		9.2
	19-Nov-04	7.9	7.8	628	
	25-Nov-04	4.0	7.7	598	11.8
	2-Dec-04	4.7	7.6	536	12.5
	9-Dec-04	5.1	7.6	512	
	17-Dec-04	2.8	7.7	718	#REF!
	5-Jan-05	3.9	7.7	403	
	13-Jan-05	5.0	7.6	418	12.6
	28-Jan-05	3.3	7.7	370	
	3-Feb-05	2.8	7.7	407	
	10-Feb-05	2.8	7.4	453	12.8
	7-Apr-05	4.3	7.6	360	
	15-Apr-05	4.7	7.1	409	11.7
	21-Apr-05	5.9	7.3	413	12.0
	29-Apr-05	5.8	7.3	407	12.1
	6-May-05	10.1	7.1	617	
	27-May-05	12.2	6.1	555	
	3-Jun-05	12.1	7.1	572	
	30-Jun-05	17.0	7.4	678	
	7-Jul-05	16.6	5.5	635	
	15-Jul-05	18.6	7.0	967	9.0
	21-Jul-05	18.4	7.9	1313	8.4
	28-Jul-05	16.7	7.3	800	8.9
	2-Aug-05	18.5	8.8	720	
	12-Aug-05	17.6	7.4	1144	
	1-Sep-05	17.1		690	9.3
	9-Sep-05	17.3	6.5	696	
	16-Sep-05	17.0	7.4	732	
	18-Nov-05	6.1	8.2	906	
	25-Nov-05	5.9	8.1	573	11.0
	2-Dec-05	5.2	9.2	563	10.7
	9-Dec-05	4.5	9.1	552	12.2
	16-Dec-05	3.9	8.1	597	13.2
	22-Dec-05	3.8	8.0	596	12.6
	6-Jan-06	4.4	8.0	560	
	13-Jan-06	5.4	8.0	524	
	20-Jan-06	5.0	6.4	497	12.5
	27-Jan-06	3.7	7.3	535	13.2
	3-Feb-06	4.2	7.5	505	
	10-Mar-06	3.3	8.1	395	
	17-Mar-06	3.6	8.2	483	12.9
	24-Mar-06	5.1	8.1	453	
	31-Mar-06	7.3	8.0	607	
	7-Apr-06	5.1	8.1	601	
QFSW 1					
	23-Apr-04	4.7	7.6	334	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	30-Apr-04	6.9	7.8	622	
	14-May-04	15.9	7.9	608	8.9
	20-May-04	7.5	7.5	483	8.3
	28-May-04	12.1	7.9	546	9.0
	4-Jun-04	15.4	8.0	626	9.4
	11-Jun-04	18.3	8.1	702	
QFSW 2					
	23-Apr-04	5.9	7.8	374	
	30-Apr-04	11.9	8.1	640	
	14-May-04	11.8	7.8	538	10.6
	20-May-04	11.2	7.9	559	11.0
	28-May-04	9.7	7.9	477	11.0
	4-Jun-04	15.7	7.8	590	9.9
	11-Jun-04	16.0	7.8	652	9.2
	17-Jun-04	14.0	7.7	649	
	23-Jun-04	15.2	7.9	701	
	1-Jul-04	13.1	7.7	662	7.8
	22-Jul-04	19.6	7.8		8.4
	29-Jul-04	16.3	7.6	659	9.6
	6-Aug-04	16.6	7.8	708	9.0
	12-Aug-04	15.5	7.8	712	
	19-Aug-04	17.3	7.7	757	9.6
	26-Aug-04	17.0	7.7	712	
	3-Sep-04	17.2	7.8	679	8.1
	9-Sep-04	14.3	8.0	713	7.9
	17-Sep-04	13.7	7.7	732	8.2
	23-Sep-04	16.3	7.6	803	8.1
	1-Oct-04	14.6	7.6	783	8.4
	7-Oct-04	14.3	7.8	774	9.2
	14-Oct-04	11.4	7.6	712	9.0
	20-Oct-04	9.8	7.7	692	10.0
	28-Oct-04	10.7	7.7	809	9.5
	4-Nov-04	8.0	7.6	595	9.6
	11-Nov-04	7.3	7.7	611	10.7
	19-Nov-04	7.9	7.6	641	10.7
	25-Nov-04	5.4	7.6	624	10.5
	2-Dec-04	5.9	7.6	564	10.8
	9-Dec-04	4.6	7.5	477	10.6
	17-Dec-04	3.3	7.6	814	
	5-Jan-05	4.6	7.5	492	11.0
	13-Jan-05	3.4	7.3	373	11.3
	20-Jan-05	2.7	7.1	430	11.0
	28-Jan-05	3.0	7.3	447	10.3
	3-Feb-05	3.2	7.3	452	10.6
	10-Feb-05	4.4	7.1	477	10.3
	16-Feb-05	3.9	7.6	467	10.8
	24-Feb-04	4.1	7.8	482	10.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	3-Mar-05	2.9	7.2	469	10.8
	10-Mar-05	4.5	7.4	500	10.7
	17-Mar-05	4.1	7.2	457	10.3
	24-Mar-05	4.9	7.2	477	10.3
	30-Mar-05	6.1	7.5	477	10.4
	7-Apr-05	4.2	7.4	376	10.5
	15-Apr-05	4.9	6.9	410	10.5
	21-Apr-05	5.6	7.1	417	9.2
	29-Apr-05	6.1	7.2	414	10.4
	6-May-05	9.9	7.0	634	
	13-May-05	8.8	7.9	509	10.0
	20-May-05	10.9	7.6	530	9.6
	27-May-05	12.2	7.3	570	9.1
	3-Jun-05	12.3	6.7	585	8.5
	10-Jun-05	14.9	7.3	626	8.4
	17-Jun-05	13.0	7.2	610	7.7
	24-Jun-05	18.0	7.6	701	9.4
	30-Jun-05	17.1	7.2	690	
	7-Jul-05	16.9	6.6	852	8.0
	15-Jul-05	18.1	6.5	977	7.6
	21-Jul-05	19.1	8.1	1361	7.1
	28-Jul-05	17.1	6.9	1270	7.3
	2-Aug-05	17.8	8.1	802	5.7
	12-Aug-05	17.6	7.0	1176	9.5
	19-Aug-05	18.0	7.5	729	
	24-Aug-05	18.1	7.7	734	8.8
	1-Sep-05	17.9		712	8.7
	9-Sep-05	18.5	6.9	722	9.0
	16-Sep-05	17.4	7.3	739	
	23-Sep-05	17.9	7.8	718	9.0
	30-Sep-05	16.1	8.0	701	9.1
	7-Oct-05	14.9	8.6	815	
	14-Oct-05	15.0	8.2	695	9.0
	21-Oct-05	13.7	8.4	689	
	28-Oct-06	11.6	7.9	705	10.7
	4-Nov-05	11.0	8.2	708	
	11-Nov-05	9.4	8.4	681	10.6
	18-Nov-05	6.4	8.6	943	
	25-Nov-05	6.3	8.4	592	10.0
	2-Dec-05	5.8	9.2	583	10.3
	9-Dec-05	5.5	9.1	583	9.8
	16-Dec-05	4.7	8.2	620	9.4
	22-Dec-05	4.6	8.2	635	10.7
	6-Jan-06	5.7	8.1	592	10.7
	13-Jan-06	5.9	7.0	553	10.4
	20-Jan-06	4.9	7.2	524	10.3
	27-Jan-06	5.0	7.5	582	10.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	3-Feb-06	4.8	7.7	526	10.9
	10-Feb-06	4.4	8.1	530	11.1
	20-Feb-06	4.6	8.6	539	
	24-Feb-06	3.7	8.0	519	
	3-Mar-06	2.0	7.9	523	
	10-Mar-06	3.4	8.1	447	12.6
	20-Mar-06	3.2	8.3	703	
	24-Mar-06	5.0	8.1	463	
	31-Mar-06	7.7	8.0	617	
	13-Apr-06	8.2	8.0	623	
	21-Apr-06	9.0	8.1	634	
	26-Apr-06	8.6	8.2	693	
	5-May-06	9.9	8.0	662	
	12-May-06	10.2	8.6	724	
	19-May-06	9.5	7.4	854	
	25-May-06	11.6	7.9	756	
	2-Jun-06	12.6	7.8	741	
	9-Jun-06	12.8	7.9	609	
	19-Jun-06	12.1	7.8	654	
	23-Jun-06	12.5	7.9	672	
	30-Jun-06	17.6	8.5	787	
	7-Jul-06	17.5	8.3	765	
	14-Jul-06	18.5	7.8	779	
	21-Jul-06	17.9	8.0	781	
	28-Jul-06	19.9	7.8	815	
	4-Aug-06	21.1	7.9	599	
	11-Aug-06	19.8	7.7	783	
	18-Aug-06	19.2	7.9	870	
	25-Aug-06	16.7	7.4	917	
	1-Sep-06	18.4	7.5	902	
	8-Sep-06	18.1	7.5	888	
	15-Sep-06	16.5	7.5	895	
	21-Sep-06	15.4	7.7	885	
	28-Sep-06	13.1	7.5	933	
	6-Oct-06	14.2	7.7	889	
	13-Oct-06	10.2	7.6	907	
	20-Oct-06	9.9	7.7	911	
	26-Oct-06	9.9	7.8	931	
	3-Nov-06	8.6	8.6	903	10.7
	10-Nov-06	9.3	7.9	872	
	17-Nov-06	7.5	7.8	829	10.4
	24-Nov-06	8.0	8.4	865	11.0
	4-Dec-06	6.0	7.6	853	10.4
	8-Dec-06	5.7	7.2	840	11.2
	14-Dec-06	5.9	7.7	889	12.3
	21-Dec-06	5.6	7.9	859	11.4
	28-Dec-06	5.0	7.7	876	11.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	5-Jan-07	5.4	7.5	873	10.7
	12-Jan-07	4.8	7.3	795	11.5
	19-Jan-07	4.4	7.6	790	11.2
	26-Jan-07	4.6	8.1	796	10.3
	2-Feb-07	4.6	7.8	779	10.4
	9-Feb-07	4.6	7.7	723	9.9
	16-Feb-07	4.2	7.6	816	10.0
	22-Feb-07	4.6	8.1	816	9.4
	2-Mar-07	4.6	8.1	824	10.2
	9-Mar-07	5.3	7.3	673	9.6
	23-Mar-07	5.1	7.5	749	9.9
	30-Mar-07	6.1	7.7	671	10.7
	13-Apr-07	4.2	7.7	657	12.0
	20-Apr-07	6.6	7.7	630	11.1
	28-Apr-07	6.7	8.1	690	9.1
	4-May-07	8.1	7.9	635	8.9
	11-May-07	8.4	7.9	767	8.1
	18-May-07	9.1	8.2	674	8.2
	25-May-07	9.5	7.8	663	8.4
	1-Jun-07	10.5	7.7	703	7.7
	8-Jun-07	12.3	7.8	738	7.2
	14-Jun-07	12.3	8.0	753	7.4
	22-Jun-07	11.7	7.9	693	8.9
	29-Jun-07	14.1	8.1	697	8.5
	6-Jul-07	14.7	8.1	729	8.5
	13-Jul-07	14.5	8.2	746	8.2
	20-Jul-07	14.5	7.8	749	8.0
	27-Jul-07	14.2	7.6	683	8.1
	3-Aug-07	17.2	7.7	794	8.2
	10-Aug-07	16.5	7.6	728	8.0
	17-Aug-07	15.6	7.6	784	7.9
	24-Aug-07	15.9	7.9	803	7.5
	30-Aug-07	16.8	7.9	793	7.9
	7-Sep-07	16.9	7.7	803	8.2
	14-Sep-07	16.0	7.6	760	7.9
	21-Sep-07	16.1	7.8	770	8.6
	28-Sep-07	14.1	8.3	821	8.2
	5-Oct-07	15.1	7.5	865	8.6
	12-Oct-07	13.1	7.4	784	7.7
	19-Oct-07	13.5	8.1	598	7.6
	26-Oct-07	11.7	7.2	789	8.4
	2-Nov-07	11.1	7.4	813	9.4
	9-Nov-07	9.2	7.2	797	8.2
	16-Nov-07	8.3	7.4	838	7.8
	23-Nov-07	7.9	8.0	840	8.9
	7-Dec-07	7.0	7.8	758	8.3
	14-Dec-07	6.6	7.3	763	7.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	20-Dec-07	4.5	7.3	786	
	4-Jan-08	6.2	7.2	807	9.1
	11-Jan-08	5.1	7.5	676	11.3
	18-Jan-08	3.4	7.2	651	12.2
	25-Jan-08	3.5	7.7	667	12.4
	1-Feb-08	3.5	7.4	703	12.0
	8-Feb-08	3.9	7.2	713	11.6
	15-Feb-08	2.9	7.2	650	12.0
	22-Feb-08	3.5	7.4	752	
	29-Feb-08	3.6	7.4	723	
	7-Mar-08	3.3	7.4	737	
	14-Mar-08	3.7	7.1	725	
	20-Mar-08	3.2	7.7	732	12.8
	28-Mar-08	4.1	7.4	608	
	25-Apr-08	9.3	7.9	559	8.9
	2-May-08	7.5	6.9	530	8.2
	8-May-08	9.0	7.3	638	
	15-May-08	17.9	7.6	648	8.6
	23-May-08	10.4	7.7	576	8.4
	30-May-08	10.5	7.3	698	8.1
	6-Jun-08	15.5	7.3	798	6.6
	13-Jun-08	13.8	7.7	686	6.5
	20-Jun-08	13.2	7.7	726	6.4
	27-Jun-08	14.9	7.1	781	6.8
	4-Jul-08	14.2	7.1	783	
	11-Jul-08	15.4	7.0	763	7.1
	18-Jul-08	16.2	7.7	826	5.2
	25-Jul-08	16.8	7.0	843	5.8
	1-Aug-08	17.2	6.9	827	5.6
	8-Aug-08	16.3	7.4	814	4.8
	15-Aug-08	16.4	7.3	936	5.5
	22-Aug-08	17.4	7.5	937	4.7
	28-Aug-08	16.1	7.4		6.5
	5-Sep-08	16.4	7.8	852	6.3
	12-Sep-08	15.5	7.9	864	5.6
	19-Sep-08	15.0	8.0	882	
	26-Sep-08	15.0	7.5	859	5.7
	3-Oct-08	12.1	7.7	835	6.7
	10-Oct-08	12.2	7.2	850	7.6
	17-Oct-08	11.8		785	5.3
	24-Oct-08	10.0	7.9	820	5.4
	31-Oct-08	9.5	7.7	814	5.8
	7-Nov-08	9.7	7.5	467	8.3
	14-Nov-08	8.6		584	8.8
	28-Nov-08	5.5		412	7.1
	12-Dec-08	4.6	6.4	759	8.8
	23-Dec-08	4.0	8.0	654	8.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Jan-09	3.7		656	9.7
	23-Jan-09	3.9	8.0	666	8.3
	6-Feb-09	4.2		611	8.8
	20-Feb-09	3.3	8.1	610	13.3
	27-Feb-09	2.7	8.1	599	13.5
	6-Mar-09	3.7		519	12.6
	13-Mar-09	3.4	8.4	552	
	20-Mar-09	4.3	8.3	554	
	27-Mar-09	5.0	7.4	640	
	3-Apr-09	5.5	7.5	583	
	9-Apr-09	4.4	7.8	530	
	17-Apr-09	6.4	8.3	596	
	24-Apr-09	7.5	8.1	589	
	1-May-09	10.5	8.2	431	10.5
	8-May-09	11.1	7.5	575	10.0
	15-May-09	11.9	8.1	480	10.5
	22-May-09	11.4	8.1	497	9.5
	29-May-09	11.4	8.0	627	
	5-Jun-09	11.8	7.1	569	10.3
	12-Jun-09	12.1	8.3	575	9.6
	19-Jun-09	13.3	7.6	1229	9.7
	26-Jul-09	14.9	7.9	692	9.2
	2-Jul-09	13.4	7.6	609	9.3
	10-Jul-09	14.3			9.6
	17-Jul-09	14.1	9.1	693	9.1
	24-Jul-09	13.7	7.9	714	8.8
	31-Jul-09	14.8	8.0	739	8.9
	7-Aug-09	14.5	7.9	760	7.6
	14-Aug-09	17.5	8.3	675	6.1
	21-Aug-09	16.0	9.0	801	8.6
	28-Aug-09	15.4	8.4	738	8.8
	4-Sep-09	15.5	8.9	763	8.6
	11-Sep-09	14.8	8.3	737	8.8
	18-Sep-09	13.9	7.7	829	6.9
	25-Sep-09	13.7	7.7	731	9.9
	2-Oct-09	12.0	8.4	851	9.7
	9-Oct-09	10.8	7.7	894	11.2
	16-Oct-09	9.4	8.2	846	
	23-Oct-09	8.6	7.6	767	10.9
	30-Oct-09	9.0	7.7	804	
	6-Nov-09	7.1	6.5	808	
	13-Nov-09	8.2	7.4	858	
	20-Nov-09	7.2	7.4	737	12.1
	27-Nov-09	7.5	7.5	739	11.0
	4-Dec-09	4.8	7.6	707	12.9
	11-Dec-09	4.8	7.6	662	11.0
	18-Dec-09	4.8	7.6	758	11.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Dec-09	4.9	7.6	757	11.5
	15-Jan-10	5.0	7.6	741	10.6
	22-Jan-10	4.5	7.5	756	10.6
	5-Feb-10	5.0	7.0	742	8.4
	12-Feb-10	4.8	7.0	736	9.4
	19-Feb-10	4.9	7.9	738	10.3
	1-Mar-10	5.1	7.3	649	10.5
	5-Mar-10	5.9	7.4	542	9.2
	12-Mar-10	5.4	7.2	721	9.6
	19-Mar-10	7.3	7.6	622	10.8
	26-Mar-10	5.4	7.2	566	10.6
	9-Apr-10	7.2	7.5	666	11.9
	16-Apr-10	9.3	8.0	484	10.1
	23-Apr-10	8.7	7.0	471	11.2
	30-Apr-10	9.9	7.9	463	10.5
	7-May-10	9.7	7.9	448	10.1
	14-May-10	10.3	7.9	454	10.0
	21-May-10	11.1	7.8	498	9.4
	28-May-10	13.7	7.8	484	9.2
	4-Jun-10	13.2	7.8	541	6.2
	11-Jun-10	12.8	7.8	465	6.1
	18-Jun-10	13.5	7.7	565	11.3
	25-Jun-10	14.0	7.8	543	9.2
	9-Jul-10	15.7	7.7	541	8.8
	15-Jul-10	16.4	7.7	627	8.0
	23-Jul-10	15.6	7.6	614	9.1
	30-Jul-10	16.3	7.7	529	7.5
	6-Aug-10	15.7	7.6	606	10.8
	13-Aug-10	16.4	7.6	640	8.5
	20-Aug-10	15.7	7.6	654	6.7
	27-Aug-10	15.4	7.3	606	6.4
	3-Sep-10	16.3	7.7	674	7.7
	10-Sep-10	15.1	7.7	555	8.9
	17-Sep-10	14.3	7.7	563	8.0
	24-Sep-10	14 69	7.7		7.5
	1-Oct-10	13.2	7.7	631	7.5
	8-Oct-10	12.8	7.8	636	8.7
	15-Oct-10	11.0	7.6	596	8.3
	22-Oct-10	10.4	7.7	625	8.4
	29-Oct-10	10.2	7.8	523	7.5
	5-Nov-10	7.6	7.6	599	8.2
	12-Nov-10	8.6	7.6	630	8.4
	19-Nov-10	7.7	8.0	516	9.4
	26-Nov-10	6.2	7.6	469	10.1
	3-Dec-10	0.1	7.7	485	8.8
	9-Dec-10	4.7	7.6	413	13.0
	17-Dec-10	5.2	8.1	485	10.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Dec-10	4.8	8.1	414	8.3
	7-Jan-11	3.6	7.8	404	12.5
	14-Jan-11	4.6	7.7	380	10.2
	21-Jan-11	3.7	8.1	378	9.3
	28-Jan-11	4.5	7.7	372	8.7
	4-Feb-11	3.9	7.7	372	8.8
	11-Feb-11	4.8	8.0	443	9.1
	18-Feb-11	4.6	8.3	429	10.1
	25-Feb-11	4.4	7.4	404	12.7
	4-Mar-11	4.9	7.5	400	10.9
	11-Mar-11	2.4	7.6	362	11.6
	18-Mar-11	2.4	8.2	209	-
	25-Mar-11	5.4	8.4	402	12.0
	1-Apr-11	4.6	7.2	362	10.7
	8-Apr-11	4.6	7.9	376	9.7
	15-Apr-11	5.4	8.1	321	12.0
	21-Apr-11	4.9	8.1	373	12.1
	6-May-11	7.4	8.4	314	10.9
	13-May-11	9.7	8.2	474	12.6
	20-May-11	10.2	7.9	395	11.0
	3-Jun-11	12.9	7.9	432	9.1
	10-Jun-11	13.1	7.7	501	7.8
	17-Jun-11	13.3	6.6	481	7.9
	24-Jun-11	13.1	7.8	527	7.3
	30-Jun-11	13.8	7.5	486	9.2
	8-Jul-11	15.2	7.7	589	7.4
	14-Jul-11	15.1	8.0	593	7.3
	22-Jul-11	17.4	7.7	629	9.5
	29-Jul-11	15.4	7.9	542	6.3
	5-Aug-11	16.6	7.7	613	8.5
	12-Aug-11	15.5	7.9	644	6.8
	19-Aug-11	15.5	8.0	458	6.8
	26-Aug-11	15.2	7.8	661	7.2
	2-Sep-11	15.56	7.43	552	7.41
	9-Sep-11	15.57	8.31	632	7.17
	16-Sep-11	13.29	8.53	557	6.73
	30-Sep-11	12.88	8.17	618	8.03
	6-Oct-11	11.27	7.9	694	7.97
	14-Oct-11	13.3	7.7	580	8.6
	21-Oct-11	10.0	8.1	643	9.4
	28-Oct-11	9.6	7.7	594	8.2
	4-Nov-11	8.2	8.1	520	9.8
	11-Nov-11	7.7	8.0	591	4.0
	25-Nov-11	7.4	8.7	554	7.8
	9-Dec-11	6.6	8.1	438	7.4
	16-Dec-11	6.2	7.3	422	10.9
	6-Jan-12	5.5	7.3	448	10.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	20-Jan-12	4.7	8.4	368	8.0
	27-Jan-12	4.6	9.0	315	11.7
	3-Feb-12	4.8	8.2	284	9.2
	10-Feb-12	4.2	8.5	360	10.6
	17-Feb-12	4.7	8.6	372	11.4
	1-Mar-12	4.7	8.9	216	-
	23-Mar-12	7.4	7.6	-	8.6
	30-Mar-12	6.1	9.0	379	9.8
	13-Apr-12	6.7	8.5	409	10.1
	20-Apr-12	7.8	8.8	445	6.8
	27-Apr-12	6.0	8.7	345	9.0
	4-May-12	8.4	8.1	515	6.8
	11-May-12	9.1	7.7	315	9.4
	18-May-12	9.1	7.6	449	6.1
	25-May-12	11.4	6.4	512	5.5
	1-Jun-12	13.2	7.8	581	7.3
	8-Jun-12	13.2	8.3	545	7.8
	15-Jun-12	13.1	7.7	587	5.4
	22-Jun-12	13.2	7.7	580	7.4
	28-Jun-12	14.7	8.0	640	6.1
	6-Jul-12	15.1	7.8	688	5.5
	13-Jul-12	14.7	8.3	627	4.4
	20-Jul-12	17.4	8.1	739	6.8
	27-Jul-12	14.9	7.9	686	5.3
	3-Aug-12	17.3	7.8	741	7.9
	10-Aug-12	15.2	8.3	375	7.3
	17-Aug-12	14.2	8.8	450	5.3
	24-Aug-12	15.9	7.7	660	8.2
	31-Aug-12	16.3	7.3	723	6.9
	7-Sep-12	15.8	7.7	722	6.0
	14-Sep-12	14.6	7.0	715	7.4
	21-Sep-12	12.6	7.5	671	6.7
	28-Sep-12	11.9	7.6	722	7.6
	5-Oct-12	13.1	8.1	769	8.5
	12-Oct-12	9.8	8.5	666	6.8
	19-Oct-12	9.3	8.6	672	6.8
	26-Oct-12	10.7	7.6	710	10.6
	2-Nov-12	7.4	8.3	632	6.4
	9-Nov-12	8.3	8.7	408	9.5
	16-Nov-12	8.5	8.1	569	9.2
	23-Nov-12	8.1	8.0	515	6.0
	30-Nov-12	6.0	8.7	408	4.3
	7-Dec-12	6.5	8.1	542	6.8
	14-Dec-12	6.4	8.1	463	9.8
	21-Dec-12	5.6	7.7	516	10.9
	4-Jan-13	4.8	7.7	509	8.6
	11-Jan-13	4.3	7.7	450	8.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jan-13	4.2	7.8	489	10.2
	25-Jan-13	4.3	7.9	492	6.9
	15-Feb-13	3.5	7.7	648	9.8
	22-Feb-13	3.6	7.5	372	7.3
	1-Mar-13	3.3	7.6	486	8.5
	8-Mar-13	5.2	7.5	387	10.1
	15-Mar-13	3.6	-	374	8.6
	22-Mar-13	3.6	7.7	431	10.4
	28-Mar-13	4.4	7.5	370	9.4
	5-Apr-13	3.8	7.7	375	11.3
	12-Apr-13	3.3	7.7	382	12.4
	26-Apr-13	5.2	7.6	343	10.1
	3-May-13	8.9	7.6	350	9.0
	9-May-13	10.6	7.8	449	10.1
	16-May-13	9.1	8.0	410	10.3
	24-May-13	8.2	7.7	439	8.2
	31-May-13	12.7	7.8	466	8.0
	14-Jun-13	14.5	7.9	509	6.5
	21-Jun-13	12.4	8.0	528	11.3
	27-Jun-13	12.6	8.1	532	10.9
	5-Jul-13	14.4	7.7	588	7.9
	12-Jul-13	17.5	7.7	538	5.0
	19-Jul-13	16.9	7.8	525	7.7
	25-Jul-13	14.1	7.5	565	9.0
	2-Aug-13	15.6	8.1	596	9.2
	8-Aug-13	16.0	8.1	548	8.2
	16-Aug-13	14.8	8.2	646	8.9
	23-Aug-13	15.9	8.0	573	6.7
	30-Aug-13	16.0	7.9	570	6.0
	6-Sep-13	15.7	7.8	560	6.6
	13-Sep-13	13.3	7.7	541	8.5
	20-Sep-13	12.9	7.9	529	8.1
	27-Sep-13	12.8	7.8	520	8.1
	4-Oct-13	-	-	-	-
	11-Oct-13	11.3	7.6	502	7.6
	18-Oct-13	10.7	7.5	500	5.7
	25-Oct-13	8.6	7.5	423	3.9
	31-Oct-13	8.3	7.3	406	3.8
	8-Nov-13	3.5	7.2	400	5.0
	14-Nov-13	2.1	7.2	420	4.9
	22-Nov-13	7.5	7.9	449	4.0
	29-Nov-13	6.6	8.4	427	10.7
	6-Dec-13	5.2	8.0	404	8.1
	19-Dec-13	6.0	8.2	414	5.1
	3-Jan-14	2.3	7.8	530	3.3
	10-Jan-14	5.0	8.4	404	4.6
	17-Jan-14	4.7	8.5	394	10.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	31-Jan-14	4.5	7.3	436	8.5
	7-Feb-14	3.5	7.8	426	3.9
	14-Feb-14	5.0	7.2	447	6.0
	21-Feb-14	4.4	7.3	435	8.3
	28-Feb-14	4.2	7.3	437	8.5
	7-Mar-14	4.4	7.3	439	8.5
	14-Mar-14	4.1	6.4	443	7.0
	21-Mar-14	4.2	7.2	449	4.9
	28-Mar-14	4.0	7.6	389	9.9
	4-Apr-14	3.7	6.9	416	9.0
	11-Apr-14	3.6	7.6	363	10.4
	17-Apr-14	4.6	8.0	631	11.0
	25-Apr-14	4.3	7.9	603	10.3
	1-May-14	4.7	7.8	580	9.2
	9-May-14	12.2	7.6	418	5.6
	16-May-14	10.0	7.1	450	8.2
	23-May-14	11.9	7.5	382	6.2
	30-May-14	12.0	7.2	375	6.1
	6-Jun-14	12.5	7.3	391	7.6
	13-Jun-14	12.7	7.2	398	7.5
	20-Jun-14	13.2	7.9	416	8.1
	27-Jun-14	14.4	7.2	420	8.2
	4-Jul-14	13.3	8.0	492	8.7
	11-Jul-14	14.3	7.9	482	7.2
	18-Jul-14	12.6	8.4	575	-
	25-Jul-14	13.1	8.8	615	-
	1-Aug-14	13.2	8.6	575	6.8
	8-Aug-14	13.8	8.5	523	6.6
	15-Aug-14	12.5	8.3	520	7.3
	22-Aug-14	13.1	8.9	662	-
	29-Aug-14	13.5	9.0	663	-
	5-Sep-14	14.1	9.0	672	-
	12-Sep-14	10.2	8.0	639	5.8
	19-Sep-14	10.2	8.0	423	6.2
	26-Sep-14	10.1	8.0	418	6.2
	3-Oct-14	12.8	7.5	431	6.8
	10-Oct-14	12.6	7.6	419	7.0
	16-Oct-14	11.7	8.2	656	7.4
	24-Oct-14	9.4	8.5	427	6.3
	31-Oct-14	6.4	8.4	420	6.3
	7-Nov-14	0.4	7.3	447	8.0
	14-Nov-14	-1.3	7.4	423	6.7
	20-Nov-14	-1.2	7.3	416	6.7
	28-Nov-14	-1.5	7.3	413	5.2
	5-Dec-14	-0.3	7.2	418	6.9
	12-Dec-14	-0.3	7.2	412	6.6
	19-Dec-14	-1.3	7.2	427	6.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	8-Jan-15	0.4	7.2	420	6.3
	14-Jan-15	0.9	7.4	446	7.3
	23-Jan-15	-0.4	7.2	420	7.9
	6-Feb-15	4.3	7.8	570	8.6
	27-Feb-15	4.6	7.8	577	8.2
	6-Mar-15	4.5	7.6	576	8.7
	13-Mar-15	5.1	7.6	569	8.2
	20-Mar-15	5.5	7.6	349	8.4
	26-Mar-15	4.6	7.7	337	8.9
	2-Apr-15	4.9	7.7	341	9.0
	10-Apr-15	6.4	7.9	288	9.9
	17-Apr-15	5.7	9.2	372	12.6
	23-Apr-15	5.2	7.9	419	10.2
	1-May-15	7.1	7.6	466	10.2
	8-May-15	10.2	9.2	472	-
	15-May-15	8.7	7.8	414	9.3
	21-May-15	8.9	7.8	420	10.6
	28-May-15	11.8	7.8	485	8.8
	4-Jun-15	11.2	7.7	478	8.7
	12-Jun-15	10.8	7.6	535	7.0
	18-Jun-15	12.8	7.8	548	7.1
	26-Jun-15	13.6	7.7	495	-
	10-Jul-15	13.0	7.9	557	-
	17-Jul-15	13.0	7.9	557	-
	22-Jul-15	12.7	8.1	558	-
	30-Jul-15	16.4	8.0	665	-
	5-Aug-15	12.8	7.6	586	6.8
	13-Aug-15	14.9	7.7	703	6.9
	21-Aug-15	15.0	8.2	635	-
	28-Aug-15	-	8.2	605	-
	3-Sep-15	16.9	7.6	700	7.7
	10-Sep-15	17.0	7.8	682	7.9
	18-Sep-15	13.8	7.6	626	7.6
	25-Sep-15	14.3	7.7	632	9.1
	2-Oct-15	9.7	7.3	544	7.2
	9-Oct-15	11.0	7.4	561	7.8
	16-Oct-15	10.3	7.8	549	8.5
	23-Oct-15	9.3	7.5	558	8.2
	30-Oct-15	8.8	7.5	576	8.7
	5-Nov-15	11.0	7.9	596	7.5
	13-Nov-15	8.7	7.5	549	5.2
	19-Nov-15	9.6	7.8	648	11.9
	26-Nov-15	7.0	7.6	558	10.3
	4-Dec-15	6.6	7.4	564	10.4
	10-Dec-15	7.5	7.4	574	8.3
	17-Dec-15	6.9	7.7	492	7.4
	23-Dec-15	7.3	7.6	499	7.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	30-Dec-15	5.3	7.4	466	8.4
	8-Jan-15	5.5	7.3	470	8.5
	14-Jan-16	4.3	7.1	441	8.4
	22-Jan-16	5.0	7.9	504	7.9
	29-Jan-16	3.6	7.5	472	9.0
	5-Feb-16	4.5	7.5	466	9.0
	11-Feb-16	3.7	7.6	466	9.2
	18-Feb-16	5.4	7.5	484	8.8
	25-Feb-16	3.3	7.1	442	9.2
	4-Mar-16	4.5	7.6	448	9.0
	10-Mar-16	1.6	7.0	276	11.8
	18-Mar-16	4.7	7.7	388	10.8
	28-Mar-16	1.3	7.5	99	12.7
	1-Apr-16	3.7	7.3	237	10.4
	7-Apr-16	3.7	7.1	271	10.7
	15-Apr-16	6.9	7.5	340	10.3
	22-Apr-16	8.8	8.0	449	10.2
	29-Apr-16	6.9	8.3	439	11.1
	6-May-16	10.5	8.1	528	9.3
	13-May-16	12.5	7.8	632	-
	20-May-16	13.0	8.2	650	8.8
	27-May-16	14.7	8.1	581	7.7
	2-Jun-16	13.5	8.0	531	6.5
	10-Jun-16	12.1	8.1	733	8.6
	17-Jun-16	17.0	8.0	695	8.6
	24-Jun-16	13.4	7.9	561	7.9
	28-Jun-16	14.1	8.1	626	11.1
	8-Jul-16	16.7	8.1	587	9.8
	15-Jul-16	16.0	8.2	582	7.7
	22-Jul-16	18.0	7.8	769	8.0
	29-Jul-16	15.5	8.1	691	8.4
	5-Aug-16	16.8	8.3	674	8.0
	12-Aug-16	18.0	8.1	832	8.0
	19-Aug-16	16.4	7.9	661	7.0
	26-Aug-16	14.8	7.9	676	7.6
	2-Sep-16	13.1	7.5	586	7.3
	9-Sep-16	14.7	7.9	587	7.5
	16-Sep-16	12.4	8.1	612	8.3
	21-Sep-16	15.5	8.0	623	10.1
	30-Sep-16	12.0	8.3	604	9.7
	7-Oct-16	12.5	7.4	621	7.0
	13-Oct-16	11.2	8.0	532	9.5
	19-Oct-16	12.4	7.5	645	9.8
	27-Oct-16	6.6	8.0	492	7.2
	3-Nov-16	9.5	7.8	592	7.3
	11-Nov-16	8.1	6.1	496	9.0
	18-Nov-16	9.2	7.7	751	7.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	24-Nov-16	7.5	7.3	516	8.4
	2-Dec-16	6.8	7.8	468	4.9
	7-Dec-16	5.8	7.9	453	5.9
	16-Dec-16	4.9	7.5	768	9.2
	22-Dec-16	5.6	7.7	750	8.8
	6-Jan-17	4.5	7.7	412	9.4
	13-Jan-17	4.0	7.8	439	9.7
	20-Jan-17	4.8	7.8	470	8.7
	26-Jan-17	4.8	7.8	494	8.8
	3-Feb-17	3.5	7.8	440	8.6
	10-Feb-17	4.0	7.8	413	7.8
	17-Feb-17	4.0	7.7	492	8.9
	19-Apr-17	9.3	6.9	449	11.2
	3-May-17	7.8	7.1	374	9.6
	16-May-17	14.5	8.2	548	8.4
	28-Jun-17	14.8	7.9	625	6.8
	18-Jul-17	17.4	8.0	705	7.9
	15-Aug-17	15.1	8.3	557	6.4
	18-Sep-17	14.1	6.4	679	5.7
	18-Oct-17	11.1	7.9	626	7.3
	15-Nov-17	6.9	7.8	550	9.1
	14-Dec-17	4.3	7.9	495	3.3
	17-Jan-18	3.1	7.4	445	8.6
	23-Feb-18	2.3	7.9	334	8.0
	20-Mar-18	3.6	7.5	406	12.1
	18-Apr-18	3.2	7.8	624	15.7
	14-May-18	10.3	7.7	597	7.9
	18-Jun-18	16.4	7.8	654	6.4
	19-Jul-18	15.5	7.6	683	5.1
	23-Aug-18	15.9	7.7	674	5.2
	19-Sep-18	14.9	7.5	737	3.8
	24-Oct-18	8.6	7.8	714	5.4
	21-Nov-18	4.6	7.6	699	7.3
	12-Dec-18	6.1	7.8	697	7.5
	18-Jan-19	5.1	7.6	422.4	7.2
	26-Feb-19	2.5	7.8	608	9.9
SW 0-2					
	16-Jul-04	25.4	7.7	769	5.7
	22-Jul-04	29.2	8.0		7.2
	29-Jul-04	24.2	7.9	768	
	6-Aug-04	21.6	8.2	774	8.1
	12-Aug-04	15.5	8.1	683	
	20-Aug-04	20.0	8.0	801	6.0
	26-Aug-04	21.5	8.0	785	
	3-Sep-04	23.1	7.9	742	6.0
	9-Sep-04	15.8	8.3	716	7.9
	17-Sep-04	11.9	7.7	691	7.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	1-Oct-04	17.1	8.0	825	8.8
	7-Oct-04	14.3	7.9	755	7.0
	14-Oct-04	10.2	7.8	709	7.9
	20-Oct-04	7.8	7.8	636	11.9
	28-Oct-04	11.7	8.0	803	9.3
	4-Nov-04	4.1	7.8	493	13.0
	11-Nov-04	3.4	7.8	528	
	19-Nov-04	7.7	7.9	624	
	2-Dec-04	0.1	7.4	436	11.3
	9-Dec-04	0.1	7.6	402	12.1
	17-Dec-04	0.1	7.3	441	10.3
	5-Jan-05	0.1	7.3	388	10.7
	13-Jan-05	0.1	7.2	197	#REF!
	30-Mar-05	2.6	7.8	373	#REF!
	15-Apr-05	3.1	7.1	307	11.8
	21-Apr-05	9.8	7.6	370	
	29-Apr-05	6.4	7.5	323	
	6-May-05	17.4	7.7	560	
	13-May-05	11.8	8.4	494	
	20-May-05	9.8	7.2	478	9.3
	27-May-05	20.8	7.7	679	8.4
	3-Jun-05	19.8	7.6	670	9.1
	10-Jun-05	23.8	8.0	764	6.0
	17-Jun-05	15.7	7.2	535	6.7
	24-Jun-05	25.4	8.0	770	
	30-Jun-05	23.7	7.9	808	
	7-Jul-05	23.0	6.8	803	5.0
	21-Oct-05	10.0	8.1	630	11.0
	28-Oct-05	6.5	7.9	564	12.3
	4-Nov-05	11.1	7.7	654	9.4
	11-Nov-05	5.0	7.8	515	12.3
	18-Nov-05	0.3	7.1	850	
	2-Dec-05	0.1	8.5	437	11.3
	9-Dec-05	0.1	8.9	476	8.1
	16-Dec-05	0.1	7.8	490	9.1
	22-Dec-05	0.1	7.6	481	6.7
	28-Dec-06	0.3	7.8	842	13.3
	5-Jan-07	4.7	7.9	770	12.1
	12-Jan-07	0.1	7.8	740	12.8
	16-Mar-07	0.1	7.8	526	7.3
	23-Mar-07	0.5	7.6	490	10.6
	30-Mar-07	4.6	7.9	596	12.1
	5-Apr-07	0.1	7.2	372	12.0
	13-Apr-07	1.1	8.0	561	13.7
	20-Apr-07	11.5	8.1	572	
	28-Apr-07	10.3	8.3	550	10.3
	4-May-07	14.2	8.2	576	10.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-May-07	15.6	8.0	644	8.6
	18-May-07	12.9	8.0	612	9.8
	25-May-07	18.9	7.7	644	7.1
	1-Jun-07	20.5	7.7	670	5.6
	8-Jun-07	20.3	7.6	743	5.4
	14-Jun-07	19.6	7.6	761	5.7
	29-Jun-07	20.5	8.0	743	6.4
	6-Jul-07	20.5	8.0	743	6.4
	13-Jul-07	18.0	8.2	785	8.2
	20-Jul-07	17.1	7.4	756	8.1
	24-Aug-07	18.9	7.8	913	6.5
	30-Aug-07	18.0	7.8	872	7.1
	7-Sep-07	19.4	7.4	860	6.5
	14-Sep-07	13.4	7.4	740	7.9
	21-Sep-07	15.4	8.1	793	8.2
	28-Sep-07	13.3	8.4	817	7.9
	5-Oct-07	13.0	7.4	876	8.1
	12-Oct-07	8.6	7.2	713	8.5
	19-Oct-07	14.4	7.7	779	7.5
	26-Oct-07	8.6	7.3	757	10.8
	2-Nov-07	5.7	7.5	819	10.9
	9-Nov-07	2.5	7.4	776	12.0
	16-Nov-07	1.5	7.3	790	13.0
	11-Jan-08	0.4	7.1	478	10.7
	4-Apr-08	0.3	7.2	485	
	11-Apr-08	2.1	7.0	431	11.8
	18-Apr-08	10.2	6.8	494	8.5
	25-Apr-08	10.5	7.8	552	7.1
	2-May-08	8.1	7.0	617	9.4
	8-May-08	8.5	6.7	584	9.9
	15-May-08	12.2	7.5	683	8.1
	23-May-08	10.9	7.8	557	7.8
	30-May-08	8.1	6.3	566	10.5
	6-Jun-08	24.2	7.0	627	5.4
	13-Jun-08	18.5	7.0	655	5.1
	20-Jun-08	14.3	7.8	723	5.7
	27-Jun-08	20.5	6.7	815	4.6
	4-Jul-08	16.3	6.8	778	6.5
	11-Jul-08	17.3	6.9	773	5.2
	18-Jul-08	21.1	7.4	879	3.9
	25-Jul-08	18.4	7.3	707	4.3
	1-Aug-08	18.3	7.2	701	3.9
	8-Aug-08	17.1	7.4	549	4.2
	15-Aug-08	15.8	6.4	732	4.0
	22-Aug-08	20.2	7.3	740	4.7
	28-Aug-08	16.0	7.3		6.1
	5-Sep-08	17.5	7.6	874	5.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	12-Sep-08	13.8	7.6	851	5.4
	19-Sep-08	10.9	7.9	568	6.0
	26-Sep-08	12.8	7.4	854	5.7
	3-Oct-08	7.4	7.3	665	7.7
	10-Oct-08	7.4	6.8	791	8.5
	17-Oct-08	7.9	6.5	748	5.9
	24-Oct-08	3.3	7.6	670	6.8
	31-Oct-08	2.5	8.1	720	9.1
	7-Nov-08	8.2	9.9	451	5.7
	14-Nov-08	6.3	8.8	609	8.1
	20-Mar-09	0.2	8.4	526	11.2
	27-Mar-09	2.3	7.1	566	
	3-Apr-09	6.4	7.5	498	10.3
	17-Apr-09	5.8	7.8	529	11.8
	24-Apr-09	7.4	8.0	530	11.7
	1-May-09	14.5	7.8	378	8.5
	8-May-09	13.9	7.5	555	6.8
	15-May-09	12.5	7.9	470	10.2
	22-May-09	14.5	7.7	517	3.3
	29-May-09	13.1	7.7	559	6.7
	5-Jun-09	13.7	7.5	546	3.5
	12-Jun-09	15.8	7.8	623	7.2
	19-Jun-09	16.6	7.2	1214	7.5
	26-Jun-09	25.1	7.7	687	5.6
	2-Jul-09	16.4	7.5	584	6.2
	10-Jul-09	17.8			6.2
	17-Jul-09	14.8	8.8	740	6.1
	24-Jul-09	17.5	7.7	732	6.2
	31-Jul-09	17.2	7.5	742	5.8
	7-Aug-09	14.9	7.6	782	5.0
	14-Aug-09	15.8	8.9	707	8.5
	21-Aug-09	18.8	8.0	788	5.6
	28-Aug-09	14.1	8.3	734	8.1
	4-Sep-09	13.1	8.4	654	9.2
	11-Sep-09	13.6	8.0	752	7.8
	18-Sep-09	12.5	7.7	826	7.5
	25-Sep-09	12.3	7.8	678	8.2
	9-Oct-09	9.4	7.5	764	10.4
	16-Oct-09	2.0	7.9	774	12.2
	23-Oct-09	4.2			7.9
	30-Oct-09	3.1	7.9	735	9.1
	6-Nov-09	2.2	7.3	711	12.4
	13-Nov-09	2.5	7.5	786	7.5
	20-Nov-09	5.7	7.2	350	10.9
	27-Nov-09	3.6		682	11.6
	4-Dec-09	0.8	7.2	605	13.0
	19-Mar-10	7.6	7.5	464	9.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	26-Mar-10	0.6	7.2	535	11.2
	2-Apr-10	10.7	6.6	451	9.2
	9-Apr-10	4.8	7.3	582	12.4
	16-Apr-10	12.2	7.6	494	8.5
	23-Apr-10	7.9	7.8	443	9.5
	30-Apr-10	10.7	7.7	458	8.4
	7-May-10	10.4	7.8	396	9.1
	14-May-10	11.1	7.8	346	10.8
	21-May-10	17.7	7.8	578	7.1
	28-May-10	23.2	7.7	607	5.5
	4-Jun-10	17.0	7.7	427	5.3
	11-Jun-10	15.8	7.8	471	5.7
	18-Jun-10	18.2	7.2	604	8.8
	25-Jun-10	18.6	7.7	585	7.6
	9-Jul-10	20.0	7.2	532	4.7
	15-Jul-10	23.4	7.8	722	2.4
	23-Jul-10	10.4	7.6	573	7.3
	30-Jul-10	18.8	7.8	552	7.1
	6-Aug-10	18.6	7.7	636	8.6
	13-Aug-10	21.2	7.7	703	4.3
	20-Aug-10	16.1	7.6	651	6.5
	27-Aug-10	14.8	7.5	407	6.2
	30-Aug-10	17.8	7.6	632	4.6
	1-Sep-10	20.2	7.7	706	4.1
	3-Sep-10	19.8	7.7	720	3.9
	7-Sep-10	15.9	7.6	521	5.2
	10-Sep-10	13.1	7.8	510	6.8
	17-Sep-10	11.2	7.6	475	7.4
	24-Sep-10	16.2	7.8		6.1
	1-Oct-10	11.3	7.6	523	7.0
	8-Oct-10	9.5	7.6	563	8.2
	15-Oct-10	9.4	7.6	561	8.3
	22-Oct-10	3.1	7.7	441	10.3
	29-Oct-10	6.4	7.6	416	5.1
	5-Nov-10	1.5	7.8	413	11.2
	12-Nov-10	3.1	7.8	469	10.7
	19-Nov-10	1.3	8.1	357	12.3
	26-Nov-10	0.3	7.8	345	11.8
	3-Dec-10	0.2	7.8	334	10.3
	1-Apr-11	2.0	7.3	301	11.2
	8-Apr-11	2.7	7.4	299	9.2
	15-Apr-11	3.4	7.7	252	11.7
	21-Apr-11	2.8	8.0	287	13.1
	29-Apr-11	5.1	-	309	12.2
	6-May-11	8.6	8.1	307	9.3
	13-May-11	10.3	8.2	347	9.3
	20-May-11	14.1	7.9	349	8.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	27-May-11	10.9	8.1	320	9.0
	3-Jun-11	15.5	7.8	448	9.9
	10-Jun-11	16.5	7.9	482	9.4
	17-Jun-11	16.7	7.8	514	8.1
	24-Jun-11	16.8	7.9	538	6.8
	30-Jun-11	15.7	7.8	505	10.3
	8-Jul-11	20.1	8.0	652	8.2
	14-Jul-11	17.6	7.8	633	6.9
	22-Jul-11	22.2	7.7	707	8.1
	29-Jul-11	20.6	7.7	567	5.6
	12-Aug-11	17.8	8.0	689	6.0
	19-Aug-11	18.0	8.0	478	5.9
	26-Aug-11	19.1	8.0	741	6.1
	2-Sep-11	20.9	7.8	398	8.7
	9-Sep-11	15.9	8.0	640	6.2
	16-Sep-11	9.7	7.7	475	8.3
	23-Sep-11	12.9	7.7	557	5.4
	30-Sep-11	13.7	8.2	552	8.3
	6-Oct-11	8.1	8.2	453	5.9
	14-Oct-11	14.3	7.8	486	6.3
	21-Oct-11	8.7	7.8	401	9.6
	28-Oct-11	5.4	8.6	475	11.2
	4-Nov-11	4.3	8.0	435	11.2
	11-Nov-11	3.3	7.6	498	5.3
	18-Nov-11	0.8	7.6	445	12.6
	25-Nov-11	3.8	7.9	449	8.4
	2-Dec-11	0.6	7.9	346	14.6
	9-Dec-11	0.2	7.3	327	11.4
	16-Dec-11	1.3	7.5	280	14.0
	16-Mar-12	6.0	7.5	250	11.6
	23-Mar-12	10.6	7.5	-	7.6
	30-Mar-12	2.5	7.8	290	8.1
	13-Apr-12	5.4	8.0	340	10.9
	20-Apr-12	8.6	7.9	401	4.4
	27-Apr-12	3.0	8.0	288	12.3
	4-May-12	13.9	7.8	452	3.6
	11-May-12	9.0	7.8	298	10.6
	18-May-12	10.8	8.0	489	8.5
	25-May-12	11.5	7.5	501	9.0
	1-Jun-12	10.6	8.2	467	8.5
	8-Jun-12	16.8	8.1	558	7.9
	15-Jun-12	18.2	8.1	562	7.9
	22-Jun-12	20.0	8.0	726	7.4
	28-Jun-12	18.7	8.2	648	6.3
	6-Jul-12	22.4	8.0	853	5.3
	13-Jul-12	18.8	8.1	683	5.6
	20-Jul-12	19.2	7.9	781	4.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	27-Jul-12	18.9	7.9	691	5.9
	3-Aug-12	18.6	7.9	720	4.0
	10-Aug-12	16.2	7.8	524	6.0
	17-Aug-12	17.3	7.9	461	5.3
	24-Aug-12	16.7	8.2	667	8.6
	31-Aug-12	18.5	7.7	757	7.2
	7-Sep-12	16.3	8.2	716	4.2
	14-Sep-12	15.2	7.0	593	1.9
	21-Sep-12	10.8	8.0	534	8.7
	28-Sep-12	7.8	6.5	648	9.8
	5-Oct-12	14.3	7.1	736	7.2
	12-Oct-12	4.7	8.0	574	11.3
	19-Oct-12	12.2	8.4	724	4.4
	26-Oct-12	10.4	7.3	615	4.7
	2-Nov-12	1.8	6.3	386	6.9
	9-Nov-12	2.2	7.6	363	11.2
	16-Nov-12	2.8	8.1	438	8.0
	23-Nov-12	6.4	7.7	443	7.4
	30-Nov-12	5.2	7.6	433	7.3
	7-Dec-12	1.1	7.5	386	8.9
	14-Dec-12	0.8	7.7	365	12.3
	21-Dec-12	0.1	7.4	404	12.2
	28-Mar-13	1.5	7.9	303	9.8
	5-Apr-13	0.0	8.0	250	6.9
	12-Apr-13	1.7	8.2	230	7.0
	19-Apr-13	11.2	7.6	277	8.7
	26-Apr-13	4.7	7.8	262	6.1
	3-May-13	15.2	7.8	293	10.5
	9-May-13	13.6	7.8	475	7.5
	16-May-13	11.3	7.8	410	8.2
	24-May-13	5.9	7.7	322	8.4
	31-May-13	19.5	7.7	509	8.5
	7-Jun-13	11.6	-	351	6.2
	14-Jun-13	19.5	7.9	517	5.4
	21-Jun-13	14.9	7.8	539	8.1
	27-Jun-13	15.2	7.9	536	8.1
	5-Jul-13	19.2	7.7	621	6.3
	12-Jul-13	14.7	7.6	582	7.0
	19-Jul-13	19.6	7.8	556	5.6
	25-Jul-13	14.6	7.7	523	8.9
	2-Aug-13	18.2	8.1	576	8.6
	8-Aug-13	19.0	8.1	565	8.5
	16-Aug-13	19.2	8.0	560	8.4
	23-Aug-13	19.2	8.1	562	8.5
	30-Aug-13	19.2	8.2	548	8.3
	6-Sep-13	18.7	8.1	530	8.1
	13-Sep-13	12.9	8.2	530	8.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	20-Sep-13	17.4	8.2	556	8.1
	27-Sep-13	12.6	7.8	550	8.2
	4-Oct-13	10.2	7.6	545	8.2
	11-Oct-13	10.2	7.5	540	8.0
	18-Oct-13	9.8	7.5	539	9.0
	25-Oct-13	7.6	7.6	423	3.9
	31-Oct-13	7.4	7.5	406	3.9
	8-Nov-13	7.4	7.3	398	3.8
	14-Nov-13	3.3	7.4	350	3.0
	22-Nov-13	3.7	7.3	360	3.2
	6-Dec-13	-0.1	7.6	258	7.3
	17-Apr-14	4.2	7.8	491	8.0
	25-Apr-14	4.0	7.8	486	8.2
	1-May-14	4.3	7.6	480	8.2
	9-May-14	11.0	7.6	421	4.3
	16-May-14	10.0	7.1	450	8.2
	23-May-14	9.9	7.1	432	8.7
	30-May-14	10.1	7.1	423	8.8
	6-Jun-14	11.3	7.1	430	8.6
	13-Jun-14	12.5	7.2	432	8.5
	20-Jun-14	13.2	7.2	442	8.5
	27-Jun-14	14.2	7.2	421	7.9
	4-Jul-14	14.6	7.1	406	7.8
	11-Jul-14	14.6	7.1	413	7.8
	18-Jul-14	15.1	8.4	600	-
	25-Jul-14	14.9	8.7	608	-
	1-Aug-14	15.0	8.6	565	4.9
	8-Aug-14	15.3	8.5	562	4.9
	15-Aug-14	13.2	8.5	486	5.2
	22-Aug-14	16.1	8.6	639	7.5
	29-Aug-14	14.9	8.6	659	-
	12-Sep-14	12.0	7.8	623	6.2
	19-Sep-14	10.3	7.9	449	4.9
	26-Sep-14	10.3	7.9	440	5.0
	3-Oct-14	12.9	7.7	425	4.7
	10-Oct-14	11.9	7.6	420	4.5
	16-Oct-14	12.1	7.5	430	4.0
	24-Oct-14	7.6	7.6	489	6.9
	31-Oct-14	7.0	7.6	423	6.0
	7-Nov-14	0.5	7.3	431	7.0
	14-Nov-14	0.2	7.2	428	6.8
	20-Nov-14	-1.2	7.3	432	6.2
	26-Dec-14	1.3	7.2	418	7.0
	2-Apr-15	2.8	7.6	281	9.8
	23-Apr-15	2.5	8.0	343	13.2
	1-May-15	8.1	8.0	447	9.1
	8-May-15	17.3	9.2	523	-

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-May-15	11.4	7.8	413	9.2
	21-May-15	11.2	8.0	420	11.4
	28-May-15	16.7	7.9	506	8.7
	4-Jun-15	15.5	8.1	507	9.5
	12-Jun-15	14.1	7.7	523	7.3
	18-Jun-15	17.8	7.8	579	6.9
	10-Jul-15	15.9	7.9	545	-
	17-Jul-15	15.5	8.0	541	-
	22-Jul-15	20.5	7.8	683	7.7
	30-Jul-15	24.6	8.1	743	-
	5-Aug-15	14.7	7.6	541	6.1
	13-Aug-15	-	7.9	611	-
	21-Aug-15	13.7	8.0	543	7.2
	28-Aug-15	14.6	8.1	565	7.8
	3-Sep-15	19.6	8.0	710	7.6
	10-Sep-15	18.6	7.7	621	7.1
	18-Sep-15	16.4	7.7	654	8.3
	25-Sep-15	14.0	7.6	583	9.6
	2-Oct-15	6.9	7.6	501	10.6
	9-Oct-15	10.4	7.7	530	8.5
	16-Oct-15	10.5	7.8	483	10.5
	23-Oct-15	5.9	7.6	464	10.8
	30-Oct-15	6.5	7.5	424	10.0
	5-Nov-15	9.9	7.5	445	6.3
	13-Nov-15	5.2	7.3	358	8.1
	19-Nov-15	9.8	7.7	535	12.1
	26-Nov-15	1.0	7.3	362	15.3
	4-Dec-15	2.0	7.5	390	15.5
	10-Dec-15	4.7	7.4	465	11.4
	17-Dec-15	3.6	7.7	370	11.3
	23-Dec-15	5.1	7.4	378	10.9
	30-Dec-15	-0.1	7.4	321	11.4
	8-Jan-16	0.1	7.2	355	12.1
	10-Mar-16	-0.1	6.9	210	10.4
	18-Mar-16	0.9	7.4	289	10.8
	28-Mar-16	1.0	6.6	132	11.5
	1-Apr-16	4.7	7.3	170	9.6
	7-Apr-16	0.2	7.4	219	12.5
	15-Apr-16	2.7	7.0	256	12.9
	22-Apr-16	10.7	7.9	426	8.6
	29-Apr-16	4.7	7.4	352	11.2
	6-May-16	9.2	7.9	424	8.5
	13-May-16	13.8	8.1	566	-
	20-May-16	13.5	8.0	570	8.7
	27-May-16	16.5	7.8	543	6.4
	2-Jun-16	15.9	7.9	544	6.5
	10-Jun-16	10.5	7.9	629	9.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jun-16	14.4	7.9	581	8.0
	24-Jun-16	13.7	7.9	573	8.8
	28-Jun-16	16.0	8.0	609	10.7
	8-Jul-16	18.3	8.0	661	8.0
	15-Jul-16	18.0	7.9	562	6.9
	22-Jul-16	19.0	7.6	636	5.4
	29-Jul-16	16.4	7.8	606	5.9
	7-Oct-16	13.9	7.9	576	9.1
	27-Oct-16	1.7	8.0	396	12.0
	3-Nov-16	8.1	7.6	504	10.8
	11-Nov-16	5.0	7.8	409	12.2
	18-Nov-16	6.7	7.8	695	11.3
	24-Nov-16	1.5	7.4	369	11.8
	2-Dec-16	2.3	7.5	340	7.2
	16-Dec-16	0.0	7.7	334	4.5
	26-Jan-17	0.0	7.5	362	10.1
	19-Apr-17	11.2	7.2	423	11.5
	16-May-17	17.4	8.2	483	7.8
	28-Jun-17	14.5	7.6	535	7.4
	18-Jul-17	19.6	6.1	666	9.2
	15-Aug-17	16.0	8.3	505	7.0
	18-Sep-17	14.2	7.7	649	7.7
	17-Oct-17	6.8	7.8	443	9.7
	14-Nov-17	0.5	7.7	413	12.8
	22-Feb-18	-0.2	7.5	235	8.7
	20-Mar-18	-0.2	7.5	358	11.4
	15-May-18	12.5	7.6	555	5.2
	18-Jun-18	18.8	7.7	641	6.3
	19-Jul-18	15.6	7.7	712	6.3
	23-Aug-18	15.2	7.6	628	4.5
	19-Sep-18	14.6	7.6	734	6.1
	24-Oct-18	2.9	7.5	641	10.0
	21-Nov-18	0.0	7.6	674	9.1
	12-Dec-18	0.3	8.1	637	9.9
SW 3					
	22-May-03	10.0			
	18-Mar-04	0.6		340	4.4
	19-Apr-04	8.7	7.4	239	10.3
	19-May-04	14.6	7.5	378	5.3
	30-Mar-05	1.1	7.0	236	7.5
	11-Apr-05	1.5	6.1	154	7.5
	16-Jan-06	0.8	7.8	602	6.3
	20-Mar-06	0.5	7.8	209	
	18-Apr-06	10.1	7.7	339	
	23-May-06	8.5	7.5	426	
	27-Nov-06	6.1	7.6	737	7.6
	17-Dec-06	1.4	7.5	353	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	21-Jan-07	2.5	7.6	452	6.5
	15-Apr-07	1.7	8.1	351	10.8
	13-May-07	13.2	8.0	849	7.0
	4-Apr-08	0.1	7.7	275	8.2
	23-Apr-08	18.7	7.8	329	5.8
	21-May-08	14.7	6.9	365	4.9
	15-Mar-09	2.0	7.7	295	10.4
	12-Apr-09	12.5	7.3	354	10.6
	17-May-09	20.5	7.7	351	4.5
	14-Mar-10	1.3	7.7	265	9.9
	11-Apr-10	8.2	7.8	373	11.3
	16-May-10	15.3	7.6	219	5.4
	13-Jun-10	18.5	7.5	334	6.2
	18-Jul-10	19.8	7.4	308	5.9
	14-Nov-10	6.0	7.3	365	10.6
	16-Jan-11	0.2	8.8	218	7.6
	13-Mar-11	0.3	8.1	209	7.1
	17-Mar-11	0.5	8.0	141	5.9
	22-Mar-11	0.5	7.9	204	8.2
	1-Apr-11	1.2	7.4	197	7.3
	5-Apr-11	0.4	8.0	166	12.3
	8-Apr-11	1.8	7.9	185	9.3
	12-Apr-11	4.4	6.3	164	10.8
	15-Apr-11	3.0	7.8	140	10.1
	18-Apr-11	2.1	7.8	200	11.7
	20-Apr-11	2.5	8.0	182	8.8
	21-Apr-11	2.3	8.1	185	12.5
	26-Apr-11	7.1	6.6	232	9.6
	29-Apr-11	5.2	7.6	225	11.2
	6-May-11	8.2	8.2	213	7.3
	15-May-11	10.7	8.4	252	9.3
	16-May-11	10.8	7.2	209	9.8
	18-May-11	12.2	8.2	228	7.0
	19-May-11	17.1	8.4	264	10.3
	20-May-11	15.5	7.8	256	6.7
	27-May-11	11.1	-	242	7.6
	3-Jun-11	13.7	7.6	304	5.9
	13-Jun-11	13.4	7.0	316	5.1
	16-Oct-11	9.9	7.4	296	8.0
	18-Dec-11	1.0	8.2	146	9.0
	18-Mar-12	12.8	7.5	215	5.9
	18-Nov-12	4.9	7.4	227	6.3
	16-Dec-12	1.2	7.4	215	10.8
	15-Jan-13	0.1	7.6	218	5.4
	19-Mar-13	0.2	7.7	185	6.7
	15-Apr-13	8.9	7.5	236	6.8
	13-May-13	7.4	7.6	257	7.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Nov-13	0.9	8.0	218	3.2
	15-Apr-14	0.4	7.6	161	7.0
	12-May-14	17.0	7.1	350	4.6
	22-Oct-14	9.4	7.2	418	4.9
	17-Dec-14	0.2	8.9	262	-
	22-Apr-15	9.2	7.8	229	7.5
	15-Jun-15	18.8	7.6	342	1.7
	19-Jan-16	0.0	7.1	219	11.0
	17-Feb-16	0.1	7.1	243	9.8
	15-Mar-16	2.6	7.4	173	10.6
	20-Apr-16	15.8	7.6	299	7.4
	17-May-16	8.0	7.8	319	8.4
	21-Mar-16	1.3	7.6	280	5.8
	19-Apr-17	8.2	7.5	263	8.0
	16-May-17	10.8	7.9	415	3.5
	28-Jun-17	14.5	7.7	344	4.7
	18-Jul-17	16.2	5.6	446	-
	17-Oct-17	9.7	7.7	458	7.3
	14-Nov-17	4.8	7.9	489	14.7
	22-Feb-18	0.0	7.3	160	6.2
	18-Apr-18	-0.2	7.7	370	5.8
	14-May-18	14.1	7.4	675	6.2
	21-Nov-18	0.0	7.7	713	9.0
	18-Jan-19	1.2	7.5	402.3	8.6
SW 3A					
	22-May-03	12.0			
	17-Mar-04	0.1		303	4.2
	19-Apr-04	8.6	7.2	214	6.8
	19-May-04	16.4	7.2	349	5.0
	24-Jun-04	17.0	7.2	470	2.7
	30-Mar-05	0.1	7.0	267	4.0
	11-Apr-05	1.1	6.5	167	7.2
	24-May-05	12.1	7.9	322	4.8
	16-Jan-06	0.1	8.0	178	1.8
	20-Mar-06	0.1	7.8	204	
	18-Apr-06	10.0	7.5	294	
	23-May-06	9.2	7.5	382	7.6
	19-Jun-06	19.7	6.5	688	5.6
	27-Nov-06	5.2	7.2	351	7.5
	17-Dec-06	0.6	7.2	369	2.8
	16-Apr-07	0.9	7.8	344	4.5
	13-May-07	17.0	8.2	389	3.5
	7-Apr-08	1.3	7.6	273	7.5
	23-Apr-08	18.4	7.7	323	2.8
	21-May-08	14.2	6.9	385	4.5
	17-Jun-08	16.3	7.7	465	3.5
	20-Oct-08	7.4	7.7	388	6.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Mar-09	0.3	7.5	342	7.6
	12-Apr-09	9.9	7.8	360	6.6
	17-May-09	18.4	7.6	358	3.9
	14-Jun-09	14.0	8.1	941	6.5
	11-Oct-09	5.8	6.9	414	8.3
	15-Nov-09	5.6	7.9	417	
	14-Mar-10	0.1	7.7	342	10.9
	11-Apr-10	8.0	7.9	399	9.8
	16-May-10	15.7	7.5	343	4.9
	23-May-10	18.6	7.3	432	4.2
	13-Jun-10	19.2	7.3	401	3.7
	18-Jul-10	19.5	7.5	331	6.5
	17-Oct-10	7.5	7.6	327	6.4
	14-Nov-10	3.6	7.5	246	9.9
	17-Apr-11	2.4	8.3	233	6.5
	15-May-11	10.6	7.9	235	10.6
	13-Jun-11	14.1	7.5	362	6.1
	16-Oct-11	8.3	7.7	300	5.6
	20-Nov-11	1.3	7.8	256	7.5
	19-Dec-11	0.2	8.3	164	6.2
	18-Mar-12	9.8	7.3	231	5.5
	15-Apr-12	3.7	8.3	231	
	13-May-12	14.5	7.7	369	6.5
	13-Aug-12	18.2	8.1	417	3.1
	18-Sep-12	14.1	7.6	444	7.4
	16-Oct-12	6.3	6.1	396	3.3
	20-Nov-12	3.1	7.5	234	5.5
	17-Dec-12	0.2	7.7	195	6.6
	15-Apr-13	4.4	7.3	227	4.6
	13-May-13	6.9	7.5	255	8.5
	19-Nov-13	1.2	8.0	231	3.0
	15-Apr-14	0.2	7.9	182	5.6
	12-May-14	16.9	6.9	365	6.1
	18-Aug-14	14.5	8.5	409	6.5
	8-Sep-14	14.6	8.8	425	7.3
	22-Oct-14	10.0	7.3	463	5.0
	22-Apr-15	8.2	7.5	229	3.0
	19-May-15	14.2	7.5	361	3.8
	15-Jun-15	17.9	7.6	390	3.5
	21-Jul-15	17.7	7.8	437	-
	11-Aug-15	16.2	7.7	394	4.2
	18-Nov-15	5.2	7.2	263	5.9
	8-Dec-15	1.7	7.3	251	9.9
	15-Mar-16	0.4	7.1	164	5.8
	20-Apr-16	14.3	7.2	304	3.6
	17-May-16	7.7	7.5	263	5.2
	22-Jun-16	15.8	7.3	504	3.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	24-Jan-17	0.0	7.0	215	6.0
	21-Mar-17	0.2	7.9	248	3.7
	19-Apr-17	7.4	7.3	247	4.9
	16-May-17	10.2	7.3	405	3.3
	28-Jun-17	14.2	7.5	360	2.4
	18-Jul-17	17.6	7.5	435	2.9
	15-Aug-17	15.6	7.8	349	2.2
	18-Sep-17	14.0	7.3	398	3.4
	17-Oct-17	7.8	7.5	295	3.2
	14-Nov-17	0.9	7.6	277	6.0
	14-Dec-17	-0.4	7.4	282	7.8
	22-Feb-17	-0.3	7.5	208	5.1
	14-May-18	9.3	7.3	467	7.0
SW 4					
	13-Jan-05	0.9	7.2	125	13.6
	31-Mar-06	6.0	7.2	360	
	7-Apr-06	6.6	7.9	463	
	13-Apr-06	15.5	8.6	538	
	17-Nov-06	4.4	7.4	509	9.3
	18-Mar-07	1.5	8.0	338	11.4
	7-Apr-08	2.8	7.5	316	8.8
	15-Mar-09	2.0	7.6	356	6.0
	12-Apr-09	11.0	8.1	558	
	14-Mar-10	2.3	8.0	383	8.4
	19-Jul-10	20.6	7.3	303	5.0
	16-Dec-12	1.4	6.9	308	5.7
	13-Jan-13	0.3	7.4	370	4.3
	15-Apr-13	8.6	7.5	349	6.0
	19-Nov-13	2.6	8.0	338	1.4
	15-Apr-14	3.7	7.5	161	2.7
	22-Oct-14	8.6	7.5	421	7.0
	22-Apr-15	5.7	7.5	565	1.7
	15-Mar-16	3.2	7.1	327	4.4
	20-Apr-16	16.8	7.9	467	8.5
	17-May-16	8.5	7.7	472	3.9
	24-Jan-17	-0.1	7.2	327	3.0
	21-Mar-17	1.1	7.5	356	6.9
	19-Apr-17	7.4	7.4	401	8.6
	16-May-17	10.8	7.9	523	13.7
	28-Jun-17	13.9	7.0	425	2.6
	17-Oct-17	7.4	7.2	335	6.7
	14-Nov-17	2.3	7.3	441	12.3
	14-Dec-17	0.9	7.2	510	7.1
	22-Feb-18	-0.2	7.1	196	1.0
	20-Mar-18	0.4	7.4	404	9.0
	18-Apr-18	0.0	7.4	639	2.2
	15-May-18	15.9	7.8	711	6.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	21-Nov-18	0.1	7.5	698	6.7
	12-Dec-18	0.9	7.5	673	4.4
SW 5					
	22-May-03	11.0			
	16-Mar-04	0.6	7.3	469	5.7
	19-Apr-04	8.0	7.5	316	8.2
	19-May-04	14.9	7.5	464	5.1
	24-Jun-04	14.1	7.5	458	5.1
	29-Jul-04	16.1	7.6	886	9.1
	26-Aug-04	15.6	7.5	430	8.3
	22-Sep-04	11.7	7.2	400	3.2
	21-Oct-04	6.7	7.5	375	8.0
	16-Nov-04	1.3	7.4	400	10.3
	28-Mar-05	0.9	7.0	336	9.7
	11-Apr-05	1.7	6.3	212	8.2
	24-May-05	11.6	6.9	411	8.8
	28-Jun-05	20.2	7.7	522	9.7
	11-Jul-05	17.8	5.5	487	8.2
	22-Aug-05	14.6	6.8	441	8.8
	27-Sep-05	10.3	7.3	386	3.8
	24-Oct-05	5.9	7.9	562	3.2
	13-Nov-05	6.0	8.1	382	10.9
	20-Mar-06	0.8	8.0	317	11.6
	18-Apr-06	9.4	7.7	453	6.6
	23-May-06	6.3	8.3	553	
	21-Jun-06	17.5	7.5	513	
	11-Jul-06	17.7	7.5	486	
	22-Aug-06	19.3	7.1	485	
	20-Sep-06	12.2	7.2	588	
	18-Oct-06	9.7	7.3	471	
	24-Nov-06	1.0	7.6	604	11.2
	17-Dec-06	1.0	7.6	587	11.2
	18-Mar-07	0.5	7.8	560	4.8
	15-Apr-07	3.1	8.1	489	8.8
	13-May-07	19.1	8.2	516	8.9
	17-Jun-07	20.1	7.8	568	4.0
	15-Jul-07	18.7	7.8	518	#REF!
	18-Oct-07	13.0	7.7	564	6.4
	21-Nov-07	1.8	7.7	627	8.2
	12-Dec-07	0.2	7.7	587	4.9
	20-Feb-08	0.2	7.8	335	2.9
	18-Mar-08	0.5	7.7	547	5.5
	2-Apr-08	1.3	7.7	382	6.1
	24-Apr-08	12.4	8.1	461	8.6
	21-May-08	10.8	7.7	474	8.5
	17-Jun-08	17.8	7.6	450	5.3
	15-Jul-08	17.9	7.3	555	4.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Aug-08	17.2	7.9	606	3.5
	16-Sep-08	12.2	7.8	499	4.0
	22-Oct-08	2.8	7.5	538	#REF!
	23-Nov-08	0.2		609	3.0
	8-Feb-09	0.3		439	2.8
	15-Mar-09	2.7	8.5	368	7.2
	12-Apr-09	9.6	7.8	477	9.0
	17-May-09	15.5	7.5	415	2.8
	14-Jun-09	14.6	7.3	1007	5.0
	12-Jul-09	19.2	7.6	573	8.2
	9-Aug-09	17.1	9.0	512	3.1
	13-Sep-09	17.6	7.3	617	3.5
	11-Oct-09	2.0	7.4	576	10.0
	15-Nov-09	1.6	7.6	567	10.8
	17-Jan-10	0.6	8.2	222	6.7
	14-Mar-10	4.0	7.5	404	7.9
	11-Apr-10	13.1	8.0	524	10.6
	16-May-10	14.6	7.7	390	6.2
	13-Jun-10	21.0	7.8	471	11.8
	18-Jul-10	19.0	7.5	446	3.5
	15-Aug-10	22.0	7.6	546	4.7
	12-Sep-10	13.4	7.9	461	7.9
	17-Oct-10	6.6	7.7	399	9.1
	14-Nov-10	4.2	7.7	274	7.8
	13-Mar-11	1.5	7.9	286	5.6
	17-Apr-11	3.6	8.1	263	10.2
	15-May-11	11.6	7.7	303	6.1
	12-Jun-11	14.0	7.5	372	9.3
	17-Jul-11	25.9	7.8	582	6.2
	14-Aug-11	22.4	8.0	403	10.4
	18-Sep-11	15.2	8.4	380	4.4
	16-Oct-11	7.3	7.5	394	6.5
	20-Nov-11	0.6	8.9	368	8.6
	18-Dec-11	0.4	8.7	271	9.1
	18-Mar-12	13.5	7.4	340	4.8
	15-Apr-12	4.8	8.5	331	14.5
	13-May-12	19.3	8.2	423	13.2
	17-Jun-12	25.1	8.2	611	13.6
	16-Jul-12	22.2	8.0	627	3.0
	15-Aug-12	15.6	8.7	400	2.5
	19-Sep-12	11.2	7.6	497	8.4
	18-Oct-12	10.2	8.3	399	6.2
	20-Nov-12	4.3	7.6	352	7.9
	20-Dec-12	0.3	7.3	656	11.2
	15-Jan-13	0.2	7.6	285	8.3
	16-Apr-13	9.3	7.8	322	7.4
	14-May-13	8.1	7.8	313	8.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Jun-13	19.5	7.8	454	6.2
	17-Jul-13	22.5	7.1	407	8.4
	20-Aug-13	16.9	8.7	492	3.8
	18-Sep-13	13.0	8.0	438	6.7
	16-Oct-13	12.9	8.4	386	3.2
	20-Nov-13	0.3	8.1	276	2.9
	16-Apr-14	1.0	8.4	231	9.3
	13-May-14	15.6	7.6	389	4.9
	17-Jun-14	17.1	7.7	446	6.5
	15-Jul-14	18.2	8.4	488	8.0
	19-Aug-14	14.2	8.5	484	5.6
	9-Sep-14	15.9	8.5	448	4.9
	22-Oct-14	9.5	8.5	408	5.9
	22-Apr-15	5.8	7.6	346	8.2
	19-May-15	15.7	7.8	399	10.1
	16-Jun-15	20.1	7.5	469	3.3
	22-Jul-15	18.3	7.3	511	3.1
	12-Aug-15	18.0	7.6	516	3.0
	8-Sep-15	21.1	7.4	621	1.1
	15-Oct-15	8.5	7.2	423	3.1
	18-Nov-15	4.9	7.1	380	8.0
	8-Dec-15	2.5	7.7	370	12.1
	15-Mar-16	2.9	7.3	264	10.0
	21-Apr-16	9.6	7.6	375	3.4
	17-May-16	7.6	7.8	368	7.5
	22-Jun-16	16.9	7.5	498	2.1
	20-Jul-16	17.6	8.0	487	4.2
	24-Aug-16	18.4	7.3	577	2.8
	19-Sep-16	15.4	7.4	619	1.0
	17-Oct-16	12.8	7.3	590	1.3
	15-Nov-16	3.7	7.6	410	7.1
	21-Mar-17	0.9	7.4	325	8.1
	19-Apr-17	8.1	7.4	359	6.7
	16-May-17	12.1	7.8	527	8.5
	28-Jun-17	13.8	7.3	422	3.0
	18-Jul-17	18.0	7.0	498	2.1
	15-Aug-17	16.6	8.0	408	1.4
	18-Sep-17	15.3	7.3	512	1.1
	17-Oct-17	6.5	7.2	347	4.0
	14-Nov-17	0.8	7.2	343	9.3
	22-Feb-18	-0.3	7.4	188	9.2
	20-Mar-18	1.0	7.4	335	9.4
	18-Apr-18	-0.2	7.6	440	4.6
	14-May-18	13.9	7.6	604	5.7
	18-Jun-18	20.1	7.6	521	3.4
	19-Jul-18	21.2	7.8	508	8.0
	23-Aug-18	19.5	7.5	468.3	6.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Sep-18	18.9	7.5	647	4.7
	24-Oct-18	3.3	7.5	515	7.5
SW 6					
	22-May-03	12.0			
	23-Jun-03	18.1			
	19-Apr-04	8.7	7.6	299	7.8
	19-May-04	15.4	7.5	425	4.6
	24-Jun-04	14.7	7.3	435	1.8
	29-Jul-04	16.5	7.1	841	1.8
	26-Aug-04	14.5	7.2	413	6.1
	22-Sep-04	11.9	7.0	393	1.5
	21-Oct-04	6.4	7.2	309	2.1
	16-Nov-04	3.2	6.8	414	5.8
	11-Apr-05	0.5	6.1	173	6.6
	24-May-05	12.2	6.9	400	4.6
	28-Jun-05	21.8	7.7	529	0.4
	11-Jul-05	19.8	6.3	500	0.7
	22-Aug-05	17.0	6.9	457	0.5
	27-Sep-05	13.2	7.1	411	0.5
	28-Oct-05	5.6	7.9	440	2.4
	14-Nov-05	6.1	7.6	369	6.1
	18-Apr-06	10.0	7.7	426	
	23-May-06	6.6	8.0	504	
	21-Jun-06	18.1	7.5	469	
	11-Jul-06	18.3	7.3	463	
	22-Aug-06	18.9	7.2	482	
	20-Sep-06	12.5	6.9	464	
	18-Oct-06	9.2	7.3	453	
	24-Nov-06	0.8	7.8	546	11.4
	17-Dec-06	0.6	7.6	546	12.7
	16-Apr-07	2.9	8.0	474	9.1
	13-May-07	18.3	8.0	496	7.0
	17-Jun-07	20.4	7.7	592	0.8
	15-Jul-07	17.3	7.6	518	2.4
	18-Oct-07	11.3	7.6	646	3.6
	21-Nov-07	1.6	7.9	578	9.4
	7-Apr-08	6.2	7.4	365	8.7
	24-Apr-08	12.7	7.8	452	3.0
	21-May-08	10.5	7.6	436	7.0
	17-Jun-08	16.2	7.5	296	2.4
	16-Jul-08	17.5	7.3	511	1.6
	19-Aug-08	16.6	7.6	565	2.9
	16-Sep-08	11.5	7.7	460	3.9
	22-Oct-08	2.8	7.4	475	5.1
	15-Mar-09	1.0	7.5	344	9.2
	12-Apr-09	10.4	9.6	440	7.6
	17-May-09	15.8	7.6	404	4.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Jun-09	18.5	7.4	964	4.8
	12-Jul-09	16.8	7.8	556	6.2
	9-Aug-09	17.0	8.0	490	3.0
	13-Sep-09	18.5	6.9	537	5.9
	11-Oct-09	3.3	7.3	554	10.5
	15-Nov-09	1.5	7.3	526	10.5
	14-Mar-10	1.2	7.6	383	9.7
	11-Apr-10	7.3	8.2	499	11.8
	16-May-10	14.1	7.7	368	5.3
	13-Jun-10	20.1	7.6	429	5.3
	18-Jul-10	20.7	7.5	397	5.4
	15-Aug-10	21.5	7.7	526	1.9
	12-Sep-10	13.6	7.8	447	4.1
	17-Oct-10	6.5	7.7	384	7.8
	14-Nov-10	4.0	7.6	259	9.0
	17-Apr-11	3.9	8.0	246	9.2
	15-May-11	12.0	7.8	286	6.1
	12-Jun-11	14.4	7.6	352	4.5
	17-Jul-11	23.2	7.6	528	8.5
	14-Aug-11	21.7	8.1	403	4.9
	18-Sep-11	14.4	8.3	424	4.2
	16-Oct-11	7.5	7.7	371	6.7
	20-Nov-11	0.6	8.2	343	10.0
	18-Mar-12	13.8	7.5	299	5.5
	15-Apr-12	4.8	8.6	314	14.6
	13-May-12	18.3	7.8	439	6.1
	17-Jun-12	21.5	8.0	567	3.2
	16-Jul-12	21.2	7.9	611	1.6
	15-Aug-12	16.0	8.0	484	1.4
	19-Sep-12	10.8	7.4	407	1.3
	18-Oct-12	9.3	8.1	349	2.6
	20-Nov-12	3.8	7.5	327	6.6
	16-Apr-13	9.7	7.9	312	7.5
	14-May-13	8.3	7.7	304	8.4
	18-Jun-13	18.3	7.8	422	1.7
	17-Jul-13	22.7	7.1	407	8.4
	20-Aug-13	16.7	8.2	435	2.2
	18-Sep-13	11.7	7.8	391	3.1
	16-Oct-13	12.6	8.3	356	2.3
	20-Nov-13	0.1	8.3	266	2.1
	16-Apr-14	0.9	7.8	423	11.8
	13-May-14	16.2	7.8	380	6.6
	17-Jun-14	17.3	7.6	446	7.6
	15-Jul-14	17.1	7.5	459	7.9
	19-Aug-14	13.6	8.2	463	3.2
	9-Sep-14	16.6	8.3	444	4.2
	22-Oct-14	8.9	7.3	423	3.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Apr-15	6.3	7.8	333	8.2
	20-May-15	14.2	8.0	371	9.5
	16-Jun-15	19.6	7.6	433	2.9
	22-Jul-15	17.7	7.5	473	3.3
	12-Aug-15	17.4	7.7	473	3.8
	8-Sep-15	18.7	7.4	512	1.5
	15-Oct-15	8.6	7.1	358	3.2
	18-Nov-15	4.8	7.2	347	8.4
	8-Dec-15	1.7	7.7	332	13.8
	15-Mar-16	1.2	7.2	187	10.6
	21-Apr-16	9.4	7.8	347	4.4
	17-May-16	7.0	7.8	337	8.4
	22-Jun-16	15.2	7.6	452	3.3
	20-Jul-16	14.5	7.7	452	4.4
	24-Aug-16	17.0	7.4	475	3.6
	19-Sep-16	13.1	7.5	576	4.1
	17-Oct-16	12.4	7.4	545	5.1
	15-Nov-16	3.5	7.7	383	9.0
	21-Mar-17	0.3	7.5	301	9.8
	19-Apr-17	8.2	7.4	323	7.8
	16-May-17	12.0	7.8	495	8.4
	28-Jun-17	13.7	7.3	382	7.8
	18-Jul-17	17.6	7.2	453	4.3
	15-Aug-17	16.2	8.1	368	4.3
	18-Sep-17	14.2	7.5	471	5.0
	17-Oct-17	7.2	7.4	325	7.4
	14-Nov-17	1.1	7.4	316	12.0
	20-Mar-18	0.4	7.5	309	10.8
	18-Apr-18	-0.4	7.7	409	5.8
	14-May-18	14.8	7.6	479	5.5
	18-Jun-18	18.7	7.6	478.5	3.6
	19-Jul-18	19.6	7.6	532	3.5
	23-Aug-18	18.0	7.5	470.6	4.0
	19-Sep-18	18.4	7.6	613	4.0
	24-Oct-18	3.3	7.6	567	7.8
	21-Nov-18	0.0	7.9	546	10.3
	12-Dec-18	0.1	7.6	507	8.0
SW 6A					
	22-Oct-03	5.1	6.6	461	
	16-Mar-04	0.3	6.1	435	10.2
	19-Apr-04	9.0	7.6	303	11.5
	19-May-04	15.4	7.7	432	7.8
	24-Jun-04	14.8	7.7	433	7.2
	29-Jul-04	17.7	7.7	867	6.4
	26-Aug-04	15.2	7.8	432	
	22-Sep-04	11.7	7.7	417	8.0
	21-Oct-04	6.9	7.7	356	9.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Nov-04	2.1	7.6	339	12.0
	28-Mar-05	0.6	7.4	303	12.4
	11-Apr-05	1.8	6.4	196	10.9
	24-May-05	12.5	7.3	407	8.4
	28-Jun-05	21.5	7.7	528	6.4
	11-Jul-05	19.6	6.1	503	5.8
	22-Aug-05	15.8	6.9	460	6.8
	27-Sep-05	11.7	7.3	382	7.6
	24-Oct-05	6.3	8.1	448	10.8
	14-Nov-05	5.5	7.8	356	11.0
	16-Jan-06	0.1	7.1	285	10.8
	20-Mar-06	0.4	8.3	276	11.0
	18-Apr-06	10.1	7.9	414	9.1
	23-May-06	7.2	8.5	493	10.1
	21-Jun-06	18.9	7.8	460	
	11-Jul-06	19.0	7.9	463	
	22-Aug-06	19.2	7.6	501	
	20-Sep-06	11.9	7.6	469	
	18-Oct-06	9.4	7.5	443	
	24-Nov-06	1.8	7.9	521	13.4
	17-Dec-06	1.2	7.8	521	14.1
	18-Mar-07	0.4	7.8	511	9.6
	16-Apr-07	3.1	8.1	460	11.5
	13-May-07	17.9	8.2	483	8.3
	17-Jun-07	20.3	8.1	535	5.5
	15-Jul-07	18.5	7.8	508	6.8
	19-Aug-07	17.0	8.0	523	7.9
	18-Sep-07	12.2	7.9	476	8.4
	18-Oct-07	12.2	7.8	489	8.0
	21-Nov-07	2.5	7.8	556	10.9
	21-Jan-08	0.1	6.5	460	2.7
	18-Mar-08	0.3	7.6	506	11.9
	2-Apr-08	0.4	7.5	369	9.6
	24-Apr-08	12.5	7.6	452	6.1
	21-May-08	10.3	7.7	439	8.4
	17-Jun-08	16.8	7.7	348	6.3
	15-Jul-08	18.6	7.3	525	5.8
	19-Aug-08	17.8	7.8	556	4.1
	12-Sep-08	13.5	7.8	515	5.2
	22-Oct-08	3.1	7.5	466	8.1
	23-Nov-08	0.5	7.6	540	7.3
	14-Dec-08	0.1	6.8	436	4.9
	18-Jan-09	0.1	7.5	529	6.7
	8-Feb-09	0.5		412	7.0
	15-Mar-09	1.9	8.0	339	13.1
	12-Apr-09	9.8	8.8	447	10.6
	17-May-09	14.5	7.9	402	7.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Jun-09	14.4	8.5	947	8.6
	12-Jul-09	17.6	8.2	474	9.1
	9-Aug-09	16.3	8.2	484	7.5
	13-Sep-09	16.0	6.9	492	9.1
	11-Oct-09	6.4	8.1	530	12.0
	15-Nov-09	2.1	7.4	495	
	13-Dec-09	0.2	7.5	553	13.5
	17-Jan-10	1.2	8.0	549	12.5
	7-Feb-10	0.2	7.4	548	12.8
	14-Mar-10	2.8	7.5	364	10.9
	11-Apr-10	11.1	8.0	494	12.2
	16-May-10	13.1	8.0	362	8.8
	13-Jun-10	19.6	8.0	426	10.6
	18-Jul-10	18.4	7.8	400	9.3
	15-Aug-10	20.2	8.1	481	7.9
	12-Sep-10	13.0	8.2	433	9.9
	17-Oct-10	8.9	8.1	377	10.4
	14-Nov-10	4.5	8.0	253	10.0
	19-Dec-10	0.5	8.0	260	11.3
	16-Jan-11	0.1	7.9	273	9.6
	20-Feb-11	0.4	7.9	275	6.7
	13-Mar-11	2.1	7.9	269	8.8
	20-Mar-11	0.7	7.8	251	10.2
	17-Apr-11	3.7	8.0	248	10.0
	15-May-11	11.6	7.8	287	8.4
	12-Jun-11	13.6	7.9	345	8.4
	17-Jul-11	22.1	8.4	491	8.1
	14-Aug-11	21.2	8.2	309	7.7
	18-Sep-11	15.2	8.6	380	9.3
	16-Oct-11	7.8	7.8	347	11.3
	20-Nov-11	1.6	8.4	229	13.2
	18-Dec-11	1.0	8.4	248	14.6
	15-Jan-12	0.6	8.0	237	11.9
	19-Feb-12	0.6	8.5	253	13.4
	18-Mar-12	13.1	7.6	297	7.2
	15-Apr-12	6.0	8.6	321	13.8
	13-May-12	19.7	8.1	444	8.3
	17-Jun-12	25.2	8.4	558	12.8
	16-Jul-12	23.4	8.4	522	7.3
	15-Aug-12	16.4	8.3	417	6.0
	19-Sep-12	12.6	7.9	407	9.3
	18-Oct-12	10.4	8.6	347	8.5
	20-Nov-12	4.2	7.6	321	8.8
	20-Dec-12	0.6	7.3	609	12.4
	15-Jan-13	0.2	7.5	264	9.2
	20-Feb-13	0.2	7.9	266	12.7
	20-Mar-13	0.4	7.7	246	13.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Apr-13	8.3	8.0	268	8.5
	14-May-13	8.1	7.9	300	9.9
	18-Jun-13	19.5	7.9	430	6.2
	17-Jul-13	22.6	7.7	453	7.2
	18-Sep-13	13.6	8.2	385	10.6
	16-Oct-13	12.7	8.5	354	5.0
	20-Nov-13	0.5	7.8	259	7.2
	17-Dec-13	0.3	8.7	269	7.2
	16-Apr-14	0.6	7.9	201	11.5
	13-May-14	15.2	7.8	366	8.0
	17-Jun-14	17.3	8.0	425	8.3
	15-Jul-14	16.6	7.6	440	10.6
	19-Aug-14	14.5	8.5	445	7.1
	9-Sep-14	16.0	8.6	474	4.8
	22-Oct-14	9.9	7.2	463	5.9
	16-Dec-14	0.7	8.2	323	-
	18-Mar-15	1.8	7.8	238	11.1
	22-Apr-15	6.0	7.8	322	10.9
	19-May-15	15.5	8.1	377	10.8
	16-Jun-15	19.6	7.8	434	6.9
	22-Jul-15	18.9	8.0	476	8.3
	12-Aug-15	17.8	8.0	454	-
	25-Aug-15	17.3	8.2	398	6.3
	8-Sep-15	20.5	7.8	473	8.0
	15-Oct-15	9.4	7.7	346	9.6
	18-Nov-15	5.3	7.2	349	11.3
	8-Dec-15	2.7	8.0	339	17.2
	19-Jan-16	-0.1	7.3	-	11.1
	15-Mar-16	2.4	7.5	226	11.7
	21-Apr-16	9.5	7.8	352	8.9
	17-May-16	7.5	8.1	347	10.7
	22-Jun-16	16.4	8.2	445	7.6
	20-Jul-16	17.2	8.3	450	8.1
	24-Aug-16	18.4	8.2	430	7.6
	19-Sep-16	15.2	7.7	508	8.2
	17-Oct-16	13.2	8.0	404	8.3
	15-Nov-16	4.8	7.5	360	12.7
	12-Dec-16	0.2	7.4	502	14.4
	24-Jan-17	0.3	7.5	281	11.5
	15-Feb-17	0.0	7.8	312	14.2
	21-Mar-17	0.9	7.8	311	12.4
	19-Apr-17	8.3	7.6	334	11.4
	16-May-17	11.6	8.0	494	9.9
	28-Jun-17	13.7	7.7	389	8.2
	18-Jul-17	17.3	7.5	447	9.2
	15-Aug-17	16.3	8.5	359	8.5
	18-Sep-17	15.1	7.9	447	8.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Oct-17	7.6	7.7	276	10.1
	14-Nov-17	1.9	7.6	325	14.1
	14-Dec-17	0.0	7.5	305	16.8
	17-Jan-18	-0.3	7.4	283	6.9
	22-Feb-18	-0.3	7.7	164	8.9
	20-Mar-18	1.1	7.9	313	15.4
	18-Apr-18	0.2	7.8	418	9.8
	14-May-18	14.1	7.9	479	8.3
	18-Jun-18	20.3	8.2	492.6	8.1
	19-Jul-18	21.5	8.2	483.6	7.7
	23-Aug-18	19.4	8.1	467.1	7.2
	19-Sep-18	17.6	7.7	487.2	2.8
	24-Oct-18	4.0	8.3	523	12.2
	21-Nov-18	0.1	7.8		12.3
	12-Dec-18	0.4	7.7		11.6
	18-Jan-19	0.1	7.7	517	10.8
SW 7					
	22-May-03	11.0			
	25-Oct-05	6.2	7.6	396	9.8
	19-Apr-06	9.0	7.7	435	
	24-May-06	10.5	7.8	471	
	20-Jun-06	21.0	7.4	419	
	12-Jul-06	20.2	7.3	283	
	27-Nov-06	7.1	7.8	479	7.7
	17-Dec-06	1.7	7.8	517	12.5
	17-Apr-07	3.4	7.9	465	12.8
	13-May-07	15.6	8.2	429	8.6
	4-Apr-08	3.2	7.3	357	11.6
	23-Apr-08	17.0	7.6	451	6.8
	21-May-08	10.1	7.6	348	8.7
	15-Mar-09	9.6	8.2	394	
	12-Apr-09	12.6	7.9	277	
	17-May-09	14.5	7.6	415	8.0
	18-Mar-10	1.9	7.0	423	11.1
	12-Apr-10	12.4	7.7	468	11.9
	17-May-10	14.2	7.8	380	8.2
	17-Apr-11	2.9	7.9	351	12.6
	15-May-11	9.9	7.6	299	10.3
	12-Jun-11	15.2	7.9	347	7.5
	20-Mar-12	16.3	7.6	368	8.3
	17-Apr-13	11.0	8.2	332	11.4
	13-May-13	8.6	7.7	262	10.3
	12-May-14	21.1	8.0	380	3.9
	23-Apr-15	2.3	8.3	303	16.2
	15-Mar-16	4.8	7.5	295	12.5
	20-Apr-16	17.2	7.7	367	18.3
	17-May-16	13.5	8.8	314	18.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Mar-17	-0.2	7.7	332	9.1
	19-Apr-17	13.8	7.5	377	12.2
	16-May-17	18.5	8.3	149	8.8
	28-Jun-17	15.6	7.7	323	5.9
	24-Feb-18	3.7	8.3	291	13.5
	14-May-18	15.8	7.5	368	6.2
SW 8					
	22-May-03	8.0			
	20-Apr-04	11.9	7.8	441	
	19-May-04	17.4	7.7	591	
	24-Jun-04	18.9	7.6	617	
	29-Jul-04	21.9	7.7	491	
	26-Aug-04	20.5	7.9	441	
	23-Sep-04	17.3	8.1	403	
	18-Nov-04	6.0	8.5	273	
	11-Apr-05	8.5	7.0	513	
	26-May-05	19.3	7.8	549	
	29-Jun-05	24.4	7.9	637	
	12-Jul-05	25.0	7.7	589	
	22-Aug-05	20.6	8.7	449	8.2
	25-Oct-05	6.7	7.8	434	3.6
	16-Nov-05	5.8	7.7	305	11.1
	19-Apr-06	11.3	7.8	538	
	24-May-06	11.8	7.8	560	
	20-Jun-06	22.1	7.8	470	
	12-Jul-06	22.5	7.8	355	
	21-Aug-06	21.6	7.3	381	
	17-Oct-06	7.6	8.2	282	
	27-Nov-06	5.6	8.4	301	11.8
	17-Dec-06	3.8	7.7	405	9.5
	16-Apr-07	4.8	7.9	572	
	13-May-07	14.9	8.1	509	
	4-Apr-08	0.4	7.2	496	10.8
	15-Mar-09	7.5	7.7	295	
	12-Apr-09	9.6	8.1	515	
	17-May-09	15.4	7.7	423	
	11-Apr-10	12.3	7.7	507	12.5
	17-Apr-11	5.6	7.9	338	13.7
	15-May-11	11.56	7.58	297	11.98
	20-Mar-12	17.64	7.66	384	8.37
	17-Apr-13	9.4	7.7	386	10.9
	13-May-13	7.2	7.6	246	10.1
	12-May-14	18.6	7.1	391	3.4
	23-Apr-15	7.4	7.8	150	11.9
	15-Mar-16	0.9	6.8	135	7.3
	24-Feb-18	0.3	7.9	158	8.6
SW 9					

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-May-03	8.0			
	13-Feb-04	1.0		314	9.3
	18-Mar-04	0.5		393	7.1
	20-Apr-04	8.3	7.6	259	10.8
	19-May-04	15.3	7.6	416	7.4
	24-Jun-04	16.4	7.7	483	8.3
	29-Mar-05	1.9	7.5	279	10.5
	11-Apr-05	0.9	6.7	179	11.5
	26-May-05	16.9	7.7	415	7.4
	18-Jan-06	1.5	7.4	231	10.3
	22-Mar-06	0.5	8.0	219	13.4
	19-Apr-06	7.5	7.8	360	
	24-May-06	9.3	7.9	420	
	27-Nov-06	5.5	7.7	424	8.4
	17-Dec-06	0.9	7.6	423	10.9
	16-Apr-07	0.8	8.0	386	11.3
	13-May-07	11.7	8.2	415	9.4
	4-Apr-08	3.7	7.4	353	7.1
	23-Apr-08	13.7	7.8	361	
	21-May-08	9.0	7.7	372	9.4
	15-Mar-09	10.4	7.7	342	5.4
	12-Apr-09	8.4	7.9	393	11.1
	17-May-09	11.2	7.4	340	8.4
	14-Mar-10	0.5	7.3	323	12.9
	11-Apr-10	9.0	8.2	367	13.1
	16-May-10	10.6	7.7	274	8.6
	23-May-10	18.3	7.3	346	7.8
	13-Jun-10	15.0	7.7	333	10.4
	18-Jul-10	19.2	7.9	4.28	11.1
	17-Oct-10	6.4	8.0	286	10.1
	14-Nov-10	5.3	7.8	244	9.6
	20-Mar-11	0.7	7.9	200	10.9
	17-Apr-11	2.1	8.2	217	10.5
	15-May-11	8.7	7.6	220	9.8
	12-Jun-11	16.1	7.7	315	7.9
	18-Mar-12	12.7	7.7	231	8.2
	15-Apr-12	7.5	8.5	278	10.3
	13-May-12	21.6	8.2	320	7.4
	16-Dec-12	1.9	7.1	348	8.1
	13-Jan-13	0.2	7.7	222	9.0
	16-Apr-13	-	8.3	167	9.1
	13-May-13	7.6	7.2	231	11.0
	18-Jun-13	16.0	7.9	343	5.7
	19-Nov-13	2.5	8.3	235	1.9
	15-Apr-14	0.2	7.7	149	11.2
	12-May-14	15.5	7.7	306	4.1
	23-Oct-14	8.3	-	345	11.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Apr-15	2.4	7.8	206	11.8
	16-Jun-15	14.6	7.8	372	6.7
	15-Mar-16	1.0	6.9	167	11.9
	20-Apr-16	7.9	7.5	246	8.5
	17-May-16	11.0	7.9	318	8.7
	25-Jan-17	1.4	7.9	218	10.7
	22-Mar-17	0.1	7.6	530	7.7
	19-Apr-17	9.1	7.1	254	9.6
	16-May-17	14.3	8.0	310	7.0
	28-Jun-17	13.2	7.8	356	7.4
	15-Nov-17	3.2	7.9	285	7.7
	24-Feb-18	0.0	7.8	185	13.6
	14-May-18	11.4	7.6	349	6.8
	12-Dec-18	2.6	7.7	375.6	7.6
SW 10					
	22-May-03	15.0			
	22-Oct-03	6.2	7.5	523	
	11-Feb-04	1.2		306	13.8
	18-Mar-04	2.9		448	7.7
	20-Apr-04	8.5	8.0	261	
	19-May-04	10.8	8.0	386	
	24-Jun-04	13.0	8.0	434	
	29-Jul-04	16.0	8.0	452	8.9
	26-Aug-04	16.5	8.1	477	
	21-Sep-04	15.9	8.2	486	8.2
	21-Oct-04	7.9	7.7	367	6.8
	17-Nov-04	8.5	7.7	384	9.2
	29-Mar-05	4.5	7.8	314	
	11-Apr-05	5.5	7.3	229	
	26-May-05	11.3	6.8	386	10.2
	29-Jun-05	15.9	7.9	503	9.7
	12-Jul-05	17.8	7.8	528	6.8
	22-Aug-05	14.9	8.9	394	8.6
	25-Sep-05	14.2	7.9	443	8.7
	25-Oct-05	7.3	7.9	471	10.4
	16-Nov-05	7.2	8.3	349	10.0
	13-Dec-05	0.1	7.5	248	6.1
	17-Jan-06	1.7	6.8	242	12.9
	22-Mar-06	3.8	8.4	266	
	19-Apr-06	7.7	8.2	361	
	24-May-06	10.5	8.0	457	
	23-Jun-06	14.0	7.9	497	
	12-Jul-06	15.6	8.1	464	
	23-Aug-06	17.5	7.9	512	
	21-Sep-06	11.0	7.9	461	
	19-Oct-06	9.5	7.5	457	
	27-Nov-06	6.0	8.5	488	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Dec-06	3.0	8.2	493	
	16-Apr-07	3.2	8.2	420	
	13-May-07	11.5	8.4	440	
	21-Nov-07	5.6	8.0	431	13.2
	4-Apr-08	4.6	7.4	376	10.2
	23-Apr-08	10.4	8.0	347	10.1
	20-May-08	10.6	7.2	408	9.8
	18-Jun-08	12.9	8.0	451	8.0
	19-Aug-08	12.4	7.8	559	5.8
	21-Oct-08	8.0	7.7	442	7.2
	23-Nov-08	3.8	7.7	471	9.7
	14-Dec-08	3.6	7.1	378	7.5
	18-Jan-09				
	8-Feb-09	2.2		329	9.7
	15-Mar-09	4.4	8.1	333	
	12-Apr-09	5.9	9.0	406	
	17-May-09	15.6	8.2	382	8.1
	14-Jun-09	12.6	8.3	900	9.4
	12-Jul-09	14.1	9.6	506	7.7
	9-Aug-09	16.8	8.2	485	8.5
	11-Oct-09	5.5	7.9	474	11.5
	15-Nov-09	5.9	7.7	409	10.6
	13-Dec-09	0.1	7.8	458	12.7
	14-Mar-10	5.2	7.8	435	14.7
	11-Apr-10	9.1	8.1	443	
	16-May-10	9.2	8.2	312	10.6
	13-Jun-10	12.7	8.1	357	12.5
	18-Jul-10	17.9	8.1	330	11.4
	15-Aug-10	15.4	8.3	318	9.3
	12-Sep-10	13.4	8.2	415	8.6
	17-Oct-10	10.3	7.9	352	8.4
	14-Nov-10	6.0	8.0	251	10.3
	20-Feb-11	1.1	8.3	248	11.6
	13-Mar-11	3.4	8.4	247	13.4
	22-Mar-11	4.0	8.4	306	13.0
	17-Apr-11	6.6	8.3	277	13.2
	15-May-11	10.3	8.6	301	12.0
	12-Jun-11	12.0	8.2	298	9.2
	17-Jul-11	16.1	8.4	498	10.8
	18-Sep-11	13.4	8.6	296	8.4
	16-Oct-11	11.2	7.8	302	9.4
	20-Nov-11	5.7	8.7	290	11.0
	18-Dec-11	3.8	8.4	250	12.3
	19-Feb-12	2.5	7.9	231	12.1
	18-Mar-12	11.4	7.9	253	7.5
	15-Apr-12	9.6	8.5	316	9.7
	13-May-12	14.9	7.9	356	7.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jun-12	18.3	8.4	388	6.3
	15-Jul-12	21.3	8.4	479	6.3
	12-Aug-12	15.7	8.4	464	6.6
	16-Sep-12	12.6	7.7	367	9.0
	14-Oct-12	10.3	8.9	269	7.0
	18-Nov-12	6.4	7.8	329	8.4
	16-Dec-12	2.2	8.0	609	-
	13-Jan-13	2.6	8.2	256	11.0
	17-Apr-13	5.5	7.9	239	12.2
	14-May-13	7.9	8.1	283	6.9
	19-Jun-13	11.4	8.4	340	10.9
	16-Jul-13	17.7	8.2	426	7.9
	21-Aug-13	16.5	8.4	426	10.4
	16-Oct-13	12.0	8.5	360	6.0
	20-Nov-13	4.2	8.5	204	3.0
	17-Apr-14	5.4	8.1	412	10.7
	13-May-14	9.6	7.2	322	10.6
	18-Jun-14	12.7	8.3	362	10.5
	15-Jul-14	13.1	7.8	416	8.7
	23-Oct-14	7.7	7.9	390	6.0
	23-Apr-15	5.1	8.3	303	13.8
	19-May-15	10.5	8.4	315	13.6
	15-Jun-15	13.1	8.0	388	9.7
	22-Jul-15	14.1	8.2	428	8.1
	11-Aug-15	16.3	8.3	446	8.6
	25-Aug-15	14.0	-	-	-
	8-Sep-15	20.0	8.0	445	5.6
	16-Oct-15	8.6	8.3	142	7.5
	10-Nov-15	8.4	7.0	309	6.6
	18-Nov-15	8.1	7.9	344	11.3
	9-Dec-15	5.3	7.9	331	12.7
	20-Jan-16	1.4	7.8	286	11.0
	18-Feb-16	0.6	7.6	281	14.4
	15-Mar-16	4.6	7.6	269	13.0
	21-Apr-16	7.8	7.8	299	13.4
	18-May-16	10.3	8.5	222	11.2
	23-Jun-16	13.0	8.4	389	9.5
	5-Jul-16	17.1	8.2	322	11.7
	21-Jul-16	20.4	8.3	275	4.9
	9-Aug-16	22.0	8.3	538	5.1
	24-Aug-16	19.4	8.4	404	5.7
	19-Sep-16	18.3	8.3	506	6.4
	18-Oct-16	16.1	8.2	415	8.9
	15-Nov-16	8.4	7.9	323	7.5
	12-Dec-16	0.2	7.6	395	13.3
	25-Jan-17	2.3	8.1	278	12.1
	17-Feb-17	1.2	8.3	309	15.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Mar-17	-0.2	8.1	343	14.4
	19-Apr-17	5.8	8.3	216	14.5
	16-May-17	8.6	8.3	312	10.4
	28-Jun-17	11.8	8.3	389	9.4
	7-Jul-17	13.5	8.2	386	8.5
	19-Jul-17	15.8	8.2	313	9.6
	2-Aug-17	16.3	8.4	366	9.1
	16-Aug-17	15.8	8.5	440	7.8
	18-Sep-17	15.0	8.1	2.91	7.8
	18-Oct-17	12.5	8.2	361	5.5
	15-Nov-17	5.0	8.4	337	10.7
	14-Dec-17	1.4	8.4	283	12.6
	18-Jan-18	1.0	8.0	273	10.1
	23-Feb-18	4.1	8.2	238	11.8
	21-Mar-18	1.4	8.3	260	11.5
	15-May-18	10.1	8.1	433	10.4
	18-Jun-18	8.2	8.2	474.3	9.1
	19-Jul-18	16.4	8.3	478.2	8.8
	24-Aug-18	18.1	8.3	479.2	8.1
	20-Sep-18	14.1	8.2	442.7	9.4
	25-Oct-18	7.2	8.1	467.8	9.0
	22-Nov-18	1.5	8.2	730.6	11.9
	13-Dec-18	2.4	8.3	468	12.4
	19-Jan-19	0.5	7.9	515	12.9
	19-Mar-19	2.6	8.3	415.4	12.8
SW 11					
	22-May-03	8.0			
	13-Feb-04	3.8		309	12.3
	18-Mar-04	4.3		410	9.6
	21-Apr-04	5.4	8.0	213	
	19-May-04	7.8	8.0	317	
	24-Jun-04	8.7	8.0	357	
	29-Jul-04	12.7	8.1	404	
	26-Aug-04	14.2	8.2	389	
	22-Sep-04	14.1	8.2	391	10.1
	21-Oct-04	7.0	7.9	323	11.2
	18-Nov-04	8.0	7.9	370	10.8
	29-Mar-05	6.4	7.8	305	
	11-Apr-05	4.6	6.8	207	
	26-May-05	8.3	7.4	311	
	29-Jun-05	10.3	7.9	368	
	12-Jul-05	11.5	7.7	371	10.8
	28-Sep-05	11.4	7.9	443	8.7
	25-Oct-05	6.2	8.0	393	10.9
	16-Nov-05	6.3	7.8	268	11.2
	13-Dec-05	0.3	8.2	299	13.4
	18-Jan-06	5.1	7.2	260	12.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	24-Mar-06	4.9	8.3	250	
	24-May-06	7.7	8.1	418	
	21-Jun-06	9.9	8.1	426	
	12-Jul-06	11.9	8.1	364	
	24-Aug-06	13.6	7.9	428	
	21-Sep-06	11.8	8.3	404	
	19-Oct-06	9.1	7.9	433	
	23-Nov-06	6.1	7.9	425	
	17-Dec-06	5.1	8.0	436	
	21-Jan-07	2.8	8.3	438	
	17-Apr-07	4.1	8.2	382	
	13-May-07	6.0	8.2	400	
	17-Jun-07	9.5	8.4	428	
	15-Jul-07	12.7	8.1	454	
	19-Aug-07	13.3	8.0	449	9.4
	17-Sep-07	12.7	8.3	426	8.8
	18-Oct-07	12.8	8.0	422	8.5
	19-Nov-07	3.6	7.8	464	11.4
	11-Dec-07	4.3	7.9	440	11.8
	22-Jan-08	3.9	7.8	361	12.7
	20-Feb-08	3.7	8.0	378	
	17-Mar-08	4.5	7.8	400	
	2-Apr-08	4.3	7.8	312	
	23-Apr-08	6.1	7.7	300	10.9
	22-May-08	5.6	7.4	374	11.2
	17-Jun-08	8.7	7.8	434	11.0
	15-Jul-08	12.6	7.3	465	8.6
	19-Aug-08	11.8	7.4	526	6.3
	16-Sep-08	10.1	8.1	477	8.2
	22-Oct-08	6.9	7.9	428	6.8
	23-Nov-08	5.7	8.0	428	8.7
	14-Dec-08	4.8	8.4	336	8.8
	18-Jan-09	3.9	8.1	317	9.0
	8-Feb-09	3.9		344	8.0
	15-Mar-09	4.2	8.3	308	
	12-Apr-09	4.6	8.0	352	
	17-May-09	8.2	8.4	317	
	14-Jun-09	9.4	7.8	809	
	12-Jul-09	9.7	8.6	446	11.5
	9-Aug-09	12.9	8.6	444	10.0
	13-Sep-09	10.0	7.6	413	
	11-Oct-09	6.7	8.2	487	11.5
	15-Nov-09	5.6	8.3	341	12.2
	13-Dec-09	3.3	7.7	454	12.3
	17-Jan-10	4.7	8.0	388	12.6
	7-Feb-10	3.3	7.8	431	12.0
	14-Mar-10	4.9	7.4	349	13.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-Apr-10	6.8	8.0	373	
	16-May-10	6.7	8.0	254	12.3
	13-Jun-10	8.3	8.0	276	
	18-Jul-10	9.3	8.0	324	15.2
	15-Aug-10	13.1	8.2	332	10.6
	12-Sep-10	10.3	8.3	352	10.6
	17-Oct-10	7.3	7.9	317	11.3
	14-Nov-10	6.3	7.9	241	10.6
	19-Dec-10	4.8	8.4	182	11.4
	16-Jan-11	4.8	8.3	251	12.6
	20-Feb-11	4.6	8.1	251	11.8
	13-Mar-11	4.9	8.2	242	13.5
	17-Apr-11	5.4	8.1	227	12.7
	15-May-11	5.6	7.8	209	13.5
	12-Jun-11	8.6	8.2	152	11.1
	17-Jul-11	14.2	8.3	280	9.7
	14-Aug-11	15.0	8.6	260	9.9
	18-Sep-11	12.4	8.9	279	10.2
	16-Oct-11	9.2	7.7	279	11.9
	20-Nov-11	5.3	7.9	288	12.0
	18-Mar-12	6.1	8.0	194	9.3
	15-Apr-12	9.1	8.7	279	12.4
	13-May-12	9.3	8.0	279	11.5
	17-Jun-12	12.1	8.2	333	13.5
	16-Jul-12	16.0	8.2	375	7.1
	14-Aug-12	10.0	7.8	495	7.4
	18-Sep-12	11.0	7.7	335	9.9
	14-Oct-12	10.3	6.7	184	7.8
	18-Nov-12	6.8	7.8	280	9.2
	16-Dec-12	5.0	7.7	568	10.3
	13-Jan-13	4.9	8.1	279	11.2
	19-Mar-13	4.2	8.3	203	9.1
	17-Apr-13	4.8	7.9	198	10.2
	14-May-13	5.7	8.0	237	10.7
	19-Jun-13	8.3	8.1	281	12.7
	16-Jul-13	11.0	8.1	338	11.4
	21-Aug-13	13.4	8.4	313	9.9
	18-Sep-13	10.8	8.0	328	11.3
	16-Oct-13	9.6	8.2	312	5.8
	20-Nov-13	6.2	7.5	273	3.8
	17-Apr-14	4.5	8.1	215	11.0
	13-May-14	8.6	6.6	256	12.4
	18-Jun-14	7.8	8.0	281	10.5
	16-Jul-14	9.8	7.9	244	8.6
	19-Aug-14	12.0	8.8	388	10.5
	9-Sep-14	13.0	9.0	398	4.1
	23-Oct-14	8.0	8.0	391	5.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Dec-14	5.0	8.5	315	-
	20-Jan-14	2.5	6.9	293	0.1
	18-Mar-15	2.5	8.3	179	13.4
	22-Apr-15	4.8	8.0	259	13.7
	19-May-15	7.1	8.3	253	-
	15-Jun-15	7.2	8.2	305	11.7
	22-Jul-15	9.8	7.9	321	-
	11-Aug-15	11.0	8.3	352	11.4
	25-Aug-15	11.7	8.3	317	9.5
	8-Sep-15	13.6	8.0	362	9.0
	15-Oct-15	9.4	8.3	311	9.9
	18-Nov-15	8.4	8.0	367	11.5
	9-Dec-15	5.2	7.7	315	13.3
	19-Jan-16	3.3	7.9	247	14.5
	17-Feb-16	4.1	7.7	276	14.0
	15-Mar-16	4.5	7.8	201	13.6
	21-Apr-16	4.6	8.0	227	14.8
	18-May-16	7.2	8.2	294	13.2
	23-Jun-16	8.7	8.4	304	11.8
	5-Jul-16	12.7	8.4	298	15.7
	21-Jul-16	13.9	8.2	365	10.3
	9-Aug-16	16.3	8.5	336	11.4
	24-Aug-16	16.6	8.4	215	10.0
	19-Sep-16	14.9	8.4	366	9.8
	18-Oct-16	13.8	8.3	367	11.6
	16-Nov-16	6.7	7.9	253	9.6
	12-Dec-16	1.9	8.7	467	14.8
	25-Jan-17	5.1	8.1	265	12.0
	17-Feb-17	3.5	8.2	290	14.6
	22-Mar-17	3.3	8.3	279	12.9
	19-Apr-17	4.6	7.3	231	15.6
	16-May-17	8.0	7.8	262	13.2
	28-Jun-17	8.0	7.9	300	12.4
	7-Jul-17	9.3	7.4	301	13.7
	19-Jul-17	9.7	8.1	336	11.9
	2-Aug-17	10.6	8.1	323	10.9
	16-Aug-17	10.6	8.2	348	11.2
	18-Sep-17	10.8	8.1	340	10.7
	18-Oct-17	8.9	8.2	361	11.1
	15-Nov-17	6.2	8.3	335	7.1
	14-Dec-17	3.1	8.5	284	11.1
	18-Jan-18	4.1	7.9	264	8.7
	23-Feb-18	4.3	8.1	225	8.9
	21-Mar-18	3.9	8.3	268	13.0
	19-Apr-18	3.9	8.2	243	10.1
	15-May-18	5.9	8.0	358	11.9
	18-Jun-18	8.2	8.2	430.9	10.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Jun-18	11.9	8.2	244.9	10.1
	24-Aug-18	13.8	8.4	435.4	9.8
	20-Sep-18	13.1	8.5	438.6	9.7
	25-Oct-18	4.9	8.2	430.1	11.0
	22-Nov-18	2.3	8.3		12.9
	13-Dec-18	4.9	8.3	411.9	12.2
	19-Jan-19	3.6	8.2	396.3	12.8
	28-Feb-19	3.9	8.4	341	12.8
	19-Mar-19	4.6	8.2	349.8	12.4
SW 11A					
	22-May-03	8.0			
	13-Feb-04	4.8		325	11.9
	18-Mar-04	4.7		436	9.1
	21-Apr-04	4.4	7.8	223	
	19-May-04	6.0	7.8	308	
	24-Jun-04	6.9	7.6	345	
	29-Jul-04	9.1	7.5	383	
	29-Mar-05	5.2	7.8	308	
	11-Apr-05	4.3	7.0	208	
	26-May-05	6.0	7.4	291	
	29-Jun-05	7.6	8.2	347	
	12-Jul-05	8.5	7.8	352	
	23-Aug-05	11.0	7.4	373	11.0
	16-Nov-05	7.8	8.2	306	11.4
	13-Dec-05	5.6	8.3	365	11.3
	18-Jan-06	5.7	7.3	230	12.5
	24-Mar-06	4.5	8.2	249	
	19-Apr-06	5.4	8.0	337	
	24-May-06	6.7	7.9	427	
	21-Jun-06	8.6	7.6	430	
	12-Jul-06	9.7	7.6	396	
	24-Aug-06	12.7	7.2	429	
	21-Sep-06	12.1	7.7	419	
	19-Oct-06	9.1	7.5	470	
	23-Nov-06	6.4	7.9	423	
	17-Dec-06	5.8	7.7	406	
	21-Jan-07	4.8	7.9	442	
	17-Apr-07	4.2	8.2	384	
	13-May-07	5.5	8.0	414	
	11-Dec-07	7.0	7.9	459	11.4
	22-Jan-08	5.2	7.8	290	
	20-Feb-08	4.6	8.1	380	
	17-Mar-08	4.7	7.8	409	
	2-Apr-08	4.2	7.7	310	12.9
	23-Apr-08	4.5	7.8	330	12.7
	22-May-08	5.6	8.1	381	10.5
	17-Jun-08	6.5	8.0	444	8.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Aug-08	8.0	7.7	542	8.3
	16-Sep-08	8.9	8.0	492	8.2
	23-Nov-08	5.8	8.2	427	
	14-Dec-08	5.7	8.1	337	8.2
	18-Jan-09	4.2	8.3	399	9.4
	8-Feb-09	4.8		348	8.9
	15-Mar-09	4.1	8.1	310	
	12-Apr-09	4.0	8.1	355	
	17-May-09	6.4	8.1	321	
	14-Jun-09	12.1	7.9	796	
	12-Jul-09	8.8	8.4	418	
	9-Aug-09	16.0	7.9	432	
	11-Oct-09	8.6	7.6	512	
	13-Dec-09	5.1	7.7	473	12.3
	17-Jan-10	4.8	8.0	439	11.7
	7-Feb-10	4.6	7.7	433	12.1
	14-Mar-10	4.9	7.6	357	13.3
	11-Apr-10	5.2	7.9	201	12.0
	16-May-10	5.8	7.8	201	12.0
	13-Jun-10	8.0	7.8	319	15.3
	18-Jul-10	8.0	7.8	319	15.3
	15-Aug-10	9.0	7.9	308	10.3
	17-Oct-10	7.8	7.9	343	11.6
	14-Nov-10	6.8	7.8	241	10.1
	16-Jan-11	5.5	8.2	182	11.9
	20-Feb-11	5.2	8.2	201	12.4
	13-Mar-11	5.1	8.4	247	13.6
	17-Apr-11	4.5	8.0	229	13.1
	15-May-11	5.5	8.1	209	13.2
	12-Jun-11	7.3	8.0	248	12.5
	16-Oct-11	9.8	7.6	270	11.7
	20-Nov-11	7.0	7.7	238	11.1
	18-Dec-11	6.3	8.1	226	13.3
	18-Mar-12	5.3	7.9	192	10.1
	15-Apr-12	5.9	8.8	259	15.9
	13-May-12	6.1	8.0	257	17.2
	12-Aug-12	9.1	7.8	415	7.4
	18-Nov-12	6.9	7.5	147	9.2
	16-Dec-12	6.1	7.6	589	10.0
	13-Jan-13	5.6	7.9	292	10.8
	19-Mar-13	4.6	8.2	199	9.5
	17-Apr-13	4.5	8.0	191	10.4
	14-May-13	5.5	8.0	289	10.6
	20-Nov-13	6.7	7.8	281	3.7
	17-Apr-14	4.7	8.1	207	10.9
	13-May-14	5.7	7.1	240	10.1
	18-Jun-14	6.9	8.1	284	10.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Dec-14	6.0	8.4	331	-
	18-Mar-15	4.8	8.1	242	13.1
	22-Apr-15	4.8	7.8	266	13.9
	19-May-15	5.8	8.1	254	-
	15-Jun-15	6.4	7.9	308	11.5
	22-Jul-15	7.5	7.8	310	-
	11-Aug-15	8.8	8.0	344	11.7
	25-Aug-15	9.9	-	-	-
	8-Sep-15	11.9	7.8	347	9.7
	18-Nov-15	8.5	7.8	348	13.4
	9-Dec-15	7.0	7.5	351	12.3
	19-Jan-16	5.7	7.7	268	13.3
	17-Feb-16	5.4	7.7	292	13.1
	15-Mar-16	4.9	7.5	201	13.3
	21-Apr-16	4.4	8.0	230	14.3
	18-May-16	5.2	8.0	283	13.0
	23-Jun-16	7.0	8.0	296	12.3
	5-Jul-16	12.3	8.6	299	13.5
	21-Jul-16	15.0	7.8	375	6.6
	9-Aug-16	22.2	8.1	468	6.3
	24-Aug-16	16.9	7.9	354	3.3
	12-Dec-16	5.4	8.5	447	11.4
	25-Jan-17	5.7	8.0	280	11.6
	17-Feb-17	5.1	8.2	306	13.0
	22-Mar-17	4.0	8.1	290	12.2
	19-Apr-17	5.0	7.2	224	14.5
	16-May-17	6.0	7.9	247	12.8
	28-Jun-17	7.0	7.8	300	12.2
	7-Jul-17	7.6	7.4	292	11.9
	19-Jul-17	7.8	8.0	326	12.1
	2-Aug-17	7.8	7.7	306	11.5
	16-Aug-17	8.8	7.8	336	11.4
	18-Sep-17	10.4	7.8	347	10.5
	18-Oct-17	9.1	7.9	373	11.5
	15-Nov-17	7.2	8.1	351	6.6
	14-Dec-17	6.0	8.3	318	7.6
	18-Jan-18	5.1	7.8	275	8.4
	23-Feb-18	5.0	8.0	166	6.9
	21-Mar-18	4.7	8.1	276	13.7
	19-Apr-18	4.5	8.0	249	9.0
	15-May-18	5.3	7.7	386	11.7
	18-Jun-18	7.8	7.8	437.8	11.7
	19-Jul-18	10.1	7.8	297.6	10.2
	22-Nov-18	2.7	8.3		12.5
	13-Dec-18	5.9	8.2	414	11.7
	19-Jan-19	5.5	8.0	397	12.1
	19-Mar-19	5.0	8.1	348.9	12.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
SW 11B					
	22-May-03	8.0			
	13-Feb-04	4.9		325	12.3
	18-Mar-04	4.4		431	8.9
	21-Apr-04	4.2	7.8	221	
	19-May-04	5.8	7.7	305	
	24-Jun-04	6.9	7.5	347	
	29-Jul-04	7.6	7.4	367	
	26-Aug-04	7.8	7.6	332	
	18-Nov-04	6.4	7.6	370	
	29-Mar-05	4.8	7.7	301	
	11-Apr-05	3.9	7.0	208	
	26-May-05	6.1	7.2	302	
	29-Jun-05	7.3	7.9	162	
	12-Jul-05	7.5	7.8	253	
	23-Aug-05	8.5	7.5	331	
	25-Sep-06	9.1	7.6	341	10.8
	25-Oct-05	8.1	8.1	439	
	16-Nov-05	7.1	7.9	328	12.0
	13-Dec-05	5.7	8.3	378	11.5
	18-Jan-06	5.4	7.7	260	12.4
	24-Mar-06	4.4	8.2	247	
	19-Apr-06	5.3	8.0	336	
	24-May-06	6.9	7.8	422	
	21-Jun-06	8.1	7.5	450	
	12-Jul-06	8.9	7.6	400	
	24-Aug-06	10.9	7.3	430	
	21-Sep-06	10.7	7.7	451	
	19-Oct-06	7.8	7.6	488	
	23-Nov-06	6.3	7.8	254	11.8
	17-Dec-06	5.7	7.7	440	
	21-Jan-07	5.1	8.0	438	
	17-Apr-07	4.1	8.1	384	13.1
	13-May-07	5.5	7.9	336	12.6
	11-Dec-07	6.2	8.0	335	11.3
	22-Jan-08	5.1	7.8	365	12.5
	20-Feb-08	4.7	8.2		
	17-Mar-08	4.6	7.8	408	
	2-Apr-08	4.5	7.7	309	
	23-Apr-08	4.9	7.9	331	11.8
	22-May-08	5.8	7.8	382	
	17-Jun-08	7.5	7.8	442	11.8
	15-Jul-08	9.1	7.5	479	9.0
	19-Aug-08	9.2	7.3	544	7.0
	16-Sep-08	7.5	7.8	490	9.2
	22-Oct-08	7.0	7.8	439	7.3
	23-Nov-08	6.3		427	8.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Dec-08	5.7	8.1	338	8.3
	18-Jan-09	2.6	8.3	410	8.6
	8-Feb-09	4.8		351	8.0
	15-Mar-09	4.1	8.4	304	
	12-Apr-09	3.9	7.6	346	
	17-May-09	6.4	8.2	324	
	14-Jun-09	6.3	8.4	846	
	12-Jul-09	7.9	8.4	402	
	9-Aug-09	9.5	8.9	454	
	11-Oct-09	7.5	8.0	512	
	15-Nov-09	6.3	7.7	431	
	13-Dec-09	5.3	7.8	462	12.1
	17-Jan-10	5.0	8.0	435	12.0
	7-Feb-10	5.0	7.5	428	11.9
	14-Mar-10	4.9	7.5	355	13.3
	11-Apr-10	5.4	7.8	386	
	16-May-10	5.8	7.8	246	12.1
	13-Jun-10	7.7	7.9	231	15.5
	18-Jul-10	8.1	7.7	322	15.4
	15-Aug-10	9.6	331.0	330	11.6
	17-Oct-10	7.5	7.9	337	11.2
	14-Nov-10	7.0	7.8	226	10.5
	20-Feb-11	5.3	8.1	260	11.3
	13-Mar-11	4.9	8.2	199	13.2
	17-Apr-11	4.7	8.0	221	12.9
	15-May-11	5.5	7.9	210	13.1
	12-Jun-11	7.4	7.9	250	11.4
	16-Oct-11	8.3	7.5	315	12.3
	20-Nov-11	6.4	8.0	302	11.1
	18-Dec-11	6.1	8.7	226	13.2
	18-Mar-12	5.5	7.9	198	8.4
	15-Apr-12	6.6	8.6	265	15.2
	13-May-12	6.4	7.7	262	13.1
	17-Jun-12	8.0	8.0	300	12.9
	12-Aug-12	8.6	7.6	491	7.3
	18-Nov-12	6.8	7.5	228	9.1
	16-Dec-12	6.1	7.6	533	9.7
	13-Jan-13	5.7	7.9	292	11.3
	19-Mar-13	3.7	8.2	190	9.9
	17-Apr-13	4.5	7.8	196	10.1
	14-May-13	5.6	7.8	238	10.1
	16-Oct-13	8.3	8.1	304	6.1
	20-Nov-13	6.9	7.9	283	3.8
	17-Apr-14	4.8	8.0	216	10.2
	13-May-14	6.0	7.5	244	10.7
	18-Jun-14	6.8	7.9	288	10.2
	23-Oct-14	7.5	7.9	395	4.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Dec-14	5.8	8.5	327	-
	18-Mar-15	4.9	8.3	243	12.2
	22-Apr-15	5.0	7.8	267	13.8
	19-May-15	6.0	8.1	257	-
	15-Jun-15	6.4	7.8	308	11.2
	22-Jul-15	7.3	7.7	309	-
	11-Aug-15	8.3	7.8	337	11.8
	25-Aug-15	8.7	-	-	-
	8-Sep-15	10.0	7.6	312	9.8
	18-Nov-15	7.4	7.8	362	13.3
	9-Dec-15	6.1	7.6	324	13.1
	19-Jan-16	5.6	7.9	269	13.7
	17-Feb-16	5.4	7.8	292	13.2
	15-Mar-16	4.7	7.6	202	13.6
	21-Apr-16	4.5	7.9	225	14.0
	18-May-16	5.4	8.0	281	13.1
	23-Jun-16	7.0	7.9	298	12.2
	5-Jul-16	10.0	8.3	294	14.5
	21-Jul-16	9.5	7.7	375	11.7
	9-Aug-16	14.4	8.1	371	11.6
	24-Aug-16	11.6	7.9	340	11.2
	18-Oct-16	10.9	8.1	347	13.6
	16-Nov-16	7.8	7.8	331	9.2
	12-Dec-16	4.2	8.4	466	12.4
	17-Feb-17	4.6	8.1	300	13.9
	22-Mar-17	4.6	8.4	289	12.6
	19-Apr-17	5.1	7.1	142	14.3
	16-May-17	6.1	7.9	221	12.8
	28-Jun-17	7.4	7.7	300	12.0
	7-Jul-17	7.7	7.7	281	12.5
	19-Jul-17	7.3	7.9	325	12.2
	2-Aug-17	8.3	7.7	252	11.5
	15-Aug-17	8.5	7.6	266	11.5
	18-Sep-17	8.6	7.7	315	11.4
	18-Oct-17	8.1	7.9	264	11.6
	15-Nov-17	6.7	8.1	346	7.0
	14-Dec-17	5.8	8.4	314	7.6
	18-Jan-18	4.8	7.9	272	8.6
	23-Feb-18	4.7	8.0	219	6.8
	21-Mar-18	4.5	8.2	275	12.1
	19-Apr-18	4.3	8.0	238	9.1
	15-May-18	5.6	7.8	387	11.7
	18-Jun-18	7.7	7.7	440.1	11.2
	19-Jul-18	9.5	7.7	431.7	10.5
	24-Aug-18	11.3	7.8	437.5	9.6
	20-Sep-18	11.6	7.8	437.5	9.5
	25-Oct-18	8.0	8.2	421	10.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Nov-18	4.7	8.4		11.8
	13-Dec-18	5.9	8.3	414.1	11.8
	19-Jan-19	5.2	8.1	396.8	12.1
	28-Feb-19	5.2	8.2	392	12.3
	19-Mar-19	4.9	8.1	348.3	12.1
SW 11C					
	22-May-03	8.0			
	18-Mar-04	4.4		431	9.0
	21-Apr-04	4.3	7.8	221	
	19-May-04	5.9	7.6	307	
	24-Jun-04	8.0	7.8	354	
	29-Mar-05	4.7	7.6	301	12.9
	11-Apr-05	4.1	7.1	203	
	26-May-05	6.1	7.2	300	
	18-Jan-06	5.5	7.3	267	12.3
	24-Mar-06	4.4	8.1	245	
	19-Apr-06	5.4	8.0	330	
	24-May-06	6.4	7.9	421	
	12-Jul-06	15.4	7.4	448	
	19-Oct-06	9.7	7.5	428	
	23-Nov-06	6.3	7.7	431	11.8
	17-Dec-06	5.6	7.6	440	
	21-Jan-07	5.1	8.0	443	12.4
	17-Apr-07	4.1	8.0	384	12.8
	13-May-07	5.5	8.0	403	12.7
	19-Nov-07	6.5	7.8	487	10.8
	11-Dec-07	5.7	7.8	461	11.7
	22-Jan-08	4.9	7.7	359	12.4
	20-Feb-08	4.3	8.0	381	
	17-Mar-08	4.4		404	
	2-Apr-08	3.7	7.7	311	13.1
	23-Apr-08	6.5	7.7	325	10.4
	22-May-08	5.7	7.6	381	11.1
	17-Jun-08	10.6	7.8	440	8.9
	15-Jul-08	7.5	7.2	462	10.1
	19-Aug-08	7.5	7.5	535	7.8
	16-Sep-08	8.5	7.8	486	9.2
	22-Oct-08	7.1	7.9	439	7.3
	23-Nov-08	6.1		357	8.2
	14-Dec-08	5.4	8.1	337	8.9
	18-Jan-09	4.3	8.3	240	9.9
	8-Feb-09	4.1		341	8.2
	15-Mar-09	3.7	8.3	205	
	12-Apr-09	4.3	8.0	356	
	17-May-09	5.7	8.1	308	12.5
	14-Jun-09	6.8	8.1	828	
	12-Jul-09	8.7	8.8	448	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	9-Aug-09	12.7	8.6	458	
	13-Sep-09	8.0	7.1	426	
	11-Oct-09	6.5	8.1	363	12.3
	15-Nov-09	6.1	8.1	424	
	13-Dec-09	3.9	7.6	430	11.7
	17-Jan-10	5.2	8.0	447	12.1
	7-Feb-10	4.8	7.8	436	12.1
	14-Mar-10	4.2	7.5	355	13.6
	11-Apr-10	5.6	7.8	377	
	16-May-10	5.6	7.9	247	12.2
	13-Jun-10	7.2	7.8	274	15.4
	18-Jul-10	8.6	7.7	321	15.2
	15-Aug-10	10.4	7.8	300	11.0
	12-Sep-10	8.8	8.1	314	11.4
	17-Oct-10	7.5	7.8	335	11.5
	14-Nov-10	6.7	7.7	256	10.5
	20-Feb-11	4.7	8.1	195	12.7
	13-Mar-11	4.6	8.1	243	13.4
	17-Apr-11	4.4	7.9	220	13.1
	15-May-11	5.5	7.9	212	13.3
	12-Jun-11	8.2	7.8	227	11.3
	16-Oct-11	8.9	7.5	320	11.6
	20-Nov-11	6.3	8.1	288	11.3
	18-Dec-11	5.9	8.7	222	13.4
	18-Mar-12	4.9	7.9	194	7.1
	15-Apr-12	5.4	8.6	251	15.8
	13-May-12	6.3	7.7	213	13.1
	17-Jun-12	7.9	7.8	220	12.7
	16-Jul-12	8.8	7.9	318	7.5
	14-Aug-12	9.1	7.6	420	7.3
	16-Sep-12	8.9	7.5	321	10.5
	18-Nov-12	6.7	7.5	280	9.1
	16-Dec-12	5.9	7.5	586	9.9
	13-Jan-13	5.2	7.9	285	11.2
	19-Mar-13	4.3	8.1	206	10.0
	17-Apr-13	4.1	7.8	196	10.1
	14-May-13	5.5	8.0	236	10.0
	16-Oct-13	8.6	7.8	307	5.8
	20-Nov-13	6.4	7.4	280	3.7
	17-Apr-14	4.4	7.8	423	10.3
	13-May-14	6.3	7.5	235	10.8
	18-Jun-14	7.9	8.1	277	10.0
	23-Oct-14	7.7	7.9	357	4.3
	16-Dec-14	5.5	8.4	324	-
	18-Mar-15	3.9	8.2	231	12.1
	22-Apr-15	4.3	7.8	260	13.7
	19-May-15	6.1	7.9	256	-

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Jun-15	7.0	7.7	312	11.1
	22-Jul-15	7.9	7.5	245	-
	11-Aug-15	8.6	7.7	341	11.5
	25-Aug-15	8.6	8.2	304	10.0
	8-Sep-15	8.1	7.6	329	11.0
	15-Oct-15	8.3	7.8	295	11.1
	18-Nov-15	6.8	7.7	363	12.5
	9-Dec-15	5.9	7.5	339	13.1
	19-Jan-16	5.1	7.9	264	13.6
	17-Feb-16	4.4	7.8	282	12.8
	15-Mar-16	4.3	7.6	204	13.4
	21-Apr-16	4.2	8.0	227	14.5
	18-May-16	5.3	8.0	283	10.0
	23-Jun-16	7.1	7.8	294	12.3
	5-Jul-16	7.7	7.8	307	18.0
	21-Jul-16	8.7	7.6	321	11.4
	9-Aug-16	8.7	7.8	471	14.3
	24-Aug-16	9.3	7.7	308	11.8
	19-Sep-16	9.1	7.6	329	11.5
	18-Oct-16	8.8	7.7	297	14.7
	16-Nov-16	7.3	7.7	319	11.0
	12-Dec-16	5.6	8.2	471	13.3
	25-Jan-17	5.2	7.9	218	11.7
	17-Feb-17	4.7	8.1	304	13.5
	22-Mar-17	4.3	8.0	287	12.7
	19-Apr-17	4.9	7.0	237	14.3
	16-May-17	5.8	7.9	248	12.7
	28-Jun-17	7.4	7.8	298	11.9
	7-Jul-17	8.8	7.5	294	13.1
	19-Jul-17	8.3	7.9	231	11.3
	2-Aug-17	8.5	7.7	314	11.3
	16-Aug-17	8.8	7.5	341	10.5
	18-Sep-17	8.5	7.6	344	11.5
	18-Oct-17	8.5	7.7	367	11.0
	15-Nov-17	6.7	8.1	341	7.0
	14-Dec-17	5.3	8.2	310	8.1
	18-Jan-18	4.6	7.8	269	9.0
	23-Feb-18	4.0	8.0	207	7.1
	21-Mar-18	4.0	8.1	238	12.4
	19-Apr-18	3.9	7.9	245	9.6
	15-May-18	5.5	7.7	386	11.7
	18-Jun-18	7.6	7.6	444.3	11.1
	19-Jul-18	8.5	7.6	437.5	11.0
	24-Aug-18	9.6	7.6	450.6	10.7
	20-Sep-18	9.6	7.6	451.4	10.5
	25-Oct-18	7.7	8.1	453.6	11.3
	22-Nov-18	6.2	8.2		12.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	13-Dec-18	5.8	8.2	418	11.9
	19-Jan-19	5.1	8.0	390.7	12.3
	28-Feb-19	4.7	8.2	385	12.4
	19-Mar-19	4.3	8.0	349.6	12.3
SW 11D					
	22-May-03	8.0			
	13-Feb-04	3.9		311	11.9
	18-Mar-04	3.7		421	9.5
	21-Apr-04	4.1	7.9	212	
	19-May-04	3.1	8.2	240	
	24-Jun-04	6.3	7.8	326	
	29-Jul-04	9.7	8.0	327	
	22-Sep-04	12.0	7.9	354	9.4
	20-Oct-04	7.2	7.9	302	10.8
	18-Nov-04	6.2	7.9	302	11.2
	29-Mar-05	4.2	7.7	294	
	11-Apr-05	3.1	7.2	211	
	26-May-05	4.5	7.2	271	
	29-Jun-05	8.6	7.9	309	
	12-Jul-05	9.9	7.5	319	9.4
	23-Aug-05	11.6	7.7	341	9.1
	25-Sep-05	11.4	7.6	342	7.6
	25-Oct-05	7.3	8.0	393	10.9
	16-Nov-05	7.0	7.8	297	11.0
	13-Dec-05	1.1	7.5	264	11.6
	18-Jan-06	5.5	7.0	266	12.6
	24-Mar-06	4.3	8.1	245	
	19-Apr-06	5.0	8.1	329	
	24-May-06	6.0	7.9	415	
	21-Jun-06	8.3	8.0	379	
	12-Jul-06	10.8	8.2	362	
	24-Aug-06	12.8	7.8	412	
	21-Sep-06	11.6	7.9	396	
	19-Oct-06	8.8	8.1	393	
	23-Nov-06	6.2	7.8	425	11.8
	17-Dec-06	5.6	7.8	440	
	21-Jan-07	4.6	8.1	434	12.9
	17-Apr-07	4.0	8.1	385	
	13-May-07	3.6	8.1	379	
	17-Jun-07	7.4	8.5	325	11.9
	19-Aug-07	12.1	8.0	423	9.1
	19-Nov-07	4.2	7.9	457	10.8
	11-Dec-07	3.1	7.9	378	11.9
	22-Jan-08	4.5	7.7	367	12.5
	20-Feb-08	3.7	8.0	383	
	17-Mar-08	4.2	7.7	402	
	2-Apr-08	4.1	7.7	315	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Apr-08	4.7	7.8	326	10.9
	22-May-08	5.7	7.5	381	10.2
	23-Nov-08	3.5	8.1	411	7.7
	14-Dec-08	5.4	8.1	337	
	8-Feb-09	3.6		324	8.2
	15-Mar-09	3.8	8.0	310	
	12-Apr-09	3.4	7.7	350	
	17-May-09	7.2	8.2	320	
	14-Mar-10	2.3	7.5	346	13.4
	11-Apr-10	5.1	7.8	385	
	16-May-10	5.9	7.8	252	11.7
	13-Jun-10	6.9	7.9	270	13.2
	18-Jul-10	8.4	7.7	321	15.2
	17-Oct-10	7.3	8.7	352	8.0
	14-Nov-10	6.7	7.8	258	9.8
	13-Mar-11	4.3	8.0	240	12.9
	17-Apr-11	4.3	7.9	221	12.7
	15-May-11	5.5	7.8	126	13.5
	12-Jun-11	7.0	8.0	239	11.9
	16-Oct-11	10.0	7.4	341	10.8
	20-Nov-11	6.0	8.0	293	11.9
	18-Dec-11	6.1	8.6	229	13.0
	18-Mar-12	5.2	7.8	192	9.8
	15-Apr-12	5.6	8.6	222	15.9
	13-May-12	6.2	7.8	256	11.8
	14-Aug-12	9.0	7.5	498	7.7
	18-Nov-12	6.7	7.5	283	9.1
	16-Dec-12	6.0	7.5	589	9.8
	13-Jan-13	5.2	7.8	283	10.9
	19-Mar-13	4.6	8.1	208	9.8
	17-Apr-13	4.2	7.8	194	9.9
	16-Oct-13	7.8	7.8	300	6.0
	20-Nov-13	6.7	7.4	280	3.7
	17-Apr-14	4.4	7.7	423	10.2
	13-May-14	5.7	7.5	245	10.0
	18-Jun-14	7.8	7.9	273	10.7
	23-Oct-14	7.6	7.9	393	4.3
	16-Dec-14	5.6	8.4	326	-
	22-Apr-15	4.6	7.7	243	13.3
	19-May-15	5.8	8.1	249	-
	15-Jun-15	6.6	7.5	310	11.1
	22-Jul-15	7.7	7.9	271	-
	11-Aug-15	9.4	8.0	309	11.1
	25-Aug-15	11.7	-	-	-
	8-Sep-15	12.0	7.8	306	9.3
	15-Oct-15	8.5	8.1	283	10.7
	18-Nov-15	7.3	7.8	327	12.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	9-Dec-15	4.8	7.7	297	13.1
	19-Jan-16	4.5	7.9	248	13.8
	17-Feb-16	4.3	7.8	277	13.4
	15-Mar-16	4.4	7.7	203	13.4
	21-Apr-16	4.1	8.0	224	14.1
	18-May-16	4.6	8.1	272	13.1
	23-Jun-16	6.9	8.3	266	11.6
	5-Jul-16	8.8	8.1	281	16.9
	21-Jul-16	10.5	7.7	321	10.2
	9-Aug-16	12.1	8.4	351	12.9
	24-Aug-16	12.6	8.1	194	9.2
	19-Sep-16	12.2	8.1	331	11.5
	18-Oct-16	11.5	8.0	302	12.6
	15-Nov-16	6.8	8.0	292	10.6
	12-Dec-16	0.8	8.3	448	13.4
	25-Jan-17	5.3	7.9	276	11.6
	17-Feb-17	4.1	8.1	296	13.5
	22-Mar-17	4.2	8.0	265	12.7
	19-Apr-17	4.4	7.1	232	14.6
	16-May-17	6.0	8.0	243	12.8
	28-Jun-17	6.9	7.9	289	12.3
	7-Jul-17	7.8	7.4	294	12.1
	19-Jul-17	8.3	8.2	314	11.7
	2-Aug-17	9.8	8.0	292	10.6
	16-Aug-17	10.3	7.8	328	10.2
	18-Sep-17	11.0	7.8	325	9.1
	18-Oct-17	9.1	8.0	334	10.8
	15-Nov-17	6.4	8.1	332	7.2
	14-Dec-17	4.6	8.3	289	8.5
	18-Jan-18	4.9	7.7	271	9.0
	23-Feb-18	4.2	8.1	210	10.2
	21-Mar-18	3.7	8.1	268	11.3
	19-Apr-18	4.0	8.0	243	10.1
	15-May-18	4.8	7.9	373	11.9
	18-Jun-18	8.1	8.1	410	10.8
	19-Jul-18	10.1	7.6	384	4.0
	24-Aug-18	11.6	8.1	405.7	9.5
	20-Sep-18	12.9	7.7	394.6	3.0
	25-Oct-18	5.2	7.9	402.9	10.9
	22-Nov-18	3.4	8.1		11.8
	13-Dec-18	5.4	8.2	413.4	11.8
	19-Jan-19	4.7	8.0	397.1	12.2
	28-Feb-19	4.7	8.2	393.4	12.2
	19-Mar-19	4.0	8.1	350.2	12.1
SW 11E					
	22-May-03	8.0			
	13-Feb-04	2.6		294	12.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Mar-04	4.2		421	9.3
	21-Apr-04	6.7	8.2	210	
	19-May-04	9.4	8.3	325	
	24-Jun-04	10.6	8.3	368	
	29-Jul-04	13.3	8.2	399	
	26-Aug-04	13.1	8.2	354	
	20-Oct-04	7.0	8.1	318	#REF!
	18-Nov-04	7.5	8.1	358	#REF!
	16-Dec-04	2.0	8.2	294	
	29-Mar-05	7.8	8.1	308	
	11-Apr-05	5.3	7.2	212	
	24-May-05	10.3	7.7	329	#REF!
	27-Jun-05	12.6	8.0	385	
	12-Jul-05	13.8	7.7	387	9.6
	23-Aug-05	13.3	7.9	371	10.0
	25-Sep-06	12.5	7.9	270	9.7
	25-Oct-05	6.7	8.1	403	
	16-Nov-05	6.5	8.1	275	11.6
	13-Dec-05	1.2	8.1	324	12.4
	18-Jan-06	4.6	7.0	251	
	24-Mar-06	5.4	8.3	246	
	19-Apr-06	8.8	8.5	319	
	24-May-06	9.2	8.3	399	
	21-Jun-06	11.3	8.3	419	
	12-Jul-06	13.4	8.2	356	
	24-Aug-06	14.8	8.1	412	
	21-Sep-06	11.6	8.2	397	
	19-Oct-06	9.4	8.2	425	
	23-Nov-06	5.9	8.2	421	
	17-Dec-06	4.7	8.2	433	
	21-Jan-07	2.0	8.5	433	
	18-Feb-07	3.3	8.5	448	
	18-Mar-07	3.8	8.4	381	
	17-Apr-07	4.3	8.4	377	
	13-May-07	6.7	8.3	395	
	17-Jun-07	11.4	8.4	449	10.6
	15-Jul-07	13.8	8.1	436	9.5
	19-Aug-07	13.7	8.0	418	9.2
	17-Sep-07	11.0	8.0	405	
	18-Oct-07	11.8	8.0	408	9.2
	19-Nov-07	2.2	7.9	455	12.4
	11-Dec-07	2.9	8.0	433	12.5
	22-Jan-08	3.6	7.9	358	13.3
	20-Feb-08	3.3	8.1	377	
	17-Mar-08	4.2	8.1	398	13.3
	2-Apr-08	4.3	7.8	313	
	23-Apr-08	7.4	7.9	304	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-May-08	5.8	7.3	359	
	17-Jun-08	9.3	7.9	425	9.3
	15-Jul-08	13.2	7.3	454	7.3
	19-Aug-08	12.0	7.7	512	
	16-Sep-08	10.8	8.2	468	9.0
	22-Oct-08	6.5	8.0	419	7.9
	23-Nov-08	5.3	8.1	421	9.0
	14-Dec-08	4.3	8.5	330	9.4
	18-Jan-09	3.1	8.1	412	4.6
	8-Feb-09	3.9		339	7.9
	15-Mar-09	4.5	8.6	298	
	12-Apr-09	5.2	8.2	331	
	17-May-09	10.4	8.3	328	10.5
	14-Jun-09	10.9	8.2	764	
	12-Jul-09	10.9	8.7	431	11.0
	9-Aug-09	14.0	8.7	433	9.3
	13-Sep-09	11.8	7.6	403	10.4
	11-Oct-09	6.3	8.3	474	12.0
	15-Nov-09	4.5	8.3	412	
	13-Dec-09	1.9	8.1	450	12.4
	17-Jan-10	3.5	8.2	427	12.9
	7-Feb-10	2.1	7.7	428	12.3
	14-Mar-10	5.2	7.9	344	13.0
	11-Apr-10	8.6	8.1	365	
	16-May-10	7.7	8.3	258	11.7
	13-Jun-10	9.7	8.4	284	14.6
	18-Jul-10	10.6	8.3	330	14.5
	15-Aug-10	13.7	8.4	248	10.0
	12-Sep-10	10.6	8.4	340	10.7
	17-Oct-10	7.3	8.2	312	11.8
	14-Nov-10	6.3	8.4	235	10.8
	19-Dec-10	4.1	8.5	237	10.5
	16-Jan-11	4.4	8.2	243	12.6
	20-Feb-11	3.7	8.3	240	12.5
	13-Mar-11	5.4	8.3	242	13.3
	17-Apr-11	5.8	8.1	230	12.6
	15-May-11	6.1	8.0	211	13.1
	12-Jun-11	10.5	8.3	263	10.0
	17-Jul-11	16.2	8.4	230	10.5
	14-Aug-11	15.3	8.4	256	8.1
	18-Sep-11	12.3	8.5	268	8.5
	16-Oct-11	9.5	7.9	280	11.9
	20-Nov-11	4.0	8.0	222	12.7
	18-Dec-11	5.6	8.6	214	13.5
	15-Jan-12	3.6	8.4	185	11.5
	19-Feb-12	4.3	8.2	179	12.7
	18-Mar-12	7.5	8.4	202	10.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Apr-12	9.1	8.9	277	12.6
	13-May-12	11.3	8.3	288	10.2
	17-Jun-12	14.4	8.2	348	13.8
	16-Jul-12	17.1	8.5	381	6.6
	14-Aug-12	10.9	8.4	302	7.3
	18-Sep-12	12.0	7.8	334	9.5
	14-Oct-12	9.2	8.3	298	8.5
	18-Nov-12	6.8	8.1	279	9.1
	16-Dec-12	4.4	7.9	552	10.5
	13-Jan-13	4.6	8.2	279	11.5
	19-Mar-13	3.9	8.3	200	10.2
	17-Apr-13	5.6	8.1	201	10.1
	14-May-13	6.1	8.2	236	8.7
	19-Jun-13	9.7	8.3	277	12.9
	16-Jul-13	13.8	8.3	346	9.8
	21-Aug-13	14.1	8.3	344	9.4
	18-Sep-13	10.6	8.2	312	10.3
	16-Oct-13	10.4	8.6	314	5.7
	20-Nov-13	5.5	7.9	260	3.6
	18-Dec-13	4.0	8.1	217	7.5
	21-Jan-14	0.9	7.7	296	3.9
	19-Feb-14	1.7	7.0	268	3.6
	19-Mar-14	1.6	7.6	268	5.3
	17-Apr-14	4.8	8.0	219	10.7
	13-May-14	11.0	6.8	268	10.5
	18-Jun-14	9.5	8.6	291	10.7
	16-Jul-14	10.4	8.9	348	8.3
	19-Aug-14	12.6	8.8	380	8.1
	9-Sep-14	13.6	8.8	386	4.2
	23-Oct-14	8.2	8.1	387	5.0
	19-Nov-14	3.8	7.5	307	6.9
	16-Dec-14	4.5	8.6	304	-
	20-Jan-15	1.7	7.9	275	1.9
	18-Mar-15	3.6	8.5	227	13.6
	22-Apr-15	4.7	8.2	257	14.3
	19-May-15	9.4	8.6	261	-
	16-Jun-15	9.2	8.4	315	10.8
	21-Jul-15	12.3	8.3	333	-
	11-Aug-15	12.9	8.3	357	11.0
	25-Aug-15	12.7	8.7	307	9.3
	8-Sep-15	16.1	7.9	363	8.1
	15-Oct-15	9.1	8.2	296	10.4
	18-Nov-15	7.4	8.2	345	13.2
	9-Dec-15	4.7	8.0	315	13.9
	20-Jan-16	2.4	7.9	214	14.3
	17-Feb-16	1.7	8.0	255	14.5
	15-Mar-16	4.2	7.7	190	13.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	21-Apr-16	5.9	8.0	232	14.6
	18-May-16	9.3	8.6	305	12.0
	23-Jun-16	10.7	8.5	314	11.4
	5-Jul-16	14.4	8.5	328	14.6
	21-Jul-16	16.0	8.4	368	9.3
	9-Aug-16	16.4	8.5	416	11.4
	24-Aug-16	16.3	8.5	361	10.0
	19-Sep-16	15.3	8.1	44	8.4
	18-Oct-16	14.1	8.2	357	12.6
	16-Nov-16	6.5	8.2	301	11.4
	12-Dec-16	1.3	8.1	454	15.7
	25-Jan-17	4.9	8.3	272	12.1
	17-Feb-17	2.9	8.5	282	15.7
	22-Mar-17	2.8	8.5	260	12.9
	19-Apr-17	4.8	7.7	221	14.4
	16-May-17	6.0	8.1	247	12.5
	28-Jun-17	8.2	8.2	299	12.1
	7-Jul-17	10.6	8.0	306	10.5
	19-Jul-17	11.7	8.3	350	11.2
	2-Aug-17	11.9	8.4	327	10.5
	16-Aug-17	11.9	8.4	261	10.7
	17-Sep-17	12.2	8.2	341	9.7
	18-Oct-17	9.7	8.5	359	8.1
	15-Nov-17	5.7	8.6	325	11.2
	14-Dec-17	2.3	8.5	276	11.8
	18-Jan-18	3.6	8.2	257	8.0
	23-Feb-18	4.3	8.4	218	13.5
	21-Mar-18	3.6	8.4	262	11.9
	19-Apr-18	3.9	8.4	233	9.6
	15-May-18	6.5	8.3	352	11.6
	18-Jun-18	8.4	8.4	422.9	10.2
	19-Jul-18	13.5	8.3	422.4	9.5
	24-Aug-18	14.7	8.4	427.4	9.3
	20-Sep-18	13.8	8.4	419.7	9.2
	25-Oct-18	5.0	8.4	416.8	11.8
	22-Nov-18	0.7	8.4		13.5
	13-Dec-18	3.8	8.5	408.8	12.7
	19-Jan-19	2.3	8.3	393.4	13.5
	19-Mar-19	4.4	8.4	348	12.4
SW 12					
	22-May-03	8.0			
	13-Feb-04	1.4		358	12.9
	18-Mar-04	2.5		640	9.9
	21-Apr-04	10.7	8.2	388	
	19-May-04	13.4	8.2	484	
	24-Jun-04	13.1	8.2	470	
	29-Jul-04	14.4	8.1	507	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	26-Aug-04	13.3	8.2	466	
	22-Sep-04	13.7	7.9	457	9.1
	20-Oct-04	7.6	8.1	412	11.1
	18-Nov-04	7.8	7.9	444	11.0
	29-Mar-05	5.1	8.0	390	
	11-Apr-05	7.1	7.2	332	
	26-May-05	13.7	7.7	464	9.7
	29-Jun-05	15.6	8.0	543	
	12-Jul-05	15.5	7.7	554	9.0
	23-Aug-05	13.9	7.8	491	10.1
	28-Sep-06	12.3	7.9	444	9.8
	25-Oct-05	7.1	8.1	534	11.4
	16-Nov-05	7.0	7.8	373	11.2
	13-Dec-05	1.9	8.0	436	12.4
	18-Jan-06	2.6	6.9	383	
	24-Mar-06	3.9	8.4	394	
	19-Apr-06	11.1	8.3	478	
	24-May-06	11.2	8.2	552	
	21-Jun-06	13.7	8.2	571	
	12-Jul-06	15.3	8.1	459	
	24-Aug-06	14.6	8.0	519	
	21-Sep-06	11.9	8.2	515	
	19-Oct-06	9.6	8.0	580	
	23-Nov-06	4.8	8.0	521	
	17-Dec-06	3.5	8.1	651	
	21-Jan-07	1.0	8.3	585	
	18-Mar-07	0.9	8.2	630	
	17-Apr-07	4.2	8.4	531	
	13-May-07	8.8	8.3	505	11.6
	17-Jun-07	14.2	8.2	605	9.1
	15-Jul-07	14.9	8.0	596	8.9
	19-Aug-07	14.1	7.9	540	8.3
	17-Sep-07	11.5	8.0	500	8.4
	18-Oct-07	12.7	7.9	522	8.8
	19-Nov-07	3.9	7.8	629	11.6
	11-Dec-07	3.0	7.8	552	11.9
	22-Jan-08	2.0	7.8	607	13.8
	20-Feb-08	1.8	8.0	566	
	17-Mar-08	0.1	8.0	578	
	2-Apr-08	4.4	7.9	454	12.6
	23-Apr-08	11.5	7.9	460	9.0
	22-May-08	7.2	7.3	489	10.3
	17-Jun-08	11.5	7.7	542	8.9
	15-Jul-08	14.1	7.1	604	7.7
	19-Aug-08	12.9	7.6	661	8.1
	16-Sep-08	11.9	8.2	598	9.2
	22-Oct-08	6.1	7.8	568	8.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Nov-08	3.5	8.2	608	9.2
	14-Dec-08	2.3	8.3	498	8.9
	8-Feb-09	2.0		405	8.6
	15-Mar-09	5.4	8.7	402	
	12-Apr-09	6.7	8.1	487	
	17-May-09	14.6	8.4	435	10.2
	14-Jun-09	13.1	7.9	981	10.3
	12-Jul-09	12.8	8.5	549	10.2
	9-Aug-09	15.4	8.6	468	8.5
	13-Sep-09	11.1	7.8	520	11.0
	11-Oct-09	6.3	8.1	620	12.1
	15-Nov-09	4.7	8.1	572	
	13-Dec-09	1.6	7.7	589	12.0
	17-Jan-10	2.2	8.0	566	11.3
	14-Mar-10	5.1	7.7	468	12.8
	11-Apr-10	9.2	7.9	543	
	16-May-10	11.4	8.3	354	10.3
	13-Jun-10	13.1	8.2	421	13.0
	18-Jul-10	15.5	8.2	481	12.6
	15-Aug-10	15.2	8.3	474	11.5
	17-Oct-10	7.7	7.8	373	11.0
	14-Nov-10	5.3	8.1	278	10.6
	13-Mar-11	3.8	8.3	298	13.7
	20-Mar-11	4.1	8.1	380	12.6
	17-Apr-11	7.3	8.3	355	12.3
	15-May-11	8.8	8.0	326	11.8
	12-Jun-11	13.5	8.3	358	8.6
	17-Jul-11	17.6	8.3	444	9.8
	14-Aug-11	15.6	8.4	320	8.7
	18-Sep-11	12.5	8.7	354	9.9
	16-Oct-11	10.0	7.6	349	11.3
	20-Nov-11	4.1	8.1	259	12.6
	18-Dec-11	3.6	8.6	386	13.0
	15-Jan-12	1.4	8.5	223	12.3
	19-Feb-12	2.5	8.3	258	13.0
	18-Mar-12	11.2	8.2	355	8.3
	15-Apr-12	8.5	8.7	357	13.8
	13-May-12	13.4	8.2	395	4.2
	17-Jun-12	15.9	8.3	453	13.0
	16-Jul-12	18.2	8.3	508	6.9
	14-Aug-12	14.7	8.2	459	7.0
	18-Sep-12	12.5	7.7	486	9.4
	18-Oct-12	9.3	8.0	374	8.4
	20-Nov-12	6.7	8.0	387	9.1
	20-Dec-12	3.3	7.7	803	10.5
	16-Jan-13	2.9	7.9	393	11.6
	19-Mar-13	0.6	7.8	426	9.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Apr-13	7.2	8.2	328	10.3
	14-May-13	7.0	8.0	337	8.2
	19-Jun-13	11.7	8.2	389	10.8
	16-Jul-13	15.8	8.2	466	8.6
	21-Aug-13	14.9	8.3	459	10.2
	18-Sep-13	10.9	8.0	422	11.2
	16-Oct-13	11.9	8.3	444	5.2
	20-Nov-13	3.5	0.5	382	3.9
	18-Dec-13	2.3	7.9	311	6.3
	17-Apr-14	4.8	8.2	311	10.9
	13-May-14	15.0	7.0	407	10.4
	18-Jun-14	13.8	8.4	375	10.0
	16-Jul-14	12.4	7.8	465	8.2
	19-Aug-14	13.4	8.7	505	8.8
	9-Sep-14	13.0	8.8	-	7.3
	23-Oct-14	8.5	7.9	537	7.0
	16-Dec-14	2.7	8.6	351	-
	20-Jan-15	0.5	7.9	344	2.2
	22-Apr-15	5.7	8.1	394	13.5
	19-May-15	12.3	8.5	257	13.5
	16-Jun-15	13.8	8.2	436	8.3
	22-Jul-15	14.7	8.4	443	-
	11-Aug-15	14.3	8.2	470	8.8
	8-Sep-15	16.9	7.9	471	7.7
	15-Oct-15	9.7	8.1	370	10.5
	18-Nov-15	8.0	8.0	435	12.1
	9-Dec-15	5.2	7.9	426	13.0
	20-Jan-16	1.3	7.9	361	14.0
	17-Feb-16	1.0	7.9	347	14.7
	15-Mar-16	4.1	7.6	289	12.9
	21-Apr-16	8.0	7.9	359	13.9
	18-May-16	10.4	8.6	442	11.9
	23-Jun-16	12.5	8.4	428	10.5
	24-Aug-16	15.5	8.4	433	8.1
	19-Sep-16	14.1	8.3	540	9.4
	18-Oct-16	13.7	8.0	454	12.2
	16-Nov-16	7.6	7.9	402	10.7
	12-Dec-16	2.2	8.0	623	14.4
	25-Jan-17	3.5	8.1	389	12.5
	17-Feb-17	1.6	8.3	372	15.4
	22-Mar-17	0.8	8.3	365	12.4
	19-Apr-17	6.3	7.6	375	12.9
	16-May-17	8.9	8.2	416	10.9
	28-Jun-17	11.2	8.4	478	10.2
	19-Jul-17	14.1	8.4	473	9.5
	16-Aug-17	13.4	8.2	468	9.7
	18-Sep-17	13.7	7.9	4.02	9.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Oct-17	10.2	8.3	454	8.6
	15-Nov-17	5.5	8.4	427	11.8
	14-Dec-17	0.7	8.2	342	12.9
	18-Jan-18	1.1	8.0	371	9.8
	23-Feb-18	3.6	8.2	307	16.9
	21-Mar-18	0.2	8.4	312	12.7
	19-Apr-18	2.1	8.3	358	12.1
	15-May-18	10.3	8.2	520	10.3
	18-Jun-18	8.8	8.2	256.9	9.9
	19-Jul-18	14.0	8.2	546	9.5
	24-Aug-18	15.1	8.4	570	9.4
	20-Sep-18	13.6	7.9	537	9.3
	25-Oct-18	5.6	8.0	592	11.5
	13-Dec-18	1.0	7.7	808	9.3
	19-Jan-19	0.9	8.1	571	12.9
	19-Mar-19	2.6	8.3	581	12.7
SW 12A					
	22-May-03	8.0			#REF!
	21-Apr-04	12.3	8.0	657	
	11-Apr-05	7.4	7.4	476	
	24-Mar-06	1.8	7.9	674	
	19-Apr-06	12.1	7.8	867	
	24-May-06	9.5	7.7	939	
	23-Nov-06	4.4	8.4	968	9.3
	17-Dec-06	3.0	7.7	992	11.2
	18-Mar-07	1.0	8.0	1066	
	17-Apr-07	3.2	8.0	915	12.2
	2-Apr-08	5.0	7.7	621	11.7
	23-Apr-08	14.2	7.8	590	9.0
	22-May-08	7.2	8.4	524	8.7
	23-Nov-08	1.6	7.8	834	8.1
	14-Dec-08	2.2	7.0	694	10.7
	8-Feb-09	1.2		522	9.1
	15-Mar-09	6.1	8.1	570	
	12-Apr-09	8.0	7.9	687	
	17-May-09	14.7	7.9	528	
	14-Mar-10	5.3	7.6	663	11.6
	11-Apr-10	8.8	8.0	848	
	16-May-10	13.7	8.0	670	10.3
	13-Jun-10	15.6	7.8	689	10.7
	18-Jul-10	17.8	7.8	778	10.0
	12-Sep-10	11.2	8.3	466	9.9
	14-Nov-10	5.5	7.9	360	8.5
	20-Mar-11	3.8	7.8	541	12.5
	17-Apr-11	9.0	7.7	628	12.5
	15-May-11	9.6	8.0	466	10.7
	16-Oct-11	10.3	7.7	329	10.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Dec-11	4.1	8.8	273	14.4
	18-Mar-12	14.5	7.8	589	7.0
	14-Aug-12	15.8	8.0	439	5.0
	20-Nov-12	6.5	7.5	633	6.3
	20-Dec-12	2.0	7.3	1130	9.3
	16-Jan-13	1.9	7.6	553	9.7
	19-Mar-13	2.1	8.1	278	10.8
	17-Apr-13	8.3	7.9	497	10.4
	14-May-13	6.4	8.0	581	9.0
	16-Oct-13	13.3	8.0	613	1.5
	20-Nov-13	3.6	7.5	503	3.1
	17-Apr-14	4.1	7.9	441	10.4
	13-May-14	15.7	6.7	664	10.0
	23-Oct-14	7.8	7.2	428	8.3
	22-Apr-15	6.0	7.8	585	13.5
	15-Mar-16	4.2	7.3	413	11.3
	21-Apr-16	8.2	7.6	543	13.1
	18-May-16	10.3	8.0	709	10.8
	21-Jul-16	16.2	8.3	468	8.3
	25-Jan-17	2.7	7.9	494	10.2
	19-Apr-17	5.8	7.1	588	10.0
	16-May-17	9.0	7.7	686	6.4
	28-Jun-17	12.2	8.0	761	6.2
	23-Feb-18	4.0	8.0	421	7.4
	15-May-18	11.4	7.8	828	8.6
	22-Nov-18	1.5	8.4	735.2	11.1
	13-Dec-18	2.9	8.3	592	12.7
SW 13					
	22-May-03	13.0			
	13-Feb-04	0.8		287	12.8
	21-Apr-04	8.2	8.3	259	
	19-May-04	15.2	8.3	390	
	24-Jun-04	18.1	8.4	413	
	29-Jul-04	21.8	8.2	434	
	26-Aug-04	20.7	8.2	394	8.1
	22-Sep-04	22.6	8.2	392	8.0
	20-Oct-04	8.6	8.0	288	11.5
	18-Nov-04	6.1	8.0	282	
	11-Apr-05	5.1	7.3	243	
	26-May-05	15.4	8.1	373	
	29-Jun-05	22.2	8.1	491	
	12-Jul-05	23.3	7.8	474	7.9
	23-Aug-05	19.9	7.6	430	6.8
	28-Sep-05	15.8	7.9	362	7.4
	25-Oct-05	8.4	8.9	382	11.6
	16-Nov-05	5.8	8.2	267	
	13-Dec-05	0.8	8.0	455	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Jan-06	2.4	7.7	270	
	24-Mar-06	3.3	8.4	255	
	19-Apr-06	8.7	8.4	342	
	24-May-06	10.2	8.3	420	
	21-Jun-06	19.0	8.3	424	
	12-Jul-06	20.8	8.4	350	
	24-Aug-06	20.2	7.9	382	
	21-Sep-06	16.2	8.1	358	
	19-Oct-06	9.7	8.2	370	
	23-Nov-06	4.6	8.1	445	
	17-Dec-06	3.3	8.2	489	
	21-Jan-07	1.7	8.4	475	
	17-Apr-07	3.8	8.5	427	
	13-May-07	10.5	8.4	404	11.1
	17-Jun-07	20.5	8.4	442	9.0
	15-Jul-07	23.3	8.1	434	7.3
	19-Aug-07	19.0	7.9	428	6.4
	17-Sep-07	15.9	7.9	379	7.2
	18-Oct-07	13.3	7.9	373	8.1
	19-Nov-07	3.9	8.1	400	12.6
	20-Feb-08	2.2	8.1	420	
	17-Mar-08	2.1	8.0	423	
	2-Apr-08	3.2	7.9	372	
	23-Apr-08	9.4	7.9	320	10.5
	22-May-08	8.8	7.8	377	11.1
	17-Jun-08	16.6	7.9	403	8.4
	15-Jul-08	22.0	7.5	425	5.8
	19-Aug-08	21.9	8.0	501	4.4
	16-Sep-08	17.6	8.4	418	6.4
	22-Oct-08	7.4	8.0	437	7.1
	23-Nov-08	3.9	8.5	462	9.0
	14-Dec-08	3.1	8.4	369	9.5
	8-Feb-09	2.5		385	8.2
	15-Mar-09	4.5	8.6	362	
	12-Apr-09	5.6	8.0	403	
	17-May-09	15.0	8.5	338	10.1
	14-Jun-09	19.6	7.9	803	
	12-Jul-09	18.2	8.2	420	9.5
	9-Aug-09	22.3	8.0	341	8.2
	13-Sep-09	16.8	7.7	374	8.6
	11-Oct-09	8.5	8.4	441	11.1
	15-Nov-09	5.6	8.5	429	
	13-Dec-09	1.4	7.7	477	12.7
	17-Jan-10	1.0	8.1	463	12.2
	14-Mar-10	4.1	7.9	410	13.5
	11-Apr-10	8.2	8.0	395	
	16-May-10	12.4	8.4	317	10.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	13-Jun-10	16.7	8.4	356	12.9
	18-Jul-10	19.1	8.2	395	11.7
	15-Aug-10	21.5	8.4	403	7.9
	12-Sep-10	15.4	8.3	391	8.0
	17-Oct-10	8.9	8.1	338	10.5
	13-Mar-11	3.4	8.4	260	13.9
	20-Mar-11	3.6	8.3	277	13.4
	17-Apr-11	5.6	8.4	240	12.5
	15-May-11	7.6	8.4	248	12.9
	12-Jun-11	17.5	8.6	305	8.7
	17-Jul-11	26.0	8.5	423	8.9
	14-Aug-11	22.6	8.5	286	6.4
	18-Sep-11	17.6	8.7	200	7.1
	16-Oct-11	10.1	7.8	274	11.3
	20-Nov-11	4.1	8.1	285	11.9
	18-Dec-11	4.0	8.9	244	14.5
	15-Jan-12	2.2	8.5	207	12.0
	19-Feb-12	2.2	8.2	222	13.2
	18-Mar-12	9.1	8.3	233	9.2
	15-Apr-12	10.6	8.8	285	12.5
	13-May-12	16.0	8.4	331	10.9
	17-Jun-12	24.3	8.6	424	11.9
	16-Jul-12	26.9	8.6	406	6.3
	14-Aug-12	16.7	8.5	337	7.0
	18-Sep-12	16.1	7.9	364	8.6
	18-Oct-12	9.8	8.4	287	8.9
	20-Nov-12	5.3	8.0	297	9.7
	20-Dec-12	3.1	7.8	591	10.6
	16-Jan-13	3.4	8.1	259	11.6
	19-Mar-13	2.3	8.3	215	10.6
	17-Apr-13	5.2	8.0	189	10.2
	14-May-13	7.4	8.2	254	7.9
	19-Jun-13	16.9	8.4	355	9.5
	16-Jul-13	25.3	8.3	369	6.4
	21-Aug-13	21.3	8.4	401	7.2
	18-Sep-13	16.7	8.2	335	9.5
	16-Oct-13	12.1	8.6	347	5.5
	20-Nov-13	4.2	8.6	276	3.9
	18-Dec-13	1.9	7.9	255	8.0
	21-Jan-14	0.8	7.5	220	4.7
	19-Feb-14	0.6	7.8	242	3.7
	19-Mar-14	0.6	7.3	232	8.4
	17-Apr-14	3.5	8.2	236	8.7
	13-May-14	12.4	7.5	277	11.6
	18-Jun-14	12.9	7.5	219	11.0
	16-Jul-14	18.2	7.8	400	8.8
	19-Aug-14	20.1	8.8	424	6.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	9-Sep-14	19.1	8.8	418	11.9
	23-Oct-14	9.6	8.1	415	9.0
	19-Nov-14	2.3	7.4	314	6.3
	16-Dec-14	3.0	8.6	314	-
	20-Jan-15	1.1	7.8	194	2.1
	22-Apr-15	6.0	8.3	292	13.1
	19-May-15	14.8	8.1	317	12.2
	16-Jun-15	16.0	8.2	359	8.3
	22-Jul-15	20.8	8.6	403	-
	11-Aug-15	19.5	8.1	396	7.1
	8-Sep-15	22.4	7.9	396	6.1
	15-Oct-15	12.1	8.1	297	8.5
	18-Nov-15	6.0	8.1	309	13.3
	9-Dec-15	3.6	8.8	305	12.3
	15-Mar-16	4.2	7.7	238	13.6
	21-Apr-16	7.5	8.0	266	13.8
	18-May-16	9.2	8.6	318	11.9
	23-Jun-16	19.1	8.3	396	6.6
	21-Jul-16	22.6	7.6	453	2.2
	24-Aug-16	23.6	8.3	372	8.2
	19-Sep-16	20.8	8.2	384	6.9
	18-Oct-16	15.1	8.3	318	10.4
	16-Nov-16	6.4	8.3	270	11.4
	12-Dec-16	1.3	8.1	433	11.6
	25-Jan-17	3.4	8.2	299	12.4
	17-Feb-17	1.1	8.4	284	14.9
	22-Mar-17	2.8	8.4	295	11.6
	19-Apr-17	6.9	7.8	279	13.6
	16-May-17	10.3	8.5	252	10.7
	28-Jun-17	12.2	8.5	362	11.1
	19-Jul-17	20.4	8.6	436	9.1
	16-Aug-17	19.6	8.3	388	8.6
	18-Sep-17	17.6	8.2	333	9.1
	18-Oct-17	11.3	8.2	345	9.0
	15-Nov-17	3.8	8.5	324	14.0
	14-Dec-17	1.6	8.4	286	13.9
	18-Jan-18	1.8	8.0	275	10.2
	23-Feb-18	3.0	8.3	225	15.3
	21-Mar-18	2.1	8.4	268	12.2
	19-Apr-18	2.4	8.4	259	12.5
	15-May-18	10.5	8.3	394	11.1
	18-Jun-18	7.5	8.3	429	8.2
	19-Jul-18	23.7	8.3	416.8	7.3
	24-Aug-18	20.4	8.3	368	8.2
	20-Sep-18	18.8	8.4	344.3	8.8
	25-Oct-18	6.2	8.6	360.9	11.8
	22-Nov-18	2.1	8.4	452.8	12.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	12-Dec-18	2.0	8.4	469.5	13.0
	18-Jan-19	1.4	8.2	443.7	13.7
	15-Mar-19	2.6	8.3	404.8	12.9
SW 14					
	22-May-03	15.0			
	10-Feb-04	0.8		292	11.0
	16-Mar-04	1.5	8.0	435	11.9
	19-Apr-04	9.5	8.4	253	
	19-May-04	14.6	8.3	385	
	24-Jun-04	15.8	8.3	385	9.3
	29-Jul-04	18.0	8.0	389	7.7
	26-Aug-04	16.0	7.9	370	
	22-Sep-04	14.7	7.7	355	8.1
	20-Oct-04	7.0	7.5	313	10.3
	16-Nov-04	3.4	7.5	294	12.0
	16-Dec-04	0.4	7.8	235	
	29-Mar-05	3.5	8.0	301	
	11-Apr-05	5.6	7.1	249	
	24-May-05	12.2	7.7	352	10.5
	28-Jun-05	21.8	8.4	488	
	11-Jul-05	21.6	7.2	471	#REF!
	22-Aug-05	16.0	7.8	383	8.2
	27-Sep-05	13.2	7.6	355	9.0
	24-Oct-05	7.9	7.6	580	9.6
	16-Nov-05	6.0	7.6	301	11.7
	12-Dec-05	0.2	8.3	255	3.0
	17-Jan-06	0.6	7.8	243	
	20-Mar-06	3.3	8.3	278	
	18-Apr-06	10.5	6.4	345	
	24-May-06	11.7	8.4	423	
	23-Jun-06	17.6	7.8	362	
	11-Jul-06	18.1	8.5	356	
	23-Aug-06	17.0	7.6	414	
	20-Sep-06	12.5	7.4	539	
	19-Oct-06	9.8	7.7	421	
	27-Nov-06	6.4	8.2	451	12.4
	17-Dec-06	2.9	8.1	505	
	18-Mar-07	2.5	8.3	429	
	17-Apr-07	5.4	8.5	425	
	13-May-07	10.2	8.0	409	11.1
	17-Jun-07	19.1	8.3	451	8.1
	15-Jul-07	19.3	8.3	447	7.2
	19-Aug-07	19.2	8.1	416	6.5
	17-Sep-07	13.4	7.8	402	8.1
	18-Oct-07	12.7	7.7	488	6.4
	21-Nov-07	3.8	7.8	475	10.8
	21-Jan-08	1.2	7.3	385	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	2-Apr-08	2.1	7.8	336	
	21-Apr-08	11.2	7.5	325	9.8
	20-May-08	13.6	7.4	379	9.5
	18-Jun-08	15.0	8.1	379	7.4
	15-Jul-08	18.5	7.6	442	5.5
	19-Aug-08	16.4	7.7	513	4.6
	17-Sep-08	13.9	8.6	444	6.1
	22-Oct-08	5.5	8.0	444	8.7
	23-Nov-08	3.9		472	8.8
	14-Dec-08	2.8	7.3	374	8.1
	15-Mar-09	4.1	8.6	386	
	12-Apr-09	6.8	8.4	346	
	17-May-09	15.5	8.3	342	10.0
	14-Jun-09	15.8	8.6	822	8.9
	12-Jul-09	17.5	9.2	366	8.8
	9-Aug-09	20.5	8.7	384	9.0
	13-Sep-09	16.1	6.5	387	9.2
	11-Oct-09	5.1	7.7	471	11.5
	15-Nov-09	3.6	7.3	446	
	13-Dec-09	1.6	7.5	489	11.9
	14-Mar-10	3.5	8.0	339	13.5
	11-Apr-10	9.4	8.3	400	11.5
	16-May-10	12.9	8.4	323	10.4
	13-Jun-10	14.0	8.3	317	13.0
	18-Jul-10	18.6	8.2	364	11.9
	15-Aug-10	17.2	8.3	387	8.9
	12-Sep-10	14.1	8.2	368	9.2
	17-Oct-10	8.2	8.0	348	11.0
	14-Nov-10	6.4	8.3	288	12.4
	13-Mar-11	3.3	8.1	241	11.5
	20-Mar-11	3.3	8.3	275	13.0
	17-Apr-11	5.9	8.4	247	12.2
	15-May-11	8.0	8.2	248	12.8
	12-Jun-11	16.7	8.4	314	9.8
	17-Jul-11	21.8	8.3	393	8.6
	14-Aug-11	18.7	8.6	264	8.4
	18-Sep-11	14.3	8.8	265	9.5
	16-Oct-11	10.0	7.7	251	12.7
	20-Nov-11	2.8	8.0	284	12.9
	18-Dec-11	3.4	9.2	241	13.6
	18-Mar-12	10.4	8.3	247	8.5
	15-Apr-12	8.0	8.9	275	12.9
	13-May-12	16.8	8.4	327	9.2
	17-Jun-12	21.0	8.4	400	13.0
	16-Jul-12	24.0	8.5	378	6.8
	14-Aug-12	16.7	8.6	447	7.0
	18-Sep-12	14.8	7.8	354	8.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Oct-12	11.1	7.2	320	7.7
	20-Nov-12	5.8	8.1	304	10.7
	18-Dec-12	4.2	7.7	623	9.7
	20-Dec-12	2.6	7.9	585	11.4
	16-Jan-13	3.1	8.3	295	11.5
	19-Mar-13	2.3	8.3	218	10.5
	17-Apr-13	6.2	8.3	241	10.4
	14-May-13	7.3	8.2	247	8.9
	19-Jun-13	15.2	8.4	315	10.1
	16-Jul-13	22.1	8.3	424	7.6
	21-Aug-13	22.2	8.3	419	7.4
	18-Sep-13	12.9	8.3	323	10.2
	16-Oct-13	12.7	8.9	360	5.4
	20-Nov-13	4.0	8.2	277	3.9
	17-Apr-14	4.0	8.2	447	10.3
	13-May-14	15.5	7.0	318	10.3
	18-Jun-14	14.2	7.5	232	8.9
	15-Jul-14	15.7	8.9	391	6.9
	9-Sep-14	16.7	8.7	427	4.3
	23-Oct-14	10.2	8.7	421	4.2
	22-Apr-15	6.2	8.3	297	13.2
	19-May-15	14.0	8.5	286	-
	15-Jun-15	16.0	8.2	351	8.7
	22-Jul-15	18.8	8.5	391	-
	11-Aug-15	17.7	8.2	398	8.6
	25-Aug-15	16.6	8.2	338	7.0
	8-Sep-15	20.3	7.9	403	6.1
	15-Oct-15	10.1	7.9	310	9.7
	18-Nov-15	7.8	7.9	346	12.7
	9-Dec-15	3.8	7.8	269	13.6
	20-Jan-16	-0.1	7.7	268	15.0
	15-Mar-16	4.7	8.3	236	14.1
	21-Apr-16	8.2	7.7	275	13.4
	18-May-16	11.0	8.6	340	11.3
	23-Jun-16	15.0	8.4	367	9.7
	21-Jul-16	19.4	7.8	397	8.6
	24-Aug-16	19.7	5.1	376	7.5
	19-Sep-16	17.4	8.0	447	8.2
	18-Oct-16	15.4	7.8	405	11.1
	16-Nov-16	7.1	7.8	315	10.4
	12-Dec-16	0.6	8.2	465	16.1
	25-Jan-17	3.2	8.2	300	13.0
	22-Mar-17	1.2	8.5	292	14.0
	19-Apr-17	6.6	7.8	272	14.4
	16-May-17	10.5	8.0	303	11.4
	28-Jun-17	12.7	8.3	375	10.5
	19-Jul-17	18.8	8.2	430	8.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Aug-17	17.1	8.2	368	8.4
	18-Sep-17	16.3	7.9	366	8.1
	18-Oct-17	11.1	8.2	354	8.9
	15-Nov-17	4.2	8.3	341	12.6
	14-Dec-17	0.0	8.4	281	-
	18-Jan-18	0.9	7.8	271	10.0
	23-Feb-18	3.1	8.3	234	8.3
	21-Mar-18	0.6	8.3	260	14.6
	19-Apr-18	2.5	8.4	263	11.7
	15-May-18	11.2	8.2	398	10.1
	18-Jun-18	17.2	8.3	438.2	8.7
	19-Jul-18	16.8	8.2	430.5	8.4
	23-Aug-18	17.9	8.1	421.5	8.1
	19-Sep-18	14.5	8.0	395.8	8.4
	25-Oct-18	5.3	7.9	435.9	11.0
	22-Nov-18	0.0	8.1	423.4	13.5
	13-Dec-18	1.9	8.4	474.7	13.3
	19-Jan-19	-0.1	8.1	432.3	14.3
	19-Mar-19	1.8	8.4	410.7	13.1
SW 15					
	19-May-04	18.2	8.2	421	9.1
	24-Jun-04	18.9	8.1	412	8.3
	29-Jul-04	20.5	8.0	398	7.5
	26-Aug-04	18.0	8.1	402	9.0
	20-Oct-04	7.9	8.0	316	11.7
	17-Nov-04	6.5	7.9	330	12.0
	16-Dec-04	0.1	7.9	134	5.6
	11-Apr-05	11.2	7.5	340	11.0
	24-May-05	15.2	7.7	389	9.5
	28-Jun-05	23.0	8.3	484	
	11-Jul-05	23.8	7.2	471	7.0
	22-Aug-05	18.4	8.7	383	8.4
	27-Sep-05	14.4	7.6	348	7.9
	24-Oct-05	8.6	7.9	400	
	15-Nov-05	4.5	7.9	285	2.9
	12-Dec-05	0.1	8.3	243	0.6
	18-Apr-06	17.9	8.4	388	
	23-May-06	16.3	8.1	420	
	20-Jun-06	20.1	8.0	399	
	11-Jul-06	21.5	8.0	376	
	23-Aug-06	18.7	7.8	378	
	20-Sep-06	13.6	7.9	345	
	19-Oct-06	10.1	7.8	390	
	27-Nov-06	6.8	8.0	490	11.9
	17-Dec-06	1.6	8.0	556	
	17-Apr-07	8.5	8.5	441	
	13-May-07	12.0	8.1	388	10.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jun-07	21.9	8.2	422	7.0
	15-Jul-07	21.8	8.1	419	7.2
	19-Aug-07	21.5	8.0	390	6.6
	17-Sep-07	16.2	8.0	330	8.3
	19-Oct-07	15.2	8.2	371	7.7
	21-Nov-07	4.2	7.9	446	#REF!
	10-Dec-07	0.9	7.7	428	11.3
	1-Apr-08	1.0	7.4	218	14.0
	21-Apr-08	21.1	7.7	406	6.8
	20-May-08	18.8	7.6	394	6.6
	18-Jun-08	16.5	8.2	830	6.9
	19-Aug-08	15.2	7.9	404	4.8
	17-Sep-08	13.9	8.4	471	6.2
	22-Oct-08	5.9	7.7	429	8.0
	23-Nov-08	1.9	7.6	518	8.7
	15-Mar-09	6.3	8.2	384	
	12-Apr-09	11.8	8.4	373	
	17-May-09	19.4	8.0	373	8.2
	14-Jun-09	15.7	8.4	826	9.6
	12-Jul-09	15.9	8.8	486	9.3
	9-Aug-09	19.8	8.0	400	8.2
	13-Sep-09	16.7	6.5	319	
	11-Oct-09	6.2	7.5	419	11.6
	15-Nov-09	5.2	7.4	407	
	13-Dec-09	0.5	7.5	508	12.2
	14-Mar-10	3.3	7.7	274	13.0
	16-May-10	19.3	8.2	408	8.5
	13-Jun-10	17.4	8.0	340	10.6
	18-Jul-10	21.4	8.0	443	10.8
	17-Oct-10	8.2	7.9	360	10.5
	14-Nov-10	6.9	8.1	303	11.7
	20-Mar-11	2.3	8.0	245	11.9
	17-Apr-11	8.5	8.1	321	10.9
	15-May-11	12.8	8.0	321	12.8
	12-Jun-11	19.6	8.2	345	8.1
	16-Oct-11	10.8	7.8	368	9.0
	20-Nov-11	3.4	8.0	297	12.0
	18-Dec-11	2.0	8.5	209	11.4
	18-Mar-12	16.9	8.0	369	7.8
	15-Apr-12	7.4	8.4	338	11.5
	13-May-12	13.7	8.0	383	9.4
	14-Aug-12	18.5	8.1	489	5.7
	18-Sep-12	14.8	7.7	426	7.4
	17-Oct-12	10.6	7.3	315	6.9
	20-Nov-12	6.1	7.7	350	8.6
	18-Dec-12	3.8	7.3	720	8.9
	15-Jan-13	1.8	7.7	642	10.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Apr-13	8.9	8.0	292	9.5
	13-May-13	11.7	8.0	367	5.7
	19-Jun-13	15.8	8.1	400	8.6
	16-Oct-13	13.8	8.6	377	4.8
	19-Nov-13	4.1	8.3	334	2.0
	16-Apr-14	5.7	8.0	307	10.8
	13-May-14	13.8	7.7	398	10.0
	15-Jul-14	15.2	8.8	472	-
	19-Aug-14	17.6	8.7	289	5.1
	9-Sep-14	16.0	8.6	560	4.5
	22-Oct-14	10.1	7.3	416	6.9
	16-Dec-14	0.4	8.3	253	-
	22-Apr-15	8.1	7.9	409	12.0
	19-May-15	12.6	8.2	404	-
	15-Jun-15	16.7	7.8	515	7.8
	21-Jul-15	18.3	8.2	475	-
	18-Nov-15	7.6	8.0	372	10.8
	9-Dec-15	4.5	7.6	341	12.3
	20-Jan-16	0.4	7.6	317	14.0
	15-Mar-16	6.4	7.9	321	12.4
	21-Apr-16	7.3	7.9	345	10.6
	18-May-16	9.6	8.1	421	9.2
	24-Aug-16	17.8	8.4	469	9.3
	19-Sep-16	16.9	7.9	395	7.2
	18-Oct-16	14.8	8.1	356	11.5
	15-Nov-16	7.7	7.1	309	10.6
	12-Dec-16	1.6	7.5	481	15.8
	24-Jan-17	2.4	8.0	307	12.2
	21-Mar-17	0.6	7.7	333	13.0
	19-Apr-17	7.4	6.2	348	12.3
	16-May-17	18.0	8.6	429	7.2
	28-Jun-17	17.1	8.2	429	7.8
	19-Jul-17	18.3	8.2	456	7.2
	16-Aug-17	16.7	8.0	386	7.4
	18-Sep-17	16.5	8.0	384	6.7
	18-Oct-17	11.5	8.1	357	9.3
	15-Nov-17	4.3	8.1	348	8.2
	23-Feb-18	0.7	7.9	254	9.9
	21-Mar-18	-0.1	8.1	300	13.7
	19-Apr-18	0.6	8.1	281	12.6
	15-May-18	13.5	7.9	477	8.7
	18-Jun-18	15.9	8.2	526	9.3
	23-Aug-18	17.8	8.1	486.8	8.5
	25-Oct-18	6.6	8.1	471.3	10.7
	22-Nov-18	2.1	8.2	736.1	13.2
	13-Dec-18	2.3	8.0	530	11.7
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TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-May-03	15.0			
	23-Jun-03	19.4			
	19-Apr-04	12.6	8.0	251	
	19-May-04	12.4	7.6	372	7.7
	24-Jun-04	14.9	7.3	423	3.5
	29-Jul-04	16.4	7.3	481	5.1
	20-Oct-04	7.9	7.4	386	8.2
	17-Nov-04	5.9	7.2	337	8.6
	29-Mar-05	2.9	7.6	344	11.9
	11-Apr-05	8.5	7.5	232	
	24-May-05	12.3	7.5	359	8.9
	27-Jun-05	19.1	7.6	488	7.8
	11-Jul-05	20.0	6.8	524	5.7
	22-Aug-05	15.2	8.3	492	7.2
	27-Sep-05	13.2	7.5	563	7.0
	24-Oct-05	8.6	8.9	1065	8.4
	14-Nov-05	5.7	8.2	527	10.7
	12-Dec-05	2.0	8.0	303	9.1
	17-Jan-06	0.4	6.4	180	13.4
	22-Mar-06	1.4	8.4	227	
	18-Apr-06	11.5	8.0	334	
	23-May-06	11.5	7.8	417	
	20-Jun-06	16.1	7.4	529	
	11-Jul-06	18.3	7.5	577	
	19-Oct-06	10.4	7.6	277	
	27-Nov-06	6.4	7.6	440	8.2
	17-Dec-06	2.5	7.7	451	12.4
	18-Mar-07	0.2	8.1	409	13.6
	16-Apr-07	2.8	8.3	397	12.4
	13-May-07	10.1	8.0	432	7.0
	19-Nov-07	4.6	7.8	576	8.4
	21-Jan-08	0.1	7.4	355	6.0
	19-Feb-08	0.2	7.7	115	10.7
	17-Mar-08	0.5	6.6	433	14.3
	1-Apr-08	0.7	7.3	207	
	23-Apr-08	13.0	8.0	324	
	21-May-08	8.9	7.7	394	6.4
	18-Jun-08	13.7	7.6	466	4.4
	15-Jul-08	15.2	7.1	537	4.0
	18-Aug-08	10.1	7.5	590	3.0
	17-Sep-08	12.2	8.3	497	5.6
	20-Oct-08	8.8	7.2	445	6.5
	14-Dec-08	1.1	7.8	349	8.7
	8-Feb-09	0.8	8.4	385	10.6
	15-Mar-09	3.5	8.5	343	
	12-Apr-09	12.2	8.8	346	
	17-May-09	20.4	8.1	352	7.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Jun-09	16.5	7.7	865	6.6
	12-Jul-09	12.1	8.2	484	7.8
	11-Oct-09	6.9	7.2	478	11.0
	15-Nov-09	3.7	7.4	424	
	14-Mar-10	1.5	8.0	357	13.7
	11-Apr-10	11.7	7.7	406	11.1
	16-May-10	15.1	8.2	339	9.0
	13-Jun-10	16.6	8.0	371	9.7
	18-Jul-10	17.0	8.0	366	10.4
	15-Aug-10	16.2	7.6	421	4.9
	17-Oct-10	7.4	7.7	328	7.9
	14-Nov-10	5.8	7.8	269	10.1
	19-Dec-10	0.8	8.1	151	11.9
	16-Jan-11	0.3	8.2	225	11.7
	13-Mar-11	1.1	8.1	185	11.8
	17-Apr-11	3.4	8.1	240	14.2
	15-May-11	8.8	8.0	240	12.5
	12-Jun-11	13.8	8.0	298	8.3
	17-Jul-11	20.0	8.2	423	8.3
	14-Aug-11	16.1	8.2	296	5.6
	18-Sep-11	12.8	8.3	302	6.2
	16-Oct-11	9.5	7.7	193	7.3
	20-Nov-11	2.3	8.0	273	11.8
	19-Dec-11	0.3	7.5	134	11.5
	19-Feb-12	1.0	7.9	204	13.2
	18-Mar-12	15.8	8.1	168	8.2
	15-Apr-12	6.6	8.3	285	10.4
	13-May-12	14.2	8.2	333	7.7
	17-Jun-12	9.4	8.2	443	8.9
	16-Jul-12	20.7	8.4	401	1.8
	14-Aug-12	15.4	8.2	320	6.1
	18-Sep-12	13.9	7.4	380	6.7
	17-Oct-12	10.6	6.7	321	6.7
	20-Nov-12	6.0	7.7	293	7.6
	18-Dec-12	4.0	7.2	-	8.0
	16-Jan-13	0.2	7.8	207	10.7
	16-Apr-13	6.6	8.1	227	10.0
	13-May-13	11.3	8.2	266	5.6
	19-Jun-13	13.3	7.9	301	7.3
	16-Jul-13	18.0	8.1	440	4.9
	21-Aug-13	17.0	8.5	400	1.1
	18-Sep-13	11.3	8.9	344	8.4
	16-Oct-13	13.1	8.8	368	5.0
	19-Nov-13	2.7	8.0	263	2.5
	18-Dec-13	0.8	8.1	241	5.6
	16-Apr-14	-0.1	7.9	131	12.6
	13-May-14	13.2	8.0	302	10.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jun-14	15.5	7.5	400	8.0
	15-Jul-14	14.0	8.8	259	4.4
	19-Aug-14	13.2	8.3	428	7.5
	9-Sep-14	14.8	8.4	474	4.5
	23-Oct-14	6.8	8.0	369	6.9
	16-Dec-14	1.1	8.6	250	-
	22-Apr-15	6.5	8.2	281	12.2
	19-May-15	13.7	7.8	322	13.2
	15-Jun-15	14.9	7.7	381	6.4
	21-Jul-15	16.3	7.9	419	-
	11-Aug-15	15.3	7.6	428	5.8
	25-Aug-15	15.5	8.2	368	5.2
	8-Sep-15	18.3	7.5	469	3.9
	15-Oct-15	9.7	7.4	344	6.4
	18-Nov-15	7.4	7.5	352	9.9
	8-Dec-15	3.7	7.7	312	16.5
	19-Jan-16	-0.1	7.6	234	13.2
	17-Feb-16	0.0	7.6	162	13.4
	15-Mar-16	4.6	7.9	220	13.1
	21-Apr-16	6.7	8.0	263	11.8
	18-May-16	9.0	8.2	345	8.4
	22-Jun-16	14.9	7.7	413	4.8
	20-Jul-16	15.8	7.9	481	4.3
	24-Aug-16	17.2	7.8	483	2.8
	19-Sep-16	15.1	7.4	452	2.9
	18-Oct-16	14.0	7.5	434	5.6
	15-Nov-16	6.8	7.6	337	6.6
	12-Dec-16	0.5	7.3	412	10.8
	24-Jan-17	2.2	8.2	260	12.2
	16-Feb-17	0.1	8.0	272	14.2
	21-Mar-17	3.7	8.3	285	11.5
	19-Apr-17	11.1	7.8	305	11.1
	16-May-17	11.5	8.0	392	6.6
	28-Jun-17	13.9	8.0	398	8.8
	19-Jul-17	15.7	7.9	454	4.6
	15-Aug-17	15.8	8.5	356	5.2
	18-Sep-17	15.6	7.9	425	4.9
	17-Oct-17	10.1	8.0	365	8.1
	14-Nov-17	4.2	8.2	299	8.3
	24-Feb-18	0.6	8.0	199	15.6
	21-Mar-18	-0.4	7.7	262	14.8
	19-Apr-18	0.4	7.6	230	13.3
	15-May-18	12.1	7.9	334	8.6
	18-Jun-18	12.9	7.6	484.9	4.8
	19-Jul-18	13.5	7.5	483.2	5.4
	23-Aug-18	15.6	7.6	465	5.3
	19-Sep-18	14.2	7.6	467.8	5.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	25-Oct-18	4.2	7.6	460.6	10.9
	22-Nov-18	0.2	7.8	436.9	11.8
	13-Dec-18	0.9	8.1		12.0
	19-Jan-19	0.0	7.9	447.2	12.1
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	22-May-03	15.0			
	10-Feb-04	1.0		315	11.6
	17-Mar-04	2.5		432	10.3
	19-Apr-04	9.9	8.2	276	
	19-May-04	15.6	8.2	386	
	24-Jun-04	17.8	8.1	430	8.2
	29-Jul-04	19.3	7.9	436	7.4
	26-Aug-04	17.2	7.9	435	
	22-Sep-04	16.5	7.9	417	8.7
	20-Oct-04	8.3	7.9	336	11.3
	17-Nov-04	5.3	7.8	320	
	16-Dec-05	1.5	8.0	264	
	29-Mar-05	2.7	7.8	297	
	11-Apr-05	7.2	7.5	284	
	24-May-05	13.4	7.7	350	9.6
	27-Jun-05	21.4	7.5	452	8.5
	11-Jul-05	22.3	6.8	477	6.6
	22-Aug-05	18.5	8.4	431	7.8
	27-Sep-05	15.4	7.4	409	8.5
	24-Oct-05	8.4	7.9	475	11.6
	14-Nov-05	6.3	7.8	353	11.2
	12-Dec-05	1.4	8.5	324	12.3
	17-Jan-06	2.4	7.0	275	13.6
	21-Mar-06	3.5	8.5	348	
	18-Apr-06	10.2	8.4	341	
	23-May-06	10.1	8.1	419	
	20-Jun-06	18.9	7.8	387	
	11-Jul-06	20.4	7.8	369	
	23-Aug-06	17.2	7.3	409	
	20-Sep-06	14.3	7.4	414	
	19-Oct-06	10.8	7.3	413	
	27-Nov-06	6.0	8.1	470	
	17-Dec-06	4.7	7.9	512	
	21-Jan-07	1.8	7.7	504	13.6
	18-Mar-07	2.3	8.3	431	
	16-Apr-07	4.4	8.4	411	
	13-May-07	13.3	8.3	405	10.1
	17-Jun-07	21.1	8.1	472	7.0
	15-Jul-07	19.7	7.8	499	6.9
	19-Aug-07	18.1	7.8	520	6.4
	17-Sep-07	14.0	7.7	397	8.1
	18-Oct-07	12.8	7.8	400	8.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Nov-07	3.8	7.9	515	11.7
	21-Jan-08	2.8	7.5	423	12.7
	19-Feb-08	2.2	7.9	431	
	17-Mar-08	1.8	6.9	462	
	1-Apr-08	2.6	7.7	301	
	23-Apr-08	12.0	7.8	362	8.5
	6-May-08	9.6	6.7	411	10.6
	21-May-08	10.6	7.3	374	9.3
	17-Jun-08	16.4	7.6	406	6.9
	15-Jul-08	14.9	6.9	563	7.0
	18-Aug-08	21.2	7.3	456	4.1
	16-Sep-08	15.1	8.0	419	7.1
	21-Oct-08	7.7	7.9	424	8.6
	23-Nov-08	3.5	7.8	486	9.8
	14-Dec-08	2.6	7.6	365	7.6
	18-Jan-09		8.5		
	8-Feb-09	1.6	8.5	430	9.9
	15-Mar-09	4.5	8.8	379	
	12-Apr-09	8.7	8.4	407	
	17-May-09	16.0	8.2	349	9.2
	14-Jun-09	17.0	7.7	802	8.5
	12-Jul-09	16.9	8.0	437	8.1
	9-Aug-09	19.7	5.7	424	6.9
	13-Sep-09	17.3	8.4	411	8.3
	11-Oct-09	7.9	7.2	457	
	15-Nov-09	4.6	7.4	439	
	13-Dec-09	1.4	7.7	443	12.9
	7-Feb-10	0.0	7.8	425	11.5
	14-Mar-10	3.6	7.9	424	13.7
	11-Apr-10	7.9	8.0	415	
	16-May-10	12.3	8.2	313	10.1
	13-Jun-10	17.1	8.1	359	11.2
	18-Jul-10	19.5	8.1	404	11.0
	15-Aug-10	19.8	8.1	421	7.7
	12-Sep-10	14.9	7.9	381	8.4
	17-Oct-10	8.7	7.9	320	10.3
	14-Nov-10	5.1	8.2	274	12.9
	19-Dec-10	1.7	8.4	244	11.8
	16-Jan-11	1.6	8.0	255	12.7
	13-Mar-11	2.4	8.3	253	12.8
	20-Mar-11	3.6	8.3	291	12.4
	17-Apr-11	4.7	8.3	264	13.7
	15-May-11	9.0	7.6	241	12.0
	12-Jun-11	14.9	8.1	303	4.4
	17-Jul-11	22.9	7.8	415	8.1
	14-Aug-11	18.5	8.2	285	7.3
	18-Sep-11	13.4	8.1	261	8.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Oct-11	10.2	8.0	300	9.8
	20-Nov-11	3.1	7.6	271	13.2
	18-Dec-11	2.9	8.2	218	12.6
	15-Jan-12	1.6	8.3	201	13.4
	19-Feb-12	1.6	8.1	226	13.7
	18-Mar-12	11.0	8.2	276	10.5
	15-Apr-12	9.2	8.5	301	10.3
	13-May-12	14.0	8.0	322	9.2
	17-Jun-12	20.8	8.1	419	12.6
	16-Jul-12	23.0	8.1	450	5.5
	14-Aug-12	18.6	8.0	279	7.0
	18-Sep-12	15.9	7.3	336	7.2
	17-Oct-12	8.7	6.7	264	7.6
	20-Nov-12	4.6	7.9	299	9.3
	18-Dec-12	4.0	7.4	634	11.1
	16-Jan-13	3.6	7.8	326	10.2
	20-Feb-13	1.8	7.9	258	14.6
	20-Mar-13	2.3	8.0	251	6.0
	16-Apr-13	5.8	7.9	259	9.7
	13-May-13	10.6	8.2	232	8.9
	19-Jun-13	16.4	8.2	344	8.1
	16-Jul-13	22.3	8.0	416	5.9
	21-Aug-13	19.5	8.2	378	6.0
	18-Sep-13	13.6	8.0	322	8.9
	16-Oct-13	11.3	8.3	365	5.7
	19-Nov-13	4.2	8.2	293	2.6
	16-Apr-14	3.2	8.1	274	10.4
	12-May-14	11.0	8.0	346	10.0
	17-Jun-14	17.9	8.1	366	10.6
	15-Jul-14	18.3	8.7	398	4.3
	19-Aug-14	16.0	8.4	412	5.7
	9-Sep-14	17.8	8.5	430	2.1
	23-Oct-14	8.2	8.6	381	8.3
	16-Dec-14	2.5	8.2	317	-
	22-Apr-15	7.6	8.1	328	12.2
	19-May-15	15.1	8.3	404	-
	15-Jun-15	17.7	8.0	387	7.5
	21-Jul-15	19.5	8.4	403	-
	11-Aug-15	19.0	8.1	416	7.9
	25-Aug-15	18.8	8.1	373	7.0
	8-Sep-15	21.6	7.8	436	5.6
	15-Oct-15	11.2	7.9	321	9.4
	18-Nov-15	5.6	8.0	330	11.5
	8-Dec-15	3.0	8.2	313	21.2
	19-Jan-16	1.1	8.1	270	15.8
	17-Feb-16	1.6	8.0	301	14.9
	15-Mar-16	5.1	8.0	273	13.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	21-Apr-16	9.2	7.9	298	11.9
	18-May-16	10.9	8.4	339	11.3
	22-Jun-16	19.4	8.2	393	8.1
	20-Jul-16	20.6	8.4	420	7.7
	24-Aug-16	20.6	8.2	389	7.8
	19-Sep-16	18.3	7.9	382	7.7
	18-Oct-16	14.5	7.6	337	12.5
	15-Nov-16	6.6	7.9	464	11.5
	12-Dec-16	1.6	8.0	398	13.8
	24-Jan-17	2.5	8.0	295	13.7
	16-Feb-17	1.5	8.1	311	15.3
	21-Mar-17	4.2	8.4	333	12.1
	19-Apr-17	9.1	7.9	306	13.3
	16-May-17	16.4	8.8	367	9.6
	28-Jun-17	15.6	8.2	377	9.2
	19-Jul-17	18.9	7.9	428	7.8
	15-Aug-17	19.0	8.6	340	7.3
	18-Sep-17	17.6	8.1	378	7.8
	17-Oct-17	11.6	8.1	355	9.9
	14-Nov-17	3.4	8.3	325	9.4
	14-Dec-17	2.2	8.0	327	14.6
	18-Jan-18	2.0	7.8	304	9.4
	24-Feb-18	3.1	8.0	264	13.1
	21-Mar-18	2.5	8.2	286	14.8
	19-Apr-18	2.2	8.0	264	12.3
	15-May-18	13.8	8.2	411	9.2
	18-Jun-18	18.7	8.1	434.6	7.4
	19-Jul-18	20.1	8.0	444.7	7.0
	23-Aug-18	19.6	8.0	429.1	7.4
	19-Sep-18	17.1	7.8	444	7.1
	25-Oct-18	5.9	8.0	442	10.8
	22-Nov-18	2.4	7.9		11.9
	13-Dec-18	3.5	8.0	496.9	11.6
	19-Jan-19	2.6	8.0	489.9	12.3
	19-Mar-19	2.5	8.3	431.8	12.7
SW 17A					
	22-May-03	11.0			
	23-Jun-03	12.7			
	10-Feb-04	2.3		295	11.3
	17-Mar-04	4.3		434	9.6
	19-Apr-04	10.8	8.2	266	
	19-May-04	11.0	8.2	341	
	24-Jun-04	11.2	8.2	338	
	29-Jul-04	11.9	8.1	332	10.7
	26-Aug-04	12.1	8.2	341	
	22-Sep-04	12.6	8.1	353	
	20-Oct-04	6.9	8.1	318	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Nov-04	4.4	8.0	310	
	16-Dec-04	1.5	8.1	272	
	29-Mar-05	6.8	8.0	315	
	11-Apr-05	8.9	7.6	275	
	24-May-05	9.2	7.7	324	
	27-Jun-05	13.5	7.7	382	
	11-Jul-05	14.2	6.8	381	10.1
	22-Aug-05	12.7	8.6	360	
	27-Sep-05	11.8	7.7	350	10.7
	24-Oct-05	7.4	7.8	427	
	14-Nov-05	6.3	8.6	323	12.4
	12-Dec-05	0.2	8.6	295	13.6
	17-Jan-06	2.4	7.7	267	13.2
	22-Mar-06	5.5	8.7	264	
	18-Apr-06	10.9	8.4	365	
	23-May-06	10.0	8.3	424	
	20-Jun-06	12.2	8.3	422	
	11-Jul-06	13.9	8.3	409	
	23-Aug-06	12.8	8.1	419	
	20-Sep-06	11.2	8.1	391	
	19-Oct-06	9.9	8.1	432	
	27-Nov-06	7.4	8.2	450	11.9
	17-Dec-06	4.5	8.1	496	
	21-Jan-07	1.0	7.9	473	
	18-Mar-07	3.6	8.3	430	
	16-Apr-07	4.6	8.4	404	
	13-May-07	9.0	8.3	408	
	17-Jun-07	13.3	8.3	452	10.4
	15-Jul-07	13.5	8.1	451	9.8
	19-Aug-07	14.9	8.3	422	9.1
	17-Sep-07	10.9	8.0	418	10.0
	18-Oct-07	11.2	8.0	432	9.6
	19-Nov-07	3.6	8.1	473	
	10-Dec-07	2.9	8.1	429	12.9
	21-Jan-08	3.3	7.6	395	
	19-Feb-08	2.6	7.9	434	#REF!
	17-Mar-08	1.5	6.6	450	
	1-Apr-08	4.4	7.6	355	
	23-Apr-08	10.4	7.9	324	8.3
	6-May-08	7.2	6.8	407	
	21-May-08	7.1	7.3	386	10.6
	17-Jun-08	9.0	7.7	425	9.4
	15-Jul-08	11.2	7.0	454	8.4
	18-Aug-08	14.5	7.4	488	5.2
	16-Sep-08	10.2	8.2	331	8.4
	21-Oct-08	5.8	7.7	423	8.2
	23-Nov-08	4.7	7.8	458	9.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Dec-08	3.4	7.7	398	8.5
	18-Jan-09	1.9	8.6	445	11.3
	8-Feb-09	3.7	8.8	417	9.8
	15-Mar-09	5.9	8.8	366	
	12-Apr-09	10.9	8.4	396	
	17-May-09	16.3	8.3	338	
	14-Jun-09	12.4	7.7	808	
	12-Jul-09	10.5	8.4	441	
	9-Aug-09	12.9	6.1	443	10.3
	13-Sep-09	12.1	8.6	401	
	11-Oct-09	6.9	7.5	460	
	15-Nov-09	4.1	7.3	414	
	13-Dec-09	1.9	7.8	443	
	17-Jan-10	2.4	8.2	449	14.0
	7-Feb-10	1.3	8.3	459	11.3
	14-Mar-10	4.9	8.0	434	13.2
	11-Apr-10	6.3	8.0	405	
	16-May-10	11.0	8.3	320	10.9
	13-Jun-10	12.5	8.3	333	13.8
	18-Jul-10	12.8	8.2	351	12.0
	15-Aug-10	12.8	8.3	348	10.6
	12-Sep-10	11.0	8.2	333	10.5
	17-Oct-10	7.5	8.1	314	11.8
	14-Nov-10	5.6	8.3	276	9.1
	19-Dec-10	2.2	8.2	248	12.8
	16-Jan-11	3.3	8.4	263	12.7
	20-Feb-11	1.5	8.1	254	12.2
	13-Mar-11	4.0	8.2	262	11.9
	20-Mar-11	6.2	8.2	302	12.1
	17-Apr-11	6.6	8.4	255	12.4
	15-May-11	7.2	7.5	233	13.0
	12-Jun-11	10.2	8.3	271	8.2
	17-Jul-11	13.9	8.0	250	8.4
	14-Aug-11	13.1	8.5	245	10.3
	18-Sep-11	11.4	8.1	276	10.3
	16-Oct-11	8.7	8.2	320	10.7
	20-Nov-11	3.1	7.5	278	14.1
	18-Dec-11	3.3	8.4	226	11.5
	15-Jan-12	2.0	8.5	216	13.7
	19-Feb-12	3.5	8.1	240	13.8
	20-Mar-12	12.1	8.3	258	10.0
	15-Apr-12	5.9	8.6	280	12.0
	13-May-12	10.6	8.3	311	11.5
	17-Jun-12	14.0	8.3	358	10.8
	16-Jul-12	16.0	8.7	381	7.3
	14-Aug-12	12.8	8.0	304	7.8
	18-Sep-12	11.8	7.2	340	9.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Oct-12	8.9	6.7	303	8.1
	20-Nov-12	6.7	7.9	317	9.4
	16-Dec-12	5.5	7.6	664	10.7
	16-Jan-13	3.0	8.1	318	11.9
	20-Feb-13	1.4	8.1	245	15.7
	20-Mar-13	3.3	8.2	246	6.6
	16-Apr-13	5.8	7.9	259	9.7
	13-May-13	9.0	8.4	277	6.4
	19-Jun-13	10.2	8.2	276	11.6
	16-Jul-13	13.8	8.0	360	9.5
	21-Aug-13	13.8	8.2	345	9.7
	18-Sep-13	9.7	7.9	314	11.9
	16-Oct-13	10.7	8.5	330	6.7
	19-Nov-13	3.9	7.9	298	2.4
	18-Dec-13	1.8	8.4	257	4.3
	16-Apr-14	4.0	8.0	237	10.5
	13-May-14	9.8	8.2	285	10.3
	17-Jun-14	11.5	8.3	312	13.3
	15-Jul-14	12.0	8.8	324	7.0
	19-Aug-14	11.0	8.5	358	8.5
	9-Sep-14	12.5	8.5	375	4.4
	23-Oct-14	6.9	8.0	375	8.1
	16-Dec-14	3.9	8.6	334	-
	20-Jan-15	0.8	7.7	171	0.1
	18-Mar-15	2.1	8.3	229	13.5
	22-Apr-15	6.7	8.2	302	12.7
	19-May-15	11.5	8.4	304	-
	15-Jun-15	12.0	8.1	365	9.8
	21-Jul-15	13.7	8.1	356	-
	11-Aug-15	13.0	8.2	372	10.2
	25-Aug-15	12.8	8.2	323	10.5
	8-Sep-15	14.6	8.0	370	8.7
	15-Oct-15	9.8	8.1	320	10.7
	18-Nov-15	7.8	8.1	365	12.8
	8-Dec-15	5.0	8.2	339	20.5
	19-Jan-16	2.0	8.1	272	15.4
	17-Feb-16	3.0	8.0	292	14.1
	15-Mar-16	6.6	8.1	282	12.8
	21-Apr-16	6.1	8.1	264	13.3
	18-May-16	7.9	8.4	334	12.7
	22-Jun-16	14.0	8.4	367	10.8
	20-Jul-16	15.1	8.5	368	10.6
	24-Aug-16	16.0	8.5	376	10.6
	19-Sep-16	15.1	8.2	384	9.8
	18-Oct-16	13.2	7.8	335	13.5
	15-Nov-16	7.2	8.2	326	12.5
	12-Dec-16	2.6	7.9	422	13.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	24-Jan-17	4.1	8.3	320	13.0
	16-Feb-17	1.6	8.3	310	15.5
	21-Mar-17	7.1	8.4	353	11.7
	19-Apr-17	9.4	8.0	311	13.2
	16-May-17	12.6	8.8	332	10.8
	28-Jun-17	10.6	8.3	350	11.6
	19-Jul-17	11.2	8.1	363	11.4
	15-Aug-17	11.8	8.8	287	11.8
	18-Sep-17	13.1	8.2	368	10.9
	17-Oct-17	9.4	8.3	357	11.3
	14-Nov-17	5.8	8.3	349	8.7
	14-Dec-17	2.2	8.1	315	14.8
	18-Jan-18	1.9	7.9	299	10.0
	24-Feb-18	3.8	8.1	269	13.0
	21-Mar-18	1.6	8.2	212	14.8
	19-Apr-18	2.8	8.2	277	12.4
	15-May-18	9.2	8.2	413	10.8
	18-Jun-18	9.8	8.3	453.3	10.7
	19-Jul-18	9.8	8.2	449.3	10.5
	23-Aug-18	13.0	8.4	452.2	10.1
	19-Sep-18	12.1	8.3	447.6	10.0
	25-Oct-18	5.4	8.3	474	11.9
	22-Nov-18	1.7	8.2	485.9	13.4
	13-Dec-18	3.3	8.3	484.2	12.7
	19-Jan-19	1.2	8.3	476.4	13.6
	19-Mar-19	3.3	8.5	433.4	12.8
SW 17B					
	20-Oct-04	8.1	7.6	313	
	11-Apr-05	5.9	7.4	264	
	24-May-05	10.0	7.3	331	10.7
	27-Jun-05	16.1	7.5	462	
	11-Jul-05	17.2	6.7	502	7.9
	22-Aug-05	15.8	8.4	509	8.0
	27-Sep-05	13.6	7.4	471	8.1
	24-Oct-05	8.9	7.6	480	11.1
	14-Nov-05	6.7	8.3	388	10.6
	17-Jan-06	2.1	7.4	258	13.1
	22-Mar-06	3.4	8.3	261	
	18-Apr-06	9.3	8.2	348	
	23-May-06	9.9	8.0	429	
	20-Jun-06	15.3	7.8	481	
	11-Jul-06	17.6	7.8	532	
	23-Aug-06	15.3	7.4	620	
	19-Oct-06	10.2	7.6	469	
	27-Nov-06	6.8	8.0	476	11.6
	17-Dec-06	4.1	7.9	497	
	16-Apr-07	3.3	8.3	392	13.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	13-May-07	10.3	8.2	415	10.3
	17-Jun-07	17.7	8.1	524	7.9
	15-Jul-07	17.5	7.7	588	6.9
	19-Aug-07	17.2	7.9	635	6.8
	17-Sep-07	12.1	7.7	547	8.0
	18-Oct-07	12.2	7.7	534	8.1
	19-Nov-07	3.8	7.8	470	11.4
	1-Apr-08	2.0	7.5	326	13.8
	23-Apr-08	10.5	7.9	341	9.2
	6-May-08	7.5	6.6	404	11.2
	21-May-08	8.4	7.2	384	9.4
	17-Jun-08	11.9	8.0	460	8.5
	15-Jul-08	18.9	7.1	425	6.0
	18-Aug-08	17.4	7.3	615	4.5
	16-Sep-08	12.5	7.9	548	7.5
	21-Oct-08	6.4	7.9	449	8.1
	23-Nov-08	4.7	7.7	492	11.2
	14-Dec-08	3.3	7.6	391	7.9
	15-Mar-09	3.7	8.8	356	
	12-Apr-09	8.2	8.8	374	
	17-May-09	15.8	8.1	179	9.1
	14-Jun-09	14.7	7.7	870	9.4
	12-Jul-09	13.6	8.1	513	9.1
	9-Aug-09	16.3	6.1	534	7.7
	13-Sep-09	14.6	8.2	532	9.4
	11-Oct-09	7.8	7.3	504	11.6
	15-Nov-09	3.6	7.4	430	
	14-Mar-10	2.9	7.9	426	13.8
	11-Apr-10	5.5	7.9	418	
	16-May-10	11.3	8.1	323	10.1
	13-Jun-10	13.9	8.0	364	12.3
	18-Jul-10	16.1	7.9	425	11.7
	15-Aug-10	16 .47	7.9	458	7.6
	12-Sep-10	13.3	7.7	442	7.8
	17-Oct-10	7.8	7.8	339	10.1
	14-Nov-10	5.5	8.1	290	13.0
	20-Mar-11	6.1	8.4	298	12.1
	17-Apr-11	4.1	8.2	245	13.3
	15-May-11	7.2	7.7	243	12.6
	12-Jun-11	11.4	8.0	293	5.8
	17-Jul-11	18.0	7.8	450	7.6
	14-Aug-11	16.4	8.2	338	9.5
	18-Sep-11	12.9	8.0	358	8.3
	16-Oct-11	9.9	8.0	364	9.1
	20-Nov-11	3.6	7.4	294	12.4
	18-Dec-11	3.3	8.4	221	11.9
	18-Mar-12	9.9	8.1	260	10.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Apr-12	6.4	8.6	277	11.6
	13-May-12	10.6	8.0	318	10.4
	17-Jun-12	16.3	8.1	430	10.6
	16-Jul-12	18.6	8.2	520	5.8
	14-Aug-12	15.6	8.1	667	7.0
	18-Sep-12	13.9	7.1	410	7.7
	17-Oct-12	9.2	6.5	324	7.5
	20-Nov-12	6.1	7.8	318	8.8
	18-Dec-12	5.0	7.4	655	10.2
	16-Jan-13	2.2	8.0	310	10.7
	16-Apr-13	5.5	8.0	242	9.9
	13-May-13	8.0	8.2	264	6.4
	19-Jun-13	11.1	8.1	334	10.4
	16-Jul-13	16.6	7.9	438	7.6
	21-Aug-13	16.2	8.0	440	7.6
	18-Sep-13	11.6	8.1	380	9.4
	16-Oct-13	12.2	8.6	328	5.8
	19-Nov-13	4.6	8.3	308	2.4
	16-Apr-14	0.9	8.2	233	10.2
	13-May-14	11.0	8.0	292	10.2
	17-Jun-14	14.7	8.0	365	11.2
	15-Jul-14	14.4	8.6	392	4.8
	23-Oct-14	7.5	7.6	408	8.1
	16-Dec-14	3.0	8.5	315	-
	22-Apr-15	5.9	8.1	310	13.2
	19-May-15	13.2	8.2	330	-
	15-Jun-15	14.3	7.9	411	8.5
	21-Jul-15	16.8	8.0	440	-
	11-Aug-15	16.1	7.9	473	8.3
	8-Sep-15	18.8	7.6	524	6.1
	15-Oct-15	10.7	7.6	372	8.7
	18-Nov-15	7.5	7.7	368	11.4
	8-Dec-15	4.0	7.9	332	19.7
	19-Jan-16	1.3	7.9	268	15.0
	17-Feb-16	1.8	7.8	296	14.0
	21-Apr-16	5.8	7.9	260	13.2
	18-May-16	8.3	8.3	335	11.6
	22-Jun-16	16.8	8.0	437	8.5
	20-Jul-16	17.1	8.1	447	10.0
	24-Aug-16	17.9	8.1	495	7.9
	19-Sep-16	15.7	7.7	481	8.2
	18-Oct-16	13.3	7.4	349	12.9
	15-Nov-16	7.4	7.8	356	10.8
	12-Dec-16	3.4	7.7	445	12.7
	24-Jan-17	3.4	8.0	308	12.5
	16-Feb-17	1.9	8.1	309	14.4
	21-Mar-17	4.4	8.2	318	12.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Apr-17	8.7	7.7	301	12.7
	16-May-17	13.6	8.6	340	9.7
	28-Jun-17	11.9	8.0	383	10.3
	18-Jul-17	14.5	7.8	432	8.9
	15-Aug-17	15.4	8.4	374	8.2
	18-Sep-17	14.3	7.8	447	8.0
	17-Oct-17	10.0	7.9	392	9.9
	14-Nov-17	5.6	8.1	357	8.2
	18-Jan-18	1.5	7.9	285	10.0
	24-Feb-18	2.5	7.9	272	13.2
	21-Mar-18	0.8	8.0	271	15.7
	19-Apr-18	0.3	8.1	244	12.9
	15-May-18	9.8	7.9	409	9.8
	18-Jun-18	7.4	7.9	503	8.7
	15-May-18	9.8	7.9	409	9.8
	18-Jun-18	7.4	7.9	503	8.7
	19-Jul-18	14.7	7.8	561	8.0
	23-Aug-18	15.4	7.8	552	8.1
	20-Sep-18	14.9	7.7	558	7.4
	24-Oct-18	6.6	7.9	521	10.5
	21-Nov-18	3.5	7.9		11.8
	12-Dec-18	3.6	8.0	485.7	11.8
	18-Jan-19	2.0	8.1	482.3	12.7
	15-Mar-19	2.8	8.2	439.2	12.5
SW 18					
	22-May-03	15.0			
	23-Jun-03	15.7			
	20-Aug-03	16.4			
	22-Oct-03	5.7	7.2	485	
	10-Feb-04	0.9		289	
	16-Mar-04	1.0	8.0	399	12.9
	19-Apr-04	11.1	8.3	272	
	19-May-04	13.4	8.2	365	
	24-Jun-04	13.6	8.2	335	
	29-Jul-04	15.9	8.2	355	
	26-Aug-04	15.2	8.2	341	
	22-Sep-04	14.7	8.2	350	10.1
	20-Oct-04	6.7	8.1	321	
	16-Nov-04	3.7	8.0	312	
	11-Apr-05	8.4	7.6	272	
	24-May-05	10.8	7.5	339	
	27-Jun-05	17.5	8.0	413	
	11-Jul-05	18.8	7.1	401	8.8
	22-Aug-05	15.0	8.7	344	9.6
	27-Sep-06	13.0	7.7	374	10.1
	24-Oct-05	7.6	8.0	482	
	15-Nov-05	3.7	8.0	290	12.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jan-06	0.2	7.7	234	
	20-Mar-06	3.4	8.1	275	
	18-Apr-06	12.1	8.5	346	
	23-May-06	10.7	8.3	427	
	20-Jun-06	14.7	7.9	417	
	11-Jul-06	17.3	8.3	391	
	23-Aug-06	15.9	8.1	376	
	20-Sep-06	11.9	8.1	370	
	19-Oct-06	10.3	8.3	463	
	27-Nov-06	7.0	8.2	461	11.9
	17-Dec-06	2.8	8.2	487	
	18-Mar-07	2.6	8.3	421	
	17-Apr-07	6.6	8.5	403	
	13-May-07	8.4	8.2	413	
	17-Jun-07	16.3	8.3	439	9.4
	15-Jul-07	17.7	8.2	426	8.8
	19-Aug-07	19.3	8.2	394	8.0
	17-Sep-07	13.4	8.0	404	9.3
	19-Oct-07	14.9	8.3	437	7.1
	21-Nov-07	4.3	8.6	478	12.3
	12-Dec-07	0.9	8.0	435	14.1
	21-Jan-08	1.1	7.4	406	
	19-Feb-08	0.6	7.8	411	
	17-Mar-08	2.5	8.0	430	
	2-Apr-08	1.4	7.7	356	
	23-Apr-08	14.3	7.8	334	8.8
	6-May-08	8.6	7.4	415	11.2
	21-May-08	12.8	7.6	387	9.2
	18-Jun-08	12.9	8.0	325	8.4
	15-Jul-08	15.6	7.5	447	6.7
	18-Aug-08	18.8	7.8	492	4.5
	17-Sep-08	12.3	8.5	484	6.7
	20-Oct-08	9.0	7.8	440	7.7
	23-Nov-08	3.5	8.6	483	9.8
	14-Dec-08	2.1	7.0	379	8.2
	8-Feb-09	2.3		339	9.4
	15-Mar-09	6.4	8.7	353	
	12-Apr-09	11.1	8.5	356	
	17-May-09	15.0	8.5	345	10.3
	14-Jun-09	12.6	7.9	814	
	12-Jul-09	12.2	8.5	437	
	9-Aug-09	16.3	9.3	420	9.4
	13-Sep-09	14.7	8.0	385	10.3
	11-Oct-09	7.2	7.3	492	
	15-Nov-09	4.0	7.4	433	
	13-Dec-09	2.2	7.9	490	12.4
	14-Mar-10	5.4	8.2	322	12.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-Apr-10	10.9	7.8	419	12.7
	16-May-10	9.8	8.4	311	11.2
	13-Jun-10	14.0	8.3	347	12.9
	18-Jul-10	17.9	8.2	406	12.1
	15-Aug-10	15.5	8.3	370	10.2
	12-Sep-10	12.5	8.3	362	10.2
	17-Oct-10	7.6	8.2	340	12.1
	14-Nov-10	5.7	8.3	279	13.1
	19-Dec-10	1.9	8.3	249	14.1
	13-Mar-11	3.2	8.2	227	12.5
	20-Mar-11	3.5	8.2	279	13.0
	17-Apr-11	5.0	8.2	253	11.7
	20-Apr-11	3.6	8.2	197	10.7
	15-May-11	9.6	8.2	257	13.2
	12-Jun-11	12.1	8.4	284	11.7
	17-Jul-11	18.4	8.4	337	8.2
	14-Aug-11	16.1	8.4	251	9.5
	18-Sep-11	12.8	8.5	290	10.1
	16-Oct-11	9.4	8.2	330	9.8
	20-Nov-11	1.7	7.7	266	15.0
	18-Dec-11	3.0	8.4	210	13.3
	19-Feb-12	1.7	7.7	221	13.4
	18-Mar-12	14.1	8.3	284	9.9
	15-Apr-12	6.8	8.5	234	12.0
	13-May-12	12.8	8.3	325	10.7
	17-Jun-12	17.9	8.3	376	8.2
	16-Jul-12	20.7	8.4	400	6.9
	14-Aug-12	16.1	8.3	442	7.6
	18-Sep-12	14.0	7.7	356	9.2
	17-Oct-12	10.1	6.9	328	8.2
	20-Nov-12	6.6	7.8	315	9.6
	18-Dec-12	4.5	7.6	635	10.9
	16-Jan-13	1.8	8.2	301	10.9
	16-Apr-13	8.7	8.3	263	10.0
	13-May-13	10.7	8.4	290	9.2
	19-Jun-13	12.6	8.3	324	10.9
	16-Jul-13	17.6	8.2	383	8.5
	21-Aug-13	17.0	8.2	365	8.7
	18-Sep-13	11.0	8.4	321	11.2
	16-Oct-13	12.5	8.5	336	5.8
	19-Nov-13	3.8	8.6	293	2.8
	16-Apr-14	3.0	8.3	249	10.5
	13-May-14	12.2	8.0	309	11.0
	18-Jun-14	15.7	8.2	338	10.2
	15-Jul-14	-	7.8	325	7.9
	19-Aug-14	13.5	8.7	387	7.0
	9-Sep-14	15.3	8.8	412	4.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Oct-14	8.0	8.3	416	6.9
	17-Dec-14	2.4	8.9	295	-
	22-Apr-15	7.1	8.2	320	13.0
	19-May-15	12.8	8.5	314	-
	15-Jun-15	14.8	8.2	405	9.4
	21-Jul-15	16.5	8.4	379	-
	11-Aug-15	15.9	8.2	393	8.7
	25-Aug-15	15.5	8.7	330	7.6
	8-Sep-15	18.9	8.0	383	7.2
	15-Oct-15	9.7	8.2	315	10.3
	18-Nov-15	8.0	8.2	373	13.0
	8-Dec-15	4.1	8.3	331	22.5
	19-Jan-16	-0.1	8.1	266	9.0
	17-Feb-16	1.3	8.2	289	15.0
	15-Mar-16	5.1	8.2	264	13.7
	21-Apr-16	7.0	8.2	276	13.2
	18-May-16	8.9	8.6	344	12.0
	22-Jun-16	14.7	8.5	364	10.3
	20-Jul-16	16.4	8.6	373	9.7
	24-Aug-16	18.0	8.6	373	8.9
	19-Sep-16	16.1	8.3	391	7.9
	18-Oct-16	15.1	8.4	411	12.7
	15-Nov-16	7.1	8.2	339	11.7
	12-Dec-16	1.2	8.2	439	14.9
	25-Jan-17	2.6	8.3	288	14.0
	16-Feb-17	-0.2	8.3	154	16.1
	21-Mar-17	5.5	8.4	330	12.3
	19-Apr-17	10.0	8.1	316	13.1
	16-May-17	10.6	8.4	441	9.9
	28-Jun-17	13.2	8.2	385	10.7
	19-Jul-17	14.8	8.3	404	10.3
	15-Aug-17	15.4	8.9	321	10.6
	18-Sep-17	15.9	8.3	394	9.7
	17-Oct-17	10.9	8.3	404	10.6
	14-Nov-17	5.1	8.4	351	8.8
	14-Dec-17	0.3	8.1	282	8.9
	18-Jan-18	0.5	7.9	284	10.8
	24-Feb-18	4.0	8.4	274	14.0
	21-Mar-18	0.6	8.3	272	14.4
	19-Apr-18	1.8	8.3	230	12.9
	15-May-18	11.4	8.3	394	10.2
	18-Jun-18	13.7	8.4	449.3	9.8
	19-Jul-18	15.0	8.3	424	9.5
	23-Aug-18	17.0	8.4	448.4	9.3
	19-Sep-18	14.0	8.4	430	9.5
	25-Oct-18	5.7	8.4	464.7	11.8
	22-Nov-18	0.0	8.2	103.1	14.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	13-Dec-18	2.5	8.4	469.9	13.2
	19-Jan-19	0.5	8.1	407.5	13.6
	19-Mar-19	1.1	8.4	425	13.6
SW 19					
	22-May-03	15.0			
	23-Jun-03	18.5			
	20-Aug-03	21.5			
	23-Oct-03	5.6	7.4	531	
	12-Feb-04	0.8		318	13.0
	16-Mar-04	0.0	8.1	434	13.4
	19-May-04	15.1	8.3	431	
	24-Jun-04	12.8	7.8	405	
	29-Jul-04	15.4	8.1	410	
	26-Aug-04	16.7	8.2	408	
	22-Sep-04	13.1	8.1	393	
	20-Oct-04	7.6	8.1	370	
	18-Nov-04	8.3	8.1	394	
	16-Dec-04	0.1	8.0	127	
	29-Mar-05	2.5	8.0	322	
	11-Apr-05	8.0	7.4	290	
	24-May-05	11.3	8.0	388	
	28-Jun-05	22.2	8.4	504	
	11-Jul-05	22.7	7.6	493	
	22-Aug-05	16.8	8.6	417	
	27-Sep-05	14.2	7.9	413	
	25-Oct-05	6.6	8.2	481	
	14-Nov-05	5.5	8.1	364	
	12-Dec-05	0.1	8.6	245	1.5
	16-Jan-06	0.1	8.2		1.6
	20-Mar-06	1.5	8.5	289	
	18-Apr-06	11.0	8.5	380	
	23-May-06	12.1	8.4	463	
	20-Jun-06	17.6	8.2	455	
	10-Jul-06	17.9	8.2	428	
	22-Aug-06	20.3	7.9	438	
	21-Sep-06	10.0	8.0	461	
	18-Oct-06	11.3	8.2	497	
	27-Nov-06	6.9	8.3	502	
	17-Dec-06	2.9	8.3	523	
	21-Jan-07	0.1	8.3	413	8.5
	18-Mar-07	0.1	8.3	461	
	16-Apr-07	3.3	8.4	452	
	13-May-07	16.0	8.6	444	9.9
	17-Jun-07	18.9	8.3	498	9.0
	15-Jul-07	16.5	8.0	488	9.6
	19-Aug-07	16.3	8.1	481	9.1
	17-Sep-07	12.1	8.1	503	9.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Oct-07	13.6	8.0	465	9.4
	21-Nov-07	4.0	8.0	552	12.1
	12-Dec-07	0.5	7.8	495	
	22-Jan-08	0.1	7.8	411	
	20-Feb-08	0.1	7.5	232	6.4
	19-Mar-08	1.0	7.8	484	
	2-Apr-08	2.7	7.7	365	
	24-Apr-08	9.1	7.2	383	9.1
	21-May-08	9.1	7.8	430	10.0
	18-Jun-08	13.5	8.3	478	8.8
	15-Jul-08	18.4	7.6	505	6.8
	19-Aug-08	16.5	8.0	542	5.6
	16-Sep-08	12.9	8.5	490	7.4
	22-Oct-08	5.0	8.0	493	7.8
	14-Dec-08	1.3	6.9	402	8.3
	15-Mar-09	6.0	8.8	361	
	12-Apr-09	6.9	7.7	433	
	17-May-09	12.5	8.6	407	
	14-Jun-09	14.0	8.4	701	
	12-Jul-09	13.7	8.5	492	10.5
	9-Aug-09	16.4	8.3	478	9.3
	13-Sep-09	11.4	7.0	454	
	11-Oct-09	4.4	7.7	541	12.8
	15-Nov-09	3.2	7.7	483	
	13-Dec-09	0.1	7.7	560	13.1
	17-Jan-10	0.2	8.3	524	12.1
	14-Mar-10	6.0	7.9	412	12.8
	11-Apr-10	10.5	8.2	460	13.7
	16-May-10	13.6	8.5	370	10.3
	13-Jun-10	15.8	8.4	394	12.6
	18-Jul-10	20.2	8.4	455	11.5
	15-Aug-10	15.9	8.3	412	10.2
	12-Sep-10	11.9	8.3	369	10.6
	17-Oct-10	7.4	8.3	373	12.2
	14-Nov-10	5.4	8.3	308	13.4
	19-Dec-10	0.8	8.6	269	14.1
	20-Feb-11	-0.02	8.2	271	10.8
	13-Mar-11	2.63	8.4	271	14.9
	20-Mar-11	3.71	8.4	304	13.5
	17-Apr-11	3.78	8.2	251	10.5
	15-May-11	10.3	8.6	301	12.0
	12-Jun-11	13.8	8.6	338	9.8
	17-Jul-11	21.2	8.4	422	10.4
	14-Aug-11	17.7	8.7	297	9.6
	18-Sep-11	13.3	8.8	324	11.3
	16-Oct-11	9.8	8.2	385	11.0
	20-Nov-11	3.1	8.2	313	13.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Dec-11	1.3	8.9	223	13.5
	19-Feb-12	1.2	8.2	240	12.4
	18-Mar-12	13.9	8.4	307	7.8
	15-Apr-12	5.2	9.0	303	15.5
	13-May-12	11.6	8.3	345	12.4
	17-Jun-12	21.2	8.4	445	6.8
	16-Jul-12	20.7	8.4	440	8.2
	15-Aug-12	15.8	8.6	440	7.0
	19-Sep-12	10.7	7.9	370	10.9
	18-Oct-12	10.6	8.3	359	8.9
	21-Nov-12	5.5	8.5	286	4.5
	18-Dec-12	4.1	7.8	678	9.8
	15-Jan-13	1.4	8.1	314	12.4
	19-Mar-13	0.0	8.2	219	12.8
	16-Apr-13	5.8	8.1	262	10.2
	14-May-13	6.9	8.3	294	9.5
	19-Jun-13	11.3	8.5	323	12.3
	17-Jul-13	20.5	8.2	420	8.8
	20-Aug-13	18.2	8.4	421	10.5
	18-Sep-13	12.5	8.4	421	10.5
	17-Oct-13	11.4	8.5	378	6.0
	20-Nov-13	2.6	8.0	305	4.1
	16-Apr-14	4.4	8.4	282	10.3
	13-May-14	14.2	8.6	354	10.3
	18-Jun-14	15.5	8.3	354	10.7
	15-Jul-14	17.0	7.8	410	8.5
	19-Aug-14	13.8	8.6	445	5.4
	9-Sep-14	15.4	8.5	459	5.0
	21-Oct-14	10.3	8.3	451	6.0
	23-Apr-15	3.2	8.4	306	15.4
	20-May-15	12.2	8.4	334	14.0
	15-Jun-15	16.5	8.4	423	8,95
	21-Jul-15	19.0	8.4	470	-
	12-Aug-15	15.4	8.3	412	10.1
	9-Sep-15	18.7	8.0	409	5.2
	16-Oct-15	8.4	8.1	343	11.9
	19-Nov-15	9.1	8.1	433	13.7
	8-Dec-15	3.8	8.3	356	23.1
	19-Jan-16	-0.1	8.1	266	9.0
	21-Apr-16	9.0	8.4	12.98	312.0
	17-May-16	10.3	8.6	379	11.6
	22-Jun-16	17.3	8.5	413	9.8
	20-Jul-16	18.0	8.5	422	9.4
	25-Aug-16	18.9	8.3	434	11.1
	19-Sep-16	14.7	8.1	414	9.1
	17-Oct-16	12.2	7.7	457	10.6
	15-Nov-16	4.9	7.6	355	13.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	12-Dec-16	0.1	7.7	311	16.9
	24-Jan-17	1.9	8.2	312	14.4
	17-Feb-17	-0.1	8.3	314	16.1
	22-Mar-17	-0.1	8.6	311	12.1
	19-Apr-17	10.4	7.8	344	12.7
	16-May-17	10.6	8.6	483	8.5
	28-Jun-17	13.1	8.4	415	10.7
	19-Jul-17	18.1	8.5	465	9.6
	16-Aug-17	17.3	8.5	445	9.5
	17-Sep-17	16.9	8.4	432	9.3
	18-Oct-17	10.4	8.5	408	8.0
	14-Nov-17	4.8	8.5	383	9.0
	14-Dec-17	-0.4	8.1	213	15.8
	17-Jan-18	-0.4		259	10.6
	24-Feb-18	2.3	8.5	271	15.2
	20-Mar-18	-0.4	8.4	281	17.3
	18-Apr-18	2.8	8.7	492	10.2
	14-May-18	14.3	8.5	461	9.9
	18-Jun-18	8.3	8.4	467.4	9.4
	19-Jul-18	16.1	8.3	474.8	9.5
	23-Aug-18	18.2	8.5	489.1	9.2
	19-Sep-18	13.9	8.3	482.9	9.8
	24-Oct-18	5.0	8.6	523	12.7
	21-Nov-18	0.0	8.2	527	14.3
	13-Dec-18	1.2	8.4		13.6
	19-Jan-19	0.0	8.2	426.7	16.2
SW 20					
	22-May-03	7.0			
	23-Jun-03	6.9			
	16-Mar-04	6.7	7.6	485	7.5
	21-Apr-04	6.4	7.4	261	
	19-May-04	6.8	7.4	334	
	24-Jun-04	7.0	7.4	331	11.4
	29-Jul-04	7.7	7.1	328	11.8
	26-Aug-04	7.8	7.3	337	
	22-Sep-04	8.9	7.5	358	9.7
	29-Mar-05	6.9	7.7	345	11.9
	11-Apr-05	7.1	7.1	254	
	24-May-05	8.2	7.3	346	
	28-Jun-05	13.4	8.3	421	
	11-Jul-05	12.8	6.8	406	
	22-Aug-05	12.2	7.6	240	10.2
	27-Sep-05	11.7	7.5	367	9.7
	12-Dec-05	2.5	8.2	328	10.6
	17-Jan-06	5.1	6.4	303	11.8
	20-Mar-06	6.9	8.2	323	
	18-Apr-06	9.5	7.9	371	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-May-06	10.2	7.8	460	
	20-Jun-06	11.2	7.7	455	
	11-Jul-06	12.1	7.7	438	
	23-Aug-06	11.0	7.5	444	
	20-Sep-06	11.0	7.6	414	
	18-Oct-06	10.1	7.6	441	
	27-Nov-06	7.6	7.7	489	10.9
	17-Dec-06	6.3	7.7	521	12.4
	21-Jan-07	5.7	7.9	498	12.2
	18-Feb-07	5.2	8.1	490	12.2
	18-Mar-07	5.7	8.0	423	12.3
	16-Apr-07	5.8	8.0	435	12.5
	13-May-07	9.8	8.0	446	
	17-Jun-07	12.0	8.1	494	9.7
	15-Jul-07	11.3	7.9	463	9.7
	19-Aug-07	13.4	8.7	469	
	21-Jan-08	5.7	7.5	380	
	19-Feb-08	5.0	7.7	451	12.0
	17-Mar-08	7.2	7.5	476	
	1-Apr-08	4.8	7.6	345	
	23-Apr-08	8.5	7.8	370	10.6
	20-May-08	10.2	6.9	255	
	17-Jun-08	7.9	8.2	462	9.8
	15-Jul-08	9.4	6.9	491	7.7
	18-Aug-08	11.2	5.7	293	5.8
	16-Sep-08	8.5	7.7	508	8.4
	20-Oct-08	8.0	7.5	414	8.5
	23-Nov-08	6.6		513	8.1
	14-Dec-08	5.5	7.2	403	8.3
	18-Jan-09	5.3	7.9	457	9.5
	8-Feb-09	6.9		443	7.9
	15-Mar-09	7.8	8.1	379	
	12-Apr-09	8.4	8.0	430	
	17-May-09	11.3	7.7	375	
	14-Jun-09	10.1	7.3	885	
	12-Jul-09	8.9	8.2	478	10.4
	9-Aug-09	9.6	8.4	481	10.9
	13-Sep-09	10.4	9.1	426	
	11-Oct-09	7.9	6.3	492	
	15-Nov-09	3.9	7.2	426	
	13-Dec-09	2.4	7.4	456	12.1
	17-Jan-10	3.8	7.7		12.1
	7-Feb-10	1.5	7.8	479	12.6
	14-Mar-10	7.8	7.8	423	11.9
	11-Apr-10	8.4	7.7	447	12.8
	16-May-10	9.3	8.0	335	11.4
	13-Jun-10	9.9	7.8	347	14.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Jul-10	9.8	7.7	351	11.7
	15-Aug-10	11.7	8.1	349	9.6
	12-Sep-10	8.7	7.7	300	11.0
	17-Oct-10	7.4	7.6	295	10.4
	14-Nov-10	6.8	7.6	287	
	19-Dec-10	5.4	8.1	261	11.3
	16-Jan-11	5.2	8.0	295	12.4
	20-Feb-11	5.5	7.9	284	12.0
	13-Mar-11	7.2	8.0	309	11.0
	17-Apr-11	6.8	8.0	282	12.0
	15-May-11	6.8	7.9	256	13.4
	12-Jun-11	8.4	7.7	240	7.8
	17-Jul-11	10.2	7.9	331	11.2
	14-Aug-11	12.3	8.0	256	11.6
	18-Sep-11	10.0	7.5	213	10.3
	16-Oct-11	7.7	8.0	324	11.4
	20-Nov-11	3.5	7.8	288	12.7
	18-Dec-11	0.3	6.8	261	10.9
	15-Jan-11	6.0	7.8	262	11.4
	19-Feb-12	5.1	7.1	272	12.7
	18-Mar-12	7.9	7.7	251	10.8
	15-Apr-12	6.0	8.7	306	10.8
	13-May-12	12.1	7.8	360	9.2
	17-Jun-12	12.3	7.7	383	8.4
	16-Jul-12	17.2	7.9	425	5.8
	14-Aug-12	12.8	7.6	451	6.6
	18-Sep-12	10.9	6.8	355	10.6
	17-Oct-12	8.0	6.8	456	7.4
	20-Nov-12	7.4	7.8	339	8.7
	18-Dec-12	6.6	7.5	728	10.1
	15-Jan-13	5.7	7.7	352	11.4
	20-Feb-13	4.1	8.1	282	13.4
	19-Mar-13	5.0	7.9	241	9.7
	16-Apr-13	6.5	7.1	265	9.7
	13-May-13	7.6	7.5	271	10.9
	18-Jun-13	9.7	7.8	334	8.4
	16-Jul-13	9.7	7.9	357	10.0
	21-Aug-13	11.0	8.0	356	10.1
	18-Sep-13	8.3	8.5	317	12.4
	16-Oct-13	9.2	8.7	337	7.0
	19-Nov-13	5.9	7.4	329	6.0
	17-Dec-13	5.0	7.8	316	4.0
	21-Jan-14	3.5	7.9	201	3.4
	20-Feb-14	5.0	7.7	314	7.8
	18-Mar-14	2.8	7.3	324	4.1
	15-Apr-14	5.9	7.7	267	11.9
	12-May-14	9.2	7.5	320	10.3

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jun-14	9.4	8.1	336	11.5
	14-Jul-14	10.8	8.9	403	2.0
	18-Aug-14	10.9	8.4	192	6.6
	8-Sep-14	10.4	8.8	398	8.9
	23-Oct-14	7.9	7.9	410	4.6
	16-Dec-14	5.9	8.2	383	-
	20-Jan-15	4.4	6.9	255	1.2
	18-Mar-15	5.3	8.3	195	12.1
	21-Apr-15	6.8	7.7	260	11.8
	19-May-15	9.6	8.0	321	15.6
	15-Jun-15	10.6	7.8	387	10.0
	21-Jul-15	11.1	8.0	376	-
	11-Aug-15	12.4	8.0	404	10.3
	8-Sep-15	11.6	7.8	372	11.4
	15-Oct-15	8.4	7.4	323	7.1
	18-Nov-15	8.0	7.9	383	11.8
	8-Dec-15	5.8	8.0	370	16.3
	19-Jan-16	1.8	7.9	287	15.1
	17-Feb-16	4.5	7.7	344	13.6
	15-Mar-16	7.1	7.5	284	12.9
	20-Apr-16	7.0	7.4	300	12.9
	17-May-16	9.7	7.9	393	11.9
	22-Jun-16	9.3	7.9	357	11.1
	20-Jul-16	10.3	8.0	372	11.0
	24-Aug-16	12.8	8.3	379	11.1
	19-Sep-16	13.0	8.2	388	9.8
	17-Oct-16	13.7	7.5	353	5.9
	15-Nov-16	6.9	7.9	500	11.4
	12-Dec-16	0.0	7.8	442	15.5
	24-Jan-17	6.2	7.8	328	12.1
	16-Feb-17	3.7	8.1	357	13.5
	21-Mar-17	7.0	7.9	388	12.1
	19-Apr-17	8.4	7.6	344	14.2
	16-May-17	9.9	8.4	349	12.5
	28-Jun-17	8.4	7.7	309	11.5
	18-Jul-17	9.4	8.1	339	11.6
	15-Aug-17	9.6	8.3	309	11.8
	17-Sep-17	9.9	7.8	379	10.3
	17-Oct-17	8.8	8.0	377	10.3
	14-Nov-17	6.8	8.0	391	8.0
	14-Dec-17	4.7	7.9	367	12.5
	17-Jan-18	5.2	7.9	341	7.8
	23-Feb-18	6.4	7.9	299	9.0
	20-Mar-18	6.3	8.0	356	13.4
	18-Apr-18	6.4	8.1	544	7.3
	14-May-18	9.3	7.7	478	11.6
	18-Jun-18	10.9	7.8	501	10.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Jul-18	9.0	7.7	500	10.1
	24-Aug-18	12.3	8.1	488.1	9.8
	19-Sep-18	10.7	8.2	476.9	9.9
	25-Oct-18	3.7	7.9	453.4	8.2
	22-Nov-18	3.1	8.1		12.1
	13-Dec-18	5.5	8.0		10.8
	19-Jan-19	5.0	7.8	500	11.4
	19-Mar-19	6.0	7.9	432.6	11.6
SW 21					
	11-Feb-04	0.3	8.5	283	10.3
	17-Mar-04	0.2	7.5	286	8.1
	21-Apr-04	10.8	8.0	310	
	19-May-04	17.5	8.1	395	
	24-Jun-04	18.9	8.1	419	
	29-Jul-04	23.1	8.0	418	8.2
	26-Aug-04	18.4	7.9	411	
	22-Sep-04	20.5	7.6	417	8.7
	20-Oct-04	9.2	7.9	321	10.8
	18-Nov-04	6.1	8.0	317	
	29-Mar-05	6.9	7.7	345	11.9
	11-Apr-05	7.1	7.1	264	
	26-May-05	19.6	8.2	418	
	28-Jun-05	25.9	8.4	432	8.0
	12-Jul-05	24.7	7.9	471	6.9
	23-Aug-05	19.9	7.3	342	8.5
	28-Sep-05	16.6	7.7	344	8.9
	25-Oct-05	8.6	8.0	319	11.6
	15-Nov-05	6.3	8.0	298	11.9
	13-Dec-05	0.5	7.6	185	12.7
	17-Jan-06	1.6	6.8	245	12.7
	22-Mar-06	1.4	8.0	247	
	19-Apr-06	13.5	8.2	388	
	23-May-06	12.4	8.1	405	
	20-Jun-06	21.8	8.1	399	
	11-Jul-06	23.3	8.1	373	
	23-Aug-06	21.3	7.9	375	
	20-Sep-06	16.3	8.0	350	
	19-Oct-06	10.0	8.0	368	
	23-Nov-06	2.4	8.3	457	13.6
	17-Dec-06	3.0	7.7	515	
	16-Apr-07	4.4	8.3	435	
	13-May-07	15.0	8.5	383	
	17-Jun-07	24.4	8.3	415	
	15-Jul-07	22.0	8.0	418	8.0
	19-Aug-07	20.1	8.0	385	8.6
	18-Oct-07	10.3	7.9	365	8.7
	21-Nov-07	4.5	8.2	418	11.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	9-Dec-07	1.5	7.2	393	12.5
	21-Jan-08	1.3	7.5	390	
	19-Feb-08	1.6	7.7	425	12.7
	17-Mar-08	1.1	7.4	444	
	1-Apr-08	2.0	7.4	326	
	23-Apr-08	16.6	7.9	394	8.2
	21-May-08	14.0	7.9	357	9.3
	17-Jun-08	19.6	7.9	336	6.7
	15-Jul-08	22.7	7.4	309	5.7
	19-Aug-08	22.1	8.1	325	4.2
	16-Sep-08	10.5	8.7	272	6.5
	21-Oct-08	10.6	8.0	332	7.6
	23-Nov-08	2.2		462	9.6
	14-Dec-08	1.8	7.3	394	9.7
	18-Jan-09	0.2	7.9	460	12.6
	8-Feb-09	1.0	8.9	429	9.0
	15-Mar-09	3.9	8.1	375	
	12-Apr-09	9.8	8.5	433	
	17-May-09	17.0	8.2	311	
	14-Jun-09	19.3	7.9	621	
	12-Jul-09	21.2	7.8	362	7.5
	9-Aug-09	20.1	6.8	361	8.8
	13-Sep-09	20.5	8.0	389	9.0
	11-Oct-09	8.5	8.5	342	11.2
	15-Nov-09	6.6	7.4	369	
	13-Dec-09	0.4	7.5	463	12.3
	7-Feb-10	0.7	7.4	502	10.9
	14-Mar-10	4.3	7.4	305	11.5
	11-Apr-10	10.6	7.9	459	14.1
	16-May-10	14.5	8.0	345	8.9
	13-Jun-10	20.7	8.0	394	10.1
	18-Jul-10	24.2	8.1	401	10.1
	12-Sep-10	18.0	8.2	362	7.5
	17-Oct-10	11.4	8.0	302	10.3
	14-Nov-10	6.8	8.1	281	12.6
	20-Feb-11	0.8	8.0	262	11.8
	13-Mar-11	1.1	8.1	233	10.9
	17-Apr-11	6.5	8.2	303	12.2
	15-May-11	12.2	8.0	283	12.1
	12-Jun-11	20.8	8.3	332	9.8
	16-Oct-11	12.1	8.2	230	9.3
	18-Dec-11	3.7	8.7	230	10.7
	18-Mar-12	15.6	8.0	304	9.2
	15-Apr-12	12.0	8.6	319	10.9
	13-May-12	17.6	8.2	347	8.8
	14-Aug-12	21.5	8.4	459	6.2
	18-Sep-12	17.8	7.9	322	7.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Oct-12	10.8	7.0	254	8.2
	20-Nov-12	5.7	8.0	316	9.4
	18-Dec-12	4.3	7.2	680	9.0
	15-Jan-13	3.5	7.4	345	9.5
	16-Apr-13	7.2	7.8	299	9.9
	13-May-13	14.5	8.0	339	5.2
	19-Jun-13	22.5	8.2	409	7.2
	16-Jul-13	28.2	8.1	444	4.3
	16-Oct-13	14.9	8.7	331	4.8
	19-Nov-13	5.3	8.7	301	2.0
	16-Apr-14	5.9	7.7	194	10.6
	13-May-14	16.0	7.9	312	9.1
	16-Dec-14	2.0	9.4	313	-
	22-Apr-15	10.2	8.0	406	11.6
	19-May-15	17.1	8.2	346	13.7
	15-Jun-15	20.5	8.0	393	7.4
	21-Jul-15	23.2	8.4	422	7.6
	11-Aug-15	21.1	7.6	396	6.9
	18-Nov-15	6.7	7.9	248	13.2
	8-Dec-15	3.5	7.4	289	13.9
	19-Jan-16	1.4	7.5	270	11.9
	17-Feb-16	1.2	7.2	3.15	11.3
	15-Mar-16	6.2	7.5	334	11.4
	21-Apr-16	11.3	7.9	345	11.5
	18-May-16	13.7	8.3	382	10.8
	21-Jul-16	23.9	8.3	288	8.5
	24-Aug-16	24.7	8.1	326	8.9
	19-Sep-16	22.0	8.2	330	8.0
	18-Oct-16	15.3	8.2	289	12.7
	16-Nov-16	6.9	7.9	264	11.3
	12-Dec-16	1.2	8.1	430	15.8
	25-Jan-17	2.1	7.5	315	10.7
	17-Feb-17	0.6	7.9	303	12.5
	22-Mar-17	4.3	8.1	350	12.1
	19-Apr-17	9.7	7.1	335	14.6
	16-May-17	20.7	8.7	427	8.7
	28-Jun-17	21.2	8.2	429	9.4
	19-Jul-17	24.0	8.1	428	7.4
	16-Aug-17	20.6	8.1	351	8.8
	19-Sep-17	19.4	8.1	343	8.0
	18-Oct-17	12.5	8.0	341	9.0
	15-Nov-17	3.8	8.1	327	8.1
	14-Dec-17	1.1	8.2	294	10.4
	23-Feb-18	1.8	7.6	237	7.2
	21-Mar-18	3.2	7.9	328	10.6
	19-Apr-18	1.7	8.0	274	11.3
	15-May-18	16.9	8.1	458	9.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Jun-18	13.6	8.2	442.7	7.4
	19-Jul-18	9.0	8.0	430	5.8
	24-Aug-18	22.7	8.2	375.8	7.5
	20-Sep-18	18.8	8.0	365.2	5.9
	25-Oct-18	7.3	8.2	378.6	10.0
	13-Dec-18	1.9	7.7	497.3	10.1
	19-Mar-19	1.5	7.6	441.3	9.9
SW 21A					
	19-May-04	15.7	8.0	378	
	24-Jun-04	17.2	8.1	384	
	29-Jul-04	22.7	8.0	416	8.2
	26-Aug-04	15.7	8.0	377	
	20-Oct-04	6.6	8.0	301	12.0
	18-Nov-04	7.9	7.9	332	11.2
	16-Dec-04	0.2	7.9	243	
	29-Mar-05	2.1	7.7	224	
	11-Apr-05	9.9	7.4	328	11.1
	26-May-05	22.0	8.2	429	8.8
	28-Jun-05	26.2	8.2	496	
	12-Jul-05	18.2	7.7	423	8.3
	23-Aug-05	13.6	7.4	363	10.1
	28-Sep-05	11.9	7.7	346	10.2
	25-Oct-05	6.2	7.9	392	
	15-Nov-05	3.9	8.0	280	12.5
	13-Dec-05	0.3	7.9	278	13.0
	17-Jan-06	0.3	6.4	219	13.8
	22-Mar-06	0.4	8.2	255	
	19-Apr-06	17.9	8.3	358	
	23-May-06	15.6	8.3	403	
	20-Jun-06	17.1	8.4	405	
	11-Jul-06	19.4	8.1	390	
	23-Aug-06	16.9	7.9	390	
	20-Sep-06	11.3	8.1	362	
	19-Oct-06	9.7	8.0	396	
	23-Nov-06	1.9	8.2	430	13.6
	17-Dec-06	1.6	8.0	497	
	16-Apr-07	2.4	8.3	420	13.6
	13-May-07	15.2	8.5	387	
	17-Jun-07	20.8	8.3	426	8.3
	15-Jul-07	19.1	8.0	419	8.7
	19-Aug-07	16.7	7.8	345	9.3
	18-Oct-07	12.8	7.9	396	9.0
	21-Nov-07	3.6	8.0	423	11.2
	9-Dec-07	0.9	7.9	395	13.0
	21-Oct-08	5.0	8.3	380	
	23-Nov-08	1.3		481	9.0
	14-Dec-08	0.3	7.6	379	9.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Mar-09	6.4	8.1	369	
	12-Apr-09	11.5	8.4	401	
	17-May-09	21.5	8.3	308	
	13-Sep-09	16.6	7.9	358	
	11-Oct-09	5.2	8.4	413	12.4
	15-Nov-09	5.6	7.6	334	
	14-Mar-10	7.0	7.4	284	11.1
	11-Apr-10	12.6	8.0	434	12.5
	16-May-10	14.3	8.1	356	9.8
	12-Sep-10	14.0	8.1	322	8.7
	14-Nov-10	6.1	8.1	268	12.0
	17-Apr-11	8.4	8.1	343	10.7
	15-May-11	9.3	8.0	267	12.3
	12-Jun-11	18.0	8.3	319	8.3
	16-Oct-11	9.4	8.0	304	9.0
	18-Dec-11	1.7	8.6	222	11.9
	18-Mar-12	18.1	7.9	351	7.9
	15-Apr-12	9.4	8.7	272	10.7
	13-May-12	19.5	8.0	368	7.3
	17-Oct-12	9.4	7.0	296	8.0
	20-Nov-12	5.6	7.9	323	8.9
	18-Dec-12	3.3	7.2	617	8.8
	15-Jan-13	0.7	7.8	306	11.0
	16-Apr-13	8.6	7.9	227	8.7
	16-Apr-14	3.2	7.2	187	10.5
	13-May-14	15.6	7.9	366	8.1
	16-Dec-14	0.0	9.7	283	-
	22-Apr-15	8.2	7.8	381	10.1
	15-Mar-16	6.8	7.7	296	10.7
	21-Apr-16	9.0	7.9	370	8.5
	21-Jul-16	17.9	7.8	401	7.0
	24-Aug-16	19.5	7.9	362	6.7
	19-Sep-16	17.8	8.0	381	7.0
	18-Oct-16	14.8	8.0	380	10.6
	16-Nov-16	6.7	7.9	301	10.3
	12-Dec-16	0.7	8.3	465	14.5
	25-Jan-17	1.8	7.8	298	11.5
	17-Feb-17	0.2	7.8	271	13.7
	22-Mar-17	0.0	8.0	383	11.3
	19-Apr-17	6.8	6.7	326	11.8
	16-May-17	20.7	8.7	404	6.9
	28-Jun-17	16.7	7.8	401	7.3
	19-Jul-17	18.4	7.7	408	6.9
	16-Aug-17	15.4	7.9	290	7.6
	19-Sep-17	15.3	7.9	374	7.7
	18-Oct-17	9.4	8.1	333	10.4
	15-Nov-17	3.7	8.2	307	8.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Dec-17	-0.3	8.3	265	11.1
	23-Feb-18	-0.1	7.9	261	7.9
	15-May-18	14.5	8.0	432	7.6
	18-Jun-18	16.5	8.1	429.4	7.9
	19-Jul-18	18.3	8.1	408.1	7.5
	24-Aug-18	18.2	8.1	399.9	7.9
	20-Sep-18	15.6	8.1	395.7	7.3
	25-Oct-18	4.1	8.1	429.3	0.8
	22-Nov-18	0.5	8.2		12.7
	13-Dec-18	1.4	7.9	483.7	11.5
SW 21B					
	19-May-04	9.6	8.2	318	
	24-Jun-04	10.5	8.2	330	
	29-Jul-04	11.4	8.1	284	
	26-Aug-04	10.3	8.1	322	
	23-Sep-04	11.0	8.1	335	
	20-Oct-04	7.5	8.1	307	11.9
	18-Nov-04	6.6	8.0	309	11.8
	29-Mar-05	2.1	7.7	224	
	11-Apr-05	2.3	7.0	231	13.6
	26-May-05	10.0	7.6	322	
	12-Jul-05	12.1	7.6	343	10.4
	23-Aug-05	11.2	7.6	341	
	28-Sep-06	10.5	7.8	330	10.9
	25-Oct-05	7.2	8.2	399	
	15-Nov-05	3.9	8.0	280	12.5
	13-Dec-05	2.6	8.3	296	12.6
	17-Jan-06	3.2	7.0	244	12.9
	19-Apr-06	9.2	8.3	340	
	23-May-06	9.4	8.3	395	
	20-Jun-06	12.1	8.2	401	
	11-Jul-06	12.9	8.2	385	
	23-Aug-06	12.6	8.0	400	
	20-Sep-06	10.7	8.0	393	
	19-Oct-06	8.8	8.0	399	
	23-Dec-06	4.9	8.4	417	
	17-Dec-06	3.7	8.2	432	
	21-Jan-07	2.7	8.1	419	
	16-Apr-07	3.7	8.4	396	13.0
	13-May-07	9.1	8.4	384	
	17-Jun-07	12.0	8.3	430	10.6
	15-Jul-07	11.6	8.2	430	10.5
	19-Aug-07	11.3	7.9	422	10.0
	17-Sep-07	10.1	8.0	401	10.4
	18-Oct-07	10.0	7.9	404	9.2
	21-Nov-07	5.2	8.0	425	10.9
	9-Dec-07	3.9	8.1	392	11.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	21-Jan-08	2.6	7.8	378	12.4
	19-Feb-08	2.9	8.1	399	
	23-Apr-08	8.5	7.9	343	10.0
	21-May-08	8.0	7.9	365	9.8
	17-Jun-08	11.7	7.9	401	8.6
	15-Jul-08	12.8	7.5	432	#REF!
	19-Aug-08	14.5	8.1	466	5.3
	16-Sep-08	14.3	8.4	419	6.4
	21-Oct-08	9.1	7.9	309	8.8
	23-Nov-08	4.7		427	8.4
	14-Dec-08	3.4	7.4	350	8.2
	12-Apr-09	2.9	8.7	375	
	17-May-09	12.0	8.3	331	10.1
	14-Jun-09	12.0	7.4	773	10.5
	12-Jul-09	13.2	8.5	417	9.6
	9-Aug-09	12.4	8.3	435	
	13-Sep-09	11.3	7.7	387	
	11-Oct-09	7.1	8.6	429	
	15-Nov-09	5.9	7.6	362	
	11-Apr-10	6.2	8.2	402	
	16-May-10	9.3	8.2	284	10.6
	12-Sep-10	11.5	8.2	340	10.3
	17-Oct-10	8.8	8.0	294	10.9
	14-Nov-10	6.1	8.3	254	12.1
	17-Apr-11	2.9	8.3	186	15.8
	15-May-11	7.7	8.1	240	12.8
	12-Jun-11	10.3	8.4	257	12.3
	17-Jul-11	14.2	8.3	328	10.9
	14-Aug-11	14.2	8.5	245	10.1
	18-Sep-11	11.1	8.6	272	10.0
	16-Oct-11	10.3	8.0	314	10.5
	20-Nov-11	5.2	8.1	270	13.5
	18-Mar-12	7.8	8.1	251	11.7
	15-Apr-12	7.6	8.7	281	10.1
	13-May-12	10.7	8.2	294	10.1
	17-Jun-12	15.1	8.4	290	7.4
	16-Jul-12	16.0	8.3	363	7.1
	14-Aug-12	16.2	8.4	478	6.9
	18-Sep-12	12.9	7.9	342	9.4
	17-Oct-12	8.7	7.0	280	9.0
	20-Nov-12	5.5	7.8	284	9.2
	18-Dec-12	3.8	7.6	560	9.4
	13-May-13	7.2	8.2	259	6.0
	19-Jun-13	11.1	8.7	299	11.6
	16-Jul-13	15.8	8.2	360	9.0
	20-Aug-13	14.3	8.3	332	9.5
	18-Sep-13	11.6	8.0	310	11.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Oct-13	11.0	8.6	304	5.5
	13-May-14	13.7	8.2	144	10.6
	17-Jun-14	14.2	8.2	322	10.0
	15-Jul-14	12.3	11.9	260	10.9
	19-Aug-14	12.7	8.8	372	5.8
	22-Oct-14	9.5	8.3	376	6.9
	22-Apr-15	4.0	7.9	263	11.0
	11-Aug-15	14.8	8.0	361	8.6
	8-Sep-15	17.4	7.8	380	7.0
	15-Oct-15	11.8	8.0	320	9.4
	18-Nov-15	8.3	7.7	334	11.2
	8-Dec-15	5.3	7.5	310	12.0
	18-May-16	8.0	8.3	324	11.4
	23-Jun-16	14.0	8.2	347	9.6
	21-Jul-16	12.3	8.5	345	11.2
	24-Aug-16	13.0	8.3	342	10.9
	19-Sep-16	12.3	8.3	341	10.9
	18-Oct-16	11.4	8.2	341	13.6
	16-Nov-16	7.1	8.1	307	11.3
	12-Dec-16	3.7	8.7	446	15.2
	25-Jan-17	4.0	8.3	298	12.3
	22-Mar-17	1.9	8.3	296	12.5
	19-Apr-17	6.6	7.4	280	13.9
	16-May-17	10.4	8.4	304	10.7
	28-Jun-17	10.3	8.3	322	11.4
	19-Jul-17	11.9	8.2	345	11.1
	16-Aug-17	11.6	8.2	310	10.9
	19-Sep-17	11.6	8.1	341	10.6
	18-Oct-17	9.1	8.3	323	11.2
	15-Nov-17	5.3	8.4	309	7.6
	14-Dec-17	3.0	8.5	283	9.4
	21-Mar-18	1.4	8.4	241	13.8
	15-May-18	9.9	8.1	386	11.0
	18-Jun-18	20.2	8.3	431.1	10.3
	19-Jul-18	12.5	8.2	427.4	10.2
	24-Aug-18	13.6	8.4	431.4	10.0
	20-Sep-18	12.5	8.3	427.6	10.0
	25-Oct-18	6.8	8.4	429.7	11.4
	22-Nov-18	3.5	8.4	435	12.6
	13-Dec-18	3.2	8.4	427.7	12.5
SW 21C					
	11-Feb-04	3.7	8.2	291	8.5
	17-Mar-04	4.0		409	9.4
	21-Apr-04	7.7	8.2	246	
	19-May-04	9.5	8.2	316	
	24-Jun-04	9.9	8.2	320	
	29-Jul-04	10.5	8.1	312	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	26-Aug-04	9.8	8.2	318	
	22-Sep-04	10.3	8.0	329	10.8
	20-Oct-04	7.3	8.1	305	11.9
	18-Nov-04	7.4	8.0	317	11.6
	29-Mar-05	5.4	8.1	281	
	11-Apr-05	5.8	7.4	251	
	26-May-05	10.0	8.0	240	
	28-Jun-05	12.0	8.3	327	
	12-Jul-05	11.2	7.6	345	10.8
	23-Aug-05	10.7	7.8	335	
	28-Sep-05	9.9	8.0	326	11.0
	25-Oct-05	7.1	8.2	397	
	15-Nov-05	5.7	8.3	272	12.3
	13-Dec-05	2.5	8.7	295	12.2
	17-Jan-06	3.6	7.4	246	13.0
	22-Mar-06	5.0	8.6	262	
	19-Apr-06	9.2	8.4	339	
	23-May-06	9.4	8.3	397	
	20-Jun-06	11.2	8.3	399	
	11-Jul-06	12.4	8.3	389	
	23-Aug-06	12.0	8.1	400	
	20-Sep-06	10.0	8.2	394	
	19-Oct-06	8.4	8.1	396	
	23-Nov-06	5.3	8.5	313	12.7
	17-Dec-06	4.6	8.2	427	
	21-Jan-07	3.0	8.5	420	
	18-Mar-07	4.7	8.3	377	
	16-Apr-07	5.2	8.4	396	
	13-May-07	8.9	8.4	383	
	17-Jun-07	11.6	8.4	428	
	15-Jul-07	11.0	8.1	431	
	19-Aug-07	10.6	7.9	425	10.4
	17-Sep-07	9.8	8.2	401	10.9
	18-Oct-07	9.9	8.0	404	9.6
	21-Nov-07	5.5	8.1	430	11.0
	9-Dec-07	4.6	8.1	394	11.8
	21-Jan-08	3.9	7.8	381	12.4
	19-Feb-08	4.2	8.0	400	
	17-Mar-08	4.1	7.7	409	
	1-Apr-08	3.9	7.7	314	
	23-Apr-08	8.8	8.0	343	10.4
	21-May-08	7.8	7.8	356	10.3
	17-Jun-08	9.0	7.8	400	
	15-Jul-08	10.2	7.3	430	9.6
	19-Aug-08	9.9	7.9	463	6.4
	16-Sep-08	9.8	8.5	428	8.0
	21-Oct-08	6.4	8.2	369	7.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-Nov-08	4.2	8.5	427	8.2
	14-Dec-08	4.8	7.2	350	7.0
	18-Jan-09	3.7	8.6	402	10.3
	8-Feb-09	4.7		333	8.6
	15-Mar-09	5.8	8.6	265	
	12-Apr-09	6.9	8.6	383	
	17-May-09	13.5	8.2	325	
	14-Jun-09	9.4	7.4	764	
	12-Jul-09	9.6	8.2	409	
	9-Aug-09	11.4	8.1	410	10.4
	13-Sep-09	10.7	7.6	379	10.6
	11-Oct-09	6.2	8.2	431	
	15-Nov-09	5.7	7.7	375	
	13-Dec-09	2.9	7.9	420	12.3
	17-Jan-10	3.9	8.5	397	12.1
	7-Feb-10	3.0	8.0	408	12.3
	14-Mar-10	5.1	7.8	393	12.1
	11-Apr-10	6.4	7.9	403	
	16-May-10	8.8	8.3	274	11.3
	13-Jun-10	9.6	8.3	280	11.9
	18-Jul-10	11.4	8.2	299	14.1
	15-Aug-10	10.9	8.4	282	11.0
	12-Sep-10	9.3	8.3	229	10.9
	17-Oct-10	7.7	8.1	286	10.7
	14-Nov-10	6.4	8.1	256	11.8
	19-Dec-10	3.7	8.3	223	12.8
	16-Jan-11	4.6	8.6	165	11.9
	20-Feb-11	3.7	8.1	240	12.1
	13-Mar-11	4.9	8.3	239	11.3
	17-Apr-11	5.7	8.3	266	12.3
	15-May-11	7.3	7.9	238	12.3
	12-Jun-11	9.7	8.3	255	12.4
	17-Jul-11	11.3	8.2	295	9.0
	14-Aug-11	11.3	8.6	218	10.4
	18-Sep-11	9.7	8.5	261	10.4
	16-Oct-11	8.3	8.1	288	10.2
	20-Nov-11	5.0	7.7	183	12.4
	20-Dec-11	4.5	8.3	199	11.6
	15-Jan-12	3.7	8.4	212	11.8
	19-Feb-12	4.4	8.0	213	12.8
	18-Mar-12	8.1	8.0	213	12.8
	15-Apr-12	6.4	8.8	268	12.0
	13-May-12	9.0	8.2	265	7.5
	17-Jun-12	11.6	8.3	322	11.8
	16-Jul-12	13.0	8.3	333	7.3
	14-Aug-12	11.0	8.1	456	7.6
	18-Sep-12	10.2	7.5	311	10.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Oct-12	8.6	6.7	217	8.2
	20-Nov-12	6.8	7.8	293	9.2
	18-Dec-12	5.7	7.7	609	9.5
	16-Jan-13	4.3	7.9	300	10.8
	20-Mar-13	4.1	8.4	238	7.7
	16-Apr-13	6.4	8.1	238	9.9
	13-May-13	7.6	8.1	260	6.7
	19-Jun-13	9.3	8.1	273	11.6
	16-Jul-13	11.8	8.1	324	10.1
	21-Aug-13	11.3	8.2	305	10.4
	18-Sep-13	9.0	7.9	291	12.0
	16-Oct-13	9.6	8.4	294	6.6
	19-Nov-13	5.4	8.5	270	2.5
	16-Apr-14	5.1	8.2	263	10.6
	13-May-14	8.8	8.1	265	10.5
	17-Jun-14	10.1	8.3	298	12.0
	15-Jul-14	10.9	7.7	330	8.7
	19-Aug-14	10.4	8.6	353	8.3
	9-Sep-14	10.8	8.8	356	4.3
	22-Oct-14	7.6	8.2	353	6.8
	16-Dec-14	4.9	9.3	313	-
	20-Jan-15	1.6	7.7	143	1.2
	18-Mar-15	2.8	8.4	214	13.8
	22-Apr-15	6.0	8.0	304	14.5
	19-May-15	8.8	8.3	267	-
	15-Jun-15	10.0	8.1	325	10.4
	21-Jul-15	10.9	8.1	323	-
	11-Aug-15	10.7	8.3	339	10.6
	25-Aug-15	10.7	8.3	297	10.9
	8-Sep-15	12.1	7.4	337	10.6
	15-Oct-15	8.7	8.1	297	10.0
	18-Nov-15	7.5	8.1	332	11.1
	8-Dec-15	5.7	7.9	316	12.9
	19-Jan-16	2.1	8.2	249	13.8
	17-Feb-16	3.6	8.0	288	13.7
	15-Mar-16	6.2	7.9	275	12.4
	21-Apr-16	7.3	8.1	283	13.4
	18-May-16	7.9	8.5	328	12.3
	23-Jun-16	9.5	8.5	316	11.6
	5-Jul-16	10.9	8.4	324	16.6
	21-Jul-16	11.9	8.5	342	10.5
	9-Aug-16	11.6	8.4	426	13.1
	24-Aug-16	12.2	8.4	336	11.1
	19-Sep-16	11.4	8.4	334	10.9
	18-Oct-16	11.7	8.3	340	13.6
	16-Nov-16	7.3	8.2	308	10.7
	12-Dec-12	3.3	8.4	442	14.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	25-Jan-17	4.8	8.3	296	11.7
	17-Feb-17	3.3	8.3	307	14.5
	22-Mar-17	2.6	8.5	304	12.2
	19-Apr-17	6.3	7.4	270	13.2
	16-May-17	10.8	8.5	197	10.8
	28-Jun-17	9.8	8.3	318	11.5
	7-Jul-17	10.9	8.2	288	11.6
	19-Jul-17	10.9	8.2	336	11.1
	2-Aug-17	10.5	8.0	311	12.0
	16-Aug-17	10.3	8.3	330	11.1
	19-Sep-17	10.4	8.2	326	11.0
	18-Oct-17	8.6	8.3	320	11.4
	15-Nov-17	5.5	8.4	311	12.9
	14-Dec-17	3.0	8.4	281	12.2
	18-Jan-18	3.4	8.0	269	9.2
	23-Feb-18	5.2	8.4	259	6.7
	21-Mar-18	3.2	8.3	270	12.5
	19-Apr-18	3.1	8.4	247	11.1
	15-May-18	8.2	8.2	398	10.8
	18-Jun-18	9.8	8.3	431.9	10.5
	19-Jul-18	10.4	8.2	428.8	10.5
	24-Aug-18	11.5	8.4	433.2	10.4
	20-Sep-18	11.0	8.4	430.6	10.2
	25-Oct-18	5.9	8.4	433.5	11.5
	22-Nov-18	2.7	8.5		12.8
	13-Dec-18	4.4	8.5	422.9	12.2
	19-Jan-19	3.0	8.3	418.9	12.8
	19-Mar-19	4.4	8.4	377	12.2
SW 21D					
	21-Apr-04	9.7	7.5	162	
	19-Apr-06	15.7	7.8	241	
	23-May-06	16.1	7.8	272	
	16-Apr-07	4.2	8.3	244	
	23-Apr-08	12.4	8.0	209	8.1
	12-Apr-09	15.4	8.0	260	9.5
	17-May-09	19.0	7.9	250	4.6
	11-Apr-10	9.2	7.8	261	13.0
	16-May-10	14.4	7.5	232	6.0
	13-Jun-10	18.2	7.5	251	7.8
	18-Jul-10	19.9	7.5	237	8.2
	14-Nov-10	5.9	8.0	199	7.9
	17-Apr-11	5.8	8.2	186	12.9
	15-May-11	8.6	8.0	159	10.2
	18-Mar-12	11.0	7.6	159	9.8
	14-Aug-12	17.2	8.2	394	3.9
	20-Nov-12	4.3	7.4	209	6.6
	18-Dec-12	1.2	7.2	376	7.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Jan-13	0.5	7.6	188	6.6
	16-Apr-13	1.1	8.2	114	9.4
	13-May-13	12.9	7.8	212	4.2
	16-Oct-13	12.4	8.5	240	3.5
	19-Nov-13	3.0	8.8	184	1.7
	13-May-14	14.6	7.4	211	5.2
	22-Oct-14	7.1	8.0	172	7.0
	16-Dec-14	-0.1	9.5	233	-
	22-Apr-15	7.2	7.6	178	11.9
	19-May-15	15.4	7.6	223	7.4
	15-Jun-15	17.3	7.4	258	2.2
	15-Mar-16	1.6	7.3	156	10.5
	21-Apr-16	8.3	7.7	195	9.7
	18-May-16	11.7	7.9	245	8.0
	25-Jan-17	-0.1	7.8	119	4.1
	19-Apr-17	7.8	7.1	194	8.1
	16-May-17	20.9	8.2	299	6.2
	28-Jun-17	18.0	7.8	279	6.9
	15-Nov-17	5.5	8.4	311	12.9
	23-Feb-18	0.3	7.8	161	5.9
	15-May-18	14.1	7.4	253	4.9
SW 22					
	26-Jun-03	9.7			
	11-Feb-04	6.0	7.9	382	9.8
	17-Mar-04	6.7		566	9.2
	21-Apr-04	6.5	7.4	301	
	19-May-04	7.1	7.3	374	
	24-Jun-04	7.1	7.3	386	
	29-Jul-04	7.2	7.2	354	
	26-Aug-04	7.5	7.3	362	
	22-Sep-04	8.6	7.7	376	
	20-Oct-04	7.9	7.2	373	10.8
	17-Nov-04	7.9	7.7	383	11.2
	16-Dec-04	7.1	7.4	369	12.1
	29-Mar-05	6.7	7.5	369	
	11-Apr-05	6.9	6.8	329	
	26-May-05	7.6	6.8	383	
	28-Jun-05	8.1	8.2	396	
	11-Jul-05	8.4	7.3	390	11.8
	22-Aug-05	8.6	9.0	380	
	27-Sep-05	8.8	7.7	373	11.6
	25-Oct-05	7.7	8.0	479	
	15-Nov-05	7.5	7.9	367	11.7
	14-Dec-05	4.9	8.1	372	12.0
	18-Jan-06	6.4	8.0	338	12.1
	21-Mar-06	6.8	8.0	380	11.9
	19-Apr-06	7.6	7.8	416	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	23-May-06	8.4	7.9	478	
	20-Jun-06	8.8	7.7	467	
	11-Jul-06	9.5	8.1	457	
	23-Aug-06	10.2	7.9	467	
	20-Sep-06	9.2	8.0	455	
	19-Oct-06	8.6	8.0	462	
	23-Nov-06	7.4	7.9	483	11.8
	17-Dec-06	7.3	7.6	515	
	21-Jan-07	5.7	7.9	495	12.2
	18-Feb-07	5.0	8.1	490	
	18-Mar-07	5.8	7.7	480	
	17-Apr-07	6.8	8.0	471	12.0
	13-May-07	8.4	8.1	426	
	17-Jun-07	8.1	8.0	505	
	15-Jul-07	8.4	7.9	506	11.3
	19-Aug-07	8.5	7.9	500	11.2
	17-Sep-07	8.5	7.9	465	10.1
	18-Oct-07	9.1	8.0	465	10.0
	21-Nov-07	7.0	7.9	503	
	11-Dec-07	6.1	8.0	435	11.3
	22-Jan-08	7.1	7.7	463	
	20-Feb-08	6.5	7.9	484	
	18-Mar-08	6.4	7.9	488	
	2-Apr-08	6.8	7.8	450	11.3
	23-Apr-08	7.1	8.0	393	10.9
	21-May-08	6.9	7.4	430	9.2
	17-Jun-08	7.3	8.1	466	10.6
	16-Jul-08	8.3	7.7	490	9.4
	19-Aug-08	8.1	7.7	533	7.0
	16-Sep-08	8.0	7.8	476	6.7
	22-Oct-08	7.4	7.9	438	6.7
	14-Dec-08	6.9	7.4	402	7.1
	18-Jan-09	6.6	8.0	468	7.2
	8-Feb-09	6.4		427	7.9
	15-Mar-09	7.1	8.1	410	
	12-Apr-09	7.1	8.2	429	
	17-May-09	8.0	7.9	376	11.8
	14-Jun-09	7.9	8.2	890	
	12-Jul-09	8.7	7.6	474	
	9-Aug-09	8.4	8.8	491	
	13-Sep-09	9.0	7.7	451	
	11-Oct-09	7.5	8.6	501	
	15-Nov-09	7.2	7.9	428	
	13-Dec-09	6.3	7.9	475	11.8
	17-Jan-10	6.1	8.3	462	12.3
	7-Feb-10	6.0	7.7	468	12.3
	14-Mar-10	7.1	7.6	465	12.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-Apr-10	7.3	8.2	455	
	16-May-10	7.6	7.9	283	11.8
	13-Jun-10	7.4	7.8	300	15.2
	18-Jul-10	8.0	8.0	317	15.2
	15-Aug-10	8.4	8.2	325	12.6
	12-Sep-10	8.2	8.2	350	11.4
	17-Oct-10	7.9	7.8	346	11.3
	14-Nov-10	7.7	7.9	263	10.1
	19-Dec-10	7.1	8.1	290	10.7
	16-Jan-11	6.9	8.0	304	11.6
	20-Feb-11	3.8	7.8	298	8.6
	13-Mar-11	7.3	8.2	205	12.2
	20-Mar-11	7.0	7.9	166	11.5
	17-Apr-11	6.7	8.1	310	8.5
	15-May-11	7.1	7.1	283	12.4
	12-Jun-11	8.4	8.0	267	12.7
	17-Jul-11	8.6	8.0	242	14.0
	14-Aug-11	8.8	8.7	225	11.2
	18-Sep-11	8.9	8.8	292	11.8
	16-Oct-11	8.3	8.0	341	11.4
	20-Nov-11	7.1	8.4	329	10.1
	18-Dec-11	7.2	8.5	262	10.3
	15-Jan-12	6.7	8.3	262	9.8
	19-Feb-12	6.9	8.2	280	11.4
	18-Mar-12	7.5	7.7	251	9.2
	15-Apr-12	7.4	8.7	314	13.1
	13-May-12	7.4	8.2	401	13.5
	17-Jun-12	8.6	7.8	344	7.8
	16-Jul-12	8.6	8.3	346	7.9
	15-Aug-12	8.7	8.2	420	6.9
	18-Sep-12	8.6	7.7	340	10.8
	18-Oct-12	8.9	8.2	313	8.7
	21-Nov-12	7.9	7.7	291	4.0
	20-Dec-12	7.2	7.5	716	10.4
	16-Jan-13	7.2	7.9	365	10.6
	20-Feb-13	6.8	8.0	301	12.1
	20-Mar-13	6.2	7.8	300	13.0
	17-Apr-13	7.1	7.6	310	9.9
	14-May-13	7.0	7.7	295	10.0
	19-Jun-13	7.6	8.1	310	12.4
	17-Jul-13	8.4	7.9	309	8.9
	21-Aug-13	8.4	8.0	338	11.8
	19-Sep-13	8.7	8.0	331	6.8
	17-Oct-13	8.2	8.3	313	6.3
	20-Nov-13	7.3	8.4	331	2.8
	22-Jan-14	1.7	7.6	220	3.9
	19-Mar-14	3.4	7.7	256	6.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Apr-14	6.8	7.9	345	10.3
	13-May-14	8.6	7.2	322	10.5
	17-Jun-14	8.7	7.7	300	12.3
	15-Jul-14	9.0	8.8	387	4.0
	19-Aug-14	9.4	8.6	380	10.4
	9-Sep-14	9.2	9.0	386	4.2
	20-Oct-14	9.0	8.8	380	4.9
	17-Dec-14	7.1	8.4	377	-
	21-Jan-15	6.3	7.8	367	1.4
	19-Mar-15	5.4	7.9	268	11.0
	23-Apr-15	6.7	7.7	358	13.5
	20-May-15	7.6	7.9	293	15.0
	15-Jun-15	7.8	7.9	348	10.9
	22-Jul-15	8.2	7.8	296	11.4
	12-Aug-15	8.4	8.1	357	11.6
	9-Sep-15	9.1	7.8	352	8.9
	16-Oct-15	7.9	7.8	330	11.2
	19-Nov-15	8.3	7.6	387	13.2
	8-Dec-15	7.0	7.9	371	12.4
	20-Jan-16	6.1	7.8	350	11.7
	18-Feb-16	4.3	7.7	332	12.6
	15-Mar-16	6.9	7.5	339	12.1
	21-Apr-16	7.1	7.6	324	13.4
	18-May-16	7.7	8.0	373	11.8
	22-Jun-16	8.0	7.9	343	12.3
	21-Jul-16	8.7	8.0	365	12.7
	25-Aug-16	9.6	8.1	358	12.4
	19-Sep-16	9.4	8.1	515	8.9
	17-Oct-16	9.5	8.0	420	10.3
	15-Nov-16	8.1	8.1	361	11.4
	12-Dec-16	5.5	8.4	503	14.1
	25-Jan-17	7.3	7.6	381	10.0
	16-Feb-17	4.9	8.1	361	13.2
	21-Mar-17	7.2	8.1	384	11.1
	19-Apr-17	7.2	7.1	333	12.9
	16-May-17	6.4	8.3	444	12.6
	28-Jun-17	7.1	7.8	340	12.4
	20-Jul-17	7.3	8.1	344	11.8
	16-Aug-17	7.3	7.7	350	11.0
	19-Sep-17	8.1	7.8	356	11.6
	17-Oct-17	8.1	8.1	358	11.1
	15-Nov-17	7.5	8.0	372	11.7
	14-Dec-17	7.4	7.4	371	12.3
	17-Jan-18	6.5	7.7	342	10.9
	23-Feb-18	6.7	7.8	330	8.4
	20-Mar-18	6.4	7.7	341	15.0
	18-Apr-18	6.4	8.1	541	10.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-May-18	7.6	7.6	473	11.2
	18-Jun-18	17.9	7.7	486.5	11.2
	18-Jul-18	8.9	7.7	494.6	10.9
	23-Aug-18	8.8	8.0	503	10.7
	20-Sep-18	8.9	8.0	501	10.8
	24-Oct-18	3.5	8.3	711	12.0
	21-Nov-18	6.3	8.1		11.0
	12-Dec-18	7.1	8.1	501	11.5
	18-Jan-19	7.0	7.7	490	11.3
	26-Feb-19	6.3	7.9	484.1	11.6
	15-Mar-19	6.7	7.8	473	11.3
SW 22A					
	11-Feb-04	2.4	8.7	453	10.8
	17-Mar-04	2.0	8.7	618	10.1
	21-Apr-04	5.6	7.9	393	
	19-May-04	5.6	7.8	496	
	24-Jun-04	7.6	8.2	548	
	29-Jul-04	10.3	8.1	607	
	26-Aug-04	7.4	8.1	586	
	22-Sep-04	13.5	8.1	690	10.4
	20-Oct-04	6.5	7.9	582	11.8
	17-Nov-04	7.7	7.9	642	10.9
	29-Mar-05	4.9	8.1	676	
	11-Apr-05	5.1	7.4	389	
	26-May-05	7.5	7.1	390	
	28-Jun-05	10.0	8.4	629	
	11-Jul-05	11.5	7.3	655	10.7
	22-Aug-05	11.3	9.0	640	
	27-Sep-05	8.5	7.8	597	
	25-Oct-05	6.1	8.7	750	#REF!
	15-Nov-05	5.9	7.8	506	11.7
	14-Dec-05	4.2	8.3	646	12.6
	18-Jan-06	3.2	7.4	469	
	21-Mar-06	5.5	8.3	545	
	19-Apr-06	6.5	8.1	581	
	23-May-06	11.9	8.3	724	
	20-Jun-06	11.6	8.2	695	
	11-Jul-06	13.8	8.4	700	
	23-Aug-06	13.3	8.2	733	
	20-Sep-06	10.8	8.3	732	
	19-Oct-06	8.9	8.2	751	
	23-Nov-06	6.1	8.4	680	12.4
	17-Dec-06	6.0	8.2	713	
	21-Jan-07	2.3	8.4	689	
	18-Mar-07	1.9	8.4	703	
	17-Apr-07	4.8	8.4	649	
	13-May-07	9.3	8.4	614	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jun-07	8.8	8.2	615	
	15-Jul-07	10.0	8.0	402	10.8
	17-Sep-07	9.1	8.2	697	10.6
	18-Oct-07	10.4	8.6		
	21-Nov-07	4.6	7.9	779	11.1
	11-Dec-07	2.3	8.1	372	13.1
	20-Feb-08	3.5	8.1	654	
	18-Mar-08	3.5	7.9	688	
	2-Apr-08	5.1	7.7	526	12.5
	23-Apr-08	8.6	7.7	523	10.2
	21-May-08	6.6	7.7	576	10.8
	17-Jun-08	9.5	8.1	656	9.8
	16-Jul-08	10.0	7.7	709	
	19-Aug-08	9.9	7.8	816	6.7
	16-Sep-08	8.5	7.7	724	10.8
	22-Oct-08	5.8	7.9	606	7.4
	23-Nov-08	5.3	8.1	625	8.3
	14-Dec-08	2.5	7.3	503	8.5
	18-Jan-09	0.2	8.5	631	12.8
	8-Feb-09	4.5		525	9.0
	15-Mar-09	5.5	8.6	520	
	12-Apr-09	7.1	8.2	429	
	17-May-09	11.5	8.5	494	
	14-Jun-09	10.0	8.3	1259	
	12-Jul-09	10.3	8.3	593	
	9-Aug-09	7.5	7.5	725	
	13-Sep-09	12.0	8.1	605	
	11-Oct-09	6.4	8.3	719	12.1
	15-Nov-09	6.4	7.7	569	12.4
	13-Dec-09	0.9	7.9	507	11.8
	17-Jan-10	0.7	8.4	518	11.4
	7-Feb-10	0.0	7.6	586	11.6
	14-Mar-10	6.1	7.4	575	12.6
	11-Apr-10	7.8	8.1	607	
	16-May-10	9.3	8.3	396	11.8
	13-Jun-10	9.8	8.3	439	14.6
	18-Jul-10	8.8	8.3	438	15.2
	15-Aug-10	10.0	8.3	368	10.5
	12-Sep-10	9.3	8.4	467	11.1
	17-Oct-10	7.0	8.1	424	11.4
	14-Nov-10	6.5	8.2	262	10.1
	19-Dec-10	3.6	8.3	363	11.5
	16-Jan-11	2.7	8.3	354	12.7
	20-Feb-11	3.6	8.0	383	10.6
	13-Mar-11	5.8	8.4	314	13.1
	20-Mar-11	5.1	7.6	407	12.0
	17-Apr-11	4.6	8.3	347	9.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-May-11	6.9	7.6	273	12.7
	12-Jun-11	8.2	8.4	375	12.5
	17-Jul-11	11.8	8.4	484	13.3
	14-Aug-11	11.9	8.7	338	10.0
	18-Sep-11	11.0	8.6	392	10.6
	16-Oct-11	8.5	8.1	483	10.9
	20-Nov-11	4.4	8.3	396	11.6
	18-Dec-11	5.2	8.6	302	11.0
	15-Jan-12	2.5	8.6	325	11.2
	19-Feb-12	4.0	8.3	329	12.1
	18-Mar-12	9.2	8.2	358	8.2
	15-Apr-12	7.0	8.7	407	12.9
	13-May-12	7.4	7.8	308	13.3
	17-Jun-12	11.8	8.4	506	7.1
	16-Jul-12	11.9	8.5	508	7.5
	15-Aug-12	9.6	8.4	486	6.8
	18-Sep-12	9.7	7.8	491	10.2
	18-Oct-12	8.8	8.4	379	8.2
	21-Nov-12	8.3	7.9	350	4.1
	20-Dec-12	4.6	7.8	889	11.1
	16-Jan-13	6.4	8.1	383	10.8
	20-Feb-13	2.9	8.3	203	14.0
	20-Mar-13	4.4	8.2	375	7.3
	17-Apr-13	6.6	7.9	335	10.5
	14-May-13	6.2	8.0	375	9.2
	19-Jun-13	9.4	8.2	443	11.0
	17-Jul-13	11.0	8.2	469	8.6
	21-Aug-13	10.7	8.2	467	11.6
	19-Sep-13	12.0	8.2	506	6.5
	17-Oct-13	9.2	8.6	422	6.2
	20-Nov-13	5.6	8.3	429	2.0
	17-Apr-14	5.2	8.0	489	11.3
	13-May-14	8.4	7.3	322	10.4
	17-Jun-14	9.4	8.4	410	10.4
	15-Jul-14	9.8	8.7	540	6.9
	19-Aug-14	10.0	8.7	542	11.0
	21-Jan-15	2.2	8.0	446	1.3
	19-Mar-15	1.3	7.7	369	14.8
	23-Apr-15	4.1	8.1	443	13.7
	20-May-15	9.5	8.5	411	14.6
	15-Jun-15	8.4	8.3	484	11.3
	22-Jul-15	8.3	8.3	484	11.8
	12-Aug-15	9.4	8.3	509	11.0
	16-Oct-15	6.9	8.0	418	11.6
	19-Nov-15	8.3	7.8	553	13.2
	8-Dec-15	4.5	8.1	476	12.7
	20-Jan-16	2.7	8.1	391	13.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Feb-16	3.2	7.9	441	14.1
	15-Mar-16	5.3	7.8	348	12.8
	21-Apr-16	7.3	7.9	407	13.7
	18-May-16	10.1	8.6	517	12.0
	22-Jun-16	11.0	8.5	496	11.3
	21-Jul-16	11.6	8.4	513	11.4
	25-Aug-16	13.1	8.5	525	11.0
	19-Sep-16	11.7	8.3	690	8.2
	17-Oct-16	8.3	8.2	508	11.0
	15-Nov-16	8.3	8.1	496	10.9
	12-Dec-16	1.1	8.0	730	14.6
	12-Jan-17	5.3	8.1	495	11.7
	16-Feb-17	3.2	8.4	436	14.6
	21-Mar-17	4.9	8.2	488	12.1
	19-Apr-17	8.9	7.8	492	13.1
	16-May-17	7.0	8.1	3.16	11.7
	28-Jun-17	8.6	8.2	471	12.1
	20-Jul-17	8.3	8.4	517	12.0
	16-Aug-17	10.3	8.3	506	11.3
	19-Sep-17	10.1	8.2	557	10.8
	17-Oct-17	9.8	8.3	529	10.5
	15-Nov-17	5.4	8.3	465	13.6
	14-Dec-17	5.7	7.8	465	13.5
	17-Jan-18	2.2	7.9	421	13.2
	23-Feb-18	4.0	8.2	361	10.4
	20-Mar-18	2.7	8.2	420	17.7
	18-Apr-18	4.5	8.6	655	12.2
	15-May-18	5.8	7.9	611	11.6
	18-Jun-18	9.8	8.1	693	11.0
	18-Jul-18	14.7	8.2	652	9.3
	23-Aug-18	8.8	8.3	677	10.5
	19-Sep-18	10.8	8.3	704	10.3
	24-Oct-18	7.6	8.2	495.8	11.2
	21-Nov-18	1.7	8.4	483.8	12.9
	12-Dec-18	3.9	8.4	657	12.7
	18-Jan-19	3.6	8.2	672	12.6
	15-Mar-19	3.5	8.3	584	12.5
SW 22B					
	18-Oct-07	11.4	8.2	629	9.3
	22-Jan-08	2.0	7.7	574	
SW 22C					
	17-Apr-07	3.2	8.4	547	13.3
	15-May-07	11.6	8.3	548	10.3
	18-Jun-07	13.3	8.5	697	
	18-Jul-07	14.0	8.0	681	9.9
	22-Aug-07	14.5	8.0	704	9.5
	17-Sep-07	11.0	8.0	651	9.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Oct-07	11.4	8.2	629	9.3
	21-Nov-07	4.6	7.8	625	10.9
	22-Jan-08	2.0	7.7	574	
	20-Feb-08	1.5	8.1	531	
	18-Mar-08	1.7	7.8	598	
	2-Apr-08	2.5	7.5	440	13.0
	23-Apr-08	10.5	7.8	461	8.7
	21-May-08	7.4	7.5	518	10.6
	17-Jun-08	12.1	8.0	583	8.6
	16-Jul-08	14.9	7.7	529	6.8
	19-Aug-08	13.7	7.6	746	5.5
	16-Sep-08	11.0	7.7	654	9.2
	22-Oct-08	5.9	7.8	497	7.2
	23-Nov-08	3.6	7.8	571	9.0
	14-Dec-08	2.5	6.9	448	8.1
	18-Jan-09	1.3	8.1	554	12.5
	8-Feb-09	1.8		419	9.3
	15-Mar-09	3.3	8.1	419	
	12-Apr-09	6.8	8.5	471	
	17-May-09	14.5	8.4	462	
	14-Jun-09	12.5	8.4	1141	
	12-Jul-09	14.0	8.0	652	10.4
	9-Aug-09	11.6	8.4	634	9.7
	13-Sep-09	14.6	8.2	617	
	11-Oct-09	6.6	8.3	610	12.0
	15-Nov-09	4.7	7.7	533	
	13-Dec-09	0.1	8.1	354	12.5
	17-Jan-10	0.1	8.2	315	15.9
	7-Feb-10	0.7	8.3	426	11.5
	14-Mar-10	4.0	7.5	468	13.5
	11-Apr-10	6.9	8.1	545	
	16-May-10	10.9	8.2	406	10.4
	13-Jun-10	12.9	8.2	450	12.6
	18-Jul-10	13.6	8.1	470	13.0
	15-Aug-10	13.5	8.3	486	9.7
	12-Sep-10	11.1	8.4	478	10.2
	17-Oct-10	7.3	7.8	7.89	10.6
	14-Nov-10	6.0	8.2	271	9.4
	19-Dec-10	2.4	8.4	300	11.9
	16-Jan-11	1.4	8.2	270	12.3
	20-Feb-11	1.7	8.0	315	10.1
	13-Mar-11	2.8	8.3	279	13.8
	20-Mar-11	2.8	7.2	340	12.8
	17-Apr-11	3.0	8.5	266	12.1
	15-May-11	8.5	7.3	280	11.8
	12-Jun-11	12.9	8.3	375	10.5
	17-Jul-11	16.1	8.4	498	10.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Aug-11	15.1	8.8	333	9.5
	18-Sep-11	12.8	8.8	403	6.8
	16-Oct-11	9.2	7.9	413	9.6
	20-Nov-11	3.6	8.2	332	11.7
	18-Dec-11	1.0	8.4	241	12.6
	15-Jan-12	0.8	8.6	262	11.9
	19-Feb-12	2.1	8.0	182	12.9
	18-Mar-12	11.4	7.8	318	7.4
	15-Apr-12	6.3	8.6	347	13.4
	13-May-12	10.2	8.1	394	11.9
	17-Jun-12	16.1	8.3	526	7.1
	16-Jul-12	16.1	8.8	530	7.6
	15-Aug-12	13.9	8.6	492	6.3
	18-Sep-12	12.5	7.8	468	8.3
	18-Oct-12	9.3	8.7	392	9.0
	21-Nov-12	6.4	8.1	325	4.2
	20-Dec-12	2.9	7.6	735	11.4
	16-Jan-13	2.8	8.0	344	11.1
	20-Feb-13	1.3	8.2	249	14.1
	20-Mar-13	2.2	8.1	308	8.9
	17-Apr-13	4.8	7.9	284	9.6
	14-May-13	6.7	8.0	319	8.7
	19-Jun-13	11.3	8.4	436	10.9
	17-Jul-13	15.8	8.2	483	8.8
	19-Sep-13	13.4	8.3	484	3.8
	17-Oct-13	10.6	9.2	419	6.0
	20-Nov-13	3.6	8.6	351	2.2
	22-Jan-14	-0.1	7.1	236	3.5
	17-Apr-14	2.9	7.4	324	11.7
	13-May-14	10.6	7.2	316	10.4
	17-Jun-14	14.5	8.0	440	9.2
	15-Jul-14	15.0	8.6	509	6.9
	19-Aug-14	13.4	8.7	363	9.7
	9-Sep-14	14.3	8.6	584	5.0
	20-Oct-14	11.3	8.3	542	4.9
	17-Dec-14	2.5	8.4	350	-
	21-Jan-15	0.5	7.3	346	0.3
	23-Apr-15	3.5	8.2	363	14.3
	20-May-15	10.5	8.3	386	13.9
	15-Jun-15	12.6	8.0	487	9.7
	22-Jul-15	12.9	8.1	524	10.3
	12-Aug-15	14.2	8.1	528	9.3
	9-Sep-15	17.2	7.8	506	4.8
	16-Oct-15	8.6	8.0	417	10.2
	19-Nov-15	8.3	7.7	451	12.6
	8-Dec-15	3.8	7.9	413	12.5
	20-Jan-16	1.3	8.0	352	13.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Feb-16	1.2	7.8	364	14.4
	15-Mar-16	3.7	7.7	278	13.1
	21-Apr-16	7.6	7.8	368	12.8
	18-May-16	9.5	8.4	456	11.0
	22-Jun-16	13.3	8.4	494	10.7
	21-Jul-16	14.9	8.1	534	10.5
	25-Aug-16	16.8	8.5	552	10.8
	19-Sep-16	14.6	8.2	644	8.0
	18-Oct-16	12.5	7.9	619	9.0
	15-Nov-16	7.5	8.0	427	11.2
	12-Dec-16	1.7	8.1	584	15.0
	25-Jan-17	2.8	8.2	397	12.5
	16-Feb-17	1.1	8.1	206	14.7
	21-Mar-17	3.7	8.4	391	12.2
	19-Apr-17	8.0	7.6	402	13.0
	16-May-17	13.4	8.1	456	9.0
	28-Jun-17	11.1	8.2	476	10.2
	20-Jul-17	12.4	8.3	527	10.3
	16-Aug-17	13.5	8.3	432	9.9
	19-Sep-17	13.4	8.2	519	8.7
	17-Oct-17	10.3	8.3	497	9.8
	15-Nov-17	4.5	8.2	414	12.9
	14-Dec-17	1.4	7.8	361	15.6
	17-Jan-18	0.8	7.8	342	14.5
	23-Feb-18	2.1	8.0	295	11.1
	20-Mar-18	0.4	8.1	279	18.5
	18-Apr-18	2.1	8.5	529	12.9
	14-May-18	8.7	8.1	539	10.6
	18-Jun-18	22.8	8.2	632	9.9
	18-Jul-18	10.9	8.2	674	10.0
	23-Aug-18	13.7	8.2	626	9.2
	19-Sep-18	13.8	8.3	658	9.4
	24-Oct-18	5.9	8.2	589	11.2
	21-Nov-18	1.7	8.2	616	12.7
	13-Dec-18	2.8	8.2	616	12.6
	19-Jan-19	2.1	8.1	626	12.9
	19-Mar-19	1.6	8.0	465	12.5
SW 23					
	17-Mar-04	0.1		385	10.2
	19-May-04	16.9	8.1	521	9.7
	24-Jun-04	14.8	8.2	521	9.0
	29-Jul-04	14.8	8.1	508	8.6
	26-Aug-04	15.7	8.2	500	8.2
	22-Sep-04	15.6	8.0	519	7.9
	20-Oct-04	7.4	7.9	422	11.3
	17-Nov-04	6.0	7.8	407	11.6
	29-Mar-05	1.2	7.5	293	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	11-Apr-05	9.2	7.5	274	11.4
	24-May-05	13.5	7.8	468	8.7
	27-Jun-05	18.8	7.9	610	9.2
	11-Jul-05	18.2	6.9	565	6.8
	22-Aug-05	15.3	8.4	492	7.1
	27-Sep-05	13.3	7.6	517	5.8
	24-Oct-05	8.0	7.9	609	10.6
	14-Nov-05	5.8	8.4	425	10.5
	12-Dec-05	0.2	8.3	277	11.0
	18-Jan-06	0.2	7.2	192	#REF!
	22-Mar-06	0.2	8.5	245	
	18-Apr-06	13.3	8.0	422	
	23-May-06	12.0	8.0	508	
	20-Jun-06	15.4	8.0	590	
	11-Jul-06	17.7	8.2	584	
	23-Aug-06	15.6	7.8	538	#REF!
	19-Sep-06	14.2	8.0	612	
	19-Oct-06	10.0	7.6	487	
	27-Nov-06	6.5	7.9	478	11.6
	17-Dec-06	2.3	7.9	492	
	18-Mar-07	0.2	8.2	456	14.4
	16-Apr-07	2.8	8.3	454	13.3
	13-May-07	12.0	8.3	520	9.8
	17-Jun-07	16.2	8.1	651	5.8
	19-Nov-07	3.1	7.7	594	11.9
	10-Dec-07	2.5	8.4	407	12.8
	19-Feb-08	0.1	7.9	278	
	2-Apr-08	0.2	7.0	156	
	23-Apr-08	14.4	8.0	441	7.1
	21-May-08	9.5	7.5	473	9.2
	17-Jun-08	13.0	7.6	590	
	15-Jul-08	14.9	7.1	665	6.5
	18-Aug-08	18.3	7.5	645	4.5
	17-Sep-08	12.8	8.3	582	6.5
	20-Oct-08	9.4	7.6	539	7.1
	15-Mar-09	0.7	8.3	384	
	12-Apr-09	9.4	8.3	415	
	17-May-09	20.4	8.3	478	9.2
	14-Jun-09	15.9	7.6	1154	9.9
	12-Jul-09	12.8	8.4	635	
	9-Aug-09	16.9	8.3	633	8.5
	13-Sep-09	14.4	7.7	552	9.7
	11-Oct-09	7.3	7.2	553	
	15-Nov-09	3.5	7.4	481	
	13-Dec-09	0.7	7.9	504	12.8
	14-Mar-10	0.4	8.2	349	15.5
	11-Apr-10	11.1	7.8	495	12.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-May-10	17.0	8.3	440	8.6
	13-Jun-10	19.2	8.2	492	11.3
	18-Jul-10	15.6	8.1	333	11.8
	15-Aug-10	16.6	8.1	533	9.1
	17-Oct-10	7.9	7.9	393	10.9
	14-Nov-10	5.1	8.0	291	12.8
	13-Mar-11	0.1	8.4	189	13.1
	17-Apr-11	2.5	8.1	282	14.7
	15-May-11	9.9	7.9	315	12.8
	12-Jun-11	14.4	8.2	373	9.8
	17-Jul-11	18.5	8.1	501	5.7
	14-Aug-11	16.5	8.4	248	6.1
	18-Sep-11	12.7	8.2	370	9.1
	16-Oct-11	9.7	7.9	361	7.7
	20-Nov-11	1.8	7.8	297	13.1
	18-Dec-11	0.7	8.1	164	11.9
	18-Mar-12	17.6	8.3	342	9.0
	15-Apr-12	6.8	8.3	332	11.7
	13-May-12	14.9	8.2	402	11.7
	17-Jun-12	19.0	8.3	533	14.1
	16-Jul-12	18.6	8.2	513	3.5
	14-Aug-12	16.8	8.2	438	6.6
	18-Sep-12	14.3	7.2	429	8.5
	17-Oct-12	10.4	6.9	350	7.7
	20-Nov-12	5.6	7.7	326	8.0
	18-Dec-12	3.9	7.4	620	10.7
	16-Jan-13	0.0	8.2	246	11.4
	16-Apr-13	8.3	8.1	232	10.1
	14-May-13	13.0	8.2	348	5.8
	19-Jun-13	14.2	7.9	305	8.1
	16-Jul-13	19.3	8.0	563	7.4
	16-Oct-13	12.3	8.4	406	5.8
	19-Nov-13	2.9	7.8	268	2.7
	13-May-14	14.1	8.0	396	11.0
	17-Jun-14	17.2	8.0	510	9.9
	15-Jul-14	5.6	8.9	245	4.3
	19-Aug-14	13.2	8.5	533	10.5
	9-Sep-14	15.2	8.7	477	4.0
	23-Oct-14	9.9	7.3	420	6.9
	16-Dec-14	0.8	8.7	251	-
	22-Apr-15	7.1	8.1	358	12.3
	19-May-15	14.8	8.4	416	-
	15-Jun-15	17.5	8.1	499	7.9
	21-Jul-15	17.3	8.2	512	-
	11-Aug-15	16.3	8.1	542	8.2
	8-Sep-15	18.7	7.8	544	6.5
	15-Oct-15	9.4	8.0	426	9.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Nov-15	8.0	7.9	402	11.0
	8-Dec-15	3.9	8.0	347	21.2
	15-Mar-16	5.5	7.9	258	13.0
	21-Apr-16	7.0	8.0	336	12.5
	18-May-16	10.0	8.3	427	11.5
	22-Jun-16	15.6	8.3	490	8.1
	20-Jul-16	17.4	831.0	503	7.5
	24-Aug-16	18.4	8.4	527	7.6
	19-Sep-16	16.3	8.2	579	8.2
	18-Oct-16	14.1	7.9	537	10.9
	15-Nov-16	7.3	8.1	408	11.6
	12-Dec-16	1.1	7.7	453	14.2
	24-Jan-17	1.8	8.1	246	14.1
	16-Feb-17	0.5	8.1	293	15.9
	21-Mar-17	3.0	8.1	306	12.8
	19-Apr-17	11.0	8.0	385	13.2
	16-May-17	18.0	8.1	457	9.4
	28-Jun-17	18.7	8.4	531	8.1
	19-Jul-17	18.4	8.4	576	7.5
	15-Aug-17	17.7	8.7	463	8.6
	17-Sep-17	15.8	8.0	550	8.3
	17-Oct-17	9.9	8.0	384	10.3
	14-Nov-17	4.2	8.1	333	9.7
SW 24					
	21-Apr-04	8.1	8.0	243	
	19-May-04	12.9	8.0	357	10.5
	24-Jun-04	12.3	8.0	370	
	29-Mar-05	5.7	7.8	274	12.2
	11-Apr-05	5.9	7.5	249	
	26-May-05	12.0	7.7	329	10.6
	28-Jun-05	16.0	8.1	383	
	11-Jul-05	18.7	6.8	374	7.7
	17-Jan-06	2.0	6.4	216	
	22-Mar-06	3.4	8.3	238	
	18-Apr-06	9.5	8.0	335	
	23-May-06	8.6	8.0	412	
	20-Jun-06	14.7	7.7	473	
	19-Oct-06	10.3	7.5	394	
	27-Nov-06	7.2	7.8	420	10.2
	17-Dec-06	3.6	7.8	428	12.6
	21-Jan-07	1.0	8.0	412	
	18-Mar-07	3.5	8.1	369	
	17-Apr-07	3.4	8.2	380	12.7
	19-Feb-08	1.5	7.9	379	
	17-Mar-08	0.4	7.5	399	
	2-Apr-08	2.8	7.6	267	
	23-Apr-08	9.6	7.8	339	8.7

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	6-May-08	7.6	7.1	403	10.1
	21-May-08	7.5	7.6	366	9.5
	17-Jun-08	10.4	7.6	444	9.0
	15-Jul-08	13.4	7.1	491	7.3
	18-Aug-08	17.8	7.4	541	4.3
	16-Sep-08	11.3	7.9	493	7.4
	21-Oct-08	6.4	7.7	396	7.7
	23-Nov-08	4.1	7.8	420	8.0
	14-Dec-08	2.3	7.6	337	
	18-Jan-09	0.8	8.4	394	11.9
	8-Feb-09	2.6	8.8	299	9.5
	15-Mar-09	4.0	8.6	340	
	12-Apr-09	8.4	8.4	372	
	17-May-09	14.8	8.1	350	
	14-Jun-09	7.2	7.3	682	10.2
	12-Jul-09	11.6	8.2	442	10.4
	9-Aug-09	15.2	8.7	451	8.9
	13-Sep-09	14.2	7.8	307	7.1
	11-Oct-09	5.2	8.4	489	12.6
	15-Nov-09	4.6	7.3	378	
	13-Dec-09	0.9	7.9	425	14.0
	17-Jan-10	1.5	8.5	391	11.4
	14-Mar-10	3.7	7.8	383	13.5
	11-Apr-10	5.7	7.9	400	
	16-May-10	11.2	8.1	292	9.5
	13-Jun-10	12.1	8.0	289	12.2
	18-Jul-10	14.5	7.8	372	12.0
	15-Aug-10	15.3	8.2	358	8.9
	12-Sep-10	11.2	8.2	334	10.3
	17-Oct-10	8.9	7.8	310	9.5
	14-Nov-10	5.7	8.1	242	11.9
	19-Dec-10	2.1	8.2	210	12.7
	16-Jan-11	1.6	8.5	219	11.3
	20-Feb-11	0.4	8.1	216	11.9
	13-Mar-11	0.3	8.3	221	12.0
	17-Apr-11	5.0	8.3	254	12.7
	15-May-11	7.5	7.8	238	12.5
	12-Jun-11	11.6	8.1	272	10.8
	17-Jul-11	16.4	8.2	344	7.9
	14-Aug-11	15.6	8.3	264	8.7
	18-Sep-11	11.9	8.3	283	9.6
	16-Oct-11	8.7	8.0	323	8.7
	20-Nov-11	1.9	7.9	252	13.6
	18-Dec-11	2.0	8.3	196	12.7
	15-Jan-12	0.9	8.3	183	13.3
	19-Feb-12	1.9	8.0	192	12.3
	18-Mar-12	11.5	8.1	274	10.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Apr-12	5.6	8.7	256	11.1
	13-May-12	11.5	7.1	304	5.1
	17-Jun-12	16.6	8.2	370	12.2
	16-Jul-12	19.2	8.4	400	6.5
	14-Aug-12	14.3	8.0	422	6.7
	18-Sep-12	13.3	7.4	349	8.7
	17-Oct-12	10.1	7.0	297	7.2
	20-Nov-12	5.9	287.0	7.75	9.0
	18-Dec-12	4.3	7.5	581	9.6
	16-Jan-13	1.0	8.1	264	11.9
	20-Feb-13	0.0	8.1	216	15.3
	20-Mar-13	0.8	8.1	209	8.8
	16-Apr-13	6.1	7.9	221	9.7
	13-May-13	10.9	8.2	274	10.0
	19-Jun-13	11.6	8.1	279	10.2
	16-Jul-13	17.1	8.0	354	8.0
	21-Aug-13	15.8	8.1	360	7.7
	18-Sep-13	10.3	7.8	306	11.0
	16-Oct-13	12.0	8.3	321	5.5
	19-Nov-13	3.4	8.5	261	2.6
	16-Apr-14	2.7	8.3	187	10.4
	13-May-14	11.4	8.2	282	11.1
	17-Jun-14	13.2	8.3	222	10.0
	15-Jul-14	13.0	8.3	284	5.3
	19-Aug-14	9.1	8.4	410	10.0
	9-Sep-14	13.7	8.7	384	2.8
	23-Oct-14	7.8	8.3	367	6.4
	16-Dec-14	2.4	9.0	280	-
	20-Jan-15	-0.1	7.7	251	1.4
	18-Mar-15	0.4	8.2	197	13.6
	22-Apr-15	6.5	8.1	295	12.3
	19-May-15	11.0	8.3	286	-
	15-Jun-15	12.8	8.1	313	8.9
	21-Jul-15	14.6	8.2	349	-
	11-Aug-15	14.1	8.3	363	10.0
	8-Sep-15	16.9	7.8	370	8.6
	15-Oct-15	8.8	8.0	293	10.5
	18-Nov-15	8.0	7.9	337	10.7
	8-Dec-15	4.3	8.1	302	19.7
	19-Jan-16	0.0	7.9	230	15.6
	17-Feb-16	0.5	7.9	248	14.5
	15-Mar-16	6.2	8.0	270	12.7
	21-Apr-16	6.4	8.1	273	13.0
	18-May-16	9.0	8.4	333	11.5
	22-Jun-16	13.9	8.4	349	9.7
	20-Jul-16	15.7	8.2	371	7.6
	24-Aug-16	17.7	8.6	382	9.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Sep-16	15.9	8.3	381	8..88
	18-Oct-16	14.7	7.7	374	10.9
	15-Nov-16	8.1	8.1	323	10.4
	12-Dec-16	0.5	7.4	412	10.8
	24-Jan-17	2.7	8.1	230	12.9
	16-Feb-17	-0.1	8.2	265	16.0
	21-Mar-17	3.9	8.2	23	12.3
	19-Apr-17	10.4	8.2	302	13.2
	16-May-17	14.8	8.6	343	7.5
	28-Jun-17	13.4	8.4	357	9.9
	19-Jul-17	15.7	8.5	248	9.6
	15-Aug-17	16.3	8.8	310	9.7
	17-Sep-17	16.1	8.2	385	9.5
	17-Oct-17	10.5	8.1	365	9.4
	14-Nov-17	6.0	8.2	316	8.2
	14-Dec-17	-0.1	8.2	251	-
	18-Jan-18	0.5	7.9	235	11.0
	24-Feb-18	2.2	8.3	236	16.3
	15-May-18	10.1	8.1	384	10.1
	18-Jun-18	16.5	8.2	431.1	8.9
	19-Jul-18	15.1	7.9	423.7	8.7
	24-Aug-18	16.3	8.2	453.5	6.5
	19-Sep-18	14.4	8.2	452.5	4.0
	25-Oct-18	5.7	7.9	419.5	8.3
	22-Nov-18	0.7	8.2		12.7
	13-Dec-18	2.0	8.0	417.3	12.4
	19-Mar-19	1.6	8.3	372	13.0
SW 24A					
	21-Apr-04	6.6	7.5	274	
	19-May-04	7.4	8.0	357	
	24-Jun-04	7.4	7.5	396	
	29-Jul-04	7.8	7.6	416	
	26-Aug-04	8.2	7.5	432	
	22-Sep-04	7.8	7.6	455	
	20-Oct-04	7.2	7.7	432	11.7
	17-Nov-04	7.4	7.7	440	11.1
	16-Dec-04	6.7	7.7	382	
	29-Mar-05	5.6	7.8	369	12.6
	11-Apr-05	6.0	7.4	298	
	26-May-05	7.4	7.7	345	12.1
	28-Jun-05	8.3	8.2	404	
	11-Jul-05	9.1	6.9	427	
	22-Aug-05	10.2	8.3	397	
	28-Sep-05	10.4	7.7	480	10.9
	15-Nov-05	6.6	7.9	419	
	12-Dec-05	5.4	8.3	405	11.2
	17-Jan-06	3.0	7.9	305	13.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Mar-06	4.3	8.5	284	
	18-Apr-06	9.0	8.3	351	
	24-May-06	8.9	8.3	447	
	20-Jun-06	11.3	8.2	492	
	11-Jul-06	12.4	8.3	468	
	23-Aug-06	11.8	8.0	492	
	20-Sep-06	10.5	7.9	475	
	19-Oct-06	9.3	8.0	508	
	27-Nov-06	7.0	8.1	518	12.2
	17-Dec-06	4.0	8.1	515	
	21-Jan-07	2.9	8.2	520	
	18-Mar-07	3.9	8.3	459	
	17-Apr-07	4.2	8.4	417	
	13-May-07	9.3	8.3	441	11.2
	17-Jun-07	8.5	8.1	522	11.5
	15-Jul-07	11.0	8.0	507	9.9
	19-Aug-07	13.0	8.1	519	
	17-Sep-07	9.8	7.9	506	9.7
	18-Oct-07	10.7	7.8	525	9.0
	19-Nov-07	4.8	7.9	572	11.6
	10-Dec-07	4.2	8.0	505	12.6
	21-Jan-08	2.9	7.6	390	
	19-Feb-08	3.0	7.9	453	
	17-Mar-08	2.0	7.1	466	
	2-Apr-08	2.0	7.1	466	
	23-Apr-08	9.6	8.0	351	
	6-May-08	6.8	7.1	421	11.3
	21-May-08	7.2	7.6	403	10.5
	17-Jun-08	8.1	7.9	479	9.8
	15-Jul-08	10.3	7.0	511	8.5
	18-Aug-08	12.8	7.4	574	5.5
	16-Sep-08	9.8	8.1	542	8.2
	21-Oct-08	5.9	7.9	480	7.9
	23-Nov-08	3.5	7.5	461	8.3
	14-Dec-08	2.8	7.2	426	8.0
	18-Jan-09	4.1	8.3	252	9.5
	8-Feb-09	3.5	8.9	452	10.2
	15-Mar-09	4.8	8.4	395	
	12-Apr-09	7.1	8.4	413	
	17-May-09	14.0	7.8	378	
	14-Jun-09	9.1	7.6	911	
	12-Jul-09	9.6	8.5	502	
	9-Aug-09	11.2	6.8	362	10.3
	13-Sep-09	10.4	7.8	472	
	11-Oct-09	7.0	8.4	554	
	15-Nov-09	4.8	7.3	488	
	13-Dec-09	3.4	7.7	545	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Jan-10	3.5	8.7	508	11.0
	7-Feb-10	2.4	7.7	368	12.6
	14-Mar-10	4.9	8.0	460	12.9
	11-Apr-10	5.4	7.8	430	
	16-May-10	9.8	8.2	318	10.6
	13-Jun-10	9.8	8.2	334	12.6
	18-Jul-10	12.5	8.2	399	12.7
	15-Aug-10	12.3	8.3	336	9.8
	12-Sep-10	10.1	8.2	403	10.5
	17-Oct-10	7.7	8.0	290	11.0
	14-Nov-10	5.9	8.3	303	12.4
	19-Dec-10	4.0	8.2	201	11.8
	16-Jan-11	3.7	8.3	292	12.9
	20-Feb-11	4.3	8.0	277	12.4
	13-Mar-11	4.3	8.1	272	11.5
	17-Apr-11	5.4	8.2	280	12.9
	15-May-11	6.9	7.7	180	12.3
	12-Jun-11	8.6	8.1	290	6.7
	17-Jul-11	9.6	7.8	356	9.4
	14-Aug-11	10.6	8.5	278	10.7
	18-Sep-11	10.5	8.1	333	9.3
	16-Oct-11	8.0	7.9	356	11.0
	20-Nov-11	5.0	7.5	348	12.3
	18-Dec-11	3.7	8.3	139	12.0
	15-Jan-12	3.1	8.4	238	12.5
	19-Feb-12	3.2	8.0	261	14.1
	18-Mar-12	9.1	8.1	264	10.9
	15-Apr-12	5.7	8.5	303	10.0
	13-May-12	10.2	8.1	309	10.5
	17-Jun-12	13.5	8.3	410	12.9
	16-Jul-12	15.0	8.4	427	6.8
	14-Aug-12	12.5	8.1	454	7.4
	18-Sep-12	11.4	7.3	398	9.6
	17-Oct-12	9.4	7.4	354	7.9
	20-Nov-12	6.7	7.8	348	9.1
	18-Dec-12	6.6	7.5	743	9.5
	16-Jan-13	2.9	8.0	317	11.5
	20-Feb-13	1.9	8.0	247	14.6
	20-Mar-13	2.6	8.1	254	7.0
	16-Apr-13	6.2	8.1	248	10.0
	13-May-13	7.2	8.1	239	10.1
	19-Jun-13	9.8	8.3	339	11.4
	16-Jul-13	12.4	8.1	406	9.8
	21-Aug-13	12.5	8.2	406	9.7
	18-Sep-13	8.3	7.8	370	12.0
	16-Oct-13	10.4	8.4	379	6.5
	19-Nov-13	4.3	8.1	324	2.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Dec-13	3.7	8.6	321	4.2
	21-Jan-14	1.1	7.6	1.56	3.3
	16-Apr-14	3.4	8.2	279	10.4
	13-May-14	9.4	8.3	246	10.4
	17-Jun-14	10.8	8.4	359	10.0
	15-Jul-14	12.0	7.8	366	4.7
	23-Oct-14	7.3	8.2	428	4.3
	16-Dec-14	4.0	8.7	370	-
	20-Jan-15	1.8	7.9	344	1.4
	18-Mar-15	1.5	8.4	252	13.2
	22-Apr-15	5.5	8.1	308	12.8
	19-May-15	9.5	8.4	314	-
	15-Jun-15	10.4	8.1	373	9.3
	21-Jul-15	10.9	7.5	382	-
	11-Aug-15	11.4	8.2	414	10.0
	25-Aug-15	11.9	8.2	366	10.2
	8-Sep-15	13.1	7.8	416	9.5
	15-Oct-15	8.4	8.0	277	11.0
	18-Nov-15	7.9	8.0	421	10.3
	8-Dec-15	5.2	8.1	389	19.4
	19-Jan-16	3.4	8.1	322	14.6
	17-Feb-16	3.3	8.0	339	14.3
	15-Mar-16	5.9	7.9	276	12.6
	21-Apr-16	5.7	8.1	268	13.6
	18-May-16	7.9	8.4	304	12.4
	22-Jun-16	12.2	8.3	394	10.6
	5-Jul-16	13.5	8.4	401	14.7
	20-Jul-16	13.1	7.8	385	9.7
	9-Aug-16	14.0	8.3	246	10.9
	24-Aug-16	17.7	8.6	382	9.9
	19-Sep-16	12.7	8.1	545	
	18-Oct-16	12.9	7.8	445	12.3
	15-Nov-16	7.2	8.1	382	11.5
	12-Dec-16	0.9	7.9	481	13.9
	24-Jan-17	3.9	8.2	319	13.2
	16-Feb-17	1.4	8.3	323	15.2
	21-Mar-17	4.8	8.4	343	12.4
	19-Apr-17	8.8	8.2	286	15.7
	16-May-17	12.2	8.8	344	10.5
	28-Jun-17	8.9	8.3	351	11.7
	7-Jul-17	12.1	8.1	382	11.1
	19-Jul-17	11.6	8.4	422	10.4
	2-Aug-17	12.7	8.4	401	10.0
	15-Aug-17	12.1	8.7	347	10.5
	17-Sep-17	12.2	8.2	428	10.2
	17-Oct-17	8.9	8.2	399	10.5
	14-Nov-17	6.1	8.3	394	8.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Dec-17	3.1	8.3	360	13.4
	18-Jan-18	2.7	7.9	299	9.3
	24-Feb-18	3.3	8.2	280	13.9
	21-Mar-18	1.1	8.2	293	14.4
	18-Apr-18	0.2	8.2	255	11.9
	15-May-18	7.4	7.9	457	11.1
	18-Jun-18	8.2	8.2	504	10.1
	19-Jul-18	10.7	8.2	516	10.2
	24-Aug-18	11.9	8.3	529	9.9
	20-Sep-18	11.8	8.2	526	9.3
	25-Oct-18	6.0	8.2	539	11.4
	22-Nov-18	1.1	8.3		12.4
	13-Dec-18	4.0	8.2	516	12.1
	19-Jan-19	1.3	8.2	479.4	13.1
	19-Mar-19	3.6	8.3	438.7	12.4
SW 24B					
	10-Feb-04	2.1	8.6	338	11.4
	17-Mar-04	3.7		471	9.6
	19-Apr-04	7.1	8.1	255	
	19-May-04	11.6	8.2	380	
	24-Jun-04	12.0	8.2	437	
	29-Jul-04	12.4	8.2	453	
	26-Aug-04	10.0	8.1	386	
	22-Sep-04	10.1	8.0	412	
	20-Oct-04	7.4	8.0	387	
	17-Nov-04	6.6	8.0	416	12.0
	16-Dec-04	2.9	8.2	358	
	29-Mar-05	5.2	8.0	338	
	11-Apr-05	4.6	7.3	254	
	26-May-05	11.2	8.2	368	
	28-Jun-05	13.6	8.4	450	
	11-Jul-05	12.8	7.1	440	10.3
	22-Aug-05	10.8	8.5	410	
	28-Sep-05	9.9	7.9	415	
	24-Oct-05	7.7	8.0	536	
	15-Nov-06	7.1	8.5	235	
	12-Dec-05	2.8	8.5	393	11.8
	17-Jan-06	5.8	7.7	328	12.1
	22-Mar-06	3.9	8.4	330	
	18-Apr-06	7.4	8.3	389	
	23-May-06	7.0	8.1	458	
	20-Jun-06	9.6	7.9	495	
	11-Jul-06	10.8	7.8	519	
	23-Aug-06	11.0	7.6	577	
	20-Sep-06	10.3	7.6	564	
	19-Oct-06	8.3	7.7	533	
	27-Nov-06	7.0	7.8	534	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Dec-06	5.9	7.8	533	
	21-Jan-07	4.8	8.2	542	
	18-Mar-07	5.5	8.2	480	
	17-Apr-07	5.7	8.3	462	
	13-May-07	7.4	8.2	442	11.7
	17-Jun-07	12.2	8.3	526	10.0
	15-Jul-07	9.2	7.8	569	11.3
	17-Sep-07	10.0	7.7	420	
	18-Oct-07	11.4	8.2	629	9.3
	19-Nov-07	5.9	7.8	581	11.3
	10-Dec-07	5.8	7.9	488	11.2
	21-Jan-08	5.6	7.6	471	
	19-Feb-08	5.4	7.9	486	
	17-Mar-08	4.7	7.2	500	
	2-Apr-08	5.8	7.7	307	
	23-Apr-08	7.5	7.8	386	10.9
	6-May-08	6.5	6.8	452	11.7
	21-May-08	6.5	7.6	427	10.6
	17-Jun-08	8.9	7.8	479	9.6
	15-Jul-08	8.7	7.0	562	8.7
	18-Aug-08	9.1	7.2	619	6.6
	16-Sep-08	8.5	8.1	568	9.1
	21-Oct-08	7.0	7.9	521	8.0
	23-Nov-08	6.5	7.6	538	8.5
	14-Dec-08	5.9	7.1	433	7.0
	18-Jan-09	4.7	8.3	487	10.7
	8-Feb-09	5.4	8.7	481	9.6
	15-Mar-09	6.0	8.4	413	
	12-Apr-09	6.7	8.4	426	
	17-May-09	8.1	8.1	380	11.7
	14-Jun-09	7.9	7.4	880	
	12-Jul-09	8.0	8.4	519	12.0
	9-Aug-09	9.7	8.8	545	11.0
	13-Sep-09	9.3	8.2	532	
	11-Oct-09	6.5	8.5	548	
	15-Nov-09	6.3	7.3	512	
	13-Dec-09	5.7	7.6	572	
	17-Jan-10	5.2	8.1	555	12.1
	7-Feb-10	4.8	7.6	552	12.2
	14-Mar-10	5.9	7.8	471	12.3
	11-Apr-10	6.1	7.8	473	
	16-May-10	7.5	8.1	309	11.5
	13-Jun-10	7.5	8.0	313	14.9
	18-Jul-10	9.3	8.0	365	12.9
	15-Aug-10	9.0	8.1	377	11.6
	12-Sep-10	8.9	8.1	377	11.6
	17-Oct-10	7.4	8.0	371	11.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	14-Nov-10	6.6	8.2	320	12.2
	19-Dec-10	4.0	8.1	283	11.7
	16-Jan-11	5.6	8.3	323	11.9
	20-Feb-11	4.4	8.0	218	11.5
	13-Mar-11	5.2	8.1	299	11.0
	17-Apr-11	5.9	8.2	302	12.7
	15-May-11	6.8	7.6	254	12.4
	12-Jun-11	8.4	7.9	230	7.8
	17-Jul-11	11.0	7.8	293	9.1
	14-Aug-11	10.5	8.3	292	11.0
	18-Sep-11	9.7	8.2	352	11.1
	16-Oct-11	8.4	7.1	358	10.6
	20-Nov-11	5.8	7.5	356	12.3
	18-Dec-11	5.9	8.1	236	11.1
	15-Jan-12	5.3	8.3	262	11.5
	19-Feb-12	5.1	7.8	286	12.7
	18-Mar-12	7.5	8.0	274	11.4
	15-Apr-12	6.2	8.5	315	10.8
	13-May-12	7.5	8.0	306	11.5
	17-Jun-12	9.1	8.1	359	14.2
	16-Jul-12	11.0	8.2	415	7.8
	14-Aug-12	9.4	7.9	486	7.7
	18-Sep-12	9.1	7.1	385	10.4
	17-Oct-12	8.4	7.4	344	8.2
	20-Nov-12	6.9	7.6	363	9.1
	18-Dec-12	5.6	7.7	720	9.6
	16-Jan-13	5.7	7.9	336	11.1
	20-Feb-13	4.8	8.0	303	12.9
	20-Mar-13	4.5	8.0	253	5.5
	16-Apr-13	6.1	8.0	256	10.0
	13-May-13	7.2	8.2	241	10.2
	19-Jun-13	9.2	8.2	314	11.9
	16-Jul-13	9.0	7.9	284	10.9
	21-Aug-13	9.2	8.0	324	11.1
	18-Sep-13	8.8	7.8	383	12.3
	16-Oct-13	8.7	8.3	362	7.1
	19-Nov-13	6.5	8.3	354	2.3
	18-Dec-13	4.5	8.6	334	7.5
	21-Jan-14	4.5	8.1	320	6.5
	16-Apr-14	5.8	8.2	352	10.2
	13-May-14	7.9	8.0	306	10.2
	17-Jun-14	8.2	8.0	247	10.2
	15-Jul-14	9.1	7.7	351	4.7
	23-Oct-14	7.5	8.1	437	9.0
	16-Dec-14	5.9	8.6	412	-
	20-Jan-15	4.2	7.8	378	1.3
	18-Mar-15	3.8	8.2	281	13.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Apr-15	6.3	8.0	350	12.9
	19-May-15	7.6	8.3	290	-
	15-Jun-15	10.4	8.1	373	9.3
	21-Jul-15	8.6	7.9	357	-
	11-Aug-15	8.9	8.1	388	11.4
	8-Sep-15	10.9	7.8	417	10.5
	15-Oct-15	8.2	8.0	384	11.2
	18-Nov-15	7.1	7.9	417	12.0
	8-Dec-15	6.1	8.0	403	19.4
	19-Jan-16	4.8	7.9	338	12.8
	17-Feb-16	5.0	7.9	374	13.1
	15-Mar-16	6.4	7.8	311	12.6
	21-Apr-16	6.3	8.0	295	13.1
	18-May-16	6.6	8.3	337	12.4
	22-Jun-16	8.4	8.1	347	11.9
	20-Jul-16	9.5	8.1	393	11.2
	24-Aug-16	13.5	8.3	405	10.3
	19-Sep-16	11.1	7.9	422	10.5
	18-Oct-16	10.2	7.7	439	14.2
	15-Nov-16	6.5	8.1	381	12.6
	12-Dec-16	4.6	7.9	482	12.4
	24-Jan-17	6.1	8.1	358	11.9
	16-Feb-17	4.7	8.2	380	13.8
	21-Mar-17	5.6	8.2	365	12.1
	19-Apr-17	7.3	7.8	323	14.2
	16-May-17	8.0	8.5	336	11.9
	28-Jun-17	7.2	7.9	356	12.1
	7-Jul-17	8.3	7.9	350	12.3
	19-Jul-17	8.2	7.9	384	11.7
	15-Aug-17	8.8	8.6	329	12.5
	17-Sep-17	9.3	8.0	403	11.0
	17-Oct-17	8.0	8.0	419	11.6
	14-Nov-17	6.5	8.2	415	8.0
	14-Dec-17	5.6	8.2	398	12.5
	18-Jan-18	5.4	7.8	241	8.3
	24-Feb-18	5.6	8.1	325	12.7
	21-Mar-18	4.3	8.1	343	12.1
	19-Apr-18	5.0	8.1	318	8.9
	15-May-18	8.5	8.1	430	10.9
	18-Jun-18	11.1	8.0	490.2	10.9
	19-Jul-18	9.1	8.0	512	10.8
	24-Aug-18	10.7	8.0	506	10.4
	20-Sep-18	12.1	8.3	528	9.7
	25-Oct-18	6.6	8.1	527	11.4
	22-Nov-18	6.0	8.2		12.2
	13-Dec-18	6.3	8.1	537	11.6
	19-Jan-19	5.3	8.0	525	12.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Mar-19	5.8	8.1	454.1	11.8
SW 24C					
	19-Feb-08	4.5	8.0	475	#REF!
	17-Mar-08	3.6	7.4	491	
	2-Apr-08	3.6	7.4	491	
	23-Apr-08	8.1	7.8	377	10.2
	6-May-08	6.6	7.0	443	12.1
	21-May-08	6.8	7.6	423	11.1
	17-Jun-08	8.3	7.6	453	10.3
	15-Jul-08	9.4	7.0	552	9.5
	18-Aug-08	10.4	7.3	604	6.5
	16-Sep-08	9.0	8.2	559	9.6
	21-Oct-08	6.5	7.9	588	8.4
	23-Nov-08	5.5	7.9	285	9.6
	14-Dec-08	5.1	7.5	429	7.1
	18-Jan-09	3.9	8.5	491	11.7
	8-Feb-09	4.8		472	9.4
	15-Mar-09	5.6	8.6	412	
	12-Apr-09	6.8	8.4	426	
	17-May-09	9.7	8.2	337	11.2
	14-Jun-09	8.6	7.6	907	
	12-Jul-09	8.5	8.3	514	
	9-Aug-09	10.5	8.4	530	10.6
	13-Sep-09	9.9	8.1	506	
	11-Oct-09	6.3	8.4	549	
	15-Nov-09	5.6	7.3	499	
	13-Dec-09	4.2	7.7	540	
	17-Jan-10	3.7	8.2	533	12.9
	7-Feb-10	2.9	7.7	506	12.1
	14-Mar-10	5.5	7.8	470	12.8
	11-Apr-10	5.9	7.3	462	
	16-May-10	8.2	8.2	313	11.4
	13-Jun-10	8.4	8.1	327	14.1
	18-Jul-10	10.5	8.1	381	12.7
	15-Aug-10	10.2	8.2	378	11.0
	17-Oct-10	7.2	8.0	374	11.5
	14-Nov-10	6.5	8.2	317	12.3
	19-Dec-10	4.8	8.1	306	12.3
	16-Jan-11	4.9	8.4	311	12.3
	20-Feb-11	4.4	8.1	219	11.6
	13-Mar-11	4.9	8.2	242	11.5
	17-Apr-11	5.7	8.2	278	12.9
	15-May-11	6.8	7.7	252	13.3
	12-Jun-11	8.3	8.0	288	6.5
	17-Jul-11	11.1	7.9	364	12.6
	14-Aug-11	10.5	8.3	284	10.8
	18-Sep-11	9.5	8.3	344	10.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Oct-11	8.2	7.9	349	11.2
	20-Nov-11	5.1	7.6	219	12.7
	15-Jan-12	4.3	8.3	257	12.2
	19-Feb-12	4.4	8.1	276	12.3
	18-Mar-12	7.8	8.1	273	11.4
	15-Apr-12	5.9	8.4	309	11.1
	13-May-12	8.3	8.0	310	11.4
	17-Jun-12	10.3	8.1	369	14.6
	16-Jul-12	12.4	8.2	419	7.3
	14-Aug-12	10.1	7.8	472	7.5
	18-Sep-12	10.0	7.4	392	9.9
	17-Oct-12	8.3	7.2	349	8.2
	20-Nov-12	6.9	7.8	357	9.3
	18-Dec-12	6.2	7.5	741	9.6
	16-Jan-13	4.8	8.1	349	11.6
	20-Feb-13	3.1	8.1	284	14.2
	20-Mar-13	4.1	8.0	277	6.4
	16-Apr-13	6.1	8.0	253	10.1
	14-May-13	7.2	8.2	238	10.1
	19-Jun-13	8.2	8.1	329	12.0
	16-Jul-13	10.4	7.9	371	10.1
	21-Aug-13	10.4	7.9	393	10.4
	18-Sep-13	8.5	7.8	375	11.9
	16-Oct-13	8.9	8.1	289	7.0
	19-Nov-13	5.6	8.3	324	2.4
	18-Dec-13	3.5	8.6	297	7.0
	22-Jan-14	2.6	7.3	304	3.1
	18-Mar-14	3.8	7.1	330	5.4
	16-Apr-14	5.2	8.2	338	11.3
	13-May-14	8.7	8.0	207	10.4
	17-Jun-14	9.7	8.2	324	12.0
	15-Jul-14	10.5	8.7	366	5.2
	19-Aug-14	9.1	8.4	410	10.0
	9-Sep-14	10.4	8.4	437	4.0
	23-Oct-14	7.5	8.1	435	8.7
	16-Dec-14	5.0	8.8	392	-
	20-Jan-15	3.3	7.8	367	1.4
	18-Mar-15	2.5	8.3	266	13.2
	22-Apr-15	6.1	8.0	317	13.1
	19-May-15	8.1	8.3	296	-
	15-Jun-15	10.4	8.1	373	9.3
	21-Jul-15	9.6	7.9	368	-
	11-Aug-15	9.6	8.2	396	11.3
	8-Sep-15	12.1	7.8	422	9.6
	15-Oct-15	8.2	8.0	374	10.5
	18-Nov-15	7.4	7.9	350	12.5
	8-Dec-15	5.7	8.1	397	19.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Jan-16	4.1	8.0	329	14.6
	17-Feb-16	4.2	7.7	358	13.2
	15-Mar-16	6.4	7.9	307	12.9
	21-Apr-16	6.4	8.0	299	12.9
	18-May-16	6.8	8.4	338	11.7
	22-Jun-16	10.2	8.3	367	11.3
	20-Jul-16	11.1	8.1	357	10.4
	24-Aug-16	10.8	8.1	388	11.2
	19-Sep-16	12.2	8.1	567	10.2
	18-Oct-16	11.6	7.8	438	12.0
	15-Nov-16	6.7	8.1	386	11.8
	12-Dec-16	3.8	7.8	482	12.6
	24-Jan-17	5.7	8.1	350	12.1
	16-Feb-17	3.6	8.2	336	13.7
	21-Mar-17	5.2	8.2	356	12.1
	19-Apr-17	7.6	7.9	321	13.7
	16-May-17	9.2	8.6	340	11.4
	28-Jun-17	8.0	8.1	354	12.0
	19-Jul-17	9.3	8.1	385	11.4
	15-Aug-17	9.8	8.6	334	11.0
	17-Sep-17	10.5	8.0	418	10.7
	17-Oct-17	8.3	8.1	413	11.4
	14-Nov-17	6.4	8.2	410	8.3
	14-Dec-17	4.2	8.0	376	13.5
	18-Jan-18	4.4	7.9	348	9.3
	24-Feb-18	5.3	8.3	322	13.6
	21-Mar-18	2.8	8.2	327	13.6
	19-Apr-18	3.9	8.2	307	10.7
	15-May-18	7.9	8.0	450	11.0
	18-Jun-18	9.8	8.1	493.6	10.6
	19-Jun-18	9.9	8.1	514	10.4
	23-Aug-18	11.4	8.1	530	9.9
	20-Sep-18	11.8	8.2	539	9.5
	25-Oct-18	6.0	8.3	548	11.2
	22-Nov-18	4.0	8.3		12.4
	12-Dec-18	5.5	8.1	531	11.9
	18-Jan-19	4.0	8.2	513	12.4
	15-Mar-19	5.3	8.3	451.4	11.9
SW 25					
	11-Feb-04	1.2	8.5	220	10.1
	17-Mar-04	1.6	8.6	353	6.2
	19-Apr-04	9.0	8.3	254	
	19-May-04	17.3	8.4	344	
	24-Jun-04	18.9	8.5	308	9.0
	29-Jul-04	22.4	8.7	564	7.6
	20-Oct-04	9.5	8.1	244	10.3
	11/17/2004	4.0	8.2	204	

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Dec-04	1.0	7.8	182	
	29-Mar-05	1.1	7.3	258	6.4
	11-Apr-05	2.6	6.4	222	7.2
	24-May-05	14.0	8.0	327	10.2
	28-Jun-05	24.7	8.2	389	
	11-Jul-05	19.4	6.7	304	#REF!
	22-Aug-05	17.2	7.1	290	8.1
	14-Nov-05	7.1	8.5	235	
	12-Dec-05	0.6	8.7	218	13.3
	20-Mar-06	1.9	8.0	260	3.7
	18-Apr-06	9.9	8.2	365	
	23-May-06	10.3	8.7	408	
	20-Jun-06	19.5	8.4	354	
	11-Jul-06	19.3	8.4	302	
	18-Oct-06	9.4	7.9	363	
	27-Nov-06	4.0	8.5	329	
	17-Dec-06	1.0	8.2	374	
	21-Jan-07	2.3	8.4	472	
	15-Apr-07	2.4	8.3	410	13.7
	13-May-07	15.9	8.6	371	9.8
	17-Jun-07	23.5	8.6	342	8.2
	12-Dec-07	1.1	8.3	347	12.9
	21-Jan-08	1.9	7.2	369	9.2
	20-Feb-08	1.4	7.9	424	12.5
	18-Mar-08	1.3	7.8	432	5.4
	2-Apr-08	0.9	7.6	428	5.3
	21-Apr-08	13.1	7.6	385	7.9
	21-May-08	11.8	7.9	364	8.7
	17-Jun-08	19.6	7.8	340	6.4
	15-Jul-08	19.3	7.4	394	6.5
	17-Sep-08	16.2	8.8	343	5.8
	20-Oct-08	10.3	8.1	304	8.5
	23-Nov-08	2.2	8.5	344	8.6
	14-Dec-08	1.8	7.5	305	7.2
	18-Jan-09	1.2	8.4	348	9.2
	8-Feb-09	1.3		410	7.2
	15-Mar-09	3.1	7.7	352	9.7
	12-Apr-09	7.8	8.2	437	
	17-May-09	16.0	8.5	337	9.5
	14-Jun-09	19.1	8.2	697	8.9
	12-Jul-09	19.0	7.7	355	7.9
	9-Aug-09	21.6	9.0	327	8.7
	13-Sep-09	17.0	8.3	299	8.9
	11-Oct-09	7.1	8.1	329	12.2
	15-Nov-09	6.3	8.3	309	
	13-Dec-09	0.5	7.6	352	
	17-Jan-10	0.8	7.5		12.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	7-Feb-10	0.8	7.5	368	11.9
	14-Mar-10	1.5	8.1	395	8.6
	11-Apr-10	10.7	8.0	392	12.2
	16-May-10	14.7	8.5	298	10.4
	13-Jun-10	21.6	8.5	353	12.0
	18-Jul-10	23.7	7.7	358	9.5
	15-Aug-10	24.2	8.7	298	6.6
	12-Sep-10	16.0	8.7	276	8.3
	17-Oct-10	9.7	8.5	222	10.7
	14-Nov-10	5.2	8.2	189	8.8
	19-Dec-10	0.8	8.5	182	12.6
	16-Jan-11	1.3	8.3	205	9.6
	20-Feb-11	1.1	8.2	227	6.8
	13-Mar-11	1.3	7.8	158	6.5
	17-Apr-11	4.0	8.0	263	11.8
	15-May-11	12.4	8.2	278	11.5
	12-Jun-11	18.5	8.6	267	10.3
	17-Jul-11	23.7	8.6	293	6.6
	14-Aug-11	20.3	8.8	209	8.0
	18-Sep-11	14.4	9.0	215	9.1
	16-Oct-11	10.2	8.4	240	9.7
	20-Nov-11	2.5	8.3	181	12.0
	18-Dec-11	1.1	8.2	161	13.7
	15-Jan-12	1.3	8.2	164	11.3
	19-Feb-12	1.5	8.1	198	11.4
	18-Mar-12	7.5	7.6	244	8.6
	15-Apr-12	9.5	8.6	286	10.5
	13-May-12	16.9	8.3	323	8.6
	17-Jun-12	21.1	8.5	322	5.7
	16-Jul-12	21.8	8.7	291	6.0
	14-Aug-12	21.3	9.0	420	7.1
	18-Sep-12	16.8	8.3	257	8.4
	17-Oct-12	9.5	7.0	220	8.2
	20-Nov-12	4.4	7.9	191	4.4
	17-Dec-12	1.7	7.7	213	-
	15-Jan-13	1.7	7.7	258	10.1
	20-Feb-13	1.9	7.7	218	9.0
	19-Mar-13	2.2	7.7	213	6.3
	15-Apr-13	4.8	7.5	284	6.3
	13-May-13	12.2	8.4	302	6.5
	18-Jun-13	21.4	8.5	337	7.6
	16-Jul-13	26.9	8.3	345	5.7
	20-Aug-13	21.3	8.5	258	6.6
	18-Sep-13	15.4	8.4	268	8.8
	16-Oct-13	14.1	9.4	258	6.8
	19-Nov-13	2.9	8.6	210	2.1
	18-Dec-13	0.9	8.2	214	8.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Apr-14	1.6	7.6	182	10.3
	12-May-14	15.0	8.2	352	8.7
	17-Jun-14	20.9	8.5	346	8.7
	14-Jul-14	22.1	9.4	363	0.2
	18-Aug-14	20.5	8.8	327	6.4
	8-Sep-14	21.0	9.4	331	9.0
	22-Oct-14	8.6	7.5	416	6.9
	19-Nov-14	0.2	7.9	166	6.2
	16-Dec-14	0.6	8.4	176	-
	22-Apr-15	8.1	8.1	340	12.0
	19-May-15	18.2	8.6	311	-
	15-Jun-15	21.8	8.5	342	9.3
	21-Jul-15	23.3	9.0	310	-
	12-Aug-15	20.4	8.6	320	8.3
	8-Sep-15	21.0	8.1	315	8.9
	15-Oct-15	11.8	8.0	259	10.1
	18-Nov-15	5.7	8.1	254	12.2
	8-Dec-15	2.4	8.4	236	19.4
	19-Jan-16	0.4	8.1	205	17.1
	17-Feb-16	1.2	7.8	243	15.2
	15-Mar-16	2.4	7.9	230	11.7
	20-Apr-16	11.7	7.9	315	12.4
	17-May-16	11.7	8.5	355	10.6
	22-Jun-16	17.7	8.5	340	8.5
	24-Aug-16	11.5	8.1	402	10.3
	15-Nov-16	7.6	8.3	396	11.4
	12-Dec-16	0.6	7.9	340	15.3
	24-Jan-17	1.2	8.3	258	13.0
	15-Feb-17	1.1	8.2	266	11.7
	21-Mar-17	3.4	8.0	301	10.3
	19-Apr-17	9.4	8.0	313	14.0
	16-May-17	12.8	8.6	436	12.4
	28-Jun-17	19.1	8.5	341	9.7
	18-Jul-17	23.1	7.3	365	7.8
	15-Aug-17	21.0	8.5	278	10.0
	17-Sep-17	19.6	8.6	328	10.1
	17-Oct-17	11.8	8.4	279	10.5
	14-Nov-17	2.4	8.1	235	14.3
	14-Dec-17	-0.2	8.0	229	19.5
SW 26					
	11-Feb-04	0.2	8.2	157	11.9
	18-Mar-04	0.2	7.3		8.9
	19-Apr-04	5.7	7.5	96	
	19-May-04	13.1	7.6	200	9.7
	24-Jun-04	13.4	8.0	263	9.9
	29-Jul-04	15.1	7.9	521	8.6
	17-Nov-04	5.5	7.6	192	10.0

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	29-Mar-05	2.3	7.4	159	
	11-Apr-05	0.6	7.0	115	11.0
	26-May-05	10.1	7.3	182	10.3
	28-Jun-05	19.1	8.0	314	9.2
	14-Dec-05	0.1	7.7	122	2.7
	21-Mar-06	0.3	8.0	195	12.1
	19-Apr-06	6.7	7.7	147	
	23-May-06	10.0	7.7	201	
	21-Jun-06	13.2	7.4	336	
	19-Oct-06	9.3	7.6	292	
	23-Nov-06	3.0	7.5	232	12.5
	17-Dec-06	1.4	7.4	221	12.7
	16-Apr-07	0.5	8.0	206	12.6
	13-May-07	9.6	8.2	225	10.3
	17-Jun-07	15.5	8.1	334	8.2
	10-Dec-07	1.4	9.0	257	13.2
	19-Feb-08	0.3	7.9	198	10.3
	17-Mar-08	0.6	7.2	233	
	1-Apr-08	0.2	7.7	198	13.6
	21-Apr-08	7.0	7.2	134	9.0
	21-May-08	6.2	7.8	201	8.5
	17-Jun-08	11.9	7.8	250	7.6
	15-Jul-08	13.8	6.9	372	6.4
	19-Aug-08	13.2	7.9	347	5.6
	16-Sep-08	11.4	7.5	235	6.6
	21-Oct-08	4.6	7.9	158	8.1
	8-Feb-09	1.0	9.2	232	8.9
	15-Mar-09	0.8	7.7	155	
	12-Apr-09	2.5	8.0	215	13.3
	17-May-09	14.1	7.8	207	9.5
	14-Jun-09	13.0	7.3	528	8.0
	12-Jul-09	11.5	8.4	347	8.1
	11-Oct-09	4.3	7.5	450	11.4
	15-Nov-09	4.3	7.7	237	9.7
	14-Mar-10	2.3	8.2	218	11.1
	11-Apr-10	7.5	8.2	199	12.6
	16-May-10	8.6	7.2	147	7.9
	13-Jun-10	14.1	7.6	202	9.4
	18-Jul-10	17.9	7.4	246	7.1
	15-Aug-10	17.4	7.7	364	6.0
	12-Sep-10	12.6	7.9	251	8.1
	17-Oct-10	8.5	7.5	225	6.9
	14-Nov-10	4.2	7.7	127	9.2
	13-Mar-11	0.7	8.3	132	9.2
	17-Apr-11	2.6	8.2	117	12.0
	15-May-11	8.0	7.6	121	9.8
	12-Jun-11	13.7	7.5	166	7.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Oct-11	9.4	7.4	196	6.9
	20-Nov-11	2.1	8.2	162	10.7
	18-Mar-12	5.6	7.5	107	7.1
	15-Apr-12	7.1	8.7	158	10.8
	13-May-12	13.7	7.6	191	7.7
	17-Jun-12	18.7	8.0	280	7.9
	19-Sep-12	9.6	7.8	174	8.8
	17-Oct-12	9.6	7.0	170	5.8
	21-Nov-12	3.2	8.0	100	4.4
	18-Dec-12	1.3	7.0	243	8.0
	15-Jan-13	0.1	7.2	122	7.9
	16-Apr-13	0.3	7.5	116	6.4
	13-May-13	8.6	7.5	263	9.0
	19-Jun-13	11.9	8.0	195	8.2
	17-Jul-13	18.4	7.7	267	4.3
	20-Aug-13	16.7	8.1	317	8.0
	19-Sep-13	13.0	8.2	269	4.9
	17-Oct-13	10.9	8.3	209	3.7
	19-Nov-13	1.8	8.7	126	1.8
	16-Apr-14	-0.1	8.2	214	8.2
	12-May-14	12.5	7.5	149	4.5
	18-Jun-14	13.6	7.7	220	8.0
	15-Jul-14	15.0	7.8	240	7.1
	19-Aug-14	12.9	8.5	220	4.0
	8-Sep-14	15.0	8.6	283	7.0
	20-Oct-14	10.2	8.4	378	6.7
	21-Apr-15	3.5	7.4	-	9.6
	19-May-15	11.7	8.0	181	11.9
	15-Jun-15	13.7	7.6	189	6.6
	22-Jul-15	13.8	7.8	283	8.3
	12-Aug-15	14.2	7.8	245	7.9
	9-Sep-15	17.2	7.8	284	5.3
	19-Nov-15	8.0	7.2	187	10.2
	8-Dec-15	2.5	7.1	152	12.2
	15-Mar-16	0.2	6.5	101	10.7
	21-Apr-16	5.2	7.8	109	10.8
	18-May-16	9.3	7.8	155	9.2
	23-Jun-16	12.6	7.9	289	6.0
	15-Nov-16	4.0	7.5	245	6.8
	12-Dec-16	0.0	7.2	287	11.3
	25-Jan-17	1.0	7.6	140	11.1
	21-Mar-17	0.8	7.8	162	10.0
	19-Apr-17	6.4	7.8	125	9.7
	16-May-17	12.9	7.6	156	7.1
	28-Jun-17	13.8	7.5	214	6.6
	20-Jul-17	15.1	7.7	282	6.7
	16-Aug-17	15.4	7.7	338	6.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	17-Sep-17	15.7	7.6	271	7.2
	17-Oct-17	10.0	7.6	210	6.1
	14-Nov-17	3.0	7.9	178	7.1
SW 26A					
	11-Feb-04	0.3	8.4	159	10.5
	18-Mar-04	0.3		191	6.9
	19-Apr-04	5.6	7.3	93	11.7
	19-May-04	12.8	7.3	195	7.3
	24-Jun-04	11.6	7.6	255	8.3
	29-Jul-04	15.2	7.6	523	7.7
	17-Nov-04	6.0	7.3	180	10.1
	29-Mar-05	2.3	7.4	156	12.0
	11-Apr-05	0.3	6.9	113	9.4
	26-May-05	9.7	6.8	177	8.2
	28-Jun-05	18.8	8.1	301	8.9
	14-Dec-05	0.2	7.7	140	5.9
	17-Jan-06	0.4	7.4	106	11.0
	21-Mar-06	0.3	7.9	120	10.7
	19-Apr-06	6.1	7.7	147	
	23-May-06	9.9	7.9	201	
	21-Jun-06	12.8	7.3	319	
	19-Oct-06	8.9	7.5	268	
	23-Nov-06	2.8	7.6	224	10.6
	17-Dec-06	1.3	7.3	210	11.3
	16-Apr-07	0.4	8.2	203	10.9
	13-May-07	9.0	8.4	217	8.1
	17-Jun-07	15.4	8.0	332	7.5
	19-Feb-08	0.3	7.7	220	11.4
	17-Mar-08	0.6	7.6	228	
	1-Apr-08	0.2	7.3	195	10.5
	21-Apr-08	6.8	6.9	145	8.1
	21-May-08	6.6	7.9	99	6.6
	17-Jun-08	12.1	7.9	268	6.9
	15-Jul-08	13.6	7.3	358	6.3
	19-Aug-08	13.4	8.1	201	5.4
	16-Sep-08	11.3	7.6	233	5.6
	21-Oct-08	5.2	8.3	204	8.5
	15-Mar-09	0.6	7.9	201	12.0
	12-Apr-09	1.6	7.5	226	12.6
	17-May-09	13.5	7.3	267	7.3
	14-Jun-09	13.8	7.3	411	9.7
	12-Jul-09	11.6	8.4	354	8.4
	9-Aug-09	15.4	8.4	256	6.0
	11-Oct-09	4.5	7.6	440	12.0
	15-Nov-09	4.1	7.6	230	9.9
	14-Mar-10	1.0	8.4	226	13.3
	11-Apr-10	7.0	8.6	216	12.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-May-10	8.6	7.4	142	7.1
	13-Jun-10	14.4	7.6	178	4.5
	18-Jul-10	17.4	7.5	2.46	8.2
	15-Aug-10	16.9	7.5	355	7.4
	12-Sep-10	12.7	7.8	284	7.1
	17-Oct-10	8.4	7.6	218	6.9
	13-Mar-11	0.4	8.2	120	8.4
	17-Apr-11	2.5	7.8	128	9.9
	15-May-11	8.0	7.6	127	8.2
	12-Jun-11	13.6	7.7	188	7.4
	16-Oct-11	9.5	7.6	196	6.0
	20-Nov-11	3.7	8.4	183	7.0
	18-Mar-12	5.6	8.1	99	7.5
	15-Apr-12	6.7	9.0	152	9.4
	13-May-12	12.6	7.8	187	7.5
	17-Jun-12	17.4	8.3	278	7.7
	19-Sep-12	9.9	8.0	209	8.1
	17-Oct-12	9.8	7.7	171	5.5
	21-Nov-12	3.6	8.2	116	4.7
	18-Dec-12	1.1	7.1	210	7.8
	15-Jan-13	0.0	7.4	119	7.3
	16-Apr-13	0.1	7.6	115	5.9
	13-May-13	8.5	7.5	255	9.2
	19-Jun-13	12.1	8.4	224	8.1
	17-Jul-13	18.5	7.4	264	4.1
	20-Aug-13	16.4	8.1	318	7.0
	19-Sep-13	12.7	8.5	276	4.2
	17-Oct-13	10.9	8.7	305	3.5
	19-Nov-13	1.7	8.7	123	1.8
	12-May-14	12.3	7.2	138	4.5
	18-Jun-14	13.9	7.5	220	7.3
	15-Jul-14	15.0	7.8	231	8.2
	19-Aug-14	18.2	8.6	241	5.3
	8-Sep-14	15.1	8.6	334	7.1
	20-Oct-14	10.3	8.3	385	6.9
	21-Apr-15	3.3	7.6	-	8.9
	19-May-15	11.6	7.9	176	12.0
	15-Jun-15	13.7	7.5	187	5.9
	22-Jul-15	14.1	7.8	280	8.6
	12-Aug-15	14.2	7.9	270	8.2
	9-Sep-15	17.1	7.6	288	4.9
	19-Nov-15	8.0	7.3	177	10.3
	8-Dec-15	2.5	7.1	148	12.5
	20-Jan-16	0.0	7.2	129	9.5
	17-Feb-16	0.0	8.0	133	8.2
	15-Mar-16	0.1	6.6	114	10.3
	21-Apr-16	5.2	7.6	109	10.6

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-May-16	9.0	7.9	149	8.7
	23-Jun-16	12.9	8.2	263	8.6
	15-Nov-16	4.3	8.0	215	9.4
	12-Dec-16	0.0	7.6	259	12.4
	24-Jan-17	0.9	7.9	138	11.2
	17-Feb-17	0.4	8.3	159	12.6
	21-Mar-17	0.4	8.1	157	10.1
	19-Apr-17	6.3	7.3	124	9.4
	16-May-17	12.7	7.7	170	6.9
	28-Jun-17	13.8	7.6	208	6.0
	20-Jul-17	15.1	7.6	270	6.1
	16-Aug-17	15.4	7.9	213	5.9
	17-Sep-17	15.7	7.9	310	7.0
	17-Oct-17	9.8	8.1	197	6.3
	14-Nov-17	2.8	8.1	173	7.4
	14-Dec-17	-0.4	8.2	81	8.6
SW 27					
	20-Oct-04	3.7	8.0	300	12.9
	15-Dec-04	0.1	7.9	232	9.3
	29-Mar-05	5.8	8.1	312	
	11-Apr-05	7.3	7.5	250	
	24-May-05	8.4	7.8	313	
	28-Jun-05	14.5	8.3	392	#REF!
	11-Jul-05	13.1	6.5	372	10.3
	22-Aug-05	11.7	8.3	336	
	27-Sep-05	10.5	7.6	323	10.7
	24-Oct-05	6.1	8.0	399	
	14-Nov-05	5.0	8.4	305	12.0
	12-Dec-05	0.1	8.6	263	7.9
	17-Jan-06	1.0	7.9	268	
	20-Mar-06	5.9	8.7	276	12.3
	18-Apr-06	10.0	8.4	296	
	23-May-06	8.7	8.3	415	
	20-Jun-06	11.2	8.3	424	
	11-Jul-06	12.7	8.3	405	
	23-Aug-06	12.2	7.9	412	
	20-Sep-06	9.9	8.1	351	
	18-Oct-06	11.1	7.8	428	
	27-Nov-06	7.6	8.2	468	11.7
	17-Dec-06	4.6	8.2	497	
	16-Apr-07	5.1	8.4	383	
	13-May-07	9.8	8.3	406	
	17-Jun-07	11.6	8.3	441	10.7
	15-Jul-07	11.4	8.0	463	10.6
	19-Aug-07	12.6	8.3	444	9.9
	17-Sep-07	9.5	7.9	417	10.4
	18-Oct-07	10.8	8.0	429	9.2

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	19-Nov-07	3.7	8.5	455	
	22-Jan-08	4.6	7.3	389	
	20-Feb-08	4.0	8.0	436	
	17-Mar-08	5.6	7.8	454	
	1-Apr-08	5.7	7.8	399	
	23-Apr-08	7.9	7.9	295	10.6
	21-May-08	9.3	6.7	384	10.5
	17-Jun-08	7.5	7.8	443	9.9
	15-Jul-08	9.2	6.9	415	9.0
	18-Aug-08	11.0	6.6	524	5.8
	16-Sep-08	8.7	8.0	484	8.9
	20-Oct-08	7.9	7.5	436	8.0
	23-Nov-08	6.2		508	8.3
	14-Dec-08	5.7	7.4	413	7.7
	18-Jan-09	4.3	8.4	392	8.8
	8-Feb-09	6.6		351	8.1
	15-Mar-09	7.4	8.2	367	
	12-Apr-09	7.5	8.3	329	
	17-May-09	10.1	8.3	352	
	14-Jun-09	9.1	7.2	825	
	12-Jul-09	8.7	8.1	466	
	9-Aug-09	7.6	8.3	485	
	13-Sep-09	9.4	8.9	419	
	11-Oct-09	6.0	7.4	466	
	15-Nov-09	5.8	7.8	419	
	13-Dec-09	3.8	7.9	484	12.5
	17-Jan-10	4.7	7.7		12.2
	7-Feb-10	3.0	7.8	470	13.0
	14-Mar-10	7.2	7.9	447	12.1
	11-Apr-10	7.4	7.6	413	12.9
	16-May-10	8.1	8.1	301	11.5
	13-Jun-10	8.7	8.1	217	14.9
	18-Jul-10	9.2	8.0	332	12.1
	15-Aug-10	10.2	8.1	344	10.3
	12-Sep-10	8.8	8.0	163	11.1
	17-Oct-10	7.6	7.9	323	11.4
	14-Nov-10	6.8	8.0	273	17.6
	19-Dec-10	5.0	8.2	245	11.9
	16-Jan-11	4.6	8.1	244	11.3
	20-Feb-11	4.7	8.1	288	11.6
	13-Mar-11	7.0	8.2	311	10.7
	17-Apr-11	6.5	8.2	213	11.8
	15-May-11	6.6	7.3	216	13.4
	12-Jun-11	8.2	7.8	262	7.3
	17-Jul-11	9.9	7.7	316	9.3
	14-Aug-11	10.9	8.1	240	11.3
	18-Sep-11	9.3	7.9	278	10.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-Oct-11	8.2	8.0	300	10.7
	20-Nov-11	4.6	7.4	296	12.8
	18-Dec-11	5.5	8.3	245	11.2
	15-Jan-12	5.6	8.1	251	12.0
	19-Feb-12	5.4	7.4	264	12.1
	18-Mar-12	8.1	7.9	210	11.1
	15-Apr-12	6.3	8.7	289	11.6
	13-May-12	10.3	8.0	320	9.6
	17-Jun-12	10.5	8.1	348	8.7
	16-Jul-12	12.2	8.1	336	6.3
	14-Aug-12	10.2	7.8	464	9.2
	18-Sep-12	9.9	7.0	339	10.3
	17-Oct-12	8.3	6.8	300	7.9
	20-Nov-12	7.6	7.8	337	9.1
	18-Dec-12	6.7	7.7	651	10.4
	15-Jan-13	6.0	7.9	357	11.4
	20-Feb-13	5.0	8.3	282	13.0
	19-Mar-13	5.5	8.1	243	11.5
	16-Apr-13	6.8	7.5	262	9.8
	13-May-13	7.5	7.9	268	10.5
	18-Jun-13	8.6	7.9	292	8.7
	16-Jul-13	10.0	7.9	347	10.5
	21-Aug-13	10.3	8.0	339	10.8
	19-Sep-13	8.5	7.9	317	12.1
	16-Oct-13	9.0	8.5	333	7.1
	19-Nov-13	5.9	7.7	322	4.0
	17-Dec-13	5.4	8.1	298	4.2
	21-Jan-14	3.6	7.5	286	3.1
	20-Feb-14	3.3	7.5	277	8.5
	18-Mar-14	2.3	7.6	285	4.0
	15-Apr-14	5.1	8.0	192	12.2
	12-May-14	9.1	7.1	265	10.2
	17-Jun-14	8.9	8.2	315	10.0
	14 ju;y 14	9.2	8.9	370	2.6
	18-Aug-14	9.5	8.8	371	7.2
	8-Sep-14	10.3	8.9	379	11.0
	23-Oct-14	7.9	8.0	403	4.3
	16-Dec-14	5.7	8.7	371	-
	20-Jan-15	3.9	7.2	342	2.0
	18-Mar-15	4.9	8.4	250	12.2
	21-Apr-15	6.6	8.0	219	11.3
	19-May-15	8.2	8.3	290	14.6
	15-Jun-15	11.8	8.2	356	9.8
	21-Jul-15	12.6	8.2	340	-
	11-Aug-15	13.0	8.2	356	10.0
	8-Sep-15	13.1	7.9	356	9.2
	15-Oct-15	8.1	8.0	299	10.5

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Nov-15	7.6	8.0	357	12.2
	8-Dec-15	5.3	8.2	341	15.9
	19-Jan-16	1.8	8.0	276	15.3
	17-Feb-16	4.0	8.0	326	13.8
	15-Mar-16	7.0	7.9	276	12.7
	20-Apr-16	6.3	7.9	149	13.4
	17-May-16	10.2	8.5	348	11.7
	22-Jun-16	10.5	8.5	342	10.9
	20-Jul-16	12.3	8.5	361	10.4
	24-Aug-16	14.4	8.1	368	5.2
	19-Sep-16	13.3	8.0	360	6.6
	17-Oct-16	11.5	8.1	373	8.5
	15-Nov-16	7.2	8.2	471	11.9
	12-Dec-16	2.0	7.7	421	12.5
	24-Jan-17	4.9	8.3	247	13.0
	16-Feb-17	2.1	8.2	318	15.1
	21-Mar-17	7.2	8.3	357	12.0
	19-Apr-17	8.7	8.2	292	13.9
	16-May-17	9.9	8.8	293	12.0
	28-Jun-17	8.5	8.1	336	11.8
	18-Jul-17	9.9	8.3	355	11.7
	15-Aug-17	10.1	8.7	287	11.8
	17-Sep-17	11.5	8.1	361	10.2
	17-Oct-17	8.4	8.2	348	11.0
	14-Nov-17	6.3	8.3	360	8.6
	14-Dec-17	3.6	8.2	335	14.1
SW 77					
	13-Dec-09				
	17-Jan-10	5.6	8.2	164	11.3
	7-Feb-10	5.7	8.4	449	12.6
	14-Mar-10	6.0	-	383	12.5
	11-Apr-10	5.9	7.5	407	12.9
	16-May-10	7.0	7.6	264	10.5
	13-Jun-10	7.9	7.5	286	12.7
	18-Jul-10	9.2	7.3	298	12.7
	15-Aug-10	10.0	7.6	326	8.6
	12-Sep-10	10.6	7.7	261	11.1
	17-Oct-10	10.2	7.0	327	8.6
	21-Oct-10	10.0	6.9	354	8.7
	14-Nov-10	9.4	7.5	294	13.7
	17-Apr-11	5.4	8.1	253	12.0
	15-May-11	6.0	7.7	219	12.8
	12-Jun-11	7.7	7.5	253	5.8
	17-Jul-11	9.4	7.3	306	10.1
	14-Aug-11	10.6	8.7	240	10.9
	16-Oct-11	10.5	8.0	353	9.1
	20-Nov-11	8.7	8.3	321	10.1

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	18-Dec-11	8.2	8.6	225	9.2
	15-Jan-12	7.0	8.2	242	10.3
	19-Feb-12	6.5	7.1	244	12.5
	18-Mar-12	5.9	7.5	214	13.3
	15-Apr-12	6.3	8.8	287	12.5
	13-May-12	7.0	7.5	281	9.5
	17-Jun-12	8.3	7.6	274	6.6
	16-Jul-12	10.8	7.8	346	6.1
	14-Aug-12	10.1	7.7	225	9.0
	18-Sep-12	11.0	6.6	348	8.2
	17-Oct-12	10.6	7.9	318	7.5
	20-Nov-12	9.3	8.0	343	8.5
	18-Dec-12	8.4	7.7	713	9.2
	15-Jan-13	7.4	7.9	306	10.3
	20-Feb-13	6.4	7.8	234	10.1
	19-Mar-13	5.9	8.1	214	12.2
	16-Apr-13	0.2	6.9	194	10.0
	13-May-13	6.1	7.4	265	11.0
	18-Jun-13	8.2	7.9	296	8.7
	16-Jul-13	9.9	8.2	333	9.9
	16-Oct-13	10.1	9.9	336	6.3
	19-Nov-13	8.9	7.3	338	6.3
	17-Dec-13	8.0	8.1	269	6.9
	18-Mar-14	4.3	6.8	280	6.0
	15-Apr-14	4.6	7.8	191	10.2
	12-May-14	6.8	7.8	252	3.3
	17-Jun-14	7.8	7.8	306	11.2
	14-Jul-14	8.7	8.9	341	1.9
	18-Aug-14	9.6	8.5	341	4.3
	8-Sep-14	10.4	8.5	378	9.9
	23-Oct-14	9.3	8.1	435	8.5
	18-Mar-15	5.7	7.6	253	10.6
	21-Apr-15	5.4	7.5	202	11.9
	19-May-15	6.4	7.9	268	14.5
	15-Jun-15	7.3	7.6	329	9.6
	21-Jul-15	13.0	8.0	358	-
	11-Aug-15	13.0	7.9	342	9.4
	25-Aug-15	10.3	7.7	325	11.4
	8-Sep-15	14.2	7.8	372	9.6
	15-Oct-15	8.8	7.8	304	9.9
	18-Nov-15	8.3	7.8	360	10.0
	8-Dec-15	6.3	7.9	344	14.6
	19-Jan-16	4.1	7.9	259	13.4
	17-Feb-16	5.1	7.9	321	12.3
	15-Mar-16	6.3	7.7	237	13.0
	20-Apr-16	6.5	7.3	291	12.6
	17-May-16	10.0	8.0	353	11.9

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	22-Jun-16	9.1	7.9	336	10.9
	5-Jul-16	10.7	8.0	267	16.3
	20-Jul-16	11.4	8.3	355	10.3
	9-Aug-16	14.9	8.1	345	11.8
	24-Aug-16	12.9	8.2	356	11.0
	19-Sep-16	13.1	8.2	374	9.4
	17-Oct-16	12.1	7.9	340	8.9
	15-Nov-16	8.7	7.4	480	9.7
	12-Dec-16	5.0	8.0	431	12.1
	24-Jan-17	6.5	7.6	267	12.0
	16-Feb-17	4.4	8.1	331	13.6
	21-Mar-17	6.5	8.0	349	12.1
	19-Apr-17	8.4	7.7	309	14.4
	16-May-17	9.2	8.1	323	11.3
	28-Jun-17	10.9	7.7	362	11.1
	7-Jul-17	11.9	8.0	334	11.5
	18-Jul-17	11.5	8.0	363	10.5
	2-Aug-17	10.9	8.2	255	10.1
	15-Aug-17	11.0	8.5	294	10.8
	17-Sep-17	11.4	7.8	356	10.3
	17-Oct-17	9.7	8.0	269	10.6
	14-Nov-17	8.1	8.0	377	7.8
	14-Dec-17	4.6	8.1	334	13.2
	17-Jan-18	5.3	8.0	311	7.9
	23-Feb-18	6.4	7.9	299	9.0
	20-Mar-18	5.3	8.1	315	14.0
	18-Apr-18	5.5	8.2	457	7.4
	14-May-18	9.3	7.8	440	10.8
	18-Jun-18	9.4	7.7	466	9.8
	23-Aug-18	12.3	7.4	481.4	10.3
	19-Sep-18	11.6	7.4	401.6	6.3
	24-Oct-18	9.3	7.7	456.3	7.0
	12-Dec-18	7.1	8.0	482.5	10.3
	15-Mar-19	4.9	7.9	392	11.3
RR3 OUT					
	18-Nov-15	8.2	6.9	494	4.9
	8-Dec-15	7.0	7.1	439	6.2
	19-Jan-16	4.6	6.7	335	7.3
	17-Feb-16	4.1	6.9	329	6.7
	15-Mar-16	5.3	7.1	349	8.2
	20-Apr-16	8.3	7.3	309	7.9
	17-May-16	7.6	7.4	358	4.9
	23-Jun-16	12.5	7.6	387	5.0
	24-Jan-17	6.2	7.5	436	6.9
	15-Feb-17	4.9	7.7	343	7.2
	21-Mar-17	4.5	7.4	320	5.7
	19-Apr-17	7.1	7.4	273	7.8

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	16-May-17	9.1	7.8	457	6.2
	28-Jun-17	11.3	7.2	379	4.4
	18-Jul-17	11.6	7.7	395	5.1
	15-Aug-17	11.0	8.0	329	1.2
	17-Sep-17	12.5	7.3	454	1.1
	17-Oct-17	11.0	7.3	474	2.5
	14-Nov-17	9.0	7.3	436	4.1
	14-Dec-17	6.9	7.2	377	5.8
	17-Jan-18	4.2	7.5	332	5.8
	22-Feb-18	4.2	7.3	407	7.5
	20-Mar-18	4.7	7.4	329	6.1
	18-Apr-18	3.3	7.5	491	5.6
	21-Nov-18	5.4	7.6	569	6.0
	12-Dec-18	7.3	7.5	529	5.3
	18-Jan-19	5.1	7.2	457.4	5.1
	15-Mar-19	4.5	7.4	279	4.5
RR3 KARST					
	18-Nov-15	8.2	7.0	493	5.2
	8-Dec-15	6.8	7.2	438	8.1
	19-Jan-16	4.2	6.9	325	9.1
	17-Feb-16	4.3	7.1	333	7.6
	15-Mar-16	4.5	7.3	289	9.6
	20-Apr-16	8.7	7.5	310	9.0
	17-May-16	8.1	7.5	364	6.2
	23-Jun-16	12.7	7.5	391	4.0
	24-Jan-17	6.0	7.4	437	7.6
	15-Feb-17	4.5	7.6	204	8.7
	21-Mar-17	4.5	7.5	323	6.6
	19-Apr-17	7.3	7.2	300	8.3
	16-May-17	8.9	7.8	457	6.4
	28-Jun-17	11.4	7.4	378	6.3
	18-Jul-17	11.9	7.7	396	5.7
	15-Aug-17	11.4	7.9	331	2.4
	17-Sep-17	13.0	7.2	462	1.6
	17-Oct-17	11.0	7.3	470	4.1
	14-Nov-17	8.8	7.3	383	5.5
	14-Dec-17	6.1	7.2	365	8.2
	17-Jan-18	4.1	7.4	332	6.4
	22-Feb-18	3.2	7.4	306	8.0
	20-Mar-18	4.7	7.5	326	8.6
	18-Apr-18	3.0	7.6	480	6.5
	15-May-18	-	7.3	467	7.0
	21-Nov-18	4.2	7.6	569	8.1
	12-Dec-18	6.7	7.5	526	6.6
PR CONTROL					
	25-Aug-15	14.6	8.4	307	8.0
	9-Sep-15	18.4	8.3	365	9.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	15-Oct-15	8.6	8.0	291	11.3
	18-Nov-15	6.9	8.0	335	11.3
	8-Dec-15	3.5	8.3	305	15.7
	19-Jan-16	-0.1	7.7	239	16.1
	17-Feb-16	0.6	8.2	276	15.8
	15-Mar-16	4.2	8.3	256	13.8
	20-Apr-16	9.7	7.7	310	12.2
	17-May-16	7.5	8.6	328	12.5
	22-Jun-16	12.5	8.5	330	11.1
	20-Jul-16	14.2	8.5	344	10.2
	24-Aug-16	16.6	8.4	252	11.5
	19-Sep-16	15.2	8.4	440	9.7
	17-Oct-16	12.6	8.1	340	9.6
	15-Nov-16	6.1	8.2	468	12.9
	12-Dec-16	0.0	7.6	405	13.4
	24-Jan-17	1.9	8.2	268	14.3
	16-Feb-17	0.4	8.4	284	16.4
	21-Mar-17	2.2	8.4	303	13.8
	19-Apr-17	7.8	7.7	305	14.1
	16-May-17	9.2	8.4	456	8.5
	28-Jun-17	11.7	8.3	358	11.1
	18-Jul-17	13.7	6.4	368	11.3
	15-Aug-17	14.4	8.8	297	11.0
	17-Sep-17	14.9	8.2	366	10.3
	17-Oct-17	8.8	8.3	338	11.5
	14-Nov-17	4.4	8.2	320	11.3
	14-Dec-17	-0.1	7.9	277	19.5
	17-Jan-18	0.2	8.1	269	12.6
	22-Feb-18	1.9	8.4	243	12.8
	20-Mar-18	-0.4	8.5	247	18.8
	18-Apr-18	2.5	8.6	430	10.7
	14-May-18	12.9	8.5	418	10.1
	18-Jun-18	14.4	8.4	423.6	9.8
	19-Jul-18	15.6	8.4	417.2	9.4
	23-Aug-18	16.3	8.5	426.1	9.2
	19-Sep-18	14.9	8.5	422.1	9.5
	24-Oct-18	5.0	8.4	449.2	12.3
	21-Nov-18	0.0	8.3	456.3	13.9
	12-Dec-18	1.1	8.3	456.3	13.4
	18-Jan-19	0.1	8.3	454	14.0
BC CONTROL					
	25-Aug-15	14.6	8.3	436	7.9
	9-Sep-15	17.9	8.0	400	5.9
	16-Oct-15	8.1	7.8	436	9.1
	19-Nov-15	9.4	8.0	405	11.7
	8-Dec-15	3.2	7.9	348	18.0
	15-Mar-16	6.2	8.1	259	13.4

TABLE B-5
SURFACE WATER FIELD CHEMISTRY DATA

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.00 A59

LOCATION	DATE	TEMPERATURE (^oC)	pH (pH units)	CONDUCTIVITY (µS/cm)	DISSOLVED OXYGEN (mg/L)
	21-Apr-16	9.7	8.5	316	12.2
	17-May-16	5.8	8.5	334	12.6
	22-Jun-16	15.7	8.4	465	8.5
	20-Jul-16	13.6	7.9	457	9.1
	25-Aug-16	17.7	8.3	577	7.3
	19-Sep-16	14.6	8.1	275	8.3
	17-Oct-16	12.3	7.9	648	8.4
	15-Nov-16	5.2	8.0	439	11.1
	12-Dec-16	0.0	7.6	318	14.5
	24-Jan-17	2.1	8.2	287	13.6
	22-Mar-17	0.0	8.9	475	6.0
	19-Apr-17	10.8	7.5	345	12.4
	16-May-17	18.0	8.6	320	7.9
	28-Jun-17	12.4	8.4	415	10.8
	19-Jul-17	17.2	8.5	485	8.6
	16-Aug-17	15.9	8.4	457	8.0
	17-Sep-17	14.6	7.1	477	8.6
	18-Oct-17	9.4	8.3	404	10.4
	14-Nov-17	5.3	8.3	375	10.3
	14-Dec-17	-0.1	8.0	203	18.8
	18-Jan-18	0.4	8.1	286	11.5
	24-Feb-18	2.2	8.3	271	14.8
	20-Mar-18	-0.4	8.5	269	17.3
	18-Apr-18	2.5	8.6	462	10.4
	14-May-18	15.2	8.4	469	9.5
	18-Jun-18	16.0	8.4	539	9.3
	19-Jul-18	14.8	8.2	633	9.6
	23-Aug-18	17.0	8.3	596	9.0
	19-Sep-18	13.6	8.2	675	9.0
	24-Oct-18	5.0	8.3	597	11.9
	21-Nov-18	0.2	8.2		13.9
	12-Dec-18	1.7	8.3	473.3	13.3
	18-Jan-19	0.1	7.9	382.6	14.9

NOTE:
- Blank indicates parameter value not available.
- Monitoring dates where surface water station was observed as frozen, dry or where insufficient

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1					
			Q1 2016		Q2 2016		Q3 2016	Q4 2016
			23-Mar-16		25-May-16		10-Aug-16	18-Oct-16
PARAMETERS	UNITS	PWQO	SUMP 1	DUP	SUMP 1	DUP	SUMP 1	SUMP 1
Total Coliform	cfu/100mL		330	48	26	20	16	NDOGT
E.Coli	cfu/100mL		131	0	13	14	5	NDOGT
Heterotrophic Plate Count	cfu/mL		-	610	>2000	>2000	>2000	>2000
Temperature (field)	°C		13.9	-	12.8	-	19	13.2
pH @25°C (lab)	pH units	6.5 - 8.5	-	7.79	8.25	8.26	7.92	7.95
pH (field)	pH units	6.5 - 8.5	8.6	-	7.8	-	8.8	8.0
Conductivity @25°C (lab)	µS/cm		-	593	700	702	925	825
Conductivity (field)	µS/cm		614	-	487	-	750	651
Dissolved Oxygen (field)	mg/L		-	-	7.6	-	-	-
Alkalinity (CaCO3)	mg/L		-	236	235	235	236	120
Hardness (CaCO3)	mg/L		-	284	324	328	364	359
Chloride	mg/L		-	36.3	76.1	76.4	139	117
Fluoride	mg/L		0.2	0.3	0.2	0.2	0.2	0.3
Nitrate (N)	mg/L		1	1.9	2	2	0.8	1
Nitrite (N)	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L		-	8	7	7	6	6
Colour	TCU		-	13	5	5	5	25
Total Suspended Solids	mg/L		-	3	21	18	8	12
Ammonia (N) - Total	mg/L		-	0.05	0.09	0.09	0.09	0.62
Unionized Ammonia as NH_3	mg/L	0.02	-	0.0003	0.0013	0.0016	0.017	0.0144
Total Kjeldahl Nitrogen	mg/L		0.16	0.1	0.3	0.2	0.3	0.8
Phosphorus - Total	mg/L	0.03	0.01	0.02	0.01	<0.01	0.01	0.02
Turbidity (field)	NTU		-	-	-	-	-	11.8
Turbidity (lab)	NTU		-	-	-	-	-	-
Silica	mg/L		-	-	-	-	-	4.59
Silicon	mg/L		-	-	-	-	-	2.15
Phenolics	mg/L	0.005	-	-	-	-	-	<0.001
Oil and Grease - Anim/Veg.	mg/L		-	-	-	-	-	<1.0
Oil and Grease - Mineral	mg/L		-	-	-	-	-	<1.0
Oil & Grease - Total	mg/L		-	-	-	-	-	<1.0
Calcium	mg/L		-	62	64	64.9	64.6	71
Magnesium	mg/L		-	31.4	40	40.4	49.4	44.2
Potassium	mg/L		-	1.2	2.5	2.4	3.8	2.8
Sodium	mg/L		-	13.9	23.2	23.1	33.2	29.4
Aluminum	mg/L		-	0.02	0.14	0.13	0.06	0.04
Antimony	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0001
Arsenic	mg/L		0.0013	0.001	0.0014	0.0013	0.0017	0.0026
Barium	mg/L		0.013	0.009	0.011	0.012	0.013	0.015
Beryllium	mg/L		-	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.2	0.084	0.016	0.029	0.029	0.049	0.037
Cadmium	mg/L	0.0002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Chromium	mg/L	0.0089	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L		-	<0.0001	0.0002	0.0002	0.0003	0.0003
Copper	mg/L	0.005	-	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	mg/L	0.3	-	0.011	0.139	0.116	0.026	0.046
Lead	mg/L	0.025	0.00033	0.00007	0.00021	0.0002	0.0001	0.00004
Manganese	mg/L		-	0.002	0.015	0.015	0.035	0.141
Molybdenum	mg/L		-	0.0004	0.0004	0.0004	0.0008	0.0006
Nickel	mg/L		-	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1					
			Q1 2016		Q2 2016		Q3 2016	Q4 2016
			23-Mar-16		25-May-16		10-Aug-16	18-Oct-16
PARAMETERS	UNITS	PWQO	SUMP 1	DUP	SUMP 1	DUP	SUMP 1	SUMP 1
Selenium	mg/L		0.002	0.002	0.004	0.004	0.005	0.006
Silver	mg/L		-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Strontium	mg/L		-	0.185	0.356	0.348	0.555	0.395
Thallium	mg/L		-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Titanium	mg/L		-	<0.005	<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L		-	0.03	0.02	0.02	0.05	<0.01
Uranium	mg/L		0.00017	0.00014	0.00016	0.00014	0.00018	0.00017
Vanadium	mg/L		-	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.02	-	<0.005	<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L		-	<0.003	<0.003	<0.003	<0.003	<0.003
Anion Sum	meq/L		-	6.06	7.15	7.16	8.84	5.93
Cation Sum	meq/L		-	6.31	7.57	7.64	8.83	8.58
Ion Ratio	AS/CS		-	0.960	0.944	0.937	1.00	0.70
TDS (Calc)	mg/L		-	303	363	365	442	349
Benzene	µg/L		-	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		-	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		-	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		-	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, o-	µg/L		-	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, total	µg/L		-	<1.1	<1.1	<1.1	<1.1	<1.1
PHC F1 (C6-C10)	µg/L		-	<50	<50	<50	<50	<50
PHC F2 (>C10-C16)	µg/L		-	<50	<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L		-	<400	<400	<400	<400	<400
PHC F4 (<C34-C50)	µg/L		-	<400	<400	<400	<400	<400

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1			
			Q1 2017	Q2 2017	Q3 2017	Q4 2017
PARAMETERS	UNITS	PWQO	1-Feb-17 SUMP 1	5-Apr-17 SUMP 1	17-Jul-17 SUMP 1	4-Oct-17 SUMP 1
Total Coliform	cfu/100mL		NDOGT	<10	>200	NDOGT
E.Coli	cfu/100mL		NDOGT	0	61	NDOGT
Heterotrophic Plate Count	cfu/mL		>2000	16	>2000	>2000
Temperature (field)	°C		2.7	6.9	16.2	15.3
pH @25°C (lab)	pH units	6.5 - 8.5	7.7	8.17	7.99	8.16
pH (field)	pH units	6.5 - 8.5	8.6	8.2	7.9	7.7
Conductivity @25°C (lab)	µS/cm		734	603	801	809
Conductivity (field)	µS/cm		-	583	828	824
Dissolved Oxygen (field)	mg/L		-	-	-	-
Alkalinity (CaCO3)	mg/L		227	208	211	202
Hardness (CaCO3)	mg/L		285	271	302	327
Chloride	mg/L		75.4	59.3	92.0	115.0
Fluoride	mg/L		0.2	0.2	0.2	0.3
Nitrate (N)	mg/L		1.5	1.8	1.7	1
Nitrite (N)	mg/L		<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L		8	7	6	6
Colour	TCU		<2	10	6	<2
Total Suspended Solids	mg/L		24	<3	<3	<3
Ammonia (N) - Total	mg/L		0.1	0.02	0.03	0.06
Unionized Ammonia as NH_3	mg/L	0.02	0.0038	0.0004	0.0008	0.0008
Total Kjeldahl Nitrogen	mg/L		0.2	0.2	0.3	0.2
Phosphorus - Total	mg/L	0.03	<0.01	0.02	0.01	<0.01
Turbidity (field)	NTU		6	6	5	5
Turbidity (lab)			-	-	-	-
Silica	mg/L		-	-	-	-
Silicon	mg/L		-	-	-	-
Phenolics	mg/L	0.005	-	-	-	-
Oil and Grease - Anim/Veg.	mg/L		-	-	-	-
Oil and Grease - Mineral	mg/L		-	-	-	-
Oil & Grease - Total	mg/L		-	-	-	-
Calcium	mg/L		55.6	56.8	57.0	53.4
Magnesium	mg/L		35.5	31.5	38.8	47.1
Potassium	mg/L		1.7	1.6	2.8	3.6
Sodium	mg/L		18.4	19.9	26.6	30.9
Aluminum	mg/L		0.03	0.07	0.06	0.03
Antimony	mg/L		<0.0001	<0.0001	0.0001	<0.0001
Arsenic	mg/L		0.0006	0.0006	0.0009	0.0011
Barium	mg/L		0.001	0.013	0.034	0.014
Beryllium	mg/L		<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.2	0.017	0.018	0.052	0.052
Cadmium	mg/L	0.0002	<0.00002	<0.00002	<0.000014	<0.000014
Chromium	mg/L	0.0089	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L		0.0001	<0.0001	0.0002	<0.0001
Copper	mg/L	0.005	<0.002	0.005	0.004	0.003
Iron	mg/L	0.3	0.027	0.052	0.105	0.044
Lead	mg/L	0.025	0.00008	<0.00002	0.00005	0.00004
Manganese	mg/L		0.011	0.005	0.018	0.051
Molybdenum	mg/L		0.0004	0.0004	0.0005	<0.01
Nickel	mg/L		<0.01	<0.01	<0.01	<0.01

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1			
			Q1 2017	Q2 2017	Q3 2017	Q4 2017
PARAMETERS	UNITS	PWQO	1-Feb-17 SUMP 1	5-Apr-17 SUMP 1	17-Jul-17 SUMP 1	4-Oct-17 SUMP 1
Selenium	mg/L		0.001	<0.001	<0.001	<0.001
Silver	mg/L		<0.00002	<0.00002	<0.00002	<0.00002
Strontium	mg/L		0.249	0.222	0.396	0.407
Thallium	mg/L		<0.00005	<0.00005	<0.00005	<0.00005
Titanium	mg/L		<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L		<0.01	<0.01	<0.01	<0.01
Uranium	mg/L		0.00014	0.00016	0.00013	0.00011
Vanadium	mg/L		<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.02	<0.005	<0.005	0.16	0.007
Zirconium	mg/L		<0.003	<0.003	<0.003	<0.003
Anion Sum	meq/L		6.94	6.12	7.06	7.48
Cation Sum	meq/L		6.54	6.34	7.28	7.98
Ion Ratio	AS/CS		1.06	0.97	0.97	0.94
TDS (Calc)	mg/L		338	309	357	382
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<1.0	<1.0
Xylene, o-	µg/L		<0.5	<0.5	<0.5	<0.5
Xylene, total	µg/L		<1.1	<1.1	<1.1	<1.1
PHC F1 (C6-C10)	µg/L		<50	<50	<50	<50
PHC F2 (>C10-C16)	µg/L		<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L		<400	<400	<400	<400
PHC F4 (<C34-C50)	µg/L		<400	<400	<400	<400

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1			
			Q1 2018	Q2 2018	Q3 2018	Q4 2018
PARAMETERS	UNITS	PWQO	6-Mar-18 SUMP 1	9-May-18 SUMP 1	5-Sep-18 SUMP 1	6-Dec-18 SUMP 1
Total Coliform	cfu/100mL		34	21	69	18
E.Coli	cfu/100mL		0	1	53	4
Heterotrophic Plate Count	cfu/mL		13	81	470	33
Temperature (field)	°C		3.5	9.2	19.7	3.2
pH @25°C (lab)	pH units	6.5 - 8.5	8.08	8.21	8.06	8.01
pH (field)	pH units	6.5 - 8.5	7.4	7.7	7.8	7.8
Conductivity @25°C (lab)	µS/cm		605	555	710	690
Conductivity (field)	µS/cm		561	582	734	688
Dissolved Oxygen (field)	mg/L		-	8.79	7.69	9.64
Alkalinity (CaCO3)	mg/L		229	217	210	230
Hardness (CaCO3)	mg/L		272	259	300	330
Chloride	mg/L		53.7	47.6	100	82
Fluoride	mg/L		0.185	0.18	0.27	0.23
Nitrate (N)	mg/L		1.04	1.16	0.68	1.32
Nitrite (N)	mg/L		<0.010	<0.010	<0.010	<0.01
Sulphate	mg/L		5.56	5.24	6.1	6.8
Colour	TCU		5.56	2.5	3	3
Total Suspended Solids	mg/L		<2.0	<2.0	<10.0	<10.0
Ammonia (N) - Total	mg/L		0.098	0.048	<0.05	0.13
Unionized Ammonia as NH_3	mg/L	0.02	0.0003	0.0004	<0.0013	0.0009
Total Kjeldahl Nitrogen	mg/L		<0.15	<0.15	0.1	0.16
Phosphorus - Total	mg/L	0.03	0.0586	0.0031	<0.02	<0.02
Turbidity (field)	NTU		0.77	-	-	-
Turbidity (lab)	NTU		-	1.24	0.5	1.4
Silica	mg/L		-	-	-	-
Silicon	mg/L		55.1	1.42	-	-
Phenolics	mg/L	0.005	-	-	<0.001	<0.001
Oil and Grease - Anim/Veg.	mg/L		-	-	-	-
Oil and Grease - Mineral	mg/L		-	-	-	-
Oil & Grease - Total	mg/L		-	-	-	-
Calcium	mg/L		55.1	53.7	50	59
Magnesium	mg/L		29.3	28.8	40	37
Potassium	mg/L		1.61	1.62	2.8	2.1
Sodium	mg/L		18.1	17.1	27	22
Aluminum	mg/L		0.012	0.027	0.01	0.023
Antimony	mg/L		<0.00010	<0.00010	<0.0005	<0.0005
Arsenic	mg/L		0.00025	0.00027	<0.001	<0.001
Barium	mg/L		0.00994	0.0098	0.012	0.011
Beryllium	mg/L		<0.00010	<0.00010	<0.0005	<0.0005
Boron	mg/L	0.2	0.018	0.02	0.044	0.031
Cadmium	mg/L	0.0002	<0.000010	<0.000010	<0.0001	<0.0001
Chromium	mg/L	0.0089	<0.00050	<0.00050	<0.005	<0.005
Cobalt	mg/L		<0.00010	<0.00010	<0.0005	<0.0005
Copper	mg/L	0.005	<0.0010	<0.0010	0.0012	<0.001
Iron	mg/L	0.3	<0.050	<0.050	<0.1	<0.10
Lead	mg/L	0.025	<0.00010	<0.00010	<0.0005	<0.0005
Manganese	mg/L		0.0178	0.00403	0.097	<0.12
Molybdenum	mg/L		0.000341	0.000314	0.00058	<0.0005
Nickel	mg/L		<0.00050	<0.00050	<0.001	0.0017

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1			
			Q1 2018	Q2 2018	Q3 2018	Q4 2018
PARAMETERS	UNITS	PWQO	6-Mar-18 SUMP 1	9-May-18 SUMP 1	5-Sep-18 SUMP 1	6-Dec-18 SUMP 1
Selenium	mg/L		<0.000050	0.000062	<0.002	<0.002
Silver	mg/L		<0.000050	<0.000050	<0.0001	<0.0001
Strontium	mg/L		0.222	0.208	0.31	0.28
Thallium	mg/L		0.000015	0.000012	<0.00005	<0.00005
Titanium	mg/L		<0.00030	0.00071	<0.005	<0.005
Tungsten	mg/L		<0.00010	<0.00010	<0.001	<0.001
Uranium	mg/L		0.000123	0.000119	0.00011	0.00011
Vanadium	mg/L		<0.00050	<0.00050	<0.0005	<0.0005
Zinc	mg/L	0.02	0.0031	<0.0030	<0.0005	<0.0005
Zirconium	mg/L		<0.00030	<0.00030	<0.001	<0.001
Anion Sum	meq/L		-	-	-	-
Cation Sum	meq/L		-	-	-	-
Ion Ratio	AS/CS		-	-	-	-
TDS (Calc)	mg/L		328	291	385	355
Benzene	µg/L		<0.5	<0.5	<0.20	<0.20
Toluene	µg/L		<0.5	<0.5	0.22	<0.20
Ethylbenzene	µg/L		<0.5	<0.5	<0.20	<0.20
Xylene, m, p-	µg/L		<0.4	<0.4	<0.40	<0.40
Xylene, o-	µg/L		<0.3	<0.3	<0.20	<0.20
Xylene, total	µg/L		<0.5	<0.5	<0.40	<0.40
PHC F1 (C6-C10)	µg/L		<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L		<100	<100	<100	<100
PHC F3 (>C16-C34)	µg/L		<250	<250	<200	<200
PHC F4 (<C34-C50)	µg/L		<250	<250	<200	<200

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1			
			Q1 2019	Q2 2019	Q3 2018	Q4 2019
PARAMETERS	UNITS	PWQO	6-Mar-18 SUMP 1	9-May-18 SUMP 1	5-Sep-18 SUMP 1	6-Dec-18 SUMP 1
Total Coliform	cfu/100mL		7			
E.Coli	cfu/100mL		9			
Heterotrophic Plate Count	cfu/mL		7			
Temperature (field)	°C					
pH @25°C (lab)	pH units	6.5 - 8.5	7.84			
pH (field)	pH units	6.5 - 8.5				
Conductivity @25°C (lab)	µS/cm		650			
Conductivity (field)	µS/cm					
Dissolved Oxygen (field)	mg/L					
Alkalinity (CaCO3)	mg/L		250			
Hardness (CaCO3)	mg/L		290			
Chloride	mg/L		58			
Fluoride	mg/L		0.22			
Nitrate (N)	mg/L		1.08			
Nitrite (N)	mg/L		<0.010			
Sulphate	mg/L		6.5			
Colour	TCU		2			
Total Suspended Solids	mg/L		<10			
Ammonia (N) - Total	mg/L		<0.05			
Unionized Ammonia as NH_3	mg/L	0.02				
Total Kjeldahl Nitrogen	mg/L		0.12			
Phosphorus - Total	mg/L	0.03	<0.02			
Turbidity (field)	NTU		-			
Turbidity (lab)	NTU		0.6			
Silica	mg/L		-			
Silicon	mg/L		55.1			
Phenolics	mg/L	0.005	-			
Oil and Grease - Anim/Veg.	mg/L		-			
Oil and Grease - Mineral	mg/L		-			
Oil & Grease - Total	mg/L		<0.5			
Calcium	mg/L		60.0			
Magnesium	mg/L		34			
Potassium	mg/L		1.7			
Sodium	mg/L		19			
Aluminum	ug/L		0.012			
Antimony	ug/L		<0.50			
Arsenic	ug/L		<1.0			
Barium	ug/L		12			
Beryllium	ug/L		<0.50			
Boron	ug/L	200	20			
Cadmium	ug/L	0.2	<0.10			
Chromium	ug/L	8.9	<5.0			
Cobalt	ug/L		<0.50			
Copper	ug/L	5	1.4			
Iron	ug/L	300	<100			
Lead	ug/L	25	<0.50			
Manganese	ug/L		73			
Molybdenum	ug/L		<0.50			
Nickel	ug/L		<1.0			

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 1			
			Q1 2019	Q2 2019	Q3 2018	Q4 2019
PARAMETERS	UNITS	PWQO	6-Mar-18 SUMP 1	9-May-18 SUMP 1	5-Sep-18 SUMP 1	6-Dec-18 SUMP 1
Selenium	ug/L		<2.0			
Silver	ug/L		<0.10			
Strontium	ug/L		240			
Thallium	ug/L		<0.050			
Titanium	ug/L		<5.0			
Tungsten	ug/L		<1.0			
Uranium	ug/L		0.14			
Vanadium	ug/L		<0.50			
Zinc	ug/L	0.02	<5.0			
Zirconium	ug/L		<1.0			
Anion Sum	meq/L		-			
Cation Sum	meq/L		-			
Ion Ratio	AS/CS		-			
TDS (Calc)	mg/L		315			
Benzene	µg/L		<25			
Toluene	µg/L		<0.20			
Ethylbenzene	µg/L		<0.20			
Xylene, m, p-	µg/L		<0.20			
Xylene, o-	µg/L		<0.40			
Xylene, total	µg/L		<0.40			
PHC F1 (C6-C10)	µg/L		<25			
PHC F2 (>C10-C16)	µg/L		<100			
PHC F3 (>C16-C34)	µg/L		<200			
PHC F4 (<C34-C50)	µg/L		<200			

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2					
			Q1 2016	Q2 2016	Q3 2016		Q4 2016	
			23-Mar-16	25-May-16	10-Aug-16		18-Oct-16	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	SUMP 2	DUP	SUMP 2	DUP
Total Coliform	cfu/100mL		16	50	102	92	NDOGT	NDOGT
E.Coli	cfu/100mL		0	21	15	15	NDOGT	NDOGT
Heterotrophic Plate Count	cfu/mL		1360	>2000	>2000	>2000	>2000	>2000
Temperature (field)	°C		4.1	15.2	20.4	-	14.4	-
pH @25°C (lab)	pH units	6.5 - 8.5	7.94	8.36	8.09	8.08	7.82	7.82
pH (field)	pH units	6.5 - 8.5	7.8	8.3	8.6	-	8.1	-
Conductivity @25°C (lab)	µS/cm		594	711	947	944	833	847
Conductivity (field)	µS/cm		307	575	684	-	415	-
Dissolved Oxygen (field)	mg/L		8.1	7.9	-	-	-	-
Alkalinity (CaCO3)	mg/L		208	235	231	227	120	120
Hardness (CaCO3)	mg/L		252	339	384	388	377	359
Chloride	mg/L		52.2	80.7	159	158	120	121
Fluoride	mg/L		0.3	0.2	0.2	0.2	0.3	0.2
Nitrate (N)	mg/L		1.5	2	0.8	0.8	0.2	0.2
Nitrite (N)	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L		6	7	7	6	5	5
Colour	TCU		8	5	4	5	42	27
Total Suspended Solids	mg/L		2	21	31	22	20	9
Ammonia (N) - Total	mg/L		0.03	0.08	0.09	0.09	0.14	0.05
Unionized Ammonia as NH_3	mg/L	0.02	0.0002	0.0042	0.0126	0.0126	0.0045	0.0016
Total Kjeldahl Nitrogen	mg/L		0.1	0.2	0.4	0.3	0.3	0.2
Phosphorus - Total	mg/L	0.03	0.01	0.01	0.03	0.01	0.02	0.01
Turbidity	NTU		-	-	-	-	-	-
Silica	mg/L		-	-	-	-	-	-
Silicon	mg/L		-	-	-	-	-	-
Phenolics	mg/L	0.005	-	-	-	-	-	-
Oil and Grease - Anim/Veg.	mg/L		-	-	-	-	-	-
Oil and Grease - Mineral	mg/L		-	-	-	-	-	-
Oil & Grease - Total	mg/L		-	-	-	-	-	-
Calcium	mg/L		53	64.8	64	64.5	73.2	69.3
Magnesium	mg/L		29.1	43	54.5	55.2	47.3	45.3
Potassium	mg/L		1.4	2.8	4.5	4.6	3.1	3.1
Sodium	mg/L		18	24.1	37.1	37.2	31.6	31.0
Aluminum	mg/L		0.02	0.14	0.06	0.06	0.11	0.07
Antimony	mg/L		<0.0001	<0.0001	0.0003	0.0002	<0.0001	<0.0001
Arsenic	mg/L		0.0013	0.0015	0.002	0.002	0.0032	0.0032
Barium	mg/L		0.009	0.011	0.016	0.015	0.018	0.018
Beryllium	mg/L		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.20	0.015	0.033	0.058	0.059	0.039	0.038
Cadmium	mg/L	0.0002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Chromium	mg/L	0.0089	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L		<0.0001	0.0002	0.0003	0.0003	0.0002	0.0002
Copper	mg/L	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron	mg/L	0.3	0.013	0.122	0.035	0.035	0.264	0.214
Lead	mg/L	0.025	0.00004	0.0002	0.00012	0.00013	0.00009	<0.00002
Manganese	mg/L		0.003	0.017	0.01	0.01	0.091	0.086
Molybdenum	mg/L		0.0004	0.0004	0.0008	0.0008	0.0007	0.0006
Nickel	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2					
			Q1 2016	Q2 2016	Q3 2016		Q4 2016	
			23-Mar-16	25-May-16	10-Aug-16		18-Oct-16	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	SUMP 2	DUP	SUMP 2	DUP
Selenium	mg/L		0.002	0.004	0.006	0.006	0.007	0.007
Silver	mg/L		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Strontium	mg/L		0.197	0.404	0.688	0.708	0.446	0.432
Thallium	mg/L		<0.00005	<0.00005	<0.000005	<0.00005	<0.00005	<0.00005
Titanium	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L		0.04	0.02	0.04	0.04	<0.01	<0.01
Uranium	mg/L		0.00017	0.00014	0.00017	0.00016	0.00018	0.00017
Vanadium	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Anion Sum	meq/L		5.87	7.27	9.33	9.19	5.91	5.93
Cation Sum	meq/L		5.86	7.9	9.41	9.5	9.03	8.63
Ion Ratio	AS/CS		1.00	0.92	0.992	0.968	0.655	0.687
TDS (Calc)	mg/L		292	373	469	466	354	347
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, o-	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, total	µg/L		<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
PHC F1 (C6-C10)	µg/L		<50	<50	<50	<50	<50	<50
PHC F2 (>C10-C16)	µg/L		<50	<50	<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L		<400	<400	<400	<400	<400	<400
PHC F4 (<C34-C50)	µg/L		<400	<400	<400	<400	<400	<400

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2					
			Q1 2017	Q2 2017		Q3 2017	Q4 2017	
			1-Feb-17	5-Apr-17		17-Jul-17	4-Oct-17	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	DUP	SUMP 2	SUMP 2	DUP 1
Total Coliform	cfu/100mL		4	<10	<10	>200	NDOGT	NDOGT
E.Coli	cfu/100mL		0	0	0	50	NDOGT	NDOGT
Heterotrophic Plate Count	cfu/mL		50	60	8	>200	>2000	>2000
Temperature (field)	°C		1.5	6.9	-	18.8	15.9	-
pH @25°C (lab)	pH units	6.5 - 8.5	7.79	8.25	8.23	7.98	8.25	8.27
pH (field)	pH units	6.5 - 8.5	8.7	8.2	-	8.0	8.0	-
Conductivity @25°C (lab)	µS/cm		734	540	533	794	815	823
Conductivity (field)	µS/cm		-	583	-	816	824	-
Dissolved Oxygen (field)	mg/L		-	-	-	-	-	-
Alkalinity (CaCO3)	mg/L		217	194	194	203	207	189
Hardness (CaCO3)	mg/L		285	222	218	297	327	322
Chloride	mg/L		82.1	45.6	45.7	94.1	124	124
Fluoride	mg/L		0.2	0.3	0.2	0.2	0.2	0.2
Nitrate (N)	mg/L		1.0	1.5	1.5	1.8	0.9	0.9
Nitrite (N)	mg/L		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sulphate	mg/L		7	6	7	6	5	5
Colour	TCU		5	8	8	3	6	8
Total Suspended Solids	mg/L		<2	5	5	<3	<3	<3
Ammonia (N) - Total	mg/L		0.02	0.03	0.02	0.05	0.03	0.03
Unionized Ammonia as NH_3	mg/L	0.02	0.0008	0.0007	0.0005	0.0019	0.0008	0.0008
Total Kjeldahl Nitrogen	mg/L		0.2	0.2	0.1	0.2	0.2	0.2
Phosphorus - Total	mg/L	0.03	<0.01	0.02	0.02	0.01	<0.01	<0.01
Turbidity (field)	NTU		-	-	-	3.0	5.0	-
Silica	mg/L		-	-	-	-	-	-
Silicon	mg/L		-	-	-	-	-	-
Phenolics	mg/L	0.005	-	-	-	-	-	-
Oil and Grease - Anim/Veg.	mg/L		-	-	-	-	-	-
Oil and Grease - Mineral	mg/L		-	-	-	-	-	-
Oil & Grease - Total	mg/L		-	-	-	-	-	-
Calcium	mg/L		55.1	49.5	48.7	52.3	48.8	47.9
Magnesium	mg/L		35.9	24.0	23.5	40.4	49.8	49.3
Potassium	mg/L		1.7	1.1	1.1	3.0	4.1	4.1
Sodium	mg/L		23.4	18.7	18.3	31.6	32.5	32.3
Aluminum	mg/L		0.03	0.07	0.09	0.04	0.05	0.05
Antimony	mg/L		0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001
Arsenic	mg/L		0.0006	0.0005	0.0006	0.0008	0.0013	0.0013
Barium	mg/L		0.011	0.011	0.011	0.014	0.012	0.012
Beryllium	mg/L		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron	mg/L	0.20	0.014	0.033	0.020	0.052	0.059	0.059
Cadmium	mg/L	0.0002	<0.00002	<0.00002	<0.00002	<0.000014	<0.000014	<0.000014
Chromium	mg/L	0.0089	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	mg/L		0.0001	<0.0001	<0.0001	0.0001	0.0001	0.0001
Copper	mg/L	0.005	<0.002	<0.002	0.002	<0.002	<0.002	<0.002
Iron	mg/L	0.3	0.014	0.063	0.074	0.014	0.048	0.046
Lead	mg/L	0.025	0.00009	<0.00002	<0.00002	0.00003	0.00007	0.00006
Manganese	mg/L		0.005	0.004	0.004	0.001	0.013	0.013
Molybdenum	mg/L		0.0005	0.0003	0.0003	0.0005	<0.01	<0.01
Nickel	mg/L		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2					
			Q1 2017	Q2 2017		Q3 2017	Q4 2017	
			1-Feb-17	5-Apr-17		17-Jul-17	4-Oct-17	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	DUP	SUMP 2	SUMP 2	DUP 1
Selenium	mg/L		0.001	0.001	0.001	<0.001	0.001	<0.001
Silver	mg/L		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Strontium	mg/L		0.234	0.147	0.145	0.414	0.465	0.464
Thallium	mg/L		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Titanium	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tungsten	mg/L		<0.01	0.21	0.13	<0.01	<0.01	<0.01
Uranium	mg/L		0.00016	0.00014	0.00014	0.00012	0.00009	0.00009
Vanadium	mg/L		<0.005	0.005	<0.005	<0.005	<0.005	<0.005
Zinc	mg/L	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zirconium	mg/L		<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Anion Sum	meq/L		6.88	5.42	5.42	6.98	7.83	7.48
Cation Sum	meq/L		6.76	5.29	5.19	7.39	8.06	7.96
Ion Ratio	AS/CS		1.02	1.03	1.04	0.94	0.97	0.94
TDS (Calc)	mg/L		340	269	268	357	393	381
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Xylene, o-	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, total	µg/L		<1.1	<1.1	<1.1	<1.1	<1.1	<1.1
PHC F1 (C6-C10)	µg/L		<50	<50	<50	<50	<50	<50
PHC F2 (>C10-C16)	µg/L		<50	<50	<50	<50	<50	<50
PHC F3 (>C16-C34)	µg/L		<400	<400	<400	<400	<400	<400
PHC F4 (<C34-C50)	µg/L		<400	<400	<400	<400	<400	<400

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2				
			Q1 2018	Q2 2018	Q3 2018	Q4 2018	
			6-Mar-18	9-May-18	5-Sep-18	6-Dec-18	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	SUMP 2	SUMP 2	DUP
Total Coliform	cfu/100mL		6	9	95	13	36
E.Coli	cfu/100mL		1	117	53	2	1
Heterotrophic Plate Count	cfu/mL		14	55	150	46	7
Temperature (field)	°C		2.9	13	21.6	4.1	4.1
pH @25°C (lab)	pH units	6.5 - 8.5	8.22	8.31	-	-	-
pH (field)	pH units	6.5 - 8.5	7.9	8.1	8.2	7.7	7.7
Conductivity @25°C (lab)	µS/cm		471	503	-	-	-
Conductivity (field)	µS/cm		510	513	682	615	615
Dissolved Oxygen (field)	mg/L		-	9.85	6.68	8.05	8.05
Alkalinity (CaCO3)	mg/L		185	200	170	230	220
Hardness (CaCO3)	mg/L		214	234	270	300	300
Chloride	mg/L		32.9	39.2	110	72	73
Fluoride	mg/L		0.108	0.132	0.19	0.19	0.18
Nitrate (N)	mg/L		0.9	1.19	0.51	1.00	0.99
Nitrite (N)	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	mg/L		3.7	4.46	5.1	5.5	6.2
Colour	TCU		4.3	<2.0	<2	9	5
Total Suspended Solids	mg/L		<2.0	<2.0	<10	<10	<10
Ammonia (N) - Total	mg/L		0.149	0.135	<0.05	0.085	0.11
Unionized Ammonia as NH_3	mg/L	0.02	0.0013	0.0042	<0.003	0.0005	0.0006
Total Kjeldahl Nitrogen	mg/L		0.16	<0.15	0.16	0.13	0.23
Phosphorus - Total	mg/L	0.03	<0.0030	0.0041	<0.020	<0.020	<0.020
Turbidity (lab)	NTU		1.95	2.27	-	-	-
Turbidity (field)	NTU		-	-	-	-	-
Silica	mg/L		-	-	-	-	-
Silicon	mg/L		-	1.1	-	-	-
Phenolics	mg/L	0.005	-	-	-	-	-
Oil and Grease - Anim/Veg.	mg/L		-	-	-	-	-
Oil and Grease - Mineral	mg/L		-	-	-	-	-
Oil & Grease - Total	mg/L		-	-	-	-	-
Calcium	mg/L		49.2	50.9	35	56	58
Magnesium	mg/L		21.8	25.8	41	34	35
Potassium	mg/L		1.1	1.38	3.3	2	2.1
Sodium	mg/L		12.4	16.1	29	22	23
Aluminum	mg/L		0.077	0.063	0.015	0.051	0.023
Antimony	mg/L		<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Arsenic	mg/L		0.00021	0.00024	<0.001	<0.001	<0.001
Barium	mg/L		0.00803	0.00869	0.0086	0.0096	0.0098
Beryllium	mg/L		<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Boron	mg/L	0.20	0.011	0.016	0.049	0.028	0.027
Cadmium	mg/L	0.0002	<0.0000050	<0.000010	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.0089	<0.00050	<0.00050	<0.005	<0.005	<0.005
Cobalt	mg/L		<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.005	0.00047	<0.0010	0.0011	0.002	0.0026
Iron	mg/L	0.3	0.039	<0.050	<0.1	<0.1	<0.1
Lead	mg/L	0.025	<0.000050	<0.00010	<0.0005	<0.0005	<0.0005
Manganese	mg/L		0.00255	0.00346	0.0032	0.002	0.0021
Molybdenum	mg/L		0.000223	0.000244	0.00054	<0.0005	<0.0005
Nickel	mg/L		<0.00050	<0.00050	<0.001	<0.001	<0.001

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2				
			Q1 2018	Q2 2018	Q3 2018	Q4 2018	
			6-Mar-18	9-May-18	5-Sep-18	6-Dec-18	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	SUMP 2	SUMP 2	DUP
Selenium	mg/L		<0.000050	<0.000050	<0.002	<0.002	<0.002
Silver	mg/L		<0.000050	<0.000050	<0.0001	<0.0001	<0.0001
Strontium	mg/L		0.137	0.169	0.29	0.25	0.25
Thallium	mg/L		<0.000010	0.00001	<0.00005	<0.00005	<0.00005
Titanium	mg/L		<0.0025	0.00149	<0.005	<0.005	<0.005
Tungsten	mg/L		<0.00010	<0.00010	<0.001	<0.001	<0.001
Uranium	mg/L		0.000091	0.000114	<0.0001	<0.0001	0.0001
Vanadium	mg/L		<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.02	<0.0010	<0.0030	<0.005	<0.005	0.005
Zirconium	mg/L		<0.00030	<0.00030	<0.001	<0.001	<0.001
Anion Sum	meq/L		-	-	-	-	-
Cation Sum	meq/L		-	-	-	-	-
Ion Ratio	AS/CS		-	-	-	-	-
TDS (Calc)	mg/L		244	268	-	-	-
Benzene	µg/L		<0.5	<0.5	<0.20	<0.20	<0.20
Toluene	µg/L		<0.5	<0.5	<0.20	<0.20	<0.20
Ethylbenzene	µg/L		<0.5	<0.5	<0.20	<0.20	<0.20
Xylene, m, p-	µg/L		<0.4	<0.4	<0.40	<0.40	<0.40
Xylene, o-	µg/L		<0.3	<0.3	<0.20	<0.20	<0.20
Xylene, total	µg/L		<0.5	<0.5	<0.40	<0.40	<0.40
PHC F1 (C6-C10)	µg/L		<25	<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L		<100	<100	<100	<100	<100
PHC F3 (>C16-C34)	µg/L		<250	<250	<200	<200	<200
PHC F4 (<C34-C50)	µg/L		<250	<250	<200	<200	<200

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2				
			Q1 2019	Q2 2019	Q3 2019	Q4 2019	
			6-Mar-18	9-May-18	5-Sep-18	6-Dec-18	
PARAMETERS	**UNITS**	**PWQO**	**SUMP 2**	**SUMP 2**	**SUMP 2**	**SUMP 2**	**DUP**
Total Coliform	cfu/100mL						
E.Coli	cfu/100mL						
Heterotrophic Plate Count	cfu/mL						
Temperature (field)	°C						
pH @25°C (lab)	pH units	6.5 - 8.5					
pH (field)	pH units	6.5 - 8.5					
Conductivity @25°C (lab)	µS/cm						
Conductivity (field)	µS/cm						
Dissolved Oxygen (field)	mg/L						
Alkalinity (CaCO3)	mg/L						
Hardness (CaCO3)	mg/L						
Chloride	mg/L						
Fluoride	mg/L						
Nitrate (N)	mg/L						
Nitrite (N)	mg/L						
Sulphate	mg/L						
Colour	TCU						
Total Suspended Solids	mg/L						
Ammonia (N) - Total	mg/L						
Unionized Ammonia as NH_3	mg/L	0.02					
Total Kjeldahl Nitrogen	mg/L						
Phosphorus - Total	mg/L	0.03					
Turbidity (lab)	NTU						
Turbidity (field)	NTU						
Silica	mg/L						
Silicon	mg/L						
Phenolics	mg/L	0.005					
Oil and Grease - Anim/Veg.	mg/L						
Oil and Grease - Mineral	mg/L						
Oil & Grease - Total	mg/L						
Calcium	mg/L						
Magnesium	mg/L						
Potassium	mg/L						
Sodium	mg/L						
Aluminum	ug/L						
Antimony	ug/L						
Arsenic	ug/L						
Barium	ug/L						
Beryllium	ug/L						
Boron	ug/L	200.00					
Cadmium	ug/L	0.2					
Chromium	ug/L	8.9					
Cobalt	ug/L						
Copper	ug/L	5					
Iron	ug/L	300					
Lead	ug/L	25					
Manganese	ug/L						
Molybdenum	ug/L						
Nickel	ug/L						

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SUMP 2				
			Q1 2019	Q2 2019	Q3 2019	Q4 2019	
			6-Mar-18	9-May-18	5-Sep-18	6-Dec-18	
PARAMETERS	UNITS	PWQO	SUMP 2	SUMP 2	SUMP 2	SUMP 2	DUP
Selenium	ug/L						
Silver	ug/L						
Strontium	ug/L						
Thallium	ug/L						
Titanium	ug/L						
Tungsten	ug/L						
Uranium	ug/L						
Vanadium	ug/L						
Zinc	ug/L	0.02					
Zirconium	ug/L						
Anion Sum	meq/L						
Cation Sum	meq/L						
Ion Ratio	AS/CS						
TDS (Calc)	mg/L						
Benzene	µg/L						
Toluene	µg/L						
Ethylbenzene	µg/L						
Xylene, m, p-	µg/L						
Xylene, o-	µg/L						
Xylene, total	µg/L						
PHC F1 (C6-C10)	µg/L						
PHC F2 (>C10-C16)	µg/L						
PHC F3 (>C16-C34)	µg/L						
PHC F4 (<C34-C50)	µg/L						

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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			QFSW2					
			Q1 2018		Q2 2018	Q3 2018		Q4 2018
			6-Mar-18		9-May-18	5-Sep-18		6-Dec-18
PARAMETERS	UNITS	PWQO	QFSW2	DUP	QFSW2	QFSW2	DUP	QFSW2
Total Coliform	cfu/100mL		34	32	32	53	68	9
E.Coli	cfu/100mL		0	0	5	14	17	2
Heterotrophic Plate Count	cfu/mL		9	9	72	270	250	5
Temperature (field)	°C		3.7	-	11.2	18.8	18.8	5.5
pH @25°C (lab)	pH units	6.5 - 8.5	8.05	8.07	8.24	-	-	-
pH (field)	pH units	6.5 - 8.5	7.6	-	7.86	8.0	8.0	7.6
Conductivity @25°C (lab)	µS/cm		607	608	554	-	-	-
Conductivity (field)	µS/cm		562	-	564	700	700	687
Dissolved Oxygen (field)	mg/L		-	-	8.18	6.84	6.84	8.21
Alkalinity (CaCO3)	mg/L		230	233	220	200	200	230
Hardness (CaCO3)	mg/L		270	273	256	290	290	330
Chloride	mg/L		54.3	54.3	48.7	110	110	87
Fluoride	mg/L		0.182	0.179	0.172	0.23	0.22	0.24
Nitrate (N)	mg/L		0.93	0.928	1.05	0.38	0.37	1.15
Nitrite (N)	mg/L		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Sulphate	mg/L		5.19	5.15	4.72	5.0	4.9	6.1
Colour	TCU		4.3	2.7	3.1	3	3	5
Total Suspended Solids	mg/L		<2.0	<2.0	<2.0	<10	<10	<10
Ammonia (N) - Total	mg/L		0.133	0.328	0.084	<0.05	<0.05	0.12
Unionized Ammonia as NH_3	mg/L	0.02	0.0005	0.0013	0.0012	<0.0016	<0.0016	0.0006
Total Kjeldahl Nitrogen	mg/L		0.19	0.37	0.16	0.23	0.19	0.24
Phosphorus - Total	mg/L	0.03	<0.0030	<0.0030	<0.0030	<0.020	<0.020	<0.020
Turbidity (lab)	NTU		-	-	1.36	-	-	-
Calcium	mg/L		55.1	54.2	55.2	45	44	59
Magnesium	mg/L		29.6	29.8	28.4	42	41	38
Potassium	mg/L		1.59	1.58	1.58	3	3	2.2
Sodium	mg/L		17.9	18.1	18.1	28	28	25
Aluminum	mg/L		0.01	0.012	0.027	0.011	0.011	0.02
Antimony	mg/L		<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Arsenic	mg/L		0.00024	0.00024	0.00027	<0.001	<0.001	<0.001
Barium	mg/L		0.0101	0.00987	0.00936	0.011	0.011	0.013
Beryllium	mg/L		<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Boron	mg/L	0.20	0.018	0.018	0.020	0.044	0.046	0.031
Cadmium	mg/L	0.0002	<0.000010	<0.000010	<0.000010	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.0089	<0.00050	<0.00050	<0.00050	<0.005	<0.005	<0.005
Cobalt	mg/L		<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Copper	mg/L	0.005	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Iron	mg/L	0.3	<0.050	<0.050	<0.050	<0.1	0.12	<0.1
Lead	mg/L	0.025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Manganese	mg/L		0.0192	0.0188	0.00419	0.094	0.094	0.14
Molybdenum	mg/L		0.000311	0.000325	0.000326	0.00061	0.00059	0.00052
Nickel	mg/L		<0.00050	<0.00050	<0.00050	<0.001	<0.001	0.0011
Selenium	mg/L		<0.000050	0.000054	<0.000050	<0.002	<0.002	<0.002
Silver	mg/L		<0.000050	<0.000050	<0.000050	<0.0001	<0.0001	<0.0001
Strontium	mg/L		0.218	0.211	0.213	0.31	0.3	0.29
Thallium	mg/L		0.000016	0.000015	0.000014	<0.00005	<0.00005	<0.00005
Titanium	mg/L		0.00036	0.00037	0.00049	<0.0005	<0.0005	<0.0005
Tungsten	mg/L		<0.00010	<0.00010	<0.00010	<0.001	<0.001	<0.001
Uranium	mg/L		0.000127	0.000124	0.00013	0.00011	0.00011	0.00012

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			QFSW2					
			Q1 2018		Q2 2018	Q3 2018		Q4 2018
			6-Mar-18		9-May-18	5-Sep-18		6-Dec-18
PARAMETERS	UNITS	PWQO	QFSW2	DUP	QFSW2	QFSW2	DUP	QFSW2
Vanadium	mg/L		<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Zinc	mg/L	0.02	0.0043	0.0038	<0.0030	<0.005	<0.005	<0.005
Zirconium	mg/L		<0.00030	<0.00030	<0.00030	<0.001	<0.001	<0.001
Anion Sum	meq/L		-	-	-	-	-	-
Cation Sum	meq/L		-	-	-	-	-	-
Ion Ratio	AS/CS		-	-	-	-	-	-
TDS (Calc)	mg/L		337	327	299	-	-	-
Benzene	µg/L		<0.5	<0.5	<0.5	<0.20	<0.20	<0.20
Toluene	µg/L		<0.5	<0.5	<0.5	<0.20	<0.20	<0.20
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.20	<0.20	<0.20
Xylene, m, p-	µg/L		<0.4	<0.4	<0.4	<0.40	<0.40	<0.40
Xylene, o-	µg/L		<0.3	<0.3	<0.3	<0.20	<0.20	<0.20
Xylene, total	µg/L		<0.5	<0.5	<0.5	<0.40	<0.40	<0.40
PHC F1 (C6-C10)	µg/L		<25	<25	<25	<25	<25	<25
PHC F2 (>C10-C16)	µg/L		<100	<100	<100	<100	<100	<100
PHC F3 (>C16-C34)	µg/L		<250	<250	<250	<200	<200	<200
PHC F4 (<C34-C50)	µg/L		<250	<250	<250	<200	<200	<200

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			QFSW2					
			Q1 2019		Q2 2019	Q3 2019		Q4 2019
			6-Mar-18		9-May-18	5-Sep-18		6-Dec-18
PARAMETERS	**UNITS**	**PWQO**	**QFSW2**	**DUP**	**QFSW2**	**QFSW2**	**DUP**	**QFSW2**
Total Coliform	cfu/100mL		1	2				
E.Coli	cfu/100mL		1	2				
Heterotrophic Plate Count	cfu/mL		3	0				
Temperature (field)	°C							
pH @25°C (lab)	pH units	6.5 - 8.5	8.05					
pH (field)	pH units	6.5 - 8.5	7.6					
Conductivity @25°C (lab)	µS/cm		607					
Conductivity (field)	µS/cm		562					
Dissolved Oxygen (field)	mg/L		-					
Alkalinity (CaCO3)	mg/L		230					
Hardness (CaCO3)	mg/L		270					
Chloride	mg/L		54.3					
Fluoride	mg/L		0.182					
Nitrate (N)	mg/L		0.93					
Nitrite (N)	mg/L		<0.010					
Sulphate	mg/L		5.19					
Colour	TCU		4.3					
Total Suspended Solids	mg/L		<2.0					
Ammonia (N) - Total	mg/L		0.133					
Unionized Ammonia as NH_3	mg/L	0.02	0.0005					
Total Kjeldahl Nitrogen	mg/L		0.19					
Phosphorus - Total	mg/L	0.03	<0.0030					
Turbidity (lab)	NTU		-					
Calcium	mg/L		55.1					
Magnesium	mg/L		29.6					
Potassium	mg/L		1.59					
Sodium	mg/L		17.9					
Aluminum	ug/L		0.01					
Antimony	ug/L		<0.00010					
Arsenic	ug/L		0.00024					
Barium	ug/L		0.0101					
Beryllium	ug/L		<0.00010					
Boron	ug/L	200.00	0.018					
Cadmium	ug/L	0.2	<0.000010					
Chromium	ug/L	8.9	<0.00050					
Cobalt	ug/L		<0.00010					
Copper	ug/L	5	<0.0010					
Iron	ug/L	300	<0.050					
Lead	ug/L	25	<0.00010					
Manganese	ug/L		0.0192					
Molybdenum	ug/L		0.000311					
Nickel	ug/L		<0.00050					
Selenium	ug/L		<0.000050					
Silver	ug/L		<0.000050					
Strontium	ug/L		0.218					
Thallium	ug/L		0.000016					
Titanium	ug/L		0.00036					
Tungsten	ug/L		<0.00010					
Uranium	ug/L		0.000127					

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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			QFSW2					
			Q1 2019		Q2 2019	Q3 2019		Q4 2019
			6-Mar-18		9-May-18	5-Sep-18		6-Dec-18
PARAMETERS	**UNITS**	**PWQO**	**QFSW2**	**DUP**	**QFSW2**	**QFSW2**	**DUP**	**QFSW2**
Vanadium	ug/L		<0.00050					
Zinc	ug/L	0.02	0.0043					
Zirconium	ug/L		<0.00030					
Anion Sum	meq/L		-					
Cation Sum	meq/L		-					
Ion Ratio	AS/CS		-					
TDS (Calc)	mg/L		337					
Benzene	µg/L		<0.5					
Toluene	µg/L		<0.5					
Ethylbenzene	µg/L		<0.5					
Xylene, m, p-	µg/L		<0.4					
Xylene, o-	µg/L		<0.3					
Xylene, total	µg/L		<0.5					
PHC F1 (C6-C10)	µg/L		<25					
PHC F2 (>C10-C16)	µg/L		<100					
PHC F3 (>C16-C34)	µg/L		<250					
PHC F4 (<C34-C50)	µg/L		<250					

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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			SW1			
			SW1	SW1	SW1	SW-DUP1
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	8-May-18	8-May-18
Total Coliform	cfu/100mL		-	-	-	-
E.Coli	cfu/100mL		-	-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-	-
Temperature (field)	°C		6.2	9.5	9.8	-
pH @25°C (lab)	pH units	6.5 - 8.5	8.08	8.18	7.97	8.01
pH (field)	pH units	6.5 - 8.5	7.3	8.3	7.4	-
Conductivity @25°C (lab)	µS/cm		809	528	525	525
Conductivity (field)	µS/cm		544	352	533	-
Dissolved Oxygen (field)	mg/L		10.0	14.1	3.7	-
Alkalinity (CaCO3)	mg/L		236	171	211	207
Hardness (CaCO3)	mg/L		322	237	243	245
Chloride	mg/L		116	50.3	46.1	45.9
Fluoride	mg/L		0.3	<0.1	0.175	0.174
Nitrate (N)	mg/L		0.2	1.3	0.262	0.257
Nitrite (N)	mg/L		<0.1	<0.1	<0.010	<0.010
Sulphate	mg/L		6	4	4.1	4.1
Colour	TCU		31	13	15.2	14.2
Total Suspended Solids	mg/L		8	<3	<2.0	<2.0
Ammonia (N) - Total	mg/L		0.02	0.01	0.035	0.065
Unionized Ammonia as NH_3	mg/L	0.02	0.0001	0.0003	0.0002	0.0003
Total Kjeldahl Nitrogen	mg/L		0.3	1.1	<0.15	0.19
Phosphorus - Total	mg/L	0.03	0.02	0.02	0.099	0.0095
Turbidity (lab)	NTU		-	-	0.31	0.33
Calcium	mg/L		60.7	49.3	50.5	53.3
Magnesium	mg/L		41.4	27.7	27.3	27.8
Potassium	mg/L		2.5	1.6	1.89	1.89
Sodium	mg/L		26.8	18.2	17.7	17
Aluminum	mg/L		0.03	0.03	<0.010	17.8
Antimony	mg/L		<0.0001	0.0001	<0.00010	<0.00010
Arsenic	mg/L		0.0004	0.0003	0.00028	0.0003
Barium	mg/L		0.011	0.009	0.0097	0.00946
Beryllium	mg/L		<0.002	<0.002	<0.00010	<0.00010
Boron	mg/L	0.20	0.016	0.014	0.023	0.024
Cadmium	mg/L	0.0002	<0.00002	<0.000014	<0.000010	<0.000010
Chromium	mg/L	0.0089	0.002	<0.002	<0.00050	<0.0005
Cobalt	mg/L		0.0002	0.0002	<0.00010	<0.00010
Copper	mg/L	0.005	<0.002	<0.002	<0.0010	<0.0010
Iron	mg/L	0.3	0.101	0.024	<0.050	<0.050
Lead	mg/L	0.025	0.00006	<0.00002	<0.00010	<0.00010
Manganese	mg/L		0.019	0.001	0.00407	0.00413
Molybdenum	mg/L		0.0005	0.0004	0.000336	0.000322
Nickel	mg/L		<0.01	<0.01	<0.00050	<0.00050
Selenium	mg/L		0.006	<0.001	<0.000050	<0.000050
Silver	mg/L		<0.00002	<0.00002	<0.000050	<0.000050
Strontium	mg/L		0.32	0.229	0.21	0.208
Thallium	mg/L		<0.00005	<0.00005	0.000017	0.000014
Titanium	mg/L		<0.005	<0.005	<0.00030	<0.00030
Tungsten	mg/L		0.02	<0.01	<0.00010	<0.00010
Uranium	mg/L		0.00009	0.00011	0.000086	0.000093

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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			SW1			
			SW1	SW1	SW1	SW-DUP1
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	8-May-18	8-May-18
Vanadium	mg/L		<0.005	<0.005	<0.00050	<0.00050
Zinc	mg/L	0.02	0.012	0.005	<0.0030	<0.0030
Zirconium	mg/L		<0.003	0.004	<0.00030	<0.00030
Anion Sum	meq/L		8.12	5.02	-	-
Cation Sum	meq/L		7.67	5.57	-	-
Ion Ratio	AS/CS		1.06	0.902	-	-
TDS (Calc)	mg/L		396	260	298	294
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.50	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.50	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.40	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.30	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.50	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
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			SW2			SW0-2		
			SW2	SW2	SW2	SW0-2	SW0-2	SW0-2
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	8-May-18	24-Oct-16	10-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-	-	-	-
E.Coli	cfu/100mL		-	-	-	-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-	-	-	-
Temperature (field)	°C		11.0	8.1	5.9	7.0	11.4	9.3
pH @25°C (lab)	pH units	6.5 - 8.5	8.08	8.12	8.01	8.2	8.2	8.0
pH (field)	pH units	6.5 - 8.5	7.4	8.1	7.26	7.5	8.3	7.5
Conductivity @25°C (lab)	µS/cm		643	529	617	762	527	515
Conductivity (field)	µS/cm		496	328	633	529	353	527
Dissolved Oxygen (field)	mg/L		8.6	14.9	10.3	11.0	12.8	5.1
Alkalinity (CaCO3)	mg/L		259	219	269	239	188	211
Hardness (CaCO3)	mg/L		269	231	283	302	256	246
Chloride	mg/L		42.8	29.8	45.7	95.8	45.7	44.7
Fluoride	mg/L		0.1	<0.1	0.043	0.2	<0.1	0.133
Nitrate (N)	mg/L		1.1	0.4	0.453	<0.1	0.3	0.037
Nitrite (N)	mg/L		<0.1	<0.1	<0.010	<0.1	<0.1	<0.010
Sulphate	mg/L		7	4	4.24	10	4	3.22
Colour	TCU		<2	3	2.2	49	38	36.8
Total Suspended Solids	mg/L		7	<3	<2.0	<3	<3	<2.0
Ammonia (N) - Total	mg/L		0.03	<0.01	0.048	0.03	<0.01	0.085
Unionized Ammonia as NH_3	mg/L	0.02	0.0002	<0.0002	0.0001	0.0001	<0.0004	0.0005
Total Kjeldahl Nitrogen	mg/L		0.2	0.2	<0.15	1.5	1.6	0.26
Phosphorus - Total	mg/L	0.03	0.01	0.01	0.039	0.02	0.03	0.526
Turbidity (lab)	NTU		-	-	0.19	-	-	0.41
Calcium	mg/L		64.1	59	66.9	62.2	57	54.1
Magnesium	mg/L		26.4	20.3	25.8	35.6	27.5	26.2
Potassium	mg/L		0.8	0.6	0.934	2.4	2.5	2.89
Sodium	mg/L		22.9	19.8	27.2	22.7	20	17.6
Aluminum	mg/L		0.03	0.03	<0.010	0.03	0.04	0.011
Antimony	mg/L		<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.00010
Arsenic	mg/L		0.0003	0.0001	0.00012	0.0014	0.0005	0.00032
Barium	mg/L		0.007	0.007	0.00797	0.011	0.008	0.0102
Beryllium	mg/L		<0.002	<0.002	<0.00010	<0.002	<0.002	<0.00010
Boron	mg/L	0.20	0.009	<0.005	<0.010	0.017	0.01	0.02
Cadmium	mg/L	0.0002	<0.00002	<0.000014	<0.000010	<0.00002	<0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	<0.002	<0.00050	<0.002	<0.002	<0.00050
Cobalt	mg/L		0.0001	<0.0001	<0.00010	0.0002	<0.0001	<0.00010
Copper	mg/L	0.005	<0.002	<0.002	<0.0010	<0.002	<0.002	<0.0010
Iron	mg/L	0.3	0.102	0.012	<0.050	0.097	0.061	0.089
Lead	mg/L	0.025	0.00011	<0.00002	<0.00010	0.00004	0.00002	<0.00010
Manganese	mg/L		0.018	0.004	0.0087	0.019	0.005	0.0393
Molybdenum	mg/L		0.0001	<0.0001	0.000075	0.0003	0.0003	0.000234
Nickel	mg/L		<0.01	<0.01	<0.00050	<0.01	<0.01	0.00056
Selenium	mg/L		<0.001	<0.001	0.000062	0.004	<0.001	0.000059
Silver	mg/L		<0.00002	<0.00002	<0.000050	<0.00002	<0.00002	<0.000050
Strontium	mg/L		0.076	0.052	0.0658	0.228	0.178	0.181
Thallium	mg/L		<0.00005	<0.00005	<0.000010	<0.00005	<0.00005	<0.000010
Titanium	mg/L		<0.005	<0.005	<0.00030	<0.005	<0.005	<0.00030
Tungsten	mg/L		<0.01	<0.01	<0.00010	0.01	<0.01	<0.00010
Uranium	mg/L		0.00009	0.00009	0.000082	0.00011	0.0001	0.000075

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW2			SW0-2		
			SW2	SW2	SW2	SW0-2	SW0-2	SW0-2
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	8-May-18	24-Oct-16	10-May-17	8-May-18
Vanadium	mg/L		<0.005	<0.005	<0.00050	<0.005	<0.005	<0.00050
Zinc	mg/L	0.02	<0.005	<0.005	<0.0030	<0.005	0.005	<0.0030
Zirconium	mg/L		<0.003	0.006	<0.00030	<0.003	0.006	<0.00030
Anion Sum	meq/L		6.62	5.31	-	7.7	5.16	-
Cation Sum	meq/L		6.4	5.49	-	7.09	6.04	-
Ion Ratio	AS/CS		1.03	0.967	-	1.09	0.854	-
TDS (Calc)	mg/L		325	266	346	373	271	302
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.40	<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.30	<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.50	<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW3				SW3B		
			SW3	SW3	DUP 2	SW3	SW3B	SW3B	SW3B
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	9-May-17	8-May-18	24-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL			-	-	-		-	-
E.Coli	cfu/100mL			-	-	-		-	-
Heterotrophic Plate Count	cfu/mL			-	-	-		-	-
Temperature (field)	°C		**DRY**	7.0	-	10.4	**DRY**	7.2	8.8
pH @25°C (lab)	pH units	6.5 - 8.5		7.86	7.94	8.01		7.8	7.9
pH (field)	pH units	6.5 - 8.5		7.9	-	7.52		7.8	7.3
Conductivity @25°C (lab)	µS/cm			315	312	381		456	447
Conductivity (field)	µS/cm			188	-	407		260	450
Dissolved Oxygen (field)	mg/L			10.8	-	6.2		10.0	5.9
Alkalinity (CaCO3)	mg/L			166	164	212		205	230
Hardness (CaCO3)	mg/L			176	176	229		229	236
Chloride	mg/L			0.9	0.9	1.74		17.6	10.8
Fluoride	mg/L			<0.1	<0.1	0.029		<0.1	0.038
Nitrate (N)	mg/L			<0.1	<0.1	<0.020		0.3	0.175
Nitrite (N)	mg/L			<0.1	<0.1	<0.010		<0.1	<0.010
Sulphate	mg/L			2	1	1.08		3	1.97
Colour	TCU			27	27	33.3		9	11
Total Suspended Solids	mg/L			<3	<3	<2.0		<3	<2.0
Ammonia (N) - Total	mg/L			<0.01	<0.01	0.053		<0.01	0.022
Unionized Ammonia as NH_3	mg/L	0.02		<0.0001	<0.0001	0.0003		<0.0001	0.0001
Total Kjeldahl Nitrogen	mg/L			0.3	0.3	0.2		0.2	<0.15
Phosphorus - Total	mg/L	0.03		0.01	0.02	0.0082		0.01	0.0031
Turbidity (lab)	NTU			-	-	0.57		-	0.39
Calcium	mg/L			47.6	47.4	61.1		60.6	61.7
Magnesium	mg/L			13.8	14.1	17.5		18.9	19
Potassium	mg/L			0.2	0.2	0.456		0.3	0.439
Sodium	mg/L			0.9	0.9	1.05		13.2	6.47
Aluminum	mg/L			0.05	0.03	0.03		0.05	<0.010
Antimony	mg/L			<0.0001	<0.0001	<0.00010		<0.0001	<0.00010
Arsenic	mg/L			<0.0001	<0.0001	0.00028		<0.0001	0.00014
Barium	mg/L			0.009	0.009	0.0117		0.012	0.0123
Beryllium	mg/L			<0.002	<0.002	<0.00010		<0.002	<0.00010
Boron	mg/L	0.20		<0.005	<0.005	<0.010		<0.005	<0.010
Cadmium	mg/L	0.0002		<0.000014	<0.000014	<0.000010		<0.000014	<0.000010
Chromium	mg/L	0.0089		<0.002	<0.002	<0.00050		<0.002	<0.00050
Cobalt	mg/L			<0.0001	<0.0001	<0.00010		<0.0001	<0.00010
Copper	mg/L	0.005		<0.002	<0.002	<0.0010		<0.002	<0.0010
Iron	mg/L	0.3		0.086	0.054	0.055		0.014	<0.050
Lead	mg/L	0.025		<0.00002	<0.00002	<0.00010		<0.00002	<0.00010
Manganese	mg/L			0.011	0.01	0.0219		0.005	0.0107
Molybdenum	mg/L			<0.0001	<0.0001	0.000051		<0.0001	0.000053
Nickel	mg/L			<0.01	<0.01	<0.00050		<0.01	<0.00050
Selenium	mg/L			<0.001	<0.001	0.000068		<0.001	0.00006
Silver	mg/L			<0.00002	<0.00002	<0.000050		<0.00002	<0.000050
Strontium	mg/L			0.043	0.044	0.0628		0.055	0.061
Thallium	mg/L			<0.00005	<0.00005	<0.000010		<0.00005	<0.000010
Titanium	mg/L			<0.005	<0.005	0.00069		<0.005	<0.00030
Tungsten	mg/L			<0.01	<0.01	<0.00010		<0.01	<0.00010
Uranium	mg/L			0.00014	0.00014	0.000176		0.00019	0.000157

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW3				SW3B		
			SW3	SW3	DUP 2	SW3	SW3B	SW3B	SW3B
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	9-May-17	8-May-18	24-Oct-16	9-May-17	8-May-18
Vanadium	mg/L			<0.005	<0.005	<0.00050		<0.005	<0.00050
Zinc	mg/L	0.02		<0.005	<0.005	<0.0030		<0.005	<0.0030
Zirconium	mg/L		**DRY**	0.005	0.004	<0.00030	**DRY**	0.006	<0.00030
Anion Sum	meq/L			3.37	3.32	-		4.69	-
Cation Sum	meq/L			3.56	3.57	-		5.16	-
Ion Ratio	AS/CS			0.948	0.929	-		0.908	-
TDS (Calc)	mg/L			165	163	240		238	269
Benzene	µg/L			<0.5	<0.5	<0.5		<0.5	<0.5
Toluene	µg/L			<0.5	<0.5	<0.5		<0.5	<0.5
Ethylbenzene	µg/L			<0.5	<0.5	<0.5		<0.5	<0.5
Xylene, m, p-	µg/L			<1.0	<1.0	<0.4		<1.0	<0.4
Xylene, o-	µg/L			<0.5	<0.5	<0.3		<0.5	<0.3
Xylene, total	µg/L			<1.1	<1.1	<0.5		<1.1	<0.5
PHC F1 (C6-C10)	µg/L			<50	<50	<25		<50	<25
PHC F2 (>C10-C16)	µg/L			<50	<50	<100		<50	<100
PHC F3 (>C16-C34)	µg/L			<400	<400	<250		<400	<250
PHC F4 (<C34-C50)	µg/L			<400	<400	<250		<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW6A				SW9		
			SW6A	DUP2	SW6A	SW6A	SW9	SW9	SW9
PARAMETERS	UNITS	PWQO	25-Oct-16	25-Oct-16	8-May-17	8-May-18	25-Oct-16	8-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-	-	-	-	-
E.Coli	cfu/100mL		-	-	-	-	-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-	-	-	-	-
Temperature (field)	°C		4.8	-	9.0	11.2	**DRY**	8.3	14.2
pH @25°C (lab)	pH units	6.5 - 8.5	8.3	8.3	8.3	8.1		8.21	8.16
pH (field)	pH units	6.5 - 8.5	7.9	-	8.0	7.8		8.2	7.77
Conductivity @25°C (lab)	µS/cm		558	556	387	454		308	342
Conductivity (field)	µS/cm		363	-	243	464		189	364
Dissolved Oxygen (field)	mg/L		12.9	-	12.5	7.6		12.2	8.6
Alkalinity (CaCO3)	mg/L		240	241	181	237		159	192
Hardness (CaCO3)	mg/L		295	306	205	244		169	200
Chloride	mg/L		29.6	29.6	10.5	14.4		< 0.5	1.09
Fluoride	mg/L		0.2	0.2	< 0.1	0.05		< 0.1	0.035
Nitrate (N)	mg/L		0.3	0.3	0.2	0.126		0.2	<0.020
Nitrite (N)	mg/L		<0.1	<0.1	< 0.1	<0.010		< 0.1	<0.010
Sulphate	mg/L		8	8	3	2.4		2	1.69
Colour	TCU		26	29	31	26.2		26	25.3
Total Suspended Solids	mg/L		10	14	<3	2.9		3	3.1
Ammonia (N) - Total	mg/L		0.02	0.02	0.03	<0.020		<0.01	0.039
Unionized Ammonia as NH_3	mg/L	0.02	0.0002	0.0002	0.0005	<0.0002		<0.0003	0.0006
Total Kjeldahl Nitrogen	mg/L		0.5	0.6	0.3	0.2		2.3	<0.15
Phosphorus - Total	mg/L	0.03	0.02	0.03	<0.01	0.0075		<0.01	0.0089
Turbidity	NTU		-	-	-	0.82		-	0.9
Calcium	mg/L		68.1	70.8	49.5	61.8		44.4	55.6
Magnesium	mg/L		30.4	31.4	19.8	22.1		14.1	15.3
Potassium	mg/L		1.4	1.4	0.9	1.57		0.7	1.52
Sodium	mg/L		10	10.3	5.8	6.06		0.8	0.86
Aluminum	mg/L		0.04	0.05	0.03	0.014		0.03	0.024
Antimony	mg/L		0.0002	<0.0001	< 0.0001	<0.00010		< 0.0001	<0.00010
Arsenic	mg/L		0.0005	0.0006	0.0002	0.00022		0.0001	0.0002
Barium	mg/L		0.014	0.015	0.01	0.0133		0.01	0.0144
Beryllium	mg/L		<0.002	<0.002	< 0.002	<0.00010		< 0.002	<0.00010
Boron	mg/L	0.20	0.007	0.007	0.012	0.011		0.01	<0.010
Cadmium	mg/L	0.0002	<0.00002	<0.00002	< 0.000014	<0.000010		< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	<0.002	< 0.002	<0.00050		< 0.002	<0.00050
Cobalt	mg/L		0.0002	0.0002	< 0.0001	<0.00010		< 0.0001	<0.00010
Copper	mg/L	0.005	<0.002	<0.002	< 0.002	<0.0010		< 0.002	<0.0010
Iron	mg/L	0.3	0.104	0.136	0.085	0.068		0.058	<0.050
Lead	mg/L	0.025	0.00017	0.00022	< 0.00002	<0.00010		0.00003	<0.00010
Manganese	mg/L		0.081	0.101	0.007	0.0269		0.001	0.00211
Molybdenum	mg/L		<0.0001	<0.0001	0.0001	0.000106		< 0.0001	0.000104
Nickel	mg/L		<0.01	<0.01	< 0.01	<0.00050		< 0.01	<0.00050
Selenium	mg/L		0.002	0.002	< 0.001	<0.000050		< 0.001	0.000061
Silver	mg/L		<0.00002	<0.00002	< 0.00002	<0.000050		< 0.00002	<0.000050
Strontium	mg/L		0.1	0.102	-	0.0846		-	0.066
Thallium	mg/L		<0.00005	<0.00005	< 0.00005	<0.000010		< 0.00005	<0.000010
Titanium	mg/L		<0.005	<0.005	< 0.005	<0.00030		< 0.005	0.0008
Tungsten	mg/L		<0.01	<0.01	< 0.01	<0.00010		< 0.01	<0.00010
Uranium	mg/L		0.00012	0.00012	0.0001	0.000103		0.00015	0.000216

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW6A				SW9		
			SW6A	DUP2	SW6A	SW6A	SW9	SW9	SW9
PARAMETERS	UNITS	PWQO	25-Oct-16	25-Oct-16	8-May-17	8-May-18	25-Oct-16	8-May-17	8-May-18
Vanadium	mg/L		<0.005	<0.005	< 0.005	<0.00050		< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	<0.005	0.006	<0.0030		< 0.005	<0.0030
Zirconium	mg/L		<0.003	<0.003	< 0.003	<0.00030	DRY	< 0.003	<0.00030
Anion Sum	meq/L		5.85	5.87	3.97	-		3.25	-
Cation Sum	meq/L		6.38	6.62	4.38	-		3.43	-
Ion Ratio	AS/CS		0.916	0.887	0.907	-		0.945	-
TDS (Calc)	mg/L		294	299	198	262		159	198
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<1.0	<0.4		<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.5	<0.3		<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<1.1	<0.5		<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<50	<25		<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<50	<100		<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<400	<250		<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<400	<250		<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW10			SW11		
			SW10	SW10	SW10	SW11	SW11	SW11
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18	16-Nov-16	8-May-17	9-May-18
Total Coliform	cfu/100mL		>2000	60	160	-	-	20
E.Coli	cfu/100mL		108	1	14	-	-	0
Heterotrophic Plate Count	cfu/mL		>2000	270	63	-	-	31
Temperature (field)	°C		7.9	6.8	11.8	6.7	5.5	6.1
pH @25°C (lab)	pH units	6.5 - 8.5	8.09	8.32	8.34	7.95	8.3	8.3
pH (field)	pH units	6.5 - 8.5	8.0	8.0	8.2	7.9	8.0	8.0
Conductivity @25°C (lab)	µS/cm		495	365	393	484	315	341
Conductivity (field)	µS/cm		331	206	424	253	179	360
Dissolved Oxygen (field)	mg/L		9.8	12.7	10.3	9.6	14.7	12.2
Alkalinity (CaCO3)	mg/L		242	183	223	236	164	201
Hardness (CaCO3)	mg/L		566	195	231	255	175	200
Chloride	mg/L		5.1	0.9	2.55	2.4	< 0.5	1.03
Fluoride	mg/L		<0.1	< 0.1	0.04	<0.1	< 0.1	0.034
Nitrate (N)	mg/L		1.4	1.2	2.72	0.3	0.3	0.266
Nitrite (N)	mg/L		0.3	< 0.1	<0.010	<0.1	< 0.1	<0.010
Sulphate	mg/L		7	2	3.63	7	3	2.49
Colour	TCU		38	6	3.3	13	9	7.3
Total Suspended Solids	mg/L		1110	32	<2.0	195	<3	<2.0
Ammonia (N) - Total	mg/L		0.22	<0.01	0.135	<0.01	<0.01	0.025
Unionized Ammonia as NH_3	mg/L	0.02	0.0034	<0.0001	0.004	<0.0001	<0.0001	0.0004
Total Kjeldahl Nitrogen	mg/L		24.8	0.3	0.25	0.3	1.6	<0.15
Phosphorus - Total	mg/L	0.03	3.16	0.03	0.0134	0.02	0.01	0.0104
Turbidity	NTU		-	-	0.43	-	-	0.68
Calcium	mg/L		174	55	66	69.8	47.2	55.3
Magnesium	mg/L		31.6	13.9	15.5	19.7	13.8	15.4
Potassium	mg/L		1	0.4	0.456	0.7	0.7	0.866
Sodium	mg/L		3.4	1.2	1.82	1.9	0.9	0.88
Aluminum	mg/L		3.02	0.11	0.028	0.16	0.03	0.021
Antimony	mg/L		<0.0001	< 0.0001	<0.00010	<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0015	0.0002	0.00013	0.0001	0.0001	0.00015
Barium	mg/L		0.065	0.007	0.00821	0.012	0.007	0.00864
Beryllium	mg/L		<0.002	< 0.002	<0.00010	<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.022	0.008	<0.010	<0.005	0.008	<0.010
Cadmium	mg/L	0.0002	0.00068	< 0.000014	<0.000010	0.00009	< 0.000014	<0.000010
Chromium	mg/L	0.0089	0.003	0.002	<0.00050	0.099	< 0.002	<0.00050
Cobalt	mg/L		0.0034	< 0.0001	<0.00010	0.0009	< 0.0001	<0.00010
Copper	mg/L	0.005	0.016	< 0.002	<0.0010	0.002	< 0.002	<0.0010
Iron	mg/L	0.3	3.53	0.181	<0.050	0.86	0.051	<0.050
Lead	mg/L	0.025	0.0175	0.00032	<0.00010	0.00022	< 0.00002	<0.00010
Manganese	mg/L		0.697	0.008	0.00168	0.036	0.001	0.00071
Molybdenum	mg/L		<0.0001	< 0.0001	<0.000050	0.0083	< 0.0001	0.000066
Nickel	mg/L		<0.01	< 0.01	<0.00050	0.1	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	<0.000050	<0.001	< 0.001	<0.000050
Silver	mg/L		<0.00002	< 0.00002	<0.000050	<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.165	-	0.086	0.092	-	0.0623
Thallium	mg/L		0.00006	< 0.00005	<0.000010	<0.00005	< 0.00005	<0.000010
Titanium	mg/L		0.012	< 0.005	0.00075	<0.005	< 0.005	0.00061
Tungsten	mg/L		0.02	< 0.01	<0.00010	<0.01	< 0.01	<0.00010
Uranium	mg/L		0.00017	0.00007	0.000085	0.00012	0.00011	0.000129

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW10			SW11		
			SW10	SW10	SW10	SW11	SW11	SW11
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18	16-Nov-16	8-May-17	9-May-18
Vanadium	mg/L		0.005	< 0.005	<0.00050	<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	0.049	< 0.005	<0.0030	<0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	< 0.003	<0.00030	<0.003	< 0.003	<0.00030
Anion Sum	meq/L		5.25	3.81	-	4.95	3.36	-
Cation Sum	meq/L		11.7	3.96	-	5.25	3.55	-
Ion Ratio	AS/CS		0.449	0.961	-	0.944	0.945	-
TDS (Calc)	mg/L		380	189	235	245	165	196
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4	<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3	<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5	<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11A		
			SW11A	SW11A	SW11A
PARAMETERS	UNITS	PWQO	25-Oct-16	8-May-17	9-May-18
Total Coliform	cfu/100mL		-	52	3
E.Coli	cfu/100mL		-	4	0
Heterotrophic Plate Count	cfu/mL		-	200	3
Temperature (field)	°C		**DRY**	5.2	5
pH @25°C (lab)	pH units	6.5 - 8.5		8.26	8.28
pH (field)	pH units	6.5 - 8.5		7.8	7.78
Conductivity @25°C (lab)	µS/cm			310	349
Conductivity (field)	µS/cm			166	372
Dissolved Oxygen (field)	mg/L			15.0	12.0
Alkalinity (CaCO3)	mg/L			161	210
Hardness (CaCO3)	mg/L			169	209
Chloride	mg/L			0.6	1.12
Fluoride	mg/L			< 0.1	0.034
Nitrate (N)	mg/L			0.3	0.222
Nitrite (N)	mg/L			< 0.1	<0.010
Sulphate	mg/L			2	2.4
Colour	TCU			8	5.4
Total Suspended Solids	mg/L			<3	2.3
Ammonia (N) - Total	mg/L			<0.01	0.045
Unionized Ammonia as NH_3	mg/L	0.02		<0.0001	0.0003
Total Kjeldahl Nitrogen	mg/L			1.4	<0.15
Phosphorus - Total	mg/L	0.03		0.01	0.0053
Turbidity	NTU		-	-	0.85
Calcium	mg/L			45.4	55.1
Magnesium	mg/L			13.5	15.7
Potassium	mg/L			0.7	0.925
Sodium	mg/L			0.9	0.92
Aluminum	mg/L			0.02	0.027
Antimony	mg/L			< 0.0001	<0.00010
Arsenic	mg/L			0.0001	0.00014
Barium	mg/L			0.008	0.00918
Beryllium	mg/L			< 0.002	<0.00010
Boron	mg/L	0.20		0.008	<0.010
Cadmium	mg/L	0.0002		< 0.000014	<0.000010
Chromium	mg/L	0.0089		< 0.002	<0.00050
Cobalt	mg/L			< 0.0001	<0.00010
Copper	mg/L	0.005		< 0.002	<0.0010
Iron	mg/L	0.3		0.031	<0.050
Lead	mg/L	0.025		< 0.00002	<0.00010
Manganese	mg/L			< 0.001	0.00069
Molybdenum	mg/L			< 0.0001	0.000066
Nickel	mg/L			< 0.01	<0.00050
Selenium	mg/L		**DRY**	< 0.001	0.000063
Silver	mg/L			< 0.00002	<0.000050
Strontium	mg/L			-	0.0594
Thallium	mg/L			< 0.00005	<0.000010
Titanium	mg/L			< 0.005	0.00048
Tungsten	mg/L			< 0.01	<0.00010
Uranium	mg/L			0.0001	0.000137

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11A		
			SW11A	SW11A	SW11A
PARAMETERS	UNITS	PWQO	25-Oct-16	8-May-17	9-May-18
Vanadium	mg/L			< 0.005	<0.00050
Zinc	mg/L	0.02		< 0.005	<0.0030
Zirconium	mg/L			< 0.003	<0.00030
Anion Sum	meq/L			3.29	-
Cation Sum	meq/L			3.44	-
Ion Ratio	AS/CS			0.957	-
TDS (Calc)	mg/L			161	200
Benzene	µg/L			<0.5	<0.5
Toluene	µg/L			<0.5	<0.5
Ethylbenzene	µg/L			<0.5	<0.5
Xylene, m, p-	µg/L			<1.0	<0.4
Xylene, o-	µg/L			<0.5	<0.3
Xylene, total	µg/L			<1.1	<0.5
PHC F1 (C6-C10)	µg/L			<50	<25
PHC F2 (>C10-C16)	µg/L			<50	<100
PHC F3 (>C16-C34)	µg/L			<400	<250
PHC F4 (<C34-C50)	µg/L			<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11B			SW11C		
			SW11B	SW11B	SW11B	SW11C	SW11C	SW11C
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18	24-Oct-16	8-May-17	9-May-18
Total Coliform	cfu/100mL		230	68	3	230	74	5
E.Coli	cfu/100mL		9	0	2	4	1	0
Heterotrophic Plate Count	cfu/mL		>2000	40	1	500	40	4
Temperature (field)	°C		9.3	5.1	5.1	8.5	4.9	5
pH @25°C (lab)	pH units	6.5 - 8.5	8.41	8.27	8.26	8.24	8.31	8.23
pH (field)	pH units	6.5 - 8.5	7.6	7.7	7.8	7.8	7.8	7.8
Conductivity @25°C (lab)	µS/cm		439	318	349	466	317	350
Conductivity (field)	µS/cm		328	164	372	336	175	371
Dissolved Oxygen (field)	mg/L		11.0	15.0	11.9	11.0	14.8	12.0
Alkalinity (CaCO3)	mg/L		230	160	195	239	317	200
Hardness (CaCO3)	mg/L		248	165	198	246	164	200
Chloride	mg/L		2.2	< 0.5	1.11	2.4	170	1.11
Fluoride	mg/L		<0.1	< 0.1	0.033	<0.1	< 0.5	0.035
Nitrate (N)	mg/L		0.2	0.3	0.217	0.4	< 0.1	0.231
Nitrite (N)	mg/L		0.2	< 0.1	<0.010	0.2	0.3	<0.010
Sulphate	mg/L		7	2	2.39	7	< 0.1	2.43
Colour	TCU		7	8	5.4	<2	2	5.5
Total Suspended Solids	mg/L		100	<3	<2.0	16	<3	<2.0
Ammonia (N) - Total	mg/L		0.02	<0.01	0.053	0.02	<0.01	0.072
Unionized Ammonia as NH_3	mg/L	0.02	0.0001	<0.0001	0.00041	0.0002	<0.0001	0.0005
Total Kjeldahl Nitrogen	mg/L		0.4	2.2	<0.15	0.2	1.1	<0.15
Phosphorus - Total	mg/L	0.03	0.08	<0.01	0.0046	0.03	<0.01	0.0057
Turbidity (lab)	NTU		-	-	0.42	-	-	0.36
Calcium	mg/L		67.8	44.1	56.2	65.9	45.6	54.1
Magnesium	mg/L		19.2	13.3		19.8	13.5	15.7
Potassium	mg/L		0.8	0.7		0.5	0.7	0.896
Sodium	mg/L		1.6	0.9		1.9	0.9	0.9
Aluminum	mg/L		0.2	0.03	0.014	0.06	0.02	<0.010
Antimony	mg/L		<0.0001	< 0.0001	<0.00010	<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0003	0.0001	0.00011	0.0002	0.0001	0.00012
Barium	mg/L		0.013	0.007	0.00914	0.01	0.007	0.009
Beryllium	mg/L		<0.002	< 0.002	<0.00010	<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.007	0.008	<0.010	0.005	0.007	<0.010
Cadmium	mg/L	0.0002	0.0001	< 0.000014	<0.000010	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0032	< 0.0001	<0.00010	0.0002	< 0.0001	<0.00010
Copper	mg/L	0.005	0.009	< 0.002	<0.0010	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	0.759	0.05	<0.050	0.037	0.033	<0.050
Lead	mg/L	0.025	0.00335	< 0.00002	<0.00010	0.00011	< 0.00002	<0.00010
Manganese	mg/L		0.489	0.002	<0.00050	0.009	< 0.001	<0.00050
Molybdenum	mg/L		<0.0001	< 0.0001	0.000066	0.0001	< 0.0001	0.000075
Nickel	mg/L		<0.01	< 0.01	<0.00050	<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.00007	<0.001	< 0.001	0.000078
Silver	mg/L		<0.00002	< 0.00002	<0.000050	<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.102	-	0.0626	0.087	-	0.0627
Thallium	mg/L		<0.00005	< 0.00005	<0.000010	<0.00005	< 0.00005	<0.000010
Titanium	mg/L		0.007	< 0.005	0.00045	<0.005	< 0.005	<0.00030
Tungsten	mg/L		<0.01	< 0.01	<0.00010	<0.01	< 0.01	<0.00010
Uranium	mg/L		0.00025	0.0001	0.000136	0.00016	0.00011	0.000137

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11B			SW11C		
			SW11B	SW11B	SW11B	SW11C	SW11C	SW11C
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18	24-Oct-16	8-May-17	9-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050	<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	0.008	< 0.005	<0.0030	<0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	< 0.003	<0.00030	<0.003	< 0.003	<0.00030
Anion Sum	meq/L		4.98	3.27	-	5.02	3.37	-
Cation Sum	meq/L		6.46	3.35	-	5.02	3.45	-
Ion Ratio	AS/CS		0.771	0.976	-	1	0.976	-
TDS (Calc)	mg/L		268	159	210	243	164	210
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4	<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3	<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5	<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11D		
			SW11D	SW11D	SW11D
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18
Total Coliform	cfu/100mL		390	28	6
E.Coli	cfu/100mL		81	0	0
Heterotrophic Plate Count	cfu/mL		>2000	10	5
Temperature (field)	°C		8.0	4.6	4.9
pH @25°C (lab)	pH units	6.5 - 8.5	8.35	8.28	8.28
pH (field)	pH units	6.5 - 8.5	8.0	7.9	7.9
Conductivity @25°C (lab)	µS/cm		435	317	317
Conductivity (field)	µS/cm		222	153	363
Dissolved Oxygen (field)	mg/L		11.3	14.9	12.1
Alkalinity (CaCO3)	mg/L		226	162	194
Hardness (CaCO3)	mg/L		242	161	198
Chloride	mg/L		1.2	0.8	0.97
Fluoride	mg/L		<0.1	< 0.1	0.037
Nitrate (N)	mg/L		0.4	0.4	0.364
Nitrite (N)	mg/L		0.2	< 0.1	<0.010
Sulphate	mg/L		7	2	2.55
Colour	TCU		4	9	6.1
Total Suspended Solids	mg/L		38	3	2.3
Ammonia (N) - Total	mg/L		0.01	<0.01	0.1
Unionized Ammonia as NH_3	mg/L	0.02	0.0002	<0.0001	0.0007
Total Kjeldahl Nitrogen	mg/L		1	0.7	<0.15
Phosphorus - Total	mg/L	0.03	0.12	0.03	0.0103
Turbidity (lab)	NTU		-	-	0.79
Calcium	mg/L		66.3	43.3	53.1
Magnesium	mg/L		18.6	12.9	15.1
Potassium	mg/L		0.5	0.7	0.871
Sodium	mg/L		1	0.9	0.885
Aluminum	mg/L		0.22	0.03	0.021
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0005	0.0001	0.00014
Barium	mg/L		0.01	0.007	0.00866
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.009	0.007	<0.010
Cadmium	mg/L	0.0002	0.00004	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	0.003	<0.00050
Cobalt	mg/L		0.0004	< 0.0001	<0.00010
Copper	mg/L	0.005	0.002	0.002	<0.0010
Iron	mg/L	0.3	0.232	0.054	<0.050
Lead	mg/L	0.025	0.0015	< 0.00002	<0.00010
Manganese	mg/L		0.051	0.002	0.00072
Molybdenum	mg/L		<0.0001	< 0.0001	0.000071
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.000059
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.086	-	0.0626
Thallium	mg/L		<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00061
Tungsten	mg/L		0.01	< 0.01	<0.00010
Uranium	mg/L		0.00012	0.00011	0.000127

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11D		
			SW11D	SW11D	SW11D
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	< 0.003	<0.00030
Anion Sum	meq/L		4.74	3.35	-
Cation Sum	meq/L		4.91	3.28	-
Ion Ratio	AS/CS		0.966	1.02	-
TDS (Calc)	mg/L		233	160	215
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11E			SW14		
			SW11E	SW11E	SW11E	SW14	SW14	SW14
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	9-May-18	24-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		230	60	41	-	-	-
E.Coli	cfu/100mL		9	0	0	-	-	-
Heterotrophic Plate Count	cfu/mL		>2000	160	30	-	-	-
Temperature (field)	°C		7.8	6.4	6.9	7.7	7.0	10.3
pH @25°C (lab)	pH units	6.5 - 8.5	8.41	8.26	8.39	8.22	8.21	8.38
pH (field)	pH units	6.5 - 8.5	7.9	8.5	8.29	7.5	8.3	8.4
Conductivity @25°C (lab)	µS/cm		439	323	336	460	458	366
Conductivity (field)	µS/cm		311	190	357	464	223	390
Dissolved Oxygen (field)	mg/L		12.5	15.5	11.77	10.1	15.1	11.0
Alkalinity (CaCO3)	mg/L		230	171	196	220	246	193
Hardness (CaCO3)	mg/L		248	190	194	219	253	200
Chloride	mg/L		2.2	< 0.5	1.04	10.2	1.2	8.54
Fluoride	mg/L		<0.1	< 0.1	0.035	<0.1	< 0.1	0.038
Nitrate (N)	mg/L		0.2	0.4	0.26	<0.1	0.4	0.51
Nitrite (N)	mg/L		0.2	< 0.1	<0.010	<0.1	< 0.1	<0.010
Sulphate	mg/L		7	3	2.52	8	3	3.89
Colour	TCU		7	8	8.1	12	7	8.2
Total Suspended Solids	mg/L		100	5	3.2	14	11	3.9
Ammonia (N) - Total	mg/L		0.02	<0.01	<0.020	0.03	<0.01	0.027
Unionized Ammonia as NH_3	mg/L	0.02	0.0002	<0.0004	<0.0006	0.0001	<0.0003	0.0011
Total Kjeldahl Nitrogen	mg/L		0.4	0.2	<0.15	0.3	0.3	<0.15
Phosphorus - Total	mg/L	0.03	0.08	0.02	0.012	0.01	0.03	0.0115
Turbidity (lab)	NTU		-	-	2.21	-	-	3.06
Calcium	mg/L		67.8	52.4	54.2	55.6	74.5	56.6
Magnesium	mg/L		19.2	14.3	14.8	19.4	16.3	15.4
Potassium	mg/L		0.8	0.8	0.885	1	0.9	1.12
Sodium	mg/L		1.6	0.8	0.881	4.4	1.4	5.87
Aluminum	mg/L		0.2	0.07	0.068	0.04	0.22	0.124
Antimony	mg/L		<0.0001	< 0.0001	<0.00010	<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0003	< 0.0001	0.00017	0.0005	< 0.0001	0.00025
Barium	mg/L		0.013	0.008	0.00914	0.012	0.016	0.0105
Beryllium	mg/L		<0.002	< 0.002	<0.00010	<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.007	< 0.005	<0.010	0.042	0.011	0.017
Cadmium	mg/L	0.0002	0.00004	< 0.000014	<0.000010	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0004	< 0.0001	<0.00010	0.0001	< 0.0001	<0.00010
Copper	mg/L	0.005	0.003	0.002	<0.0010	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	0.239	0.066	0.068	0.212	0.251	0.142
Lead	mg/L	0.025	0.00086	< 0.00002	<0.00010	0.00004	0.00015	<0.00010
Manganese	mg/L		0.092	0.004	0.00418	0.112	0.032	0.0231
Molybdenum	mg/L		<0.0001	< 0.0001	0.000078	<0.0001	0.0003	0.000124
Nickel	mg/L		<0.01	< 0.01	<0.00050	<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.000074	<0.001	< 0.001	0.000066
Silver	mg/L		<0.00002	< 0.00002	<0.000050	<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.089	0.057	0.063	0.178	0.146	0.0951
Thallium	mg/L		<0.00005	< 0.00005	<0.000010	<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00131	<0.005	0.005	0.00289
Tungsten	mg/L		0.01	< 0.01	<0.00010	0.01	< 0.01	<0.00010
Uranium	mg/L		0.00017	0.00013	0.000138	0.0003	0.00045	0.000262

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW11E			SW14		
			SW11E	SW11E	SW11E	SW14	SW14	SW14
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	9-May-18	24-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050	<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	<0.0030	<0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	0.005	<0.00030	<0.003	0.007	<0.00030
Anion Sum	meq/L		4.84	3.52	-	4.85	5.04	-
Cation Sum	meq/L		5.07	3.85	-	4.61	5.16	-
Ion Ratio	AS/CS		0.955	0.914	-	1.05	0.977	-
TDS (Calc)	mg/L		239	176	214	231	247	230
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4	<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3	<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5	<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

PARAMETERS	UNITS	PWQO	SW15		
			SW15	SW15	SW15
			24-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-
E.Coli	cfu/100mL		-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-
Temperature (field)	°C		9.5	12.2	14
pH @25°C (lab)	pH units	6.5 - 8.5	8.27	8.27	8.28
pH (field)	pH units	6.5 - 8.5	7.7	8.4	8.0
Conductivity @25°C (lab)	µS/cm		437	365	491
Conductivity (field)	µS/cm		323	320	504
Dissolved Oxygen (field)	mg/L		9.8	11.5	9.2
Alkalinity (CaCO3)	mg/L		226	183	262
Hardness (CaCO3)	mg/L		220	220	288
Chloride	mg/L		3	5.8	2.06
Fluoride	mg/L		0.1	< 0.1	0.043
Nitrate (N)	mg/L		0.3	0.8	0.412
Nitrite (N)	mg/L		0.2	< 0.1	<0.010
Sulphate	mg/L		5	3	2.96
Colour	TCU		7	7	6.6
Total Suspended Solids	mg/L		<3	14.7	3.8
Ammonia (N) - Total	mg/L		0.04	<0.01	<0.020
Unionized Ammonia as NH_3	mg/L	0.02	0.0004	<0.0005	<0.0005
Total Kjeldahl Nitrogen	mg/L		0.2	0.2	<0.15
Phosphorus - Total	mg/L	0.03	0.01	0.03	0.0178
Turbidity (lab)	NTU		-	-	2.19
Calcium	mg/L		58.2	60.4	84.6
Magnesium	mg/L		18.3	16.8	17.4
Potassium	mg/L		0.8	0.9	1.43
Sodium	mg/L		1.7	5.2	1.65
Aluminum	mg/L		0.03	0.09	0.082
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0003	< 0.0001	0.00025
Barium	mg/L		0.016	0.009	0.0216
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.016	0.008	0.02
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0001	< 0.0001	<0.00010
Copper	mg/L	0.005	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	0.028	0.104	0.096
Lead	mg/L	0.025	<0.00002	0.00005	<0.00010
Manganese	mg/L		0.066	0.013	0.0488
Molybdenum	mg/L		0.0001	0.0001	0.000121
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.000059
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.145	0.084	0.186
Thallium	mg/L		<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00268
Tungsten	mg/L		0.01	< 0.01	<0.00010
Uranium	mg/L		0.00032	0.00025	0.000422

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW15		
			SW15	SW15	SW15
PARAMETERS	UNITS	PWQO	24-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	0.005	<0.00030
Anion Sum	meq/L		4.74	3.95	-
Cation Sum	meq/L		4.51	4.65	-
Ion Ratio	AS/CS		1.05	0.849	-
TDS (Calc)	mg/L		224	206	290
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW16		
			SW16	SW16	SW16
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-
E.Coli	cfu/100mL		-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-
Temperature (field)	°C		4.2	9.2	13.8
pH @25°C (lab)	pH units	6.5 - 8.5	8.15	8.21	8.27
pH (field)	pH units	6.5 - 8.5	7.5	8.3	8.1
Conductivity @25°C (lab)	µS/cm		461	378	363
Conductivity (field)	µS/cm		283	283	388
Dissolved Oxygen (field)	mg/L		9.9	11.8	8.75
Alkalinity (CaCO3)	mg/L		235	193	211
Hardness (CaCO3)	mg/L		277	207	211
Chloride	mg/L		4.3	1.6	2.52
Fluoride	mg/L		0.2	< 0.1	0.047
Nitrate (N)	mg/L		0.1	0.5	0.386
Nitrite (N)	mg/L		<0.1	< 0.1	<0.010
Sulphate	mg/L		6	4	4.03
Colour	TCU		11	10	9.5
Total Suspended Solids	mg/L		20	5	<2.0
Ammonia (N) - Total	mg/L		0.01	<0.01	0.046
Unionized Ammonia as NH_3	mg/L	0.02	0.00004	<0.0003	0.0013
Total Kjeldahl Nitrogen	mg/L		0.4	0.2	<0.15
Phosphorus - Total	mg/L	0.03	0.12	0.02	0.0118
Turbidity (lab)	NTU		-	-	1.69
Calcium	mg/L		73.4	57.6	57.2
Magnesium	mg/L		22.7	15.4	15.9
Potassium	mg/L		2	0.4	0.705
Sodium	mg/L		1.6	1.3	1.42
Aluminum	mg/L		0.06	0.08	0.053
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0033	< 0.0001	0.00028
Barium	mg/L		0.026	0.007	0.00778
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.043	0.012	0.022
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0005	< 0.0001	<0.00010
Copper	mg/L	0.005	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	7.37	0.142	0.078
Lead	mg/L	0.025	0.00015	0.00004	<0.00010
Manganese	mg/L		1.45	0.021	0.0227
Molybdenum	mg/L		<0.0001	0.0001	0.000095
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.000052
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.221	0.103	0.113
Thallium	mg/L		<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00136
Tungsten	mg/L		<0.01	< 0.01	<0.00010
Uranium	mg/L		0.00026	0.00035	0.000266

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

PARAMETERS	UNITS	PWQO	SW16		
			SW16	SW16	SW16
			25-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	0.011	< 0.005	<0.0030
Zirconium	mg/L		<0.003	0.006	<0.00030
Anion Sum	meq/L		4.96	4.03	-
Cation Sum	meq/L		6.11	4.22	-
Ion Ratio	AS/CS		0.813	0.956	-
TDS (Calc)	mg/L		260	199	227
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW17			
			SW17	SW17	SW17	SW DUP2
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18	8-May-18
Total Coliform	cfu/100mL		-	-	-	-
E.Coli	cfu/100mL		-	-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-	-
Temperature (field)	°C		8.4	7.1	12.3	-
pH @25°C (lab)	pH units	6.5 - 8.5	8.29	8.26	8.34	8.34
pH (field)	pH units	6.5 - 8.5	7.9	8.3	8.3	-
Conductivity @25°C (lab)	µS/cm		428	399	389	385
Conductivity (field)	µS/cm		309	234	413	-
Dissolved Oxygen (field)	mg/L		11.5	14.1	10.3	-
Alkalinity (CaCO3)	mg/L		196	199	219	212
Hardness (CaCO3)	mg/L		234	215	219	220
Chloride	mg/L		11.4	3.4	5.81	5.73
Fluoride	mg/L		0.2	< 0.1	0.046	0.047
Nitrate (N)	mg/L		0.2	0.7	0.436	0.434
Nitrite (N)	mg/L		<0.1	< 0.1	<0.010	<0.010
Sulphate	mg/L		10	6	7.12	7.11
Colour	TCU		6	5	3.2	2.9
Total Suspended Solids	mg/L		8	5	<2.0	<2.0
Ammonia (N) - Total	mg/L		<0.01	<0.01	<0.020	0.034
Unionized Ammonia as NH_3	mg/L	0.02	<0.0001	<0.0003	<0.0008	0.0013
Total Kjeldahl Nitrogen	mg/L		0.4	0.2	<0.15	<0.15
Phosphorus - Total	mg/L	0.03	0.02	0.01	0.0114	0.0057
Turbidity (lab)	NTU		-	-	0.86	1.08
Calcium	mg/L		56.5	60	60.5	62.6
Magnesium	mg/L		22.5	15.7	17	16.9
Potassium	mg/L		1.2	0.5	0.757	0.758
Sodium	mg/L		7.7	2.6	4.07	4.27
Aluminum	mg/L		0.05	0.04	0.036	0.03
Antimony	mg/L		<0.0001	< 0.0001	<0.00010	<0.00010
Arsenic	mg/L		0.0005	< 0.0001	0.00021	0.00018
Barium	mg/L		0.01	0.008	0.00992	0.00999
Beryllium	mg/L		<0.002	< 0.002	<0.00010	<0.00010
Boron	mg/L	0.20	0.057	0.01	0.024	0.025
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010	<0.000010
Chromium	mg/L	0.0089	0.01	0.005	<0.00050	0.00084
Cobalt	mg/L		0.0002	< 0.0001	<0.00010	<0.00010
Copper	mg/L	0.005	<0.002	< 0.002	<0.0010	<0.0010
Iron	mg/L	0.3	0.29	0.046	<0.050	<0.050
Lead	mg/L	0.025	0.00015	< 0.00002	<0.00010	<0.00010
Manganese	mg/L		0.077	0.006	0.00871	0.00733
Molybdenum	mg/L		0.0013	0.0001	0.000146	0.000175
Nickel	mg/L		<0.01	< 0.01	<0.00050	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.000054	<0.000050
Silver	mg/L		<0.00002	< 0.00002	<0.000050	<0.000050
Strontium	mg/L		0.508	0.276	0.378	0.374
Thallium	mg/L		<0.00005	< 0.00005	<0.000010	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00072	0.00055
Tungsten	mg/L		0.01	< 0.01	<0.00010	<0.00010
Uranium	mg/L		0.00018	0.00023	0.000217	0.000213

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW17			
			SW17	SW17	SW17	SW DUP2
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050	<0.00050
Zinc	mg/L	0.02	<0.005	0.007	<0.0030	<0.00030
Zirconium	mg/L		<0.003	0.007	<0.00030	<0.00030
Anion Sum	meq/L		4.47	4.24	-	-
Cation Sum	meq/L		5.06	4.41	-	-
Ion Ratio	AS/CS		0.884	0.961	-	-
TDS (Calc)	mg/L		228	211	217	227
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW17A		
			SW17A	SW17A	SW17A
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-
E.Coli	cfu/100mL		-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-
Temperature (field)	°C		5.3	8.7	12.1
pH @25°C (lab)	pH units	6.5 - 8.5	8.41	8.38	8.39
pH (field)	pH units	6.5 - 8.5	8.0	8.4	8.4
Conductivity @25°C (lab)	µS/cm		443	377	370
Conductivity (field)	µS/cm		294	238	393
Dissolved Oxygen (field)	mg/L		13.3	13.5	10.3
Alkalinity (CaCO3)	mg/L		229	195	216
Hardness (CaCO3)	mg/L		263	210	214
Chloride	mg/L		2.9	1.7	3.2
Fluoride	mg/L		<0.1	< 0.1	0.039
Nitrate (N)	mg/L		0.6	1	0.828
Nitrite (N)	mg/L		<0.1	< 0.1	<0.010
Sulphate	mg/L		7	3	3.9
Colour	TCU		5	4	3.4
Total Suspended Solids	mg/L		8	7	7.6
Ammonia (N) - Total	mg/L		0.01	<0.01	0.064
Unionized Ammonia as NH_3	mg/L	0.02	0.0001	<0.0004	0.003
Total Kjeldahl Nitrogen	mg/L		0.2	0.2	<0.15
Phosphorus - Total	mg/L	0.03	0.01	0.01	0.009
Turbidity (lab)	NTU		-	-	2.56
Calcium	mg/L		71.1	60.7	62.6
Magnesium	mg/L		20.8	14.2	14.9
Potassium	mg/L		1.1	0.7	0.916
Sodium	mg/L		1.6	1	1.77
Aluminum	mg/L		0.05	0.06	0.052
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0002	< 0.0001	0.00016
Barium	mg/L		0.01	0.009	0.01
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.01	< 0.005	0.011
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0002	< 0.0001	<0.00010
Copper	mg/L	0.005	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	0.152	0.085	0.074
Lead	mg/L	0.025	0.00011	0.00023	0.00011
Manganese	mg/L		0.055	0.01	0.00973
Molybdenum	mg/L		0.0001	0.0005	0.000087
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	<0.000050
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.118	0.071	0.137
Thallium	mg/L		<0.0005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00187
Tungsten	mg/L		<0.01	0.02	<0.00010
Uranium	mg/L		0.00015	0.00014	0.000152

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW17A		
			SW17A	SW17A	SW17A
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	0.007	<0.00030
Anion Sum	meq/L		4.84	4.09	-
Cation Sum	meq/L		5.37	4.27	-
Ion Ratio	AS/CS		0.901	0.958	-
TDS (Calc)	mg/L		244	203	230
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW18			
			SW18	SW18 DUP	SW18	SW18
PARAMETERS	UNITS	PWQO	24-Oct-16	24-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-	-
E.Coli	cfu/100mL		-	-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-	-
Temperature (field)	°C		7.3	-	8.8	12.3
pH @25°C (lab)	pH units	6.5 - 8.5	8.42	8.41	8.39	8.41
pH (field)	pH units	6.5 - 8.5	7.9	-	8.5	8.4
Conductivity @25°C (lab)	µS/cm		494	497	395	379
Conductivity (field)	µS/cm		341	-	248	406
Dissolved Oxygen (field)	mg/L		11.5	-	13.3	10.3
Alkalinity (CaCO3)	mg/L		253	251	206	231
Hardness (CaCO3)	mg/L		257	250	240	222
Chloride	mg/L		4.4	4.4	1.4	2.5
Fluoride	mg/L		0.1	<0.1	< 0.1	0.042
Nitrate (N)	mg/L		0.2	0.2	0.6	0.564
Nitrite (N)	mg/L		0.2	0.2	< 0.1	<0.010
Sulphate	mg/L		10	10	4	4.06
Colour	TCU		10	7	5	8.2
Total Suspended Solids	mg/L		4	<3	5	7.1
Ammonia (N) - Total	mg/L		0.04	0.02	<0.01	0.065
Unionized Ammonia as NH_3	mg/L	0.02	0.0005	0.0002	<0.0005	0.0032
Total Kjeldahl Nitrogen	mg/L		0.2	0.2	0.2	<0.15
Phosphorus - Total	mg/L	0.03	<0.01	<0.01	0.01	0.0081
Turbidity (lab)	NTU		-	-	-	3.39
Calcium	mg/L		68.6	66.5	69.5	63.7
Magnesium	mg/L		20.8	20.2	16	15.8
Potassium	mg/L		0.8	0.8	0.7	0.835
Sodium	mg/L		2.8	2.7	1.4	1.58
Aluminum	mg/L		0.03	0.03	0.07	0.135
Antimony	mg/L		<0.0001	<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0002	0.0003	< 0.0001	0.0002
Barium	mg/L		0.012	0.011	0.011	0.0119
Beryllium	mg/L		<0.002	<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.026	0.025	0.005	0.014
Cadmium	mg/L	0.0002	<0.00002	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0001	0.0001	< 0.0001	<0.00010
Copper	mg/L	0.005	<0.002	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	0.014	0.013	0.086	0.203
Lead	mg/L	0.025	<0.00002	<0.00002	0.00006	0.00017
Manganese	mg/L		0.004	0.004	0.018	0.038
Molybdenum	mg/L		<0.0001	<0.0001	< 0.0001	0.000093
Nickel	mg/L		<0.01	<0.01	< 0.01	0.00053
Selenium	mg/L		<0.001	<0.001	< 0.001	0.000053
Silver	mg/L		<0.00002	<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.244	0.212	0.134	0.142
Thallium	mg/L		<0.00005	<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	<0.005	< 0.005	0.00343
Tungsten	mg/L		0.02	<0.01	< 0.01	<0.00010
Uranium	mg/L		0.00026	0.00026	0.00023	0.000191

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

PARAMETERS	UNITS	PWQO	SW18			
			SW18	SW18 DUP	SW18	SW18
			24-Oct-16	24-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	<0.005	0.007	<0.0030
Zirconium	mg/L		<0.003	<0.003	0.006	<0.00030
Anion Sum	meq/L		5.43	5.39	4.27	-
Cation Sum	meq/L		5.28	5.13	4.87	-
Ion Ratio	AS/CS		1.03	1.05	0.878	-
TDS (Calc)	mg/L		261	257	219	229
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW21C			
			SW21C	SW21C	SW21C	SW DUP3
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18	9-May-18
Total Coliform	cfu/100mL		160	46	140	94
E.Coli	cfu/100mL		1	11	0	1
Heterotrophic Plate Count	cfu/mL		460	110	70	78
Temperature (field)	°C		7.3	6.9	8.0	-
pH @25°C (lab)	pH units	6.5 - 8.5	8.42	8.37	8.39	8.34
pH (field)	pH units	6.5 - 8.5	7.6	8.2	8.3	-
Conductivity @25°C (lab)	µS/cm		445	379	376	377
Conductivity (field)	µS/cm		311	224	403	-
Dissolved Oxygen (field)	mg/L		13.1	14.2	11.2	-
Alkalinity (CaCO3)	mg/L		225	189	211	206
Hardness (CaCO3)	mg/L		236	202	221	222
Chloride	mg/L		2.2	1.5	2.31	2.32
Fluoride	mg/L		<0.1	< 0.1	0.034	0.035
Nitrate (N)	mg/L		1.8	1.6	1.86	1.86
Nitrite (N)	mg/L		0.2	< 0.1	<0.010	<0.010
Sulphate	mg/L		6	4	3.85	3.87
Colour	TCU		3	5	9.7	<2.0
Total Suspended Solids	mg/L		12	12	6.9	7.5
Ammonia (N) - Total	mg/L		0.01	<0.01	<0.020	<0.020
Unionized Ammonia as NH_3	mg/L	0.02	0.0001	<0.0002	<0.0006	<0.0006
Total Kjeldahl Nitrogen	mg/L		0.2	2	<0.15	<0.15
Phosphorus - Total	mg/L	0.03	<0.01	0.02	0.0134	0.0145
Turbidity (lab)	NTU		-	-	2.01	2.48
Calcium	mg/L		57.9	55.9	61.3	60.2
Magnesium	mg/L		22.3	15.2	17.3	17.5
Potassium	mg/L		0.3	0.3	0.376	0.371
Sodium	mg/L		0.9	0.9	0.89	0.9
Aluminum	mg/L		0.03	0.07	0.082	0.055
Antimony	mg/L		<0.0001	< 0.0001	<0.00010	<0.00010
Arsenic	mg/L		0.0001	0.0002	0.00018	0.00016
Barium	mg/L		0.005	0.005	0.00557	0.00567
Beryllium	mg/L		<0.002	< 0.002	<0.00010	<0.00010
Boron	mg/L	0.20	<0.005	0.005	<0.010	<0.010
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050	<0.00050
Cobalt	mg/L		<0.0001	< 0.0001	<0.00010	<0.00010
Copper	mg/L	0.005	<0.002	< 0.002	<0.0010	<0.0010
Iron	mg/L	0.3	0.021	0.096	0.076	0.051
Lead	mg/L	0.025	0.00006	0.00015	0.00013	<0.00010
Manganese	mg/L		0.002	0.004	0.00279	0.00191
Molybdenum	mg/L		<0.0001	< 0.0001	<0.000050	<0.000050
Nickel	mg/L		<0.01	< 0.01	<0.00050	<0.00050
Selenium	mg/L		<0.001	< 0.001	<0.000050	0.000063
Silver	mg/L		<0.00002	< 0.00002	<0.000050	<0.000050
Strontium	mg/L		0.063	-	0.067	0.0668
Thallium	mg/L		<0.00005	< 0.00005	<0.000010	<0.000010
Titanium	mg/L		<0.005	< 0.005	<0.0020	0.00142
Tungsten	mg/L		<0.01	< 0.01	<0.00010	<0.00010
Uranium	mg/L		0.00007	0.00006	0.000059	0.000059

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW21C			
			SW21C	SW21C	SW21C	SW DUP3
PARAMETERS	UNITS	PWQO	24-Oct-16	8-May-17	9-May-18	9-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	<0.0030	<0.0030
Zirconium	mg/L		<0.003	< 0.003	<0.00030	<0.00030
Anion Sum	meq/L		4.83	4.02	-	-
Cation Sum	meq/L		4.77	4.09	-	-
Ion Ratio	AS/CS		1.01	0.983	-	-
TDS (Calc)	mg/L		233	198	234	234
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW24A		
			SW24A	SW24A	SW24A
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-
E.Coli	cfu/100mL		-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-
Temperature (field)	°C		4.3	8.1	10.3
pH @25°C (lab)	pH units	6.5 - 8.5	8.35	8.3	8.34
pH (field)	pH units	6.5 - 8.5	7.9	8.5	8.2
Conductivity @25°C (lab)	µS/cm		533	388	398
Conductivity (field)	µS/cm		336	239	423
Dissolved Oxygen (field)	mg/L		13.8	13.4	10.5
Alkalinity (CaCO3)	mg/L		234	194	233
Hardness (CaCO3)	mg/L		290	223	223
Chloride	mg/L		17.5	1.5	5.18
Fluoride	mg/L		0.2	< 0.1	0.05
Nitrate (N)	mg/L		0.3	1.4	0.264
Nitrite (N)	mg/L		<0.1	< 0.1	<0.010
Sulphate	mg/L		19	4	6.33
Colour	TCU		13	5	15.4
Total Suspended Solids	mg/L		46	5	35.8
Ammonia (N) - Total	mg/L		<0.01	<0.01	<0.020
Unionized Ammonia as NH_3	mg/L	0.02	<0.0001	<0.0005	<0.0005
Total Kjeldahl Nitrogen	mg/L		0.3	0.2	<0.15
Phosphorus - Total	mg/L	0.03	0.03	0.01	0.0085
Turbidity (lab)	NTU		-	-	13.2
Calcium	mg/L		79.8	61.9	67.3
Magnesium	mg/L		22	16.7	15.4
Potassium	mg/L		1.5	0.3	0.71
Sodium	mg/L		11.6	0.8	3.89
Aluminum	mg/L		0.07	0.08	0.173
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0002	< 0.0001	0.00022
Barium	mg/L		0.015	0.006	0.0123
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.079	< 0.005	0.025
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0003	< 0.0001	0.00012
Copper	mg/L	0.005	<0.002	<0.002	0.0014
Iron	mg/L	0.3	0.123	0.089	0.226
Lead	mg/L	0.025	0.00022	0.00012	0.0002
Manganese	mg/L		0.052	0.012	0.0155
Molybdenum	mg/L		0.0001	< 0.0001	0.000143
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	0.000059
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.872	0.064	0.456
Thallium	mg/L		<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00357
Tungsten	mg/L		0.01	< 0.01	<0.00010
Uranium	mg/L		0.00026	0.0001	0.000195

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW24A		
			SW24A	SW24A	SW24A
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	<0.0030
Zirconium	mg/L		0.003	0.008	<0.00030
Anion Sum	meq/L		5.61	4.09	-
Cation Sum	meq/L		6.35	4.51	-
Ion Ratio	AS/CS		0.883	0.908	-
TDS (Calc)	mg/L		294	208	232
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW77		
			SW77	SW77	SW77
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	
Total Coliform	cfu/100mL		-	-	-
E.Coli	cfu/100mL		-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-
Temperature (field)	°C		6.4	6.3	8.7
pH @25°C (lab)	pH units	6.5 - 8.5	8.32	8.16	8.23
pH (field)	pH units	6.5 - 8.5	7.8	7.8	7.7
Conductivity @25°C (lab)	µS/cm		460	398	400
Conductivity (field)	µS/cm		295	223	427
Dissolved Oxygen (field)	mg/L		12.7	14.1	11.0
Alkalinity (CaCO3)	mg/L		233	195	230
Hardness (CaCO3)	mg/L		345	209	226
Chloride	mg/L		2.2	2.8	3.85
Fluoride	mg/L		<0.1	< 0.1	0.035
Nitrate (N)	mg/L		1.5	1.9	2.34
Nitrite (N)	mg/L		<0.1	< 0.1	<0.010
Sulphate	mg/L		7	3	2.99
Colour	TCU		<2	3	<2.0
Total Suspended Solids	mg/L		184	38	<2.0
Ammonia (N) - Total	mg/L		0.01	<0.01	0.024
Unionized Ammonia as NH_3	mg/L	0.02	0.0001	<0.0001	0.0002
Total Kjeldahl Nitrogen	mg/L		5.4	0.2	<0.15
Phosphorus - Total	mg/L	0.03	0.81	0.02	0.0045
Turbidity (lab)	NTU		-	-	0.26
Calcium	mg/L		108	62.2	72.5
Magnesium	mg/L		18.1	12.9	13.3
Potassium	mg/L		0.6	< 0.1	0.207
Sodium	mg/L		1.3	1	1.26
Aluminum	mg/L		0.92	0.07	<0.010
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0005	< 0.0001	<0.00010
Barium	mg/L		0.026	0.006	0.00706
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.006	< 0.005	<0.010
Cadmium	mg/L	0.0002	0.00008	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	0.00077
Cobalt	mg/L		0.001	< 0.0001	<0.00010
Copper	mg/L	0.005	0.005	< 0.002	<0.0010
Iron	mg/L	0.3	1.33	0.051	<0.050
Lead	mg/L	0.025	0.00289	0.00006	<0.00010
Manganese	mg/L		0.381	0.005	0.00106
Molybdenum	mg/L		<0.0001	< 0.0001	<0.000050
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	<0.000050
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.147	0.077	0.0994
Thallium	mg/L		<0.00005	< 0.00005	<0.000010
Titanium	mg/L		0.009	< 0.005	0.00036
Tungsten	mg/L		<0.01	< 0.01	<0.00010
Uranium	mg/L		0.00015	0.00008	0.000085

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			SW77		
			SW77	SW77	SW77
PARAMETERS	UNITS	PWQO	25-Oct-16	9-May-17	
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	0.01	< 0.005	<0.0030
Zirconium	mg/L		<0.003	0.006	<0.00030
Anion Sum	meq/L		4.97	4.17	-
Cation Sum	meq/L		7.05	4.21	-
Ion Ratio	AS/CS		0.705	0.989	-
TDS (Calc)	mg/L		285	207	248
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

PARAMETERS	UNITS	PWQO	BC CONTROL		
			BC CONT	BC CONT	BC CONT
			25-Oct-16	9-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-
E.Coli	cfu/100mL		-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-
Temperature (field)	°C		6.1	5.2	9.3
pH @25°C (lab)	pH units	6.5 - 8.5	8.26	8.32	8.36
pH (field)	pH units	6.5 - 8.5	7.7	8.4	8.3
Conductivity @25°C (lab)	µS/cm		714	429	446
Conductivity (field)	µS/cm		480	243	455
Dissolved Oxygen (field)	mg/L		13.5	15.6	11.0
Alkalinity (CaCO3)	mg/L		228	199	240
Hardness (CaCO3)	mg/L		362	237	247
Chloride	mg/L		57.1	8.3	11.3
Fluoride	mg/L		0.2	< 0.1	0.046
Nitrate (N)	mg/L		0.5	1.6	0.83
Nitrite (N)	mg/L		<0.1	< 0.1	<0.010
Sulphate	mg/L		61	6	6.31
Colour	TCU		20	13	15.6
Total Suspended Solids	mg/L		<3	9	6.7
Ammonia (N) - Total	mg/L		<0.01	<0.01	0.033
Unionized Ammonia as NH_3	mg/L	0.02	0.0001	<0.0003	0.0012
Total Kjeldahl Nitrogen	mg/L		0.2	9	<0.15
Phosphorus - Total	mg/L	0.03	0.02	0.02	0.011
Turbidity (lab)	NTU		-	-	4.4
Calcium	mg/L		105	70.1	70.6
Magnesium	mg/L		24.2	15	15.7
Potassium	mg/L		3.5	0.8	1.14
Sodium	mg/L		15.4	4	5.08
Aluminum	mg/L		0.04	0.09	0.154
Antimony	mg/L		<0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0014	< 0.0001	0.00024
Barium	mg/L		0.051	0.02	0.0217
Beryllium	mg/L		<0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.231	0.01	0.026
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	< 0.002	<0.00050
Cobalt	mg/L		0.0003	< 0.0001	0.0001
Copper	mg/L	0.005	<0.002	< 0.002	<0.0010
Iron	mg/L	0.3	0.023	0.091	0.18
Lead	mg/L	0.025	<0.00002	0.00003	<0.00010
Manganese	mg/L		0.044	0.009	0.0136
Molybdenum	mg/L		0.0001	0.0001	0.000125
Nickel	mg/L		<0.01	< 0.01	<0.00050
Selenium	mg/L		0.006	< 0.001	<0.000050
Silver	mg/L		<0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.913	0.156	0.19
Thallium	mg/L		<0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.00345
Tungsten	mg/L		<0.01	< 0.01	<0.00010
Uranium	mg/L		0.00038	0.00024	0.000227

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

PARAMETERS	UNITS	PWQO	BC CONTROL		
			BC CONT	BC CONT	BC CONT
			25-Oct-16	9-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	0.005	<0.0030
Zirconium	mg/L		<0.003	0.009	<0.00030
Anion Sum	meq/L		7.49	4.44	-
Cation Sum	meq/L		8	4.93	-
Ion Ratio	AS/CS		0.935	0.901	-
TDS (Calc)	mg/L		406	231	269
Benzene	µg/L		<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<250

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			PR CONTROL			
			PR CONT	PR CONT	DUP 1	PR CONT
PARAMETERS	UNITS	PWQO	25-Oct-16	8-May-17	8-May-17	8-May-18
Total Coliform	cfu/100mL		-	-	-	-
E.Coli	cfu/100mL		-	-	-	-
Heterotrophic Plate Count	cfu/mL		-	-	-	-
Temperature (field)	°C		5.4	7.8	-	8.2
pH @25°C (lab)	pH units	6.5 - 8.5	8.4	8.46	8.47	8.43
pH (field)	pH units	6.5 - 8.5	7.9	8.4	-	8.36
Conductivity @25°C (lab)	µS/cm		456	408	405	398
Conductivity (field)	µS/cm		287	246	-	428
Dissolved Oxygen (field)	mg/L		15.1	14.0	-	11.32
Alkalinity (CaCO3)	mg/L		225	208	212	250
Hardness (CaCO3)	mg/L		261	226	227	233
Chloride	mg/L		4.1	1.7	1.8	2.47
Fluoride	mg/L		<0.1	< 0.1	< 0.1	0.04
Nitrate (N)	mg/L		0.3	0.5	0.5	0.447
Nitrite (N)	mg/L		<0.1	< 0.1	< 0.1	<0.010
Sulphate	mg/L		11	5	5	6.98
Colour	TCU		10	8	7	9.7
Total Suspended Solids	mg/L		<3	10	8	5.7
Ammonia (N) - Total	mg/L		<0.01	<0.01	<0.01	0.101
Unionized Ammonia as NH_3	mg/L	0.02	<0.0001	<0.0004	<0.0004	0.0036
Total Kjeldahl Nitrogen	mg/L		1	2	3.5	<0.15
Phosphorus - Total	mg/L	0.03	0.01	0.02	0.05	0.0071
Turbidity (lab)	NTU		-	-	-	3.58
Calcium	mg/L		65.5	61.5	61.6	64.5
Magnesium	mg/L		23.6	17.5	17.6	18.6
Potassium	mg/L		1.3	0.7	0.7	0.869
Sodium	mg/L		3	1.7	1.6	
Aluminum	mg/L		0.02	0.08	0.08	0.091
Antimony	mg/L		0.0002	< 0.0001	< 0.0001	<0.00010
Arsenic	mg/L		0.0001	0.0001	0.0001	0.00019
Barium	mg/L		0.022	0.019	0.018	0.0183
Beryllium	mg/L		<0.002	< 0.002	< 0.002	<0.00010
Boron	mg/L	0.20	0.025	0.02	0.022	<0.021
Cadmium	mg/L	0.0002	<0.00002	< 0.000014	< 0.000014	<0.000010
Chromium	mg/L	0.0089	<0.002	0.004	< 0.002	0.00061
Cobalt	mg/L		0.0002	< 0.0001	< 0.0001	<0.00010
Copper	mg/L	0.005	<0.002	< 0.002	< 0.002	<0.0010
Iron	mg/L	0.3	<0.005	0.161	0.118	0.102
Lead	mg/L	0.025	<0.00002	0.00006	0.00006	<0.00010
Manganese	mg/L		0.008	0.012	0.01	0.00746
Molybdenum	mg/L		<0.0001	0.0001	0.0001	0.000158
Nickel	mg/L		<0.01	< 0.01	< 0.01	<0.00050
Selenium	mg/L		<0.001	< 0.001	< 0.001	<0.000050
Silver	mg/L		<0.00002	< 0.00002	< 0.00002	<0.000050
Strontium	mg/L		0.19	-	-	0.135
Thallium	mg/L		<0.00005	< 0.00005	< 0.00005	<0.000010
Titanium	mg/L		<0.005	< 0.005	0.006	0.00207
Tungsten	mg/L		<0.01	< 0.01	< 0.01	<0.00010
Uranium	mg/L		0.00024	0.00027	0.00025	0.000241

TABLE B-6
SURFACE WATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

			PR CONTROL			
			PR CONT	PR CONT	DUP 1	PR CONT
PARAMETERS	UNITS	PWQO	25-Oct-16	8-May-17	8-May-17	8-May-18
Vanadium	mg/L		<0.005	< 0.005	< 0.005	<0.00050
Zinc	mg/L	0.02	<0.005	< 0.005	< 0.005	<0.0030
Zirconium	mg/L		<0.003	< 0.003	< 0.003	<0.00030
Anion Sum	meq/L		4.86	4.36	4.42	-
Cation Sum	meq/L		5.37	4.61	4.62	-
Ion Ratio	AS/CS		0.905	0.945	0.958	-
TDS (Calc)	mg/L		245	216	218	245
Benzene	µg/L		<0.5	<0.5	<0.5	<0.5
Toluene	µg/L		<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L		<0.5	<0.5	<0.5	<0.5
Xylene, m, p-	µg/L		<1.0	<1.0	<1.0	<0.4
Xylene, o-	µg/L		<0.5	<0.5	<0.5	<0.3
Xylene, total	µg/L		<1.1	<1.1	<1.1	<0.5
PHC F1 (C6-C10)	µg/L		<50	<50	<50	<25
PHC F2 (>C10-C16)	µg/L		<50	<50	<50	<100
PHC F3 (>C16-C34)	µg/L		<400	<400	<400	<250
PHC F4 (<C34-C50)	µg/L		<400	<400	<400	<250

APPENDIX B – PERFORMANCE INDICATOR MONITORING PROGRAM RESULTS MONTHLY MONITORNG DATA AND TRIGGER VALUES

TABLE B7: ESCARPMENT SPRING STATIONS JANUARY 2018

Surface Water Station	January Monthly		January PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW	Flow (L/s) 'RED'
SW10	1.0	4.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11	4.1	18.2	NO TRIGGER	NO TRIGGER	11.0	1.2
SW11A	5.1	0.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11B	4.8	1.6	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11C	4.6	0.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11D	4.9	5.1	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11E	4.0	21.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW21C	3.4	7.4	NO TRIGGER	NO TRIGGER	2.8	0.5
SW24A	2.7	0.5	NO TRIGGER	NO TRIGGER	1.7	1.5
SW77	5.3	0.2	NO TRIGGER	NO TRIGGER	0.23	0.2

TABLE B8: SURFACE WATER STATIONS JANUARY 2018

Surface Water Station	January Monthly		January PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW1	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	13.8	0.9
SW2	4.6	6.3	NO TRIGGER	NO TRIGGER	3.7 (unfrozen)	1.5 (unfrozen)
SW0-2	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	78.8 (unfrozen)	48.2 (unfrozen)
SW3	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	1.7 (unfrozen)	NO TRIGGER
SW6A	-0.3	381.9	NO TRIGGER	NO TRIGGER	174.6	113.0
SW9	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW14	0.9	29.4	NO TRIGGER	NO TRIGGER	35.7	12.6
SW15	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW16	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	7.0 (unfrozen)	6.1 (unfrozen)
SW17	2.0	4.9	NO TRIGGER	NO TRIGGER	2.4	1.4
SW17A	1.9	23.4	NO TRIGGER	NO TRIGGER	15.5	0.6
SW18	0.5	61.3	NO TRIGGER	NO TRIGGER	36.3 (unfrozen)	31.6 (unfrozen)
RR3 Karst	4.1	1.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR Control	0.2	51.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC Control	0.4	25.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B9: ESCARPMENT SPRING STATIONS FEBRUARY 2018

Surface Water Station	February Monthly		February PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW10	4.1	1.1	NO TRIGGER	NO TRIGGER	0.5 (unfrozen)	0.3 (unfrozen)
SW11	4.3	39.5	NO TRIGGER	NO TRIGGER	4.6	1.4
SW11A	5.0	3.6	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11B	4.7	2.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11C	4.0	7.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11D	4.2	19.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11E	4.3	52.6	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW21C	5.2	9.0	NO TRIGGER	NO TRIGGER	2.0	0.7
SW24A	3.3	1.3	NO TRIGGER	NO TRIGGER	1.4	0.7
SW77	6.4	1.5	NO TRIGGER	NO TRIGGER	0.23	0.2

TABLE B10: SURFACE WATER STATIONS FEBRUARY 2018

Surface Water Station	February Monthly		February PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW1	-0.2	128.6	NO TRIGGER	NO TRIGGER	12.6	4.8
SW2	6.2	29.3	NO TRIGGER	NO TRIGGER	3.8 (unfrozen)	3.0 (unfrozen)
SW0-2	-0.2	280.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW3	0	27.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW6A	-0.3	1793.4	NO TRIGGER	NO TRIGGER	190.7	134.9
SW9	0	17.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW14	3.1	101.6	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW15	0.7	3.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW16	0.6	17.8	NO TRIGGER	NO TRIGGER	7.5 (unfrozen)	6.5 (unfrozen)
SW17	3.1	31.2	NO TRIGGER	NO TRIGGER	1.9	0.9
SW17A	3.8	70.5	NO TRIGGER	NO TRIGGER	9.2	2.4
SW18	4.0	159.0	NO TRIGGER	NO TRIGGER	15.5 (unfrozen)	10.0 (unfrozen)
RR3 Karst	3.2	4.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR Control	1.9	140.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC Control	2.2	55.0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B11: ESCARPMENT SPRING STATIONS MARCH 2018

Surface Water Station	March Monthly		March PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW10	1.4	0.3	NO TRIGGER	NO TRIGGER	0.4	0.2
SW11	3.9	13.7	NO TRIGGER	NO TRIGGER	11.5	2.1
SW11A	4.7	0.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11B	4.5	0.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11C	4.0	0.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11D	3.7	4.1	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11E	3.6	7.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW21C	3.2	6.5	NO TRIGGER	NO TRIGGER	1.7	0.7
SW24A	1.1	0.2	NO TRIGGER	NO TRIGGER	1.5	0.2
SW77	5.3	0.5	NO TRIGGER	NO TRIGGER	0.35	0.3

TABLE B12: SURFACE WATER STATIONS MARCH 2018

Surface Water Station	March Monthly		March PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW1	7.0	FROZEN	NO TRIGGER	NO TRIGGER	6.8	0.6
SW2	3.1	8.8	NO TRIGGER	NO TRIGGER	2.8 (unfrozen)	2.2 (unfrozen)
SW0-2	-0.2	FROZEN	NO TRIGGER	NO TRIGGER	104.3	69.3 (unfrozen)
SW3	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	5.5	0.8
SW6A	1.1	276.6	NO TRIGGER	NO TRIGGER	363.3	178.8
SW9	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	5.2	0.4
SW14	0.6	12.4	NO TRIGGER	NO TRIGGER	25.1	5.5
SW15	-0.1	0.9	NO TRIGGER	NO TRIGGER	1.7 (unfrozen)	1.5 (unfrozen)
SW16	-0.4	2.9	NO TRIGGER	NO TRIGGER	12.1	2.0
SW17	2.5	6.3	NO TRIGGER	NO TRIGGER	4.3	1.8
SW17A	1.6	24.0	NO TRIGGER	NO TRIGGER	14.7	11.7
SW18	0.6	34.6	NO TRIGGER	NO TRIGGER	66.0	48.7
RR3 Karst	4.7	1.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR Control	-0.4	57.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC Control	-0.4	FROZEN	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B13: ESCARPMENT SPRING STATIONS APRIL 2018

Surface Water Station	April Monthly		April PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) YELLOW	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW10	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	0.5	0.2
SW11	3.9	16.0	NO TRIGGER	NO TRIGGER	9.0	5.8
SW11A	4.5	0.6	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11B	4.3	2.0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11C	3.9	1.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11D	4.0	7.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11E	3.9	15.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW21C	3.1	7.4	NO TRIGGER	NO TRIGGER	3.3	1.9
SW24A	0.2	1.5	NO TRIGGER	NO TRIGGER	1.9	0.8
SW77	5.5	0.9	NO TRIGGER	NO TRIGGER	0.35	0.3

TABLE B14: SURFACE WATER STATIONS APRIL 2018

Surface Water Station	April Monthly		April PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW1	-0.5	FROZEN	NO TRIGGER	NO TRIGGER	11.7	1.5
SW2	4.9	9.3	NO TRIGGER	NO TRIGGER	8.0	6.5
SW0-2	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	50.0	31.7
SW3	-0.2	FROZEN	NO TRIGGER	NO TRIGGER	4.3	3.4
SW6A	0.2	502.4	NO TRIGGER	NO TRIGGER	382.7	200.0
SW9	FROZEN	FROZEN	NO TRIGGER	NO TRIGGER	5.6	0.1
SW14	2.5	43.8	NO TRIGGER	NO TRIGGER	15.7	6.5
SW15	0.6	3.5	NO TRIGGER	NO TRIGGER	0.6	0.1
SW16	0.4	13.6	NO TRIGGER	NO TRIGGER	4.6	2.9
SW17	2.2	12.1	NO TRIGGER	NO TRIGGER	3.1	1.6
SW17A	2.8	42.8	NO TRIGGER	NO TRIGGER	16.9	14.7
SW18	1.8	95.1	NO TRIGGER	NO TRIGGER	80.7	29.5
RR3 Karst	3.0	3.0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR Control	2.5	89.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC Control	2.5	44.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B15: ESCARPMENT SPRING STATIONS MAY 2018

Surface Water Station	May Monthly		May PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW10	10.1	0.5	NO TRIGGER	NO TRIGGER	0.2	0.1
SW11	5.9	23.8	NO TRIGGER	NO TRIGGER	10.4	2.5
SW11A	5.3	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11B	5.6	0.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11C	5.5	1.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11D	4.8	5.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW11E	6.5	51.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW21C	8.2	5.5	NO TRIGGER	NO TRIGGER	3.7	2.6
SW24A	7.4	2.2	NO TRIGGER	NO TRIGGER	1.4	0.8
SW77	9.3	1.4	NO TRIGGER	NO TRIGGER	0.3	0.2

TABLE B16: SURFACE WATER STATIONS MAY 2018

Surface Water Station	May Monthly		May PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW1	13.2	76.2	NO TRIGGER	NO TRIGGER	5.0	2.5
SW2	7.9	3.6	NO TRIGGER	NO TRIGGER	3.9	3.3
SW0-2	12.5	66.7	NO TRIGGER	NO TRIGGER	33.5	16.1
SW3	14.1	3.6	NO TRIGGER	NO TRIGGER	-	-
SW6A	14.1	324.8	NO TRIGGER	NO TRIGGER	189.1	164.4
SW9	11.4	20.1	NO TRIGGER	NO TRIGGER	-	-
SW14	11.2	35.2	NO TRIGGER	NO TRIGGER	8.8	4.1
SW15	13.5	2.4	NO TRIGGER	NO TRIGGER	0.6	0.1
SW16	12.1	22.1	NO TRIGGER	NO TRIGGER	2.4	1.0
SW17	13.8	13.4	NO TRIGGER	NO TRIGGER	2.0	1.3
SW17A	9.2	50.7	NO TRIGGER	NO TRIGGER	12.0	9.6
SW18	11.4	160.6	NO TRIGGER	NO TRIGGER	29.1	25.3
RR3 Karst	n/a	3.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR Control	12.9	50.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC Control	15.2	18.0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B17: ESCARPMENT SPRING STATIONS JUNE 2018

Surface Water Stations	June PITM Report		June PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	8.17	0.80	16.4	18.3	0.09	0.09
SW 11	8.15	3.54	10.9	12.1	2.8	1.9
SW 11A	7.82	0.56	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	7.73	0.64	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	7.55	0.51	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	8.09	0.31	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	8.36	2.67	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	9.8	4.33	10.8	12	2.1	0.6
SW 24A	8.17	1.29	12.1	13.5	0.40	0.2
SW 77	9.4	0.06	7.5	8.3	0.12	0.1

TABLE B18: SURFACE WATER STATIONS JUNE 2018

Escarpment Springs	June Monthly Report		June PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	18.4	3.4	21	23.4	3	1.1
SW 2	9.2	1.9	12.2	13.5	1.9	1.6
SW 0-2	18.8	6.6	22.9	25.4	4.9	3.6
SW 3	Dry	0.0	16.7	18.5	NO TRIGGER	NO TRIGGER
SW 6A	20.3	238.2	22.7	25.2	83.4	58.3
SW 9	Dry	0.0	14.8	16.4	NO TRIGGER	NO TRIGGER
SW 14	17.2	10.4	19.6	21.8	1.8	1.6
SW 15	15.9	0.5	20.7	23	0.2	NO TRIGGER
SW 16	12.9	1.3	17.5	19.4	0.6	0.1
SW 17	18.7	3.6	19.2	21.4	0.5	0.3
SW 17A	9.8	6.8	12.6	14	6.9	3.9
SW 18	13.7	23.8	16.1	17.9	13.3	11.5
RR3 KARST	Ponded	0.0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	14.4	38.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	16	1.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B19: ESCARPMENT SPRING STATIONS JULY 2018

Surface Water Stations	July PITM Report		July PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	16.4	0.16	19.2	21.3	0.09	0.09
SW 11	11.9	1.1	14.4	16	0.09	0.08
SW 11A	10.1	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	9.5	0.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	8.5	0.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	10.1	0.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	13.5	0.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	10.4	1.7	11.7	13	1.2	0.7
SW 24A	10.7	0.96	13.5	15	0.40	0.3
SW 77	9	0.17	9.7	10.8	0.12	0.1

TABLE B20: SURFACE WATER STATIONS JULY 2018

Escarpment Springs	July Monthly Report		July PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	17.5	1.8	21.7	24.1	0.3	0.2
SW 2	9.6	1.5	15.7	17.4	1.3	0.5
SW 0-2	15.6	1.5	26.3	29.2	3.6	1.7
SW 3		DRY	17.8	19.8	NO TRIGGER	NO TRIGGER
SW 6A	21.5	1009	21.1	23.4	55.6	47.5
SW 9		DRY	17.3	19.2	NO TRIGGER	NO TRIGGER
SW 14	16.8	3.0	21.6	24	1.1	0.5
SW 15		DRY	21.4	23.8	0.1	NO TRIGGER
SW 16	13.5	2.3	18.6	20.7	0.3	NO TRIGGER
SW 17	20.1	1.8	20.7	23	0.3	0.2
SW 17A	11	13.6	14.4	16	2.9	1.7
SW 18	15	4.5	18.6	20.7	7.1	3.8
RR3 KARST		DRY	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	15.6	11.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	14.8	0.23	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B21: ESCARPMENT SPRING STATIONS AUGUST 2018

Surface Water Stations	August PITM Report		August PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	18.1 **(13.4)**	0.1	15.8	17.5	0.09	NO TRIGGER
SW 11	13.8 **(11.8)**	1	13.5	15	0.8	0.1
SW 11A	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	11.3	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	9.6	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	11.6	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	14.7	0.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	11.5 **(10.6)**	4.9	10.8	12	0.8	0.7
SW 24A	11.9 **(11.4)**	0.4	11.7	13	0.30	0.1
SW 77	12.3 **(9.4)**	0.7	9.5	10.6	0.1	0.09

TABLE B22: SURFACE WATER STATIONS AUGUST 2018

Escarpment Springs	August Monthly Report		August PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	15.5	54.2	17.7	19.7	0.5	0.1
SW 2	11.2	5.8	15.6	17.3	0.3	0.1
SW 0-2	15.2	39.2	22.4	24.9	3.8	2.1
SW 3	0	DRY	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 6A	19.4 **(16.6)**	72.9	19.1	21.2	32.1	24.9
SW 9	0	DRY	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 14	17.9	2.5	20	22.2	1.1	0.4
SW 15	17.8	0.1	19.4	21.5	0.1	NO TRIGGER
SW 16	15.6 **(15.7)**	2.1	15.3	17	0.1	NO TRIGGER
SW 17	19.6 **(18.8)**	0.4	19.1	21.2	0.3	0.1
SW 17A	13	3.8	13.4	14.9	2.5	0.5
SW 18	17	3.8	17.4	19.3	3.5	3
RR3 KARST	DRY	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	16.3	26.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	17	0.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B23: ESCARPMENT SPRING STATIONS SEPTEMBER 2018

Surface Water Stations	September PITM Report		September PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	14.1	0	12.8	14.2	0.09	NO TRIGGER
SW 11	13.1	2.3	11.4	12.7	0.2	0.1
SW 11A	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	11.6	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	9.6	0.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	12.9	0.1	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	13.8	0.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	11	1.2	9.6	10.7	0.8	0.7
SW 24A	11.8	0.5	10.2	11.4	0.30	0.1
SW 77	11.6	0.2	9.9	11	0.1	0.09

TABLE B24: SURFACE WATER STATIONS SEPTEMBER 2018

Escarpment Springs	September Monthly Report		September PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	14.9	1.1	17.1	19	0.6	0.2
SW 2	11.7	2.4	12.8	14.2	0.1	NO TRIGGER
SW 0-2	14.6	4.5	20.8	23.1	1.9	0.4
SW 3	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 6A	17.6	26.9	14.4	16	14.7	9
SW 9	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 14	14.5	0.6	14.5	16.1	0.8	0.1
SW 15	0	0	15	16.7	0.1	NO TRIGGER
SW 16	14.2	0.8	12.5	13.9	0.1	NO TRIGGER
SW 17	17.1	0.4	15.6	17.3	0.3	0.1
SW 17A	12.1	2.4	10.9	12.1	1.2	1.1
SW 18	14	4.7	13.2	14.7	3.1	1.6
RR3 KARST	-	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	14.9	25.9	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	13.6	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B25: ESCARPMENT SPRING STATIONS OCTOBER 2018

Surface Water Stations	October PITM Report		October PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	7.2	0.3	NO TRIGGER	NO TRIGGER	0.09	0.09
SW 11	4.9	0.9	NO TRIGGER	NO TRIGGER	0.2	0.1
SW 11A	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	8	0.1	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	7.7	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	5.2	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	5	1.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	5.9	2.4	NO TRIGGER	NO TRIGGER	0.8	0.7
SW 24A	6	0.9	NO TRIGGER	NO TRIGGER	0.30	0.1
SW 77	9.3	0.2	NO TRIGGER	NO TRIGGER	0.1	0.09

TABLE B26: SURFACE WATER STATIONS OCTOBER 2018

Escarpment Springs	October Monthly Report		October PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	2.4	18.1	NO TRIGGER	NO TRIGGER	1.3	0.9
SW 2	10.1	1.7	NO TRIGGER	NO TRIGGER	0.12	0.1
SW 0-2	2.9	12.5	NO TRIGGER	NO TRIGGER	6.6	1.2
SW 3	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 6A	4	60.5	NO TRIGGER	NO TRIGGER	14.7	9
SW 9	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 14	5.3	4.8	NO TRIGGER	NO TRIGGER	0.8	0.1
SW 15	6.6	0.5	NO TRIGGER	NO TRIGGER	0.1	NO TRIGGER
SW 16	4.2	2.5	NO TRIGGER	NO TRIGGER	0.1	NO TRIGGER
SW 17	5.9	27.2	NO TRIGGER	NO TRIGGER	0.3	0.1
SW 17A	5.4	3.4	NO TRIGGER	NO TRIGGER	1.2	1.1
SW 18	5.7	6.1	NO TRIGGER	NO TRIGGER	3.1	1.6
RR3 KARST	0	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	5	13	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	5	0.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B27: ESCARPMENT SPRING STATIONS NOVEMBER 2018

Surface Water Stations	November PITM Report		November PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	1.5	0.1	NO TRIGGER	NO TRIGGER	0.1	0.09
SW 11	2.3	2.3	NO TRIGGER	NO TRIGGER	2.4	1.4
SW 11A	2.7	0	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	4.7	0.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	6.2	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	3.4	0.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	0.7	4.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	2.7	1.9	NO TRIGGER	NO TRIGGER	1.7	0.4
SW 24A	1.1	0.5	NO TRIGGER	NO TRIGGER	0.50	0.1
SW 77	0	FROZEN	NO TRIGGER	NO TRIGGER	0.2	0.1

TABLE B28: SURFACE WATER STATIONS NOVEMBER 2018

Escarpment Springs	November Monthly Report		November PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	0	FROZEN	NO TRIGGER	NO TRIGGER	2.2	0.3
SW 2	5.8	0.9	NO TRIGGER	NO TRIGGER	0.2	0.1
SW 0-2	0	FROZEN	NO TRIGGER	NO TRIGGER	10.2	4.1
SW 3	0	FROZEN	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 6A	0.1	111.1	NO TRIGGER	NO TRIGGER	96.9	32.8
SW 9	0	FROZEN	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 14	0.02	5.6	NO TRIGGER	NO TRIGGER	3.1	0.9
SW 15	2.1	0.7	NO TRIGGER	NO TRIGGER	0.6	0.2
SW 16	0.2	2.5	NO TRIGGER	NO TRIGGER	0.1	NO TRIGGER
SW 17	2.4	1.2	NO TRIGGER	NO TRIGGER	0.6	0.3
SW 17A	1.7	6.6	NO TRIGGER	NO TRIGGER	4.5	1.8
SW 18	0	FROZEN	NO TRIGGER	NO TRIGGER	18.1	9.3
RR3 KARST	4.2	FROZEN	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	0	19.2	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	0.2	6.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B29: ESCARPMENT SPRING STATIONS DECEMBER 2018

Surface Water Stations	December PITM Report		December PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 10	2.4	0.6	NO TRIGGER	NO TRIGGER	0.1	0.09
SW 11	4.9	5.6	NO TRIGGER	NO TRIGGER	3.5	0.9
SW 11A	5.9	0.4	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11B	5.9	0.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11C	5.8	0.1	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11D	5.4	1.3	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 11E	3.8	7.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 21C	4.4	3.1	NO TRIGGER	NO TRIGGER	1.7	0.4
SW 24A	4	1.9	NO TRIGGER	NO TRIGGER	0.50	0.1
SW 77	7.1	1.1	NO TRIGGER	NO TRIGGER	0.23	0.2

TABLE B30: SURFACE WATER STATIONS DECEMBER 2018

Escarpment Springs	December Monthly Report		December PITM Trigger Values			
	Temperature (°C)	Flow (L/s)	Temperature (°C) 'YELLOW'	Temperature (°C) 'RED'	Flow (L/s) 'YELLOW'	Flow (L/s) 'RED'
SW 1	0	Frozen	NO TRIGGER	NO TRIGGER	5.1	0.6
SW 2	6.3	1.6	NO TRIGGER	NO TRIGGER	1.3	0.3
SW 0-2	0.3	Frozen	NO TRIGGER	NO TRIGGER	23.8	19.2
SW 3	0	Frozen	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 6A	0.4	187.9	NO TRIGGER	NO TRIGGER	241.2	151
SW 9	2.6	0.5	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
SW 14	1.9	Frozen	NO TRIGGER	NO TRIGGER	6.2	2.5
SW 15	2.3	0.8	NO TRIGGER	NO TRIGGER	0.8	0.6
SW 16	0.9	5.1	NO TRIGGER	NO TRIGGER	2.4	Dry
SW 17	3.5	2.2	NO TRIGGER	NO TRIGGER	1.4	1.1
SW 17A	3.3	17.7	NO TRIGGER	NO TRIGGER	4.5	1.8
SW 18	2.5	25.3	NO TRIGGER	NO TRIGGER	18.1	9.3
RR3 KARST	6.7	0.6	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
PR CONTROL	1.1	43.8	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER
BC CONTROL	1.7	18.7	NO TRIGGER	NO TRIGGER	NO TRIGGER	NO TRIGGER

TABLE B31: Bi-Weekly Drivepoint Monitoring 2018

Location	2018 Measurement Water Level (m ASL)					
	May	May	June	June	July	July
RW PSW #2						
DP5 (in)	510.1	510.0	510.0	509.7	509.8	509.4
DP5 (out)	510.1	510.0	510.0	509.7	509.9	509.5
DP7 (in)	509.4	509.4	509.3	509.2	509.1	508.8
DP7 (out)	509.4	509.3	509.3	509.2	509.1	509.1
RR PSW#6						
DP2 (in)	512.3	512.3	512.3	512.2	512.2	512.2
DP2 (out)	512.3	512.3	512.3	512.2	512.2	512.2
DP4 (in)	511.2	511.2	511.2	511.1	511.1	511.1
DP4 (out)	511.2	511.2	511.2	511.1	511.1	511.1
DP8 (in)	511.4	511.4	511.4	511.3	511.4	511.3
DP8 (out)	511.4	511.4	511.4	511.3	511.3	511.3
RR PSW #3						
DP10 (in)	508.2	508.2	507.4	507.3	507.3	507.3
DP10 (out)	508.2	508.2	507.4	507.3	507.3	507.3
ANSI A						
DP6 (in)	511.9	511.8	511.7	511.6	511.0	510.5
DP6 (out)	511.9	511.8	511.7	511.6	511.5	511.5
ANSI B						
Bridson DP (in)	510.5	510.5	510.4	510.2	510.1	509.4
Bridson DP (out)	510.5	510.4	510.4	510.4	510.4	510.4
DP9 (in)	507.8	507.8	507.8	507.7	507.6	507.7
DP9 (out)	507.8	507.8	507.8	507.8	507.8	507.8

APPENDIX C

LONG TERM TREND GROUNDWATER AND SURFACE WATER MONITORING PROGRAM RESULTS

TABLE C-1
LONG TERM TREND GROUNDWATER MONITOR DETAILS

DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

111-53312.00 A61

DESIGNATION	NAD 27 NORTHING	NAD 27 EASTING	TYPE	DIAMETER (mm)	MEASURING POINT ELEVATION (m ASL)	GROUND ELEVATION (m ASL)	SCREENED INTERVAL (m ASL or Depth)	GEOLOGIC FORMATION MONITORED	MONITORING PROGRAM
DUNTROON EXPANSION LANDS MONITORS									
BH02-1	4915021	560321	O	102	523.3	522.6	Open Hole 39.5 m	Amabel/Fossil Hill	LTT
BH02-2	4915314	559904	O	102	523.2	522.5	Open Hole 39.5 m	Amabel/Fossil Hill	LTT
BH02-3	4915082	559869	O	102	530.6	529.6	Open Hole 9.5 m *	Amabel/Fossil Hill	LTT
BH02-4	4915100	559862	O	102	530.7	530.0	Open Hole 50.1 m	Amabel/Fossil Hill	LTT
BH02-5	4915356	559577	O	102	513.9	513.2	Open Hole 31.9 m	Amabel/Fossil Hill	LTT
BH02-5 (mid)	4915356	559577	O	102	514.2	513.2	Open Hole 12.4 m	Amabel	LTT
BH02-6	4914782	559692	O	102	530.3	529.5	Open Hole 48.5 m	Amabel/Fossil Hill	LTT
BH03-7-I	4915281	559331	O	102	511.0	510.3	502.9 - 501.1	Amabel	LTT
BH03-7-II	4915283	559331	O	102	511.0	510.3	508.7 - 504.8	Overburden	LTT
BH03-7-III	4915293	559354	O	102	511.7	510.6	Open Hole 30.7 m	Amabel/Fossil Hill	LTT
BH03-8	4915099	558963	O	102	520.8	520.2	Open Hole 37.9 m	Amabel/Fossil Hill	LTT
BH03-9	4914674	559088	O	102	518.9	518.5	Open Hole 39.5 m	Amabel/Fossil Hill	LTT
BRIDSON DP	4915303	560360	S	38	511.3	510.4	509.6 - 508.8	Overburden	PITM
TW04-1	4914910	559084	O	152	517.5	517.1	Open Hole 34.1 m	Amabel/Fossil Hill	LTT
TW04-2	4914934	559082	O	152	518.1	517.5	Open Hole 34.1 m	Amabel/Fossil Hill	LTT
TW04-3	4914909	559098	O	152	518.6	518.0	Open Hole 37.5 m	Amabel/Fossil Hill	LTT
DP5	4915342	559086	S	51	510.5	509.7	509.57 - 508.67	Overburden	PITM
DP6	4915513	559774	S	51	512.2	511.5	510.96 - 510.06	Overburden	PITM
BH08-1	4915197	560471	O	102	512.3	511.5	Open Hole 27.4 m	Amabel/Fossil Hill	LTT
BH08-2	4915175	560484	O	102	512.0	511.2	Open Hole 25.8 m	Amabel/Fossil Hill	LTT
BH08-3	4915198	560447	O	102	513.4	512.6	Open Hole 28.8 m	Amabel/Fossil Hill	LTT

NOTE:

- O indicates Open Hole Monitor
- DW indicates Domestic Well
- S indicates Standpipe Monitor
- R indicates Replacement Monitor
- ND indicates Not Determined
- N/A indicates information not available
- * Open hole depth changed to 9.49 mbg from 12 mbg based on measurement by TKC November 10, 2010.
- PITM - Performance Indicator Trigger Monitoring, LTT - Long Term Trend Monitoring

TABLE C-1
LONG TERM TREND GROUNDWATER MONITOR DETAILS

DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
111-53312.00 A61

DESIGNATION	NAD 27 NORTHING	NAD 27 EASTING	TYPE	DIAMETER (mm)	MEASURING POINT ELEVATION (m ASL)	GROUND ELEVATION (m ASL)	SCREENED INTERVAL (m ASL or Depth)	GEOLOGIC FORMATION MONITORED	MONITORING PROGRAM
DUNTROON EXPANSION LANDS MONITORS									
IW1	4915051	560555	O	152	512.1	511.5	Open Hole 27.3 m	Amabel/Fossil Hill	LTT
IW1a	4915052	560552	O	152	512.0	511.4	Open Hole 27.3 m	Amabel/Fossil Hill	N/A
IW2	4915272	560522	O	152	509.2	508.7	Open Hole 24 m	Amabel/Fossil Hill	LTT
IW3	4915702	560215	O	152	519.1	518.5	Open Hole 33.7 m	Amabel/Fossil Hill	LTT
IW4	4915999	560024	O	152	511.0	510.4	Open Hole 25.4 m	Amabel/Fossil Hill	LTT
NW1	4914907	560060	O	152	526.2	525.7	Open Hole 42.7 m	Amabel/Fossil Hill	LTT
NW2	4915094	560110	O	152	532.0	531.4	Open Hole 54.7 m	Amabel/Fossil Hill	LTT
NW3	4915248	560219	O	152	515.1	514.4	Open Hole 29.6 m	Amabel/Fossil Hill	LTT
NW4	4915011	559675	O	152	529.9	529.0	Open Hole 48.9 m	Amabel/Fossil Hill	LTT
NW5	4915189	559642	O	152	521.7	521.0	Open Hole 39.7 m	Amabel/Fossil Hill	LTT
NW6	4915137	559516	O	102	522.0	520.7	Open Hole 41.2 m	Amabel/Fossil Hill	LTT
NW7	4914958	559467	O	152	523.9	523.2	Open Hole 42.1 m	Amabel/Fossil Hill	LTT
NW8	4914792	559246	O	152	531.9	531.1	Open Hole 43 m	Amabel/Fossil Hill	LTT
NW9	4914749	559032	O	152	521.5	520.9	Open Hole 41.7 m	Amabel/Fossil Hill	LTT
NW10-DP	-	-	S	152	511.2	509.7	509.6 - 509.1	Overburden	LTT
NW10-Shallow	-	-	O	152	510.3	509.7	Open Hole 3.8 m	Amabel	LTT
NW10-Deep	4915376	558940	O	152	510.5	509.7	Open Hole 29.5 m	Amabel/Fossil Hill	LTT
DP7	4915351	559345	S	51	509.9	509.2	507.4 - 506.9	Overburden	PITM
DP8	4914360	559094	S	51	511.9	511.1	510.9 - 510.5	Overburden	PITM
DP9	4915407	560273	S	51	508.9	507.7	507.2 - 506.6	Overburden	PITM

NOTE:

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- R indicates Replacement Monitor
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TABLE C-1
LONG TERM TREND GROUNDWATER MONITOR DETAILS

DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
111-53312.00 A61

DESIGNATION	NAD 27 NORTHING	NAD 27 EASTING	TYPE	DIAMETER (mm)	MEASURING POINT ELEVATION (m ASL)	GROUND ELEVATION (m ASL)	SCREENED INTERVAL (m ASL or Depth)	GEOLOGIC FORMATION MONITORED	MONITORING PROGRAM
DUNTROON EXISTING QUARRY MONITORS									
98-8	4914120	559613	O	102	517.3	516.5	Open Hole 35.1 m	Amabel/Fossil Hill	LTT
98-9	4914583	559358	O	102	526.4	525.9	Open Hole 48.5 m	Amabel/Fossil Hill	LTT
98-10	4914492	559752	O	102	519.6	519.4	Open Hole 37.9 m	Amabel/Fossil Hill	Historical
98-11	4914574	560010	O	102	522.6	522.2	Open Hole 41.2 m	Amabel/Fossil Hill	Historical
98-12	4914863	560341	O	102	527.2	526.7	Open Hole 42.4 m	Amabel/Fossil Hill	LTT
98-13	4914597	560372	O	102	522.4	522.3	Open Hole 38.0 m	Amabel/Fossil Hill	Historical
DP1	4914116	559465	S	51	513.1	511.8	511.3 - 510.8	Overburden	LTT
DP2	4914373	559287	S	51	512.9	512.1	511.3 - 510.8	Overburden	PITM
DP3	4914013	560290	S	51	514.7	513.6	511.9 - 511.4	Overburden	LTT
DP4	4914013	559067	S	51	512.1	511.4	510.4 - 509.9	Overburden	PITM
E2	4914561	559937	O	203	521.0	521.0	Open Hole	Amabel	Historical
MW2	4914171	559742	O	102	524.9	523.2	Open Hole 20.8 m	Amabel	Historical
MW3 (R)	4914369	560327	O	102	515.0	514.4	Open Hole 15.4 m	Amabel	Historical
MW4	4914697	560216	O	102	522.5	521.9	Open Hole 39.9 m	Amabel/Fossil Hill	Historical
MW5	4914857	560257	O	102	529.4	529.4	Open Hole 46.1 m	Amabel/Fossil Hill	Historical
MW6	4914673	559635	O	102	534.9	533.6	Open Hole 36.4 m	Amabel	LTT
OW99-1	4914564	559559	O	102	519.4	519.1	Open Hole 29.5 m	Amabel	Historical
OW99-2	N/A	N/A	O	102	500.8	500.6	Open Hole 19.7 m	Amabel/Fossil Hill	Historical
PW99-1	4914157	559609	O	152	514.0	513.9	Open Hole 32.9 m	Amabel/Fossil Hill	LTT

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- N/A indicates information not available
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TABLE C-1
LONG TERM TREND GROUNDWATER MONITOR DETAILS

DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
111-53312.00 A61

DESIGNATION	NAD 27 NORTHING	NAD 27 EASTING	TYPE	DIAMETER (mm)	MEASURING POINT ELEVATION (m ASL)	GROUND ELEVATION (m ASL)	SCREENED INTERVAL (m ASL or Depth)	GEOLOGIC FORMATION MONITORED	MONITORING PROGRAM
PW99-2	4914568	559532	O	152	519.3	519.2	Open Hole 34.4 m	Amabel	Historical
PW99-3	N/A	N/A	O	152	501.1	500.9	Open Hole 21.4m	Amabel/Fossil Hill	Historical
QUARRY HOUSE	4915096	560251	O	102	529.4	528.7	Open Hole 14.6m	Amabel	Historical
SHOP WELL	4914801	560018	O	102	523.5	522.5	Not Measured	Amabel	Historical
OFFICE WELL	4915061	560149	O	152	532.5	532.4	Open Hole 24.7m	Amabel/Fossil Hill	Historical
OFFICE WELL (NEV	4915083	560156	O	152	532.0	531.4	Open Hole 37.2m	Amabel	Historical
OSPREY QUARRY PROPERTY MONITORS									
101-B	4913891	557900	O	152	503.0	502.5	Open Hole 6.1 m	Amabel	LTT
102-C	4914250	558331	O	102	511.4	510.5	Open Hole 7.0 m	Amabel	LTT
103-D	4913962	558506	O	152	513.4	513.2	Open Hole 7.9 m	Amabel	LTT
104-A	4913796	558198	O	152	517.7	516.9	Open Hole 9.6 m	Amabel	LTT
OW1-4	4914034	558465	O	102	514.4	513.2	Open Hole 28.6 m	Amabel/Fossil Hill	LTT
OW1-6	4913928	558508	O	102	515.0	513.9	Open Hole 30.0 m	Amabel/Fossil Hill	N/A
OW3-1	4913737	558085	O	102	508.8	508.0	Open Hole 29.3 m	Amabel/Fossil Hill	LTT
OW5-2	4914015	557876	O	102	504.2	502.8	Open Hole 27.9 m	Amabel/Fossil Hill	LTT
OW6-3	4914244	558346	O	102	511.1	510.6	Open Hole 5.3 m	Amabel	LTT
CARMARTHEN LAKE FARMS MONITORS									
CLF1	4913728	559343	DW	152	521.1	520.8	Open Hole 36.6 m	Amabel/Fossil Hill	LTT
CLF2	4913713	559284	DW	152	519.2	519.6	Open Hole 49.4 m	Amabel/Fossil Hill	LTT
CLF3	4912910	559144	DW	152	517.6	517.1	Open Hole ND	Amabel	LTT

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TABLE C-1
LONG TERM TREND GROUNDWATER MONITOR DETAILS

DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
111-53312.00 A61

DESIGNATION	NAD 27 NORTHING	NAD 27 EASTING	TYPE	DIAMETER (mm)	MEASURING POINT ELEVATION (m ASL)	GROUND ELEVATION (m ASL)	SCREENED INTERVAL (m ASL or Depth)	GEOLOGIC FORMATION MONITORED	MONITORING PROGRAM
CLF4	4913050	559369	DW	152	510.0	509.5	Open Hole 15.2 m	Amabel	LTT
CLF5	4913128	559517	DW	152	509.2	508.8	Open Hole ND	Amabel	LTT
RESIDENTIAL WELLS									
RW8	4916820	560662	DW	Dug 750	431.0	431.0	Depth: 3.5 m	Overburden	LTT
RW15	4914844	560194	DW	Drilled 152	529.7	529.2	Depth: 24.4 m	Amabel	Historical
RW16	4915178	560459	DW	Drilled 152	513.3	512.5	Depth: 16.2 m	Amabel	LTT
RW10	4916387	560013	DW	Dug 750	494.5	Not surveyed	N/A	N/A	Historical
RW1	4915265	560619	DW	Drilled 152	508.8	508.6	Depth: 16.1 m	Amabel	LTT
RW2	4915112	560930	DW	Drilled 152	505.2	504.5	Depth: 29.0 m	Amabel	LTT
RW11	4914464	561761	DW	Drilled 152	453.1	453.0	Depth: 48.8 m	Overburden/Shale	Historical
RW11 DUG	4914468	561763	DW	Dug 750	453.0	453.0	Depth: 6.0 m	Overburden	Historical
RW9	4914687	558916	DW	Drilled 152	524.0	524.0	Depth: 27.4 m	Amabel	LTT
RW17	4915446	558987	DW	Drilled 127	Not Surveyed	Not surveyed	Depth: 8.5 m	N/A	LTT
RW18	4915299	560150	DW	Dug 1000	513.8	513.0	Depth: 2.7 m	Overburden/Amabel	LTT
RW19	4915355	560221	DW	Drilled 152	Not Surveyed	Not Surveyed	Depth: 36.3 m	Amabel	LTT
RW6	4914852	561652	DW	Dug 800	451.0	451.0	Depth: 8.2 m	Overburden	LTT
RW7	4914725	561691	DW	Drilled 152	453.0	452.3	Depth: 10.1 m	Overburden/Shale	LTT
RW5	4915152	561404	DW	Drilled 152	478.6	478.0	Depth: 35.0 m	Manitoulin/Shale	LTT
RW3	4915977	559243	DW	Drilled 152	519.0	518.7	Depth: 16.5 m	Amabel	LTT
RW12	4958180	561821	DW	Dug	Not Surveyed	Not surveyed	Depth 3.7 m	Overburden	Historical

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TABLE C-1
LONG TERM TREND GROUNDWATER MONITOR DETAILS

DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
111-53312.00 A61

DESIGNATION	NAD 27 NORTHING	NAD 27 EASTING	TYPE	DIAMETER (mm)	MEASURING POINT ELEVATION (m ASL)	GROUND ELEVATION (m ASL)	SCREENED INTERVAL (m ASL or Depth)	GEOLOGIC FORMATION MONITORED	MONITORING PROGRAM
RW13	4958180	561821	DW	Dug	Not Surveyed	Not surveyed	Depth 3.7 m	Overburden	Historical
RW4	4915918	559593	DW	Drilled 152	510.5	509.8	Depth: 55.5 m	Amabel/Fossil Hill/ Cabot Head/Manitoulin	LTT

NOTE:

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- R indicates Replacement Monitor
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TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
18-May-95	520.2				
25-May-95	520.0				
22-May-96	520.7				
08-Jul-96	519.8				
06-Sep-96	519.1				
23-Dec-96	520.9				
26-Feb-97	522.2				
08-May-97	520.8				
26-Aug-97	519.2				
19-Dec-97	520.0				
27-Feb-98	519.8				
08-Apr-98	522.3				
10-May-98	519.0				
29-Dec-98	519.4				
24-Feb-99	520.7		519.9	511.2	
28-Apr-99	520.4		520.4	511.1	
26-May-99	519.7		519.5	510.1	
29-Jun-99	519.0		518.8	509.1	
26-Jul-99	518.9	511.7	518.4	508.2	511.9
17-Aug-99	518.7	511.6	518.2	507.6	511.5
27-Sep-99	518.3	511.3	517.6	507.0	511.5
25-Oct-99	518.3	511.4	517.6	507.0	511.2
21-Nov-99	519.2	511.5	519.0	508.3	511.6
21-Dec-99	520.1	511.9	519.1	508.5	511.7

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
25-Jan-00	520.3	511.2	520.4	510.3	511.0
29-Feb-00	520.3	511.7	520.6	510.4	511.8
31-Mar-00	520.3	511.1	520.3	511.2	511.2
02-Jun-00	520.8	510.0	520.8	513.1	510.1
07-Jul-00	520.8	509.4	520.4	511.3	509.5
27-Aug-00	519.7	509.0	519.0	509.9	509.1
28-Sep-00	519.6	508.9	519.3	510.1	509.0
03-Nov-00	519.1	507.8	518.7	509.0	507.9
22-Feb-01	521.0	508.1	Frozen	512.1	508.2
22-Mar-01	520.2	506.6	Frozen	511.1	506.7
26-Apr-01	521.4	509.6	521.3	513.4	509.7
31-May-01	519.6	506.3	519.3	510.6	506.4
28-Jun-01	519.1	507.2	518.7	509.9	507.3
01-Aug-01	518.6	506.9	518.0	508.9	507.0
04-Oct-01	518.1	505.7	517.3	508.4	505.9
01-Nov-01	519.4	507.6	519.3	510.2	507.7
14-Dec-01	520.1	506.8	519.7	510.9	506.9
10-Jan-02	519.5	506.0	519.2	510.8	506.1
14-Mar-02	521.4	508.6	520.8	512.2	508.7
16-May-02	519.9	508.5	519.7	511.8	508.6
20-Jun-02	519.0	508.1	518.6	510.7	508.3
11-Jul-02	518.1	507.6	520.6	509.7	507.8
13-Sep-02	515.6	505.8	516.0	508.0	505.9
01-Nov-02	513.1	508.8	514.6	507.2	508.9

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- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
16-Jan-03	510.9	507.2	Frozen	507.1	507.3
28-Mar-03	512.7	510.5	516.6	513.3	510.6
15-May-03	513.4	508.1	516.0	511.1	508.2
23-Jun-03	511.9	509.0	514.7	510.4	508.1
22-Jul-03	510.7		513.2	509.8	508.0
20-Aug-03	509.8	507.9	512.2	508.8	508.0
25-Sep-03	509.1	507.3	511.7	507.7	507.4
22-Oct-03	508.7	507.3	511.4	508.7	507.4
25-Nov-03	508.9	508.6	512.4	510.7	508.8
22-Dec-03	510.2	508.6	513.6	511.0	508.7
09-Feb-04	511.0	506.7	513.6	510.6	506.8
16-Mar-04	510.6	507.6	Frozen	512.0	507.7
20-Apr-04	514.4	509.4	517.8	512.9	509.5
18-May-04	512.4	508.4	515.5	511.4	508.5
22-Jun-04	511.2	506.8	514.3	510.9	506.9
28-Jul-04	508.9	506.9	511.7	509.6	507.0
25-Aug-04	508.2	506.5	511.0	508.3	506.6
22-Sep-04	507.8	506.2	510.5	507.4	505.9
19-Oct-04	507.4	507.4	510.2	506.8	507.5
16-Nov-04	507.1	506.3	509.8	506.6	506.4
16-Dec-04	506.8	509.5	509.6	506.7	509.6
31-Jan-05	508.5	508.2	512.0	510.7	508.3
24-Feb-05	508.5	507.4	511.8	510.0	507.5
22-Mar-05	508.1	506.9	511.4	509.4	507.0

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
20-Apr-05	511.6	511.9	516.6	515.0	512.0
25-May-05	512.4	511.6	516.3	510.8	511.7
29-Jun-05	509.9	511.5	513.6	508.5	511.6
13-Jul-05	509.3	511.4	512.9	506.8	511.5
23-Aug-05	508.2	510.6	511.7	504.1	510.8
26-Sep-05	507.7	510.9	511.2	502.7	511.0
26-Oct-05	507.5	510.9	510.9	501.9	511.0
16-Nov-05	507.4	511.3	510.9	501.5	511.5
14-Dec-05	507.2	510.5	510.5	501.4	510.7
20-Jan-06	507.2	510.8	511.1	501.8	510.9
14-Feb-06	508.8	510.5	513.0	502.1	510.7
19-Mar-06	511.9	511.8	516.3	505.2	511.9
17-Apr-06	512.9	511.7	517.6	504.5	511.8
19-May-06	511.3	510.0	515.5	502.0	510.2
19-Jun-06	509.5	508.8	513.4	500.7	508.9
10-Jul-06	508.6	509.3	512.3	500.5	509.5
21-Aug-06	507.6	509.1	510.9	500.4	509.2
18-Sep-06	507.1	509.0	510.3	500.4	509.1
17-Oct-06	506.8	509.2	509.9	500.4	509.3
20-Nov-06	507.1	509.8	511.2	500.5	510.0
15-Dec-06	508.4	510.2	512.8	500.8	510.3
22-Jan-07	509.3	509.2	513.3	500.9	509.3
19-Feb-07	508.8	508.5	512.4	500.7	Frozen
18-Mar-07	508.4	509.8	512.2	501.0	509.9

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
17-Apr-07	511.9	510.8	516.2	501.1	510.9
17-May-07	510.2	509.4	514.1	N/A	509.5
21-Jun-07	508.6	507.8	512.3	502.2	507.9
17-Jul-07	508.0	508.4	511.4	502.1	508.6
21-Aug-07	507.4	508.6	510.5	502.0	508.7
16-Sep-07	506.9	508.9	510.0	502.1	509.0
14-Oct-07	506.6	508.9	509.6	502.0	509.0
18-Nov-07	506.5	508.8	509.4	502.1	509.0
13-Dec-07	506.4	508.8	509.5	502.1	508.8
20-Jan-08	510.1	511.3	Frozen	502.6	511.2
17-Feb-08	510.2	510.6	514.3	502.6	510.7
16-Mar-08	510.3	510.4	514.5	502.4	510.8
6-Apr-08	511.6	510.6	515.8	502.4	511.7
20-Apr-08	514.1	511.8	518.8	502.8	512.0
18-May-08	511.9	510.6	516.3	502.5	510.6
15-Jun-08	509.9	509.8	514.4	502.3	509.9
13-Jul-08	509.3	510.0	513.6	502.1	510.1
17-Aug-08	508.1	510.2	512.2	502.0	510.2
14-Sep-08	N/A	509.9	512.1	502.1	510.0
19-Oct-08	507.9	509.7	511.6	502.0	509.8
16-Nov-08	N/A	510.1	N/A	N/A	510.2
23-Nov-08	508.6	N/A	513.4	502.3	N/A
14-Dec-08	509.3	510.3	513.9	502.5	510.6
18-Jan-09	N/A	510.7	514.2	502.3	Frozen

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
08-Feb-09	510.6	510.6	514.3	502.7	510.9
15-Mar-09	510.7	510.5	514.4	502.6	510.6
12-Apr-09	512.3	510.9	516.1	502.6	511.0
17-May-09	512.0	510.5	516.2	502.4	510.6
14-Jun-09	511.2	509.8	514.2	502.2	509.9
12-Jul-09	510.8	509.4	513.1	502.1	509.5
9-Aug-09	509.8	509.5	512.1	502.2	508.6
13-Sep-09	507.4	509.6	510.6	501.9	508.7
11-Oct-09	508.1	509.9	510.9	502.1	508.9
15-Nov-09	509.4	510.2	510.7	501.9	509.0
13-Dec-09	510.2	510.2	510.9	502.0	509.1
17-Jan-10	510.5	510.1	511.0	501.5	508.8
7-Feb-10	510.9	510.2	511.3	502.2	509.3
14-Mar-10	511.4	510.6	N/A	502.6	510.0
18-Apr-10	510.9	511.0	515.1	502.7	511.1
16-May-10	509.3	510.7	513.9	502.2	511.0
8-Jun-10	N/A	N/A	N/A	N/A	N/A
13-Jun-10	508.6	510.6	513.1	501.2	510.9
21-Jul-10	508.4	510.9	512.9	501.0	511.2
16-Aug-10	508.5	510.8	512.8	500.9	511.1
12-Sep-10	508.4	511.0	512.1	501.9	511.3
26-Sep-10	N/A	N/A	N/A	N/A	N/A
17-Oct-10	507.8	510.3	511.4	501.9	510.4
14-Nov-10	508.0	510.4	511.3	501.9	510.5
19-Dec-10	Buried	Buried	511.5	502.3	510.9

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
16-Jan-11	N/A	Buried	512.4	502.4	511.1
20-Feb-11	N/A	510.8	512.4	502.3	510.9
13-Mar-11	510.7	510.9	512.5	502.4	511.0
17-Apr-11	512.9	511.4	517.7	503.0	511.1
15-May-11	513.0	511.8	518.0	502.6	512.0
13-Jun-11	512.1	511.2	516.2	502.4	510.8
17-Jul-11	511.8	510.3	515.9	502.3	509.5
14-Aug-11	511.5	509.8	515.1	501.9	510.0
18-Sep-11	511.3	509.7	515.0	501.3	510.0
16-Oct-11	507.2	509.5	513.9	502.1	509.7
20-Nov-11	508.1	510.3	514.1	501.7	510.5
18-Dec-11	508.6	510.4	514.2	502.1	510.5
15-Jan-12	508.8	510.5	514.3	502.2	510.6
19-Feb-12	508.7	510.0	514.0	502.2	510.2
26-Feb-12	-	-	-	502.0	-
18-Mar-12	N/A	512.5	515.6	N/A	511.0
15-Apr-12	507.6	514.1	516.8	502.3	507.8
13-May-12	509.7	514.0	516.5	502.2	507.6
17-Jun-12	509.1	513.9	516.4	502.0	507.5
15-Jul-12	509.0	513.7	516.1	502.0	507.3
12-Aug-12	507.6	513.6	516.6	502.3	507.9
16-Sep-12	507.4	510.2	511.0	501.9	510.3
7-Oct-12				501.9	
14-Oct-12	507.8	510.0	511.0	501.8	510.3
18-Nov-12	508.6	510.4	512.1	502.3	511.0
16-Dec-12	508.9	510.5	512.4	502.3	511.1

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
13-Jan-13	509.9	511.7	513.7	503.1	511.6
17-Feb-13	510.3	512.0	514.1	503.0	511.6
17-Mar-13	509.9	511.9	513.9	503.0	511.6
31-Mar-13	-	-	-	503.3	-
14-Apr-13	510.0	512.3	514.0	502.6	511.7
12-May-13	512.0	513.4	516.3	502.4	511.1
2-Jun-13	-	-	-	502.3	-
16-Jun-13	511.8	513.2	516.2	501.1	510.7
14-Jul-13	511.5	512.8	516.1	502.3	510.6
18-Aug-13	508.9	511.7	516.0	501.9	510.8
15-Sep-13	508.9	511.6	515.9	501.9	510.6
13-Oct-13	508.8	511.0	515.9	502.0	510.7
17-Nov-13	508.3	511.4	516.1	502.0	510.8
16-Dec-13	508.4	511.3	516.0	502.0	510.7
19-Jan-14	508.6	511.5	516.1	502.0	510.6
16-Feb-14	508.6	511.6	Buried	502.1	510.4
17-Mar-14	508.6	511.7	Buried	502.0	510.5
13-Apr-14	510.6	513.5	Buried	503.0	511.4
11-May-14	509.1	511.5	517.2	502.5	510.2
15-Jun-14	-	511.0	516.1	502.1	509.7
13-Jul-14	509.1	510.6	515.0	502.0	509.6
17-Aug-14	509.2	509.6	514.9	502.0	507.3
7-Sep-14	509.6	511.1	515.0	502.0	511.2
12-Sep-14	-	-	-	502.0	-
19-Oct-14	509.7	509.6	515.0	502.1	511.3
16-Nov-14	507.7	511.0	512.0	502.0	511.5

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
14-Dec-14	507.7	511.0	512.0	501.9	511.4
18-Jan-15	507.8	511.4	512.1	501.9	510.7
15-Feb-15	N/A	N/A	N/A	N/A	N/A
15-Mar-15	507.9	511.6	511.7	502.3	511.7
19-Apr-15	511.6	511.9	514.7	502.6	512.0
17-May-15	509.4	511.7	513.7	502.2	511.8
14-Jun-15	509.8	511.8	512.3	502.2	511.9
19-Jul-15	507.6	511.7	512.3	502.1	511.8
9-Aug-15	507.2	511.6	511.6	502.2	511.7
6-Sep-15	507.1	511.5	511.0	501.9	511.6
11-Oct-15	507.0	511.2	510.4	501.9	511.3
15-Nov-15	506.6	511.6	510.2	502.0	511.8
6-Dec-15	506.4	511.6	510.1	501.9	511.7
17-Jan-16	506.4	511.6	510.5	502.0	511.7
14-Feb-16	507.2	511.5	511.6	502.1	511.8
13-Mar-16	509.6	512.0	515.5	502.8	512.1
17-Apr-16	511.7	511.9	517.3	502.7	512.0
1-May-16	-	-	-	-	-
15-May-16	509.6	511.8	514.6	502.3	511.9
5-Jun-16	-	-	-	-	-
19-Jun-16	508.1	511.6	512.6	502.1	511.8
3-Jul-16	-	-	-	-	-
17-Jul-16	507.2	511.5	511.3	501.9	511.6
24-Jul-16	-	-	-	501.9	-
7-Aug-16	-	-	-	-	-
21-Aug-16	506.5	511.6	510.2	501.9	511.7
18-Sep-16	506.2	511.6	509.9	501.9	511.7

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
16-Oct-16	506.0	511.6	509.6	501.9	511.7
13-Nov-16	505.8	511.5	509.4	501.8	511.6
27-Nov-16	-	-	-	501.9	-
11-Dec-16	505.7	511.5	509.3	501.9	511.6
15-Jan-17	505.8	511.8	510.1	502.2	511.9
12-Feb-17	506.5	511.6	511.0	502.1	511.7
19-Mar-17	509.1	511.7	514.4	502.4	511.8
9-Apr-17	-	-	-	502.7	-
16-Apr-17	509.9	511.9	515.6	502.6	512.0
11-May-17	511.6	511.9	517.2	502.7	512.0
21-May-17	-	-	-	502.6	-
13-Jun-17	-	-	-	502.3	
25-Jun-17	509.5	511.9	515.1	502.4	512.0
19-Jul-17	509.5	511.9	515.1	502.4	512.0
03-Aug-17	-	-	-	503.2	-
17-Aug-17	508.2	511.7	513.2	502.1	511.8
29-Aug-17	-	-	-	-	-
17-Sep-17	507.4	511.7	511.4	502.1	511.8
26-Sep-17	-	-	-	502.0	-
15-Oct-17	506.9	511.7	510.9	502.1	511.9
14-Nov-17	506.8	511.6	511.1	502.1	511.8
11-Dec-17	507.6	511.6	512.1	502.2	511.8
14-Jan-18	507.7	511.8	512.2	502.4	511.9
11-Feb-18	-	-	-	502.2	-
18-Feb-18	508.6	512.5	513.2	502.8	512.6
18-Mar-18	509.6	511.7	514.7	502.4	511.8
15-Apr-18	508.6	511.9	513.6	502.5	512.0
17-May-18	510.4	511.9	515.7	502.6	512.0
18-Jun-18	508.8	511.7	513.4	502.2	511.8

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-2
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
EXISTING QUARRY PROPERTY
111-53312-00 A61

DATE	MW6	BH98-8	BH98-9	BH98-12	PW99-1
17-Jul-18	507.9	511.6	512.1	502.0	511.7
22-Aug-18	507.0	511.6	510.9	502.1	511.7
18-Sep-18	506.8	511.6	510.5	501.9	511.7
23-Oct-18	506.2	511.5	509.8	501.9	511.6
19-Nov-18	506.0	511.5	510.0	502.1	Frozen
10-Dec-18	-	511.7	-	502.1	Frozen

NOTE:
- Frozen/buried indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

FIGURE C-1

GROUNDWATER HYDROGRAPH
MW6

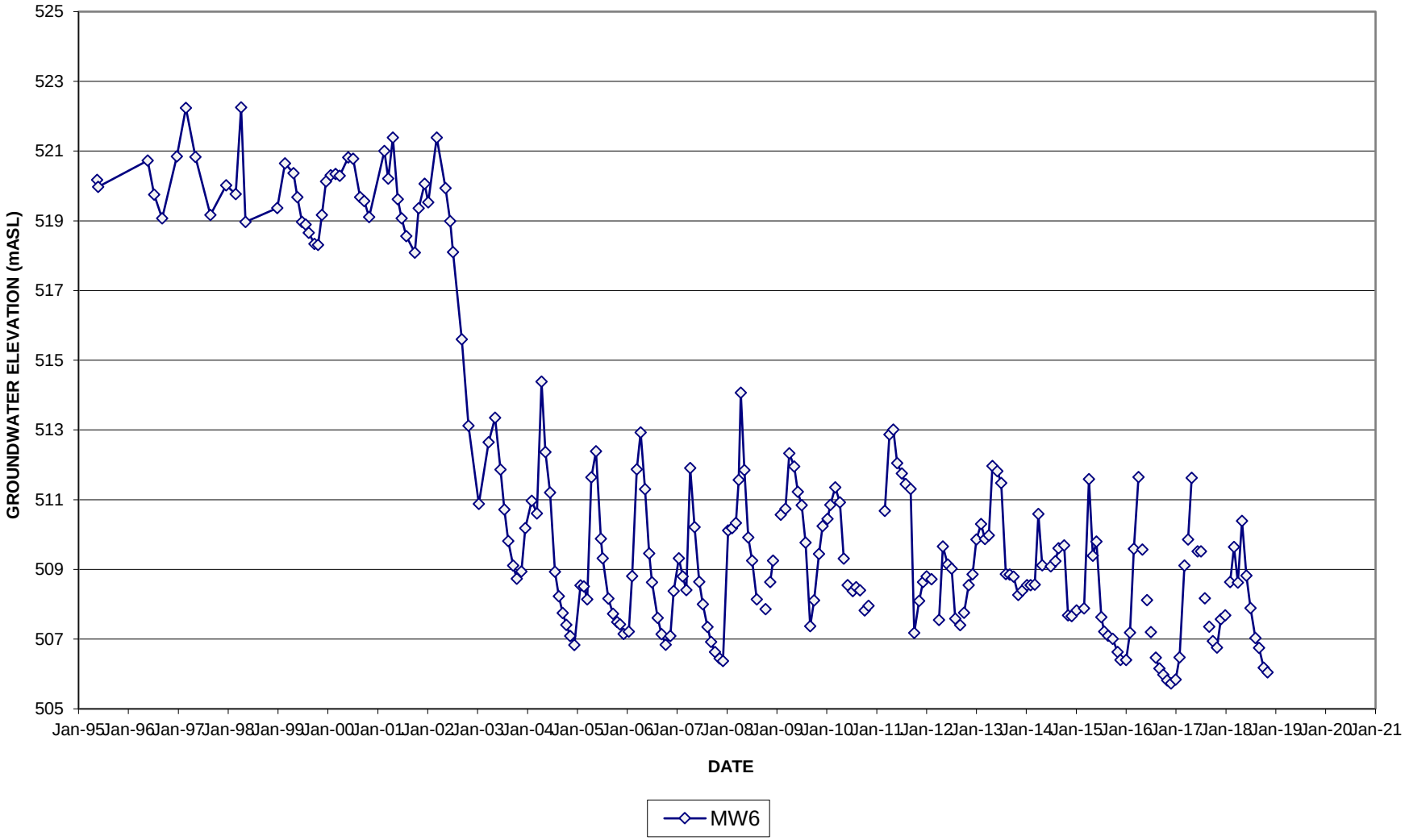


FIGURE C-2

GROUNDWATER HYDROGRAPH
BH98-8

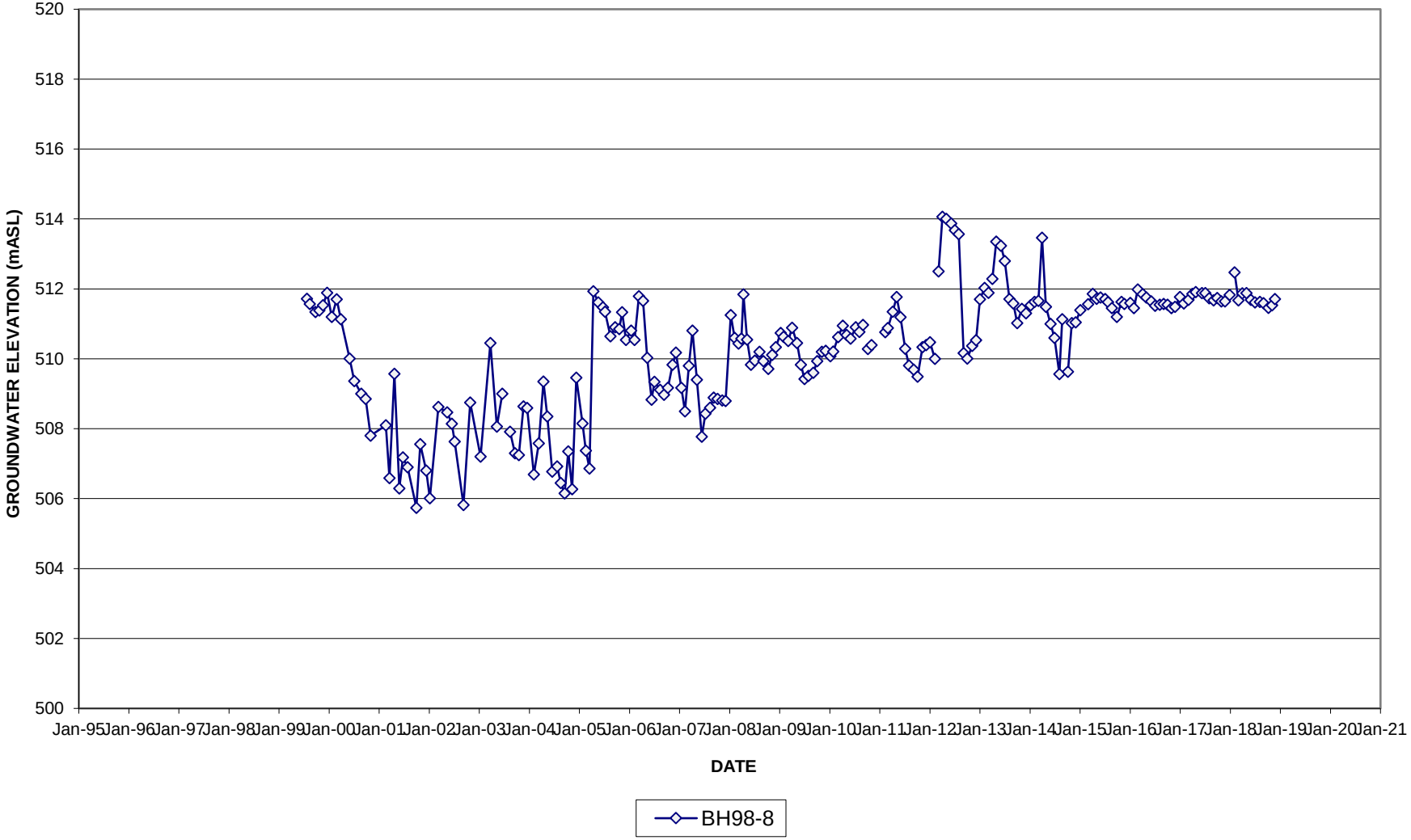


FIGURE C-3

GROUNDWATER HYDROGRAPH
BH98-9

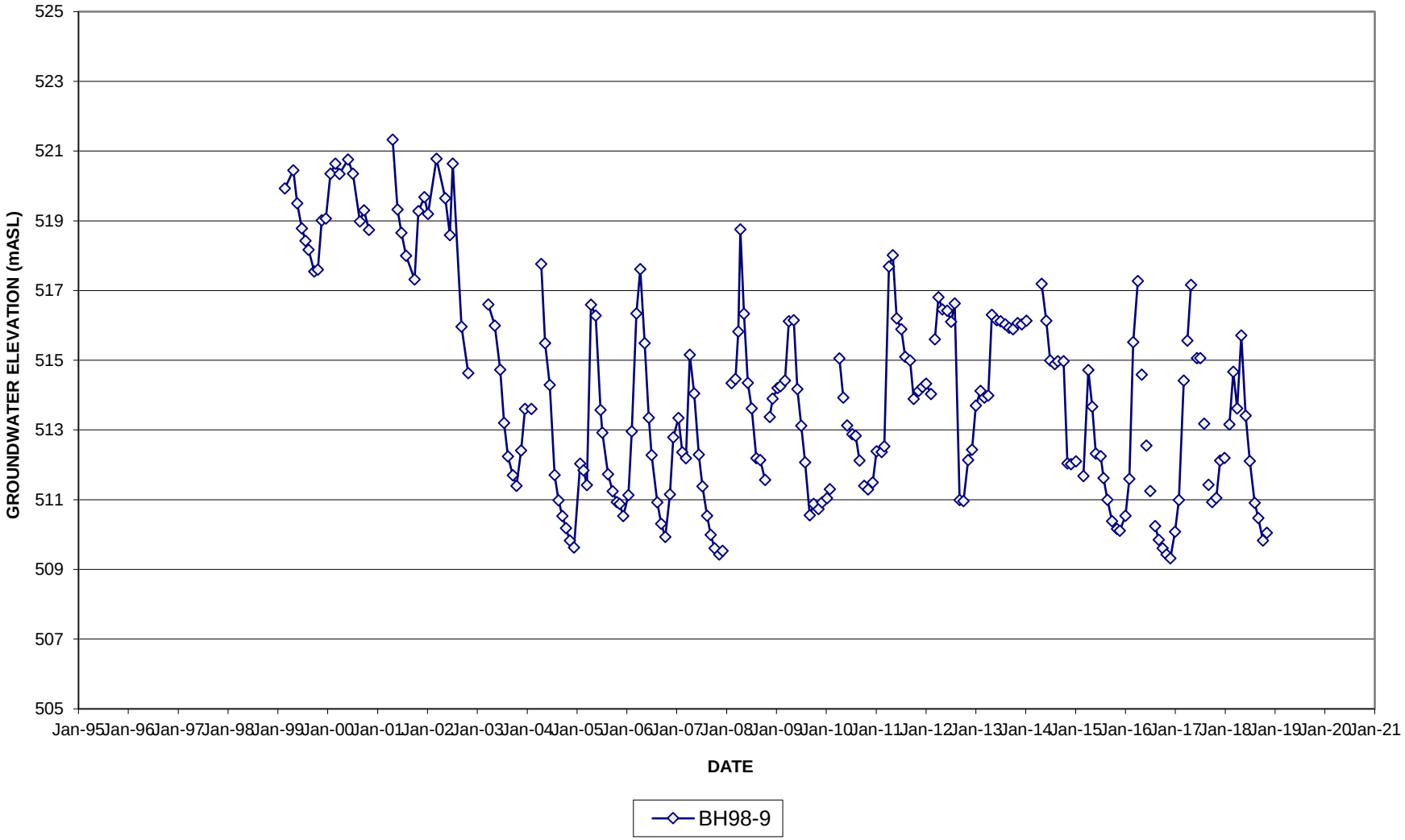


FIGURE C-4

GROUNDWATER HYDROGRAPH
BH98-12

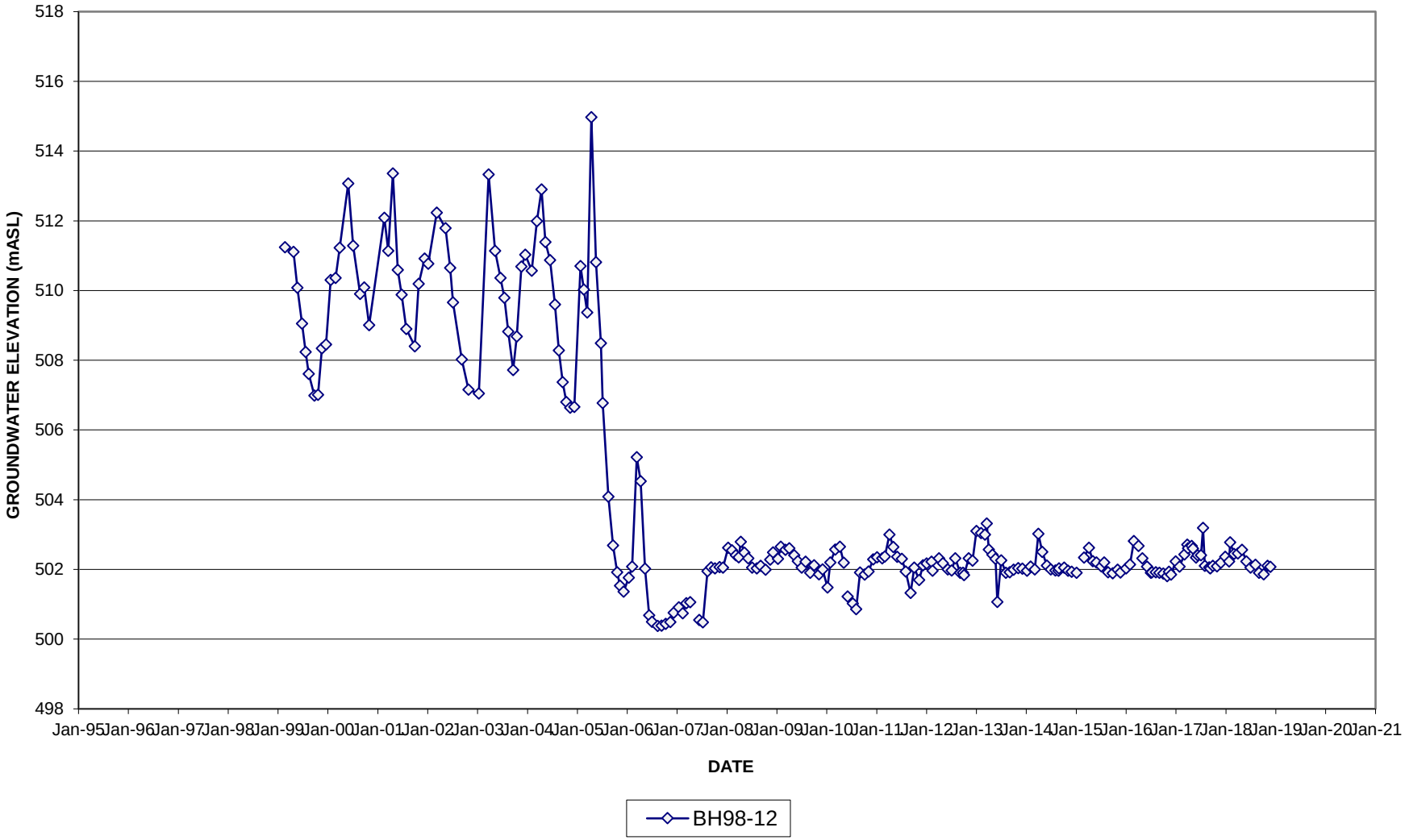


FIGURE C-4 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
BH98-12

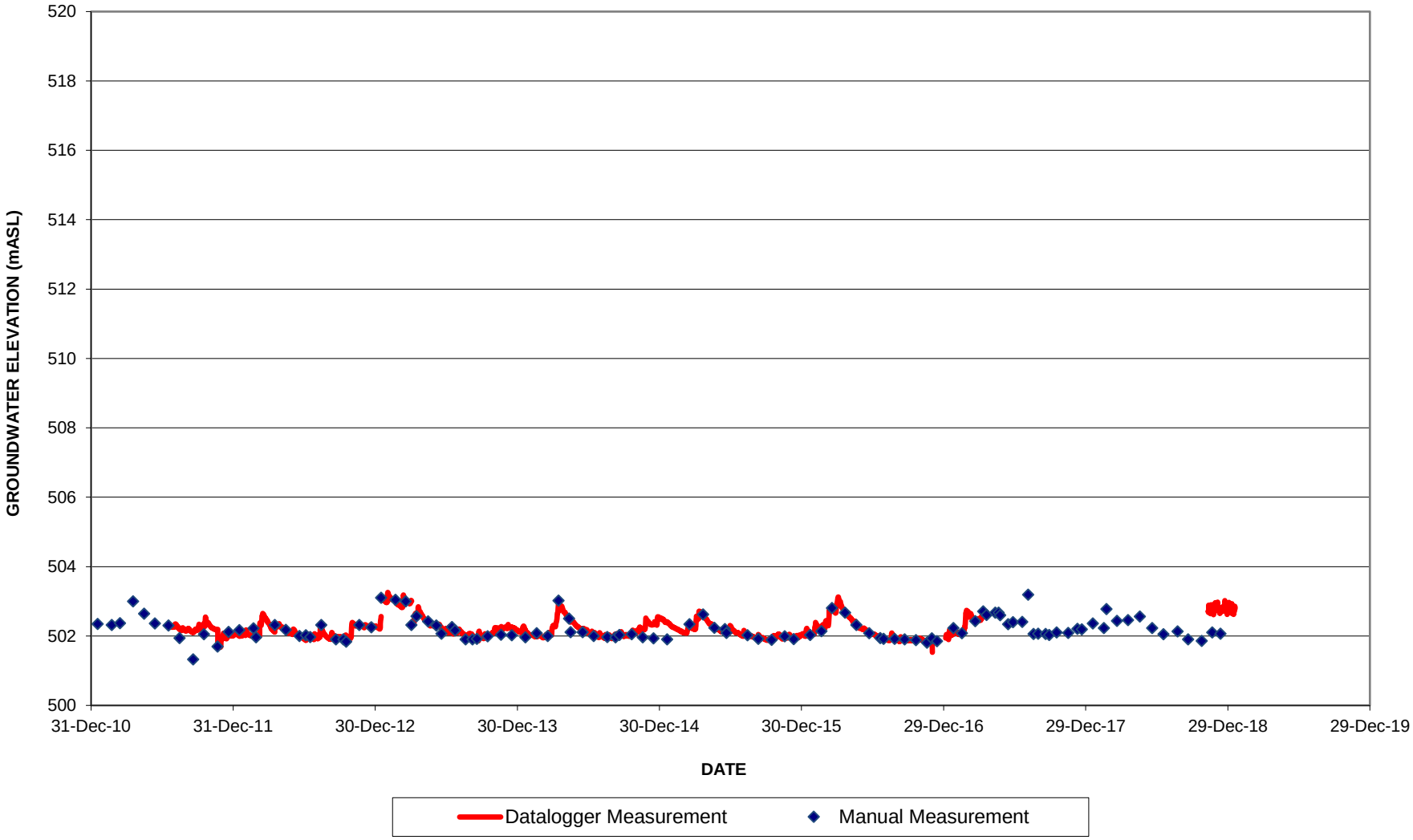


FIGURE C-5

GROUNDWATER HYDROGRAPH
PW99-1

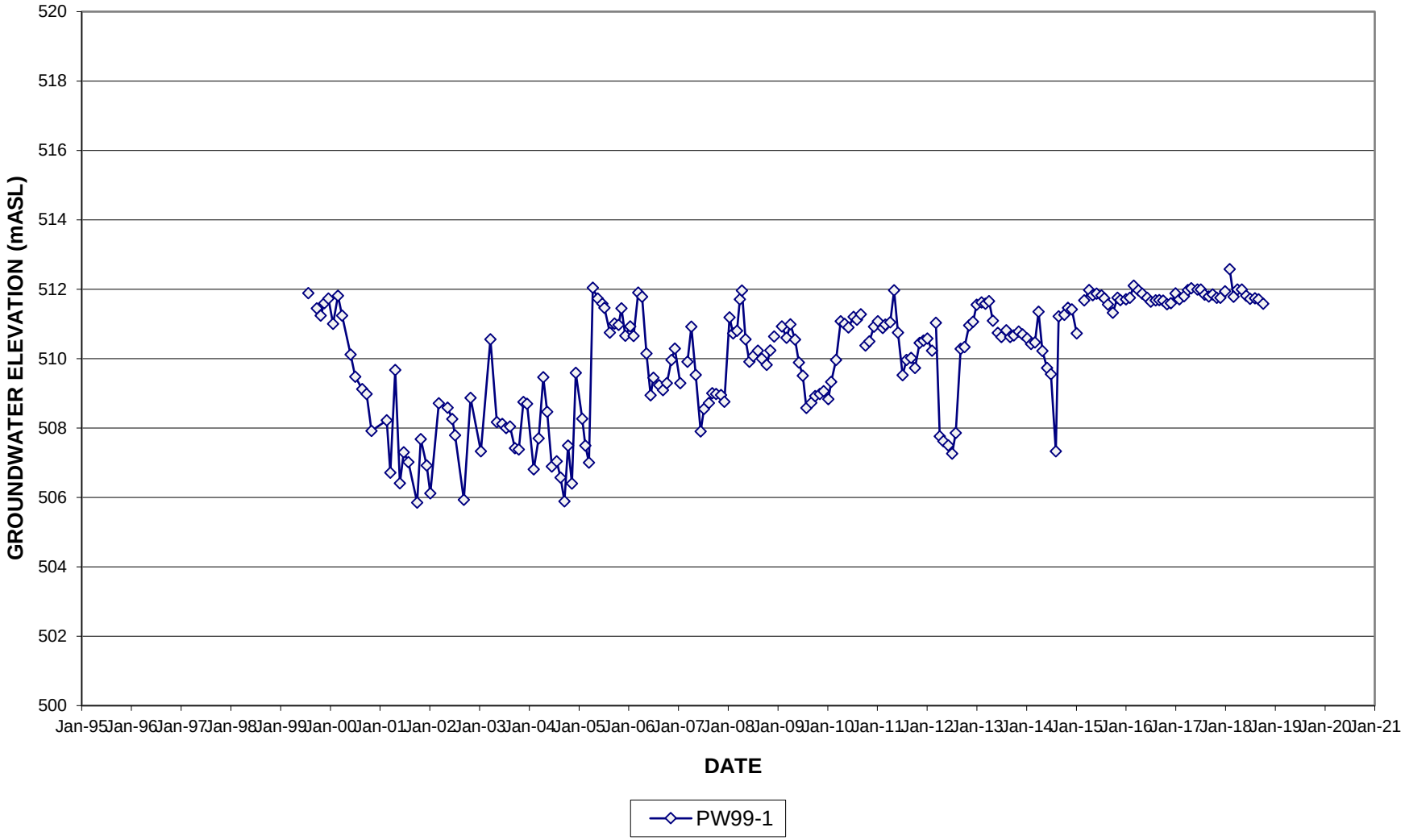


TABLE C-3
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS - INJECTION WELLS
111-53312.00 A61

DATE	IW1	IW1a	IW2	IW3	IW4
19-Oct-14					
2-Nov-14	505.2	505.1	508.1	505.7	496.1
16-Nov-14					
14-Dec-14					
18-Jan-15					
15-Feb-15					
15-Mar-15					
19-Apr-15					
17-May-15					
14-Jun-15					
19-Jul-15					
9-Aug-15					
6-Sep-15	502.2	502.1	506.1	502.6	495.4
11-Oct-15	501.3	501.2	505.5	501.8	495.1
15-Nov-15	501.7	501.6	506.4	501.7	495.0
9-Dec-15	502.8	502.7	507.4	502.8	495.4
17-Jan-16	505.2	505.1	508.0	504.9	496.0
14-Feb-16	506.8	506.7	508.3	506.6	496.8
13-Mar-16	510.5	510.4	508.9	511.5	499.2
17-Apr-16	510.1	510.0	508.7	508.9	498.6
1-May-16					
15-May-16	508.0	507.9	508.4	506.0	497.0
5-Jun-16					
19-Jun-16	504.5	504.4	507.3	504.4	496.6
3-Jul-16					
17-Jul-16	502.3	502.2	506.2	502.9	495.8
24-Jul-16	502.0		506.0	502.6	495.9
7-Aug-16					
21-Aug-16	501.4	501.3	505.4	502.0	495.4
18-Sep-16	502.0	500.9	505.1	501.8	495.2
29-Sep-16					
16-Oct-16	500.8	500.8	504.9	501.4	495.1
13-Nov-16	500.7	500.6	504.9	501.5	495.1
27-Nov-16	500.6		505.0	501.4	495.0
11-Dec-16	500.5	500.5	505.6	502.0	495.1

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-3
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS - INJECTION WELLS
111-53312.00 A61

DATE	IW1	IW1a	IW2	IW3	IW4
15-Jan-17	504.4	504.3	508.2	505.7	496.6
12-Feb-17	505.37	505.3	508.1	506.2	497.3
19-Mar-17	508.81	508.7	508.7	507.5	496.7
9-Apr-17	509.97	-	508.9	510.0	498.3
16-Apr-17	509.53	509.4	508.7	509.2	498.3
11-May-17	510.10	510.0	508.6	509.6	498.8
21-May-17	509.37	-	508.6	507.7	497.9
13-Jun-17	507.74	-	-	507.5	497.5
25-Jun-17	508.31	508.2	508.4	507.5	497.5
19-Jul-17	506.30	506.2	507.9	505.9	496.9
3-Aug-17	504.68	-	507.4	504.7	496.5
17-Aug-17	503.61	503.5	507.0	503.8	496.2
29-Aug-17	502.76	-	-	503.1	496.0
17-Sep-17	502.05	501.9	506.5	502.6	495.7
26-Sep-17	502.01	-	-	502.5	495.6
15-Oct-17	502.03	502.0	507.4	503.2	495.7
14-Nov-17	503.59	503.5	507.9	504.5	496.2
11-Dec-17	506.27	506.0	508.1	505.1	498.2
14-Jan-18	508.43	508.4	508.5	508.0	497.5
11-Feb-18	506.87	-	508.2	506.2	496.8
18-Feb-18	510.03	510.0	508.8	510.5	498.7
18-Mar-18	508.52	508.4	508.5	506.7	497.1
15-Apr-18	508.84	508.6	508.7	507.9	497.4
17-May-18	509.18	509.1	508.5	507.5	497.7
18-Jun-18	505.7	505.6	507.6	505.5	496.7
17-Jul-18	503.1	503.0	506.5	502.9	496.0
22-Aug-18	501.9	501.9	505.5	501.6	495.2
18-Sep-18	501.0	501.0	505.3	501.2	495.1
25-Oct-18	500.7	500.6	505.0	500.9	494.9
19-Nov-18	501.9	501.8	507.4	502.5	495.4
10-Dec-18	504.4	504.3	508.0		495.4

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

FIGURE C-6

GROUNDWATER HYDROGRAPH
IW1 and IW1a

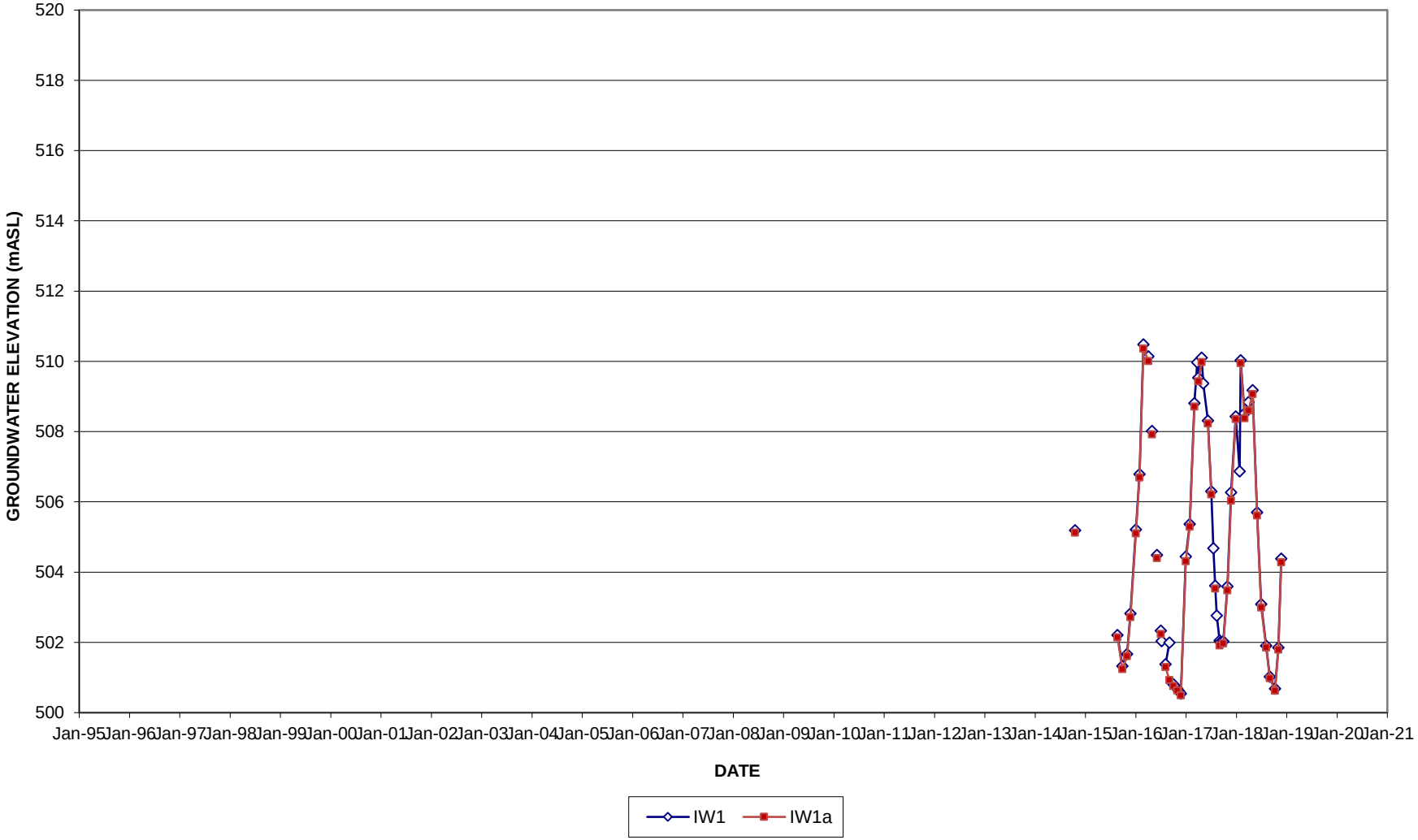


FIGURE C-6a

GROUNDWATER HYDROGRAPH
IW1

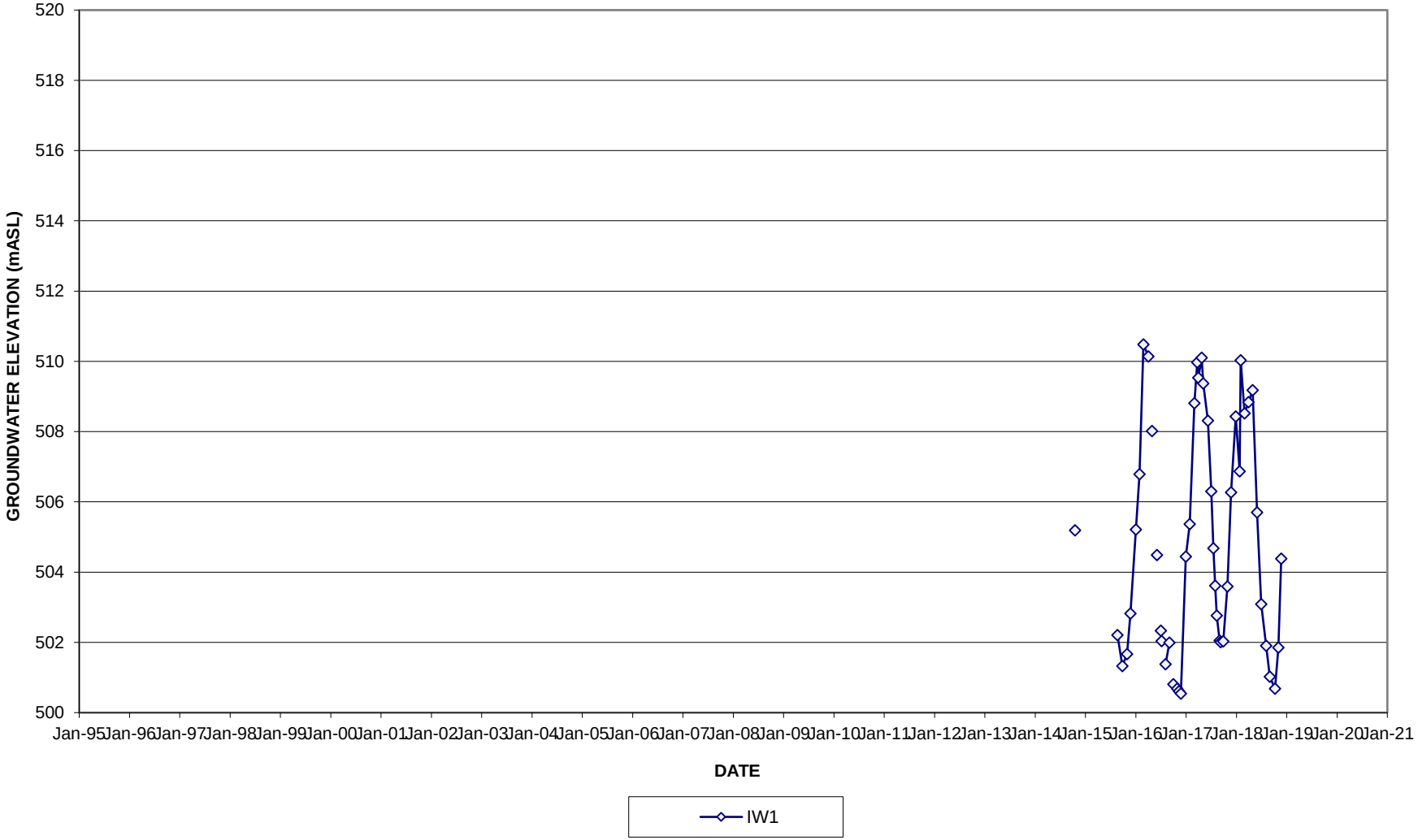


FIGURE C-6 (a)

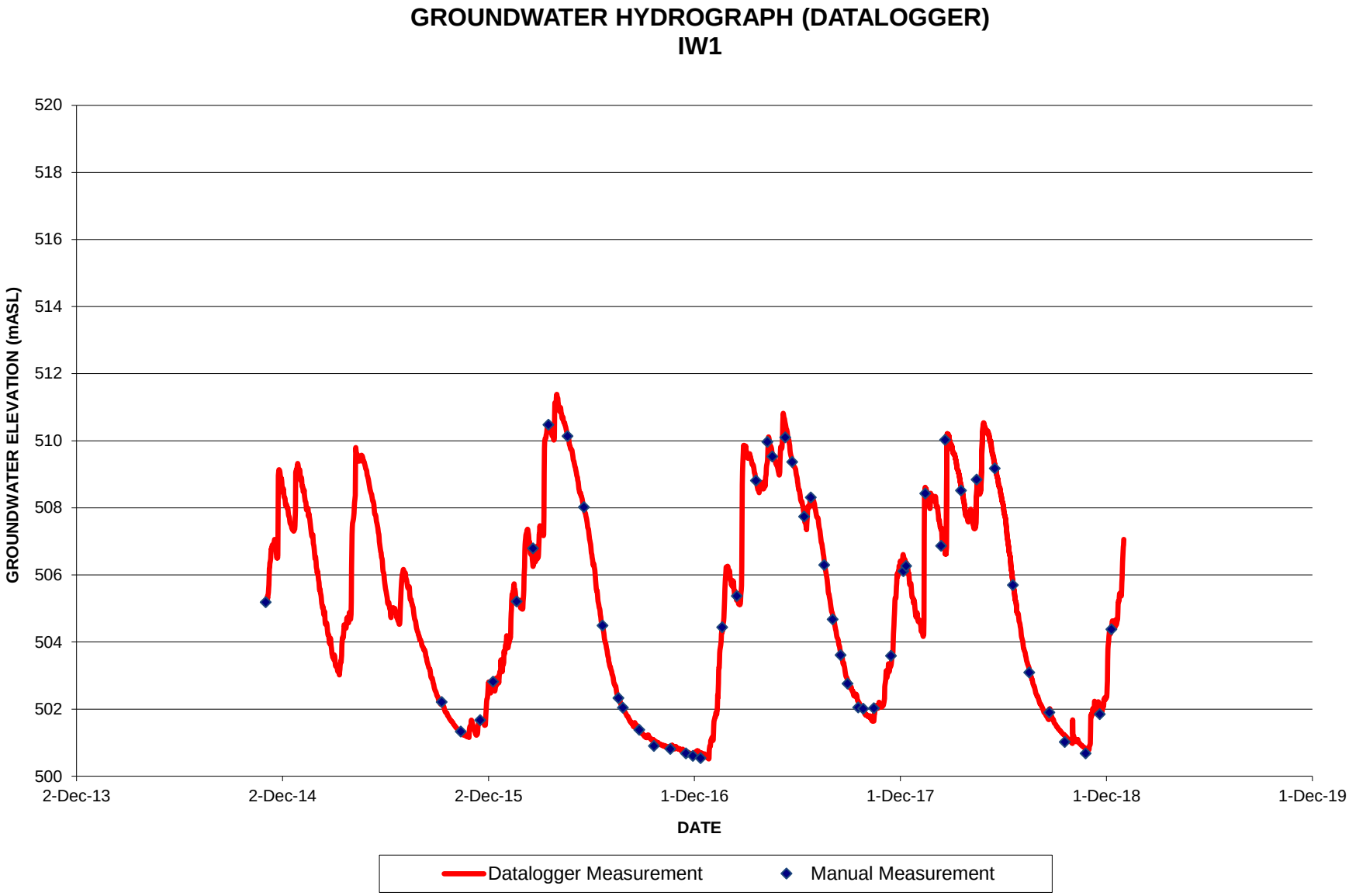

GROUNDWATER HYDROGRAPH (DATALOGGER)
IW1
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
2-Dec-13
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
1-Dec-19
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-7

GROUNDWATER HYDROGRAPH
IW2

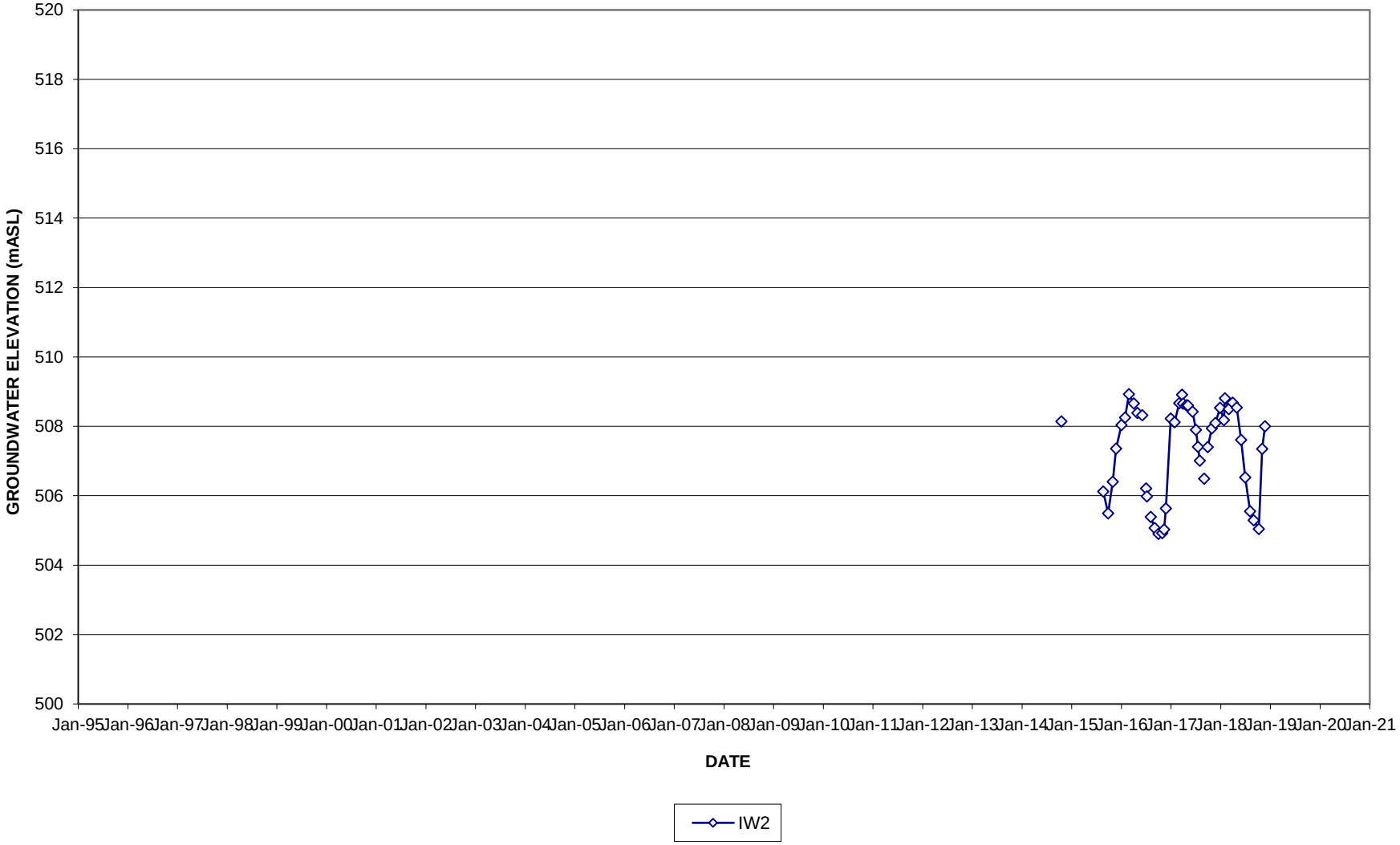


FIGURE C-7 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
IW2

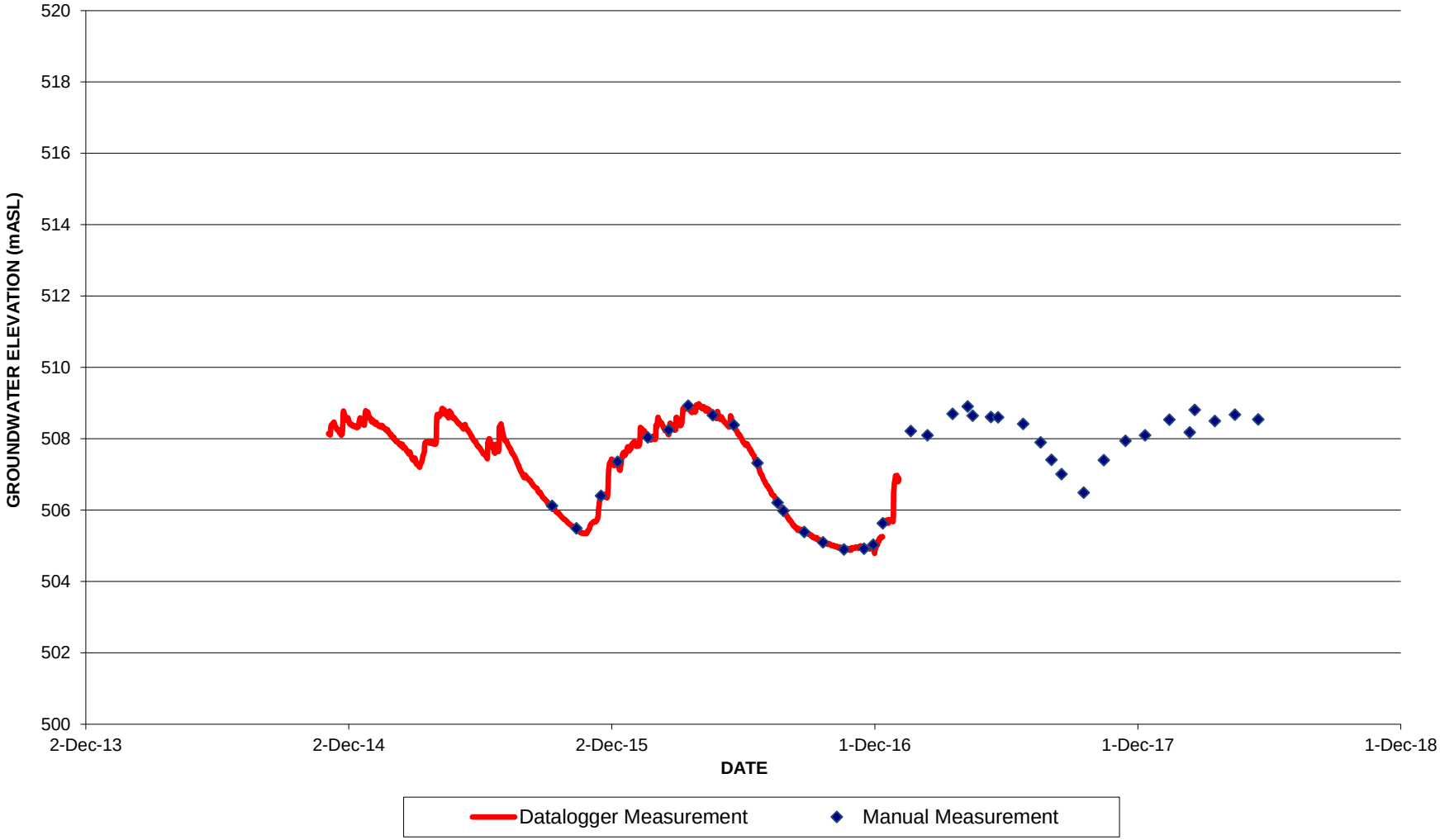


FIGURE C-8

GROUNDWATER HYDROGRAPH
IW3

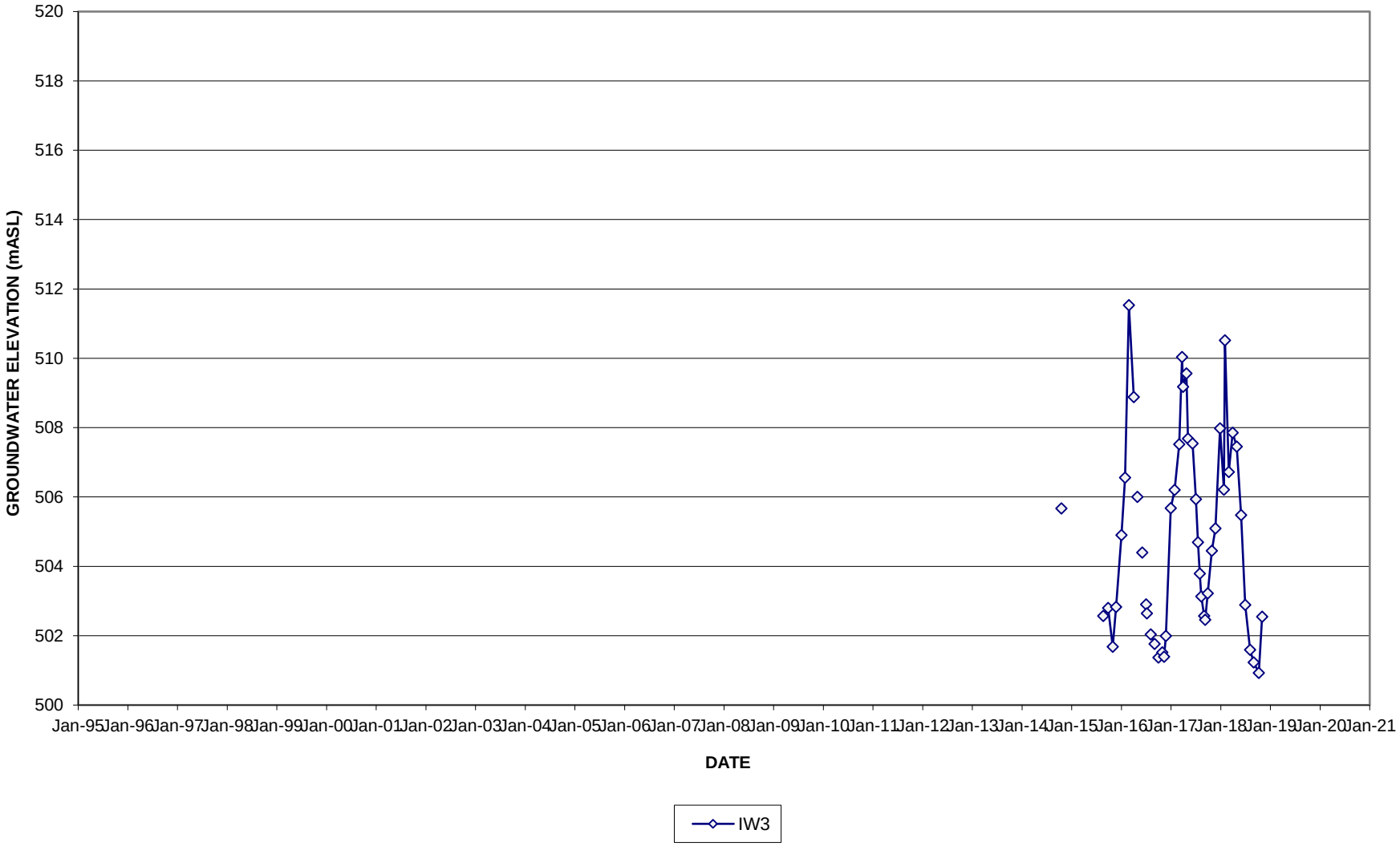


FIGURE C-8 (a)

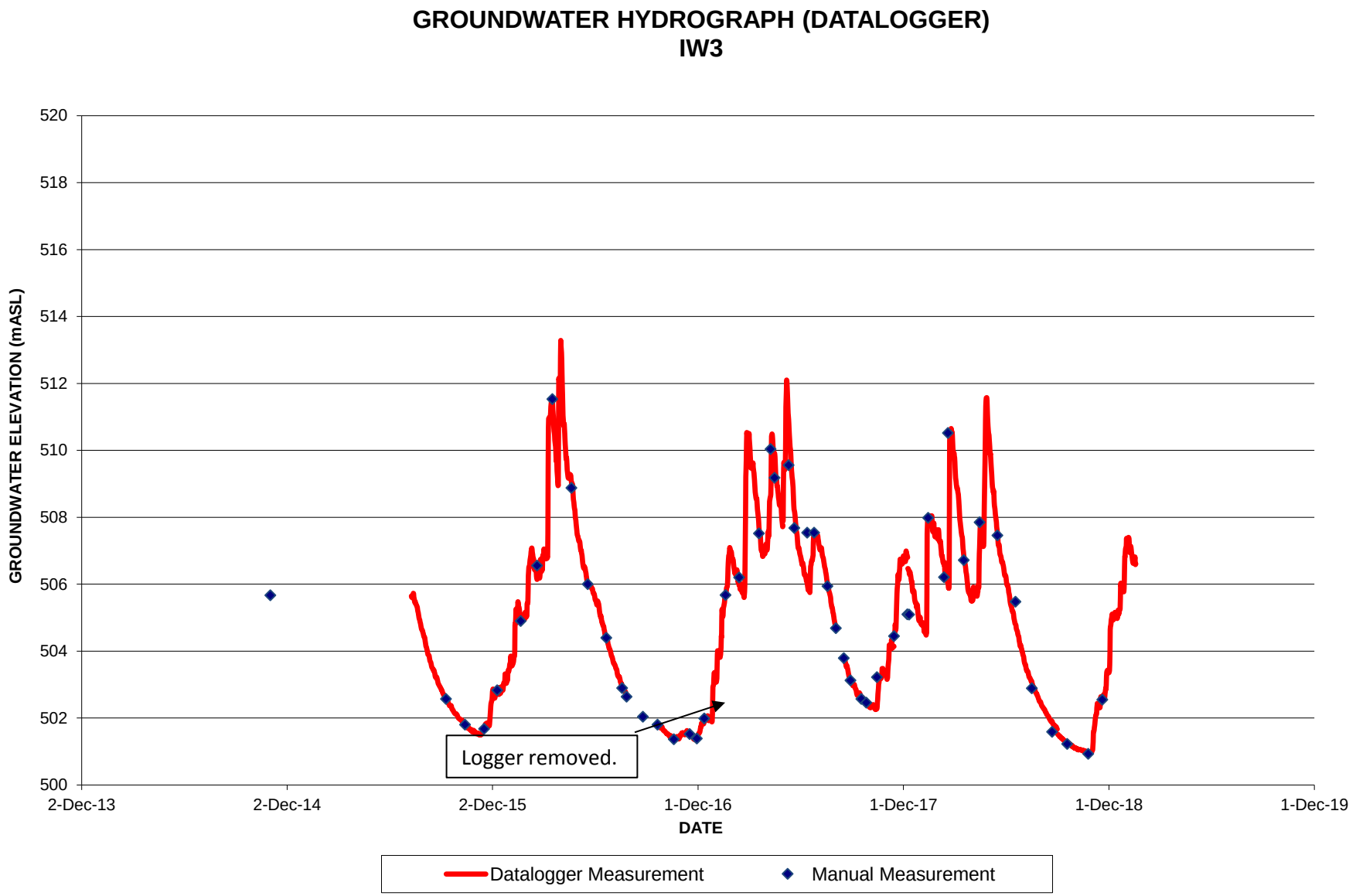

GROUNDWATER HYDROGRAPH (DATALOGGER)
IW3
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
2-Dec-13
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
1-Dec-19
DATE
Logger removed.
Datalogger Measurement
Manual Measurement

FIGURE C-9

GROUNDWATER HYDROGRAPH
IW4

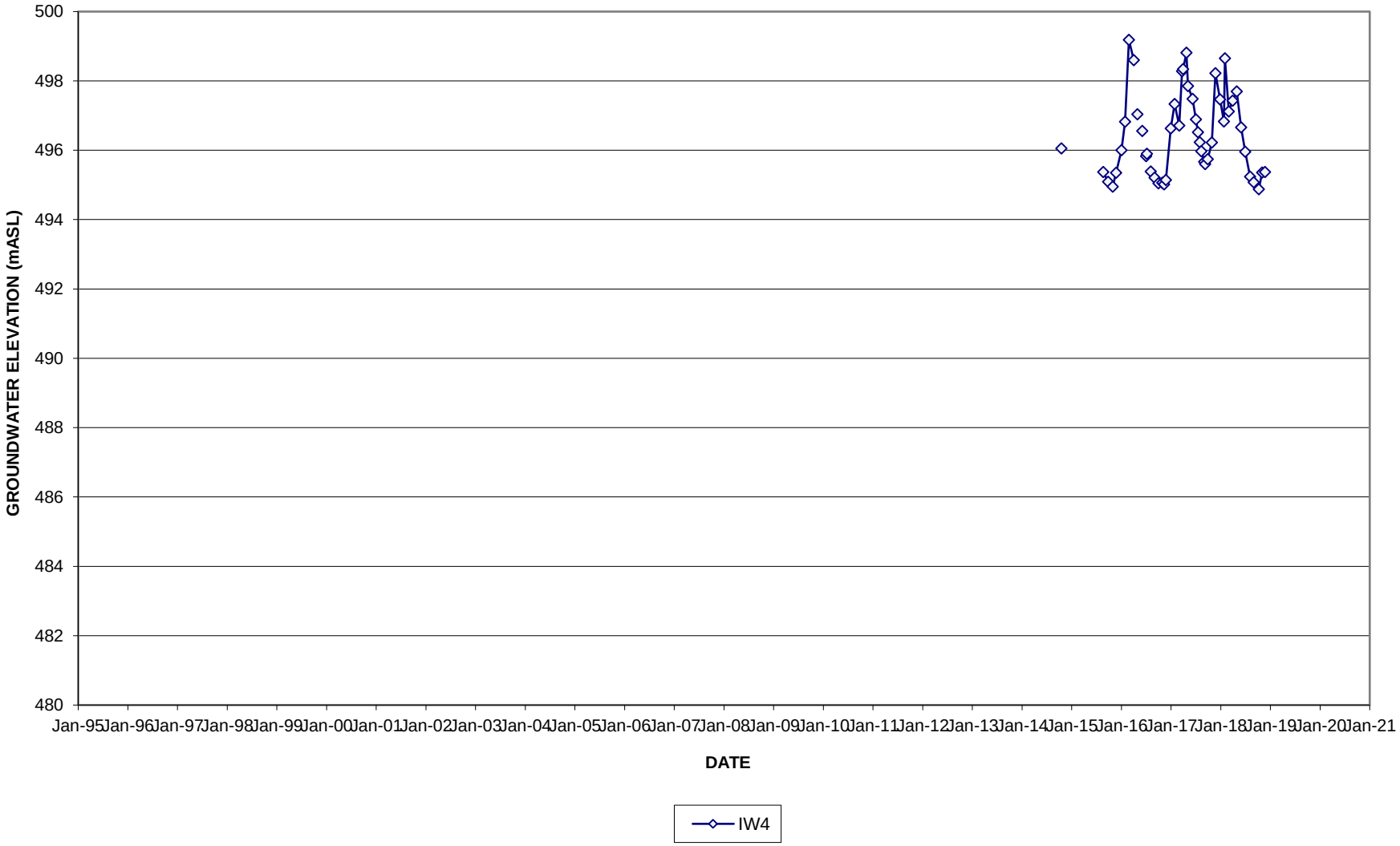


FIGURE C-9 (a)

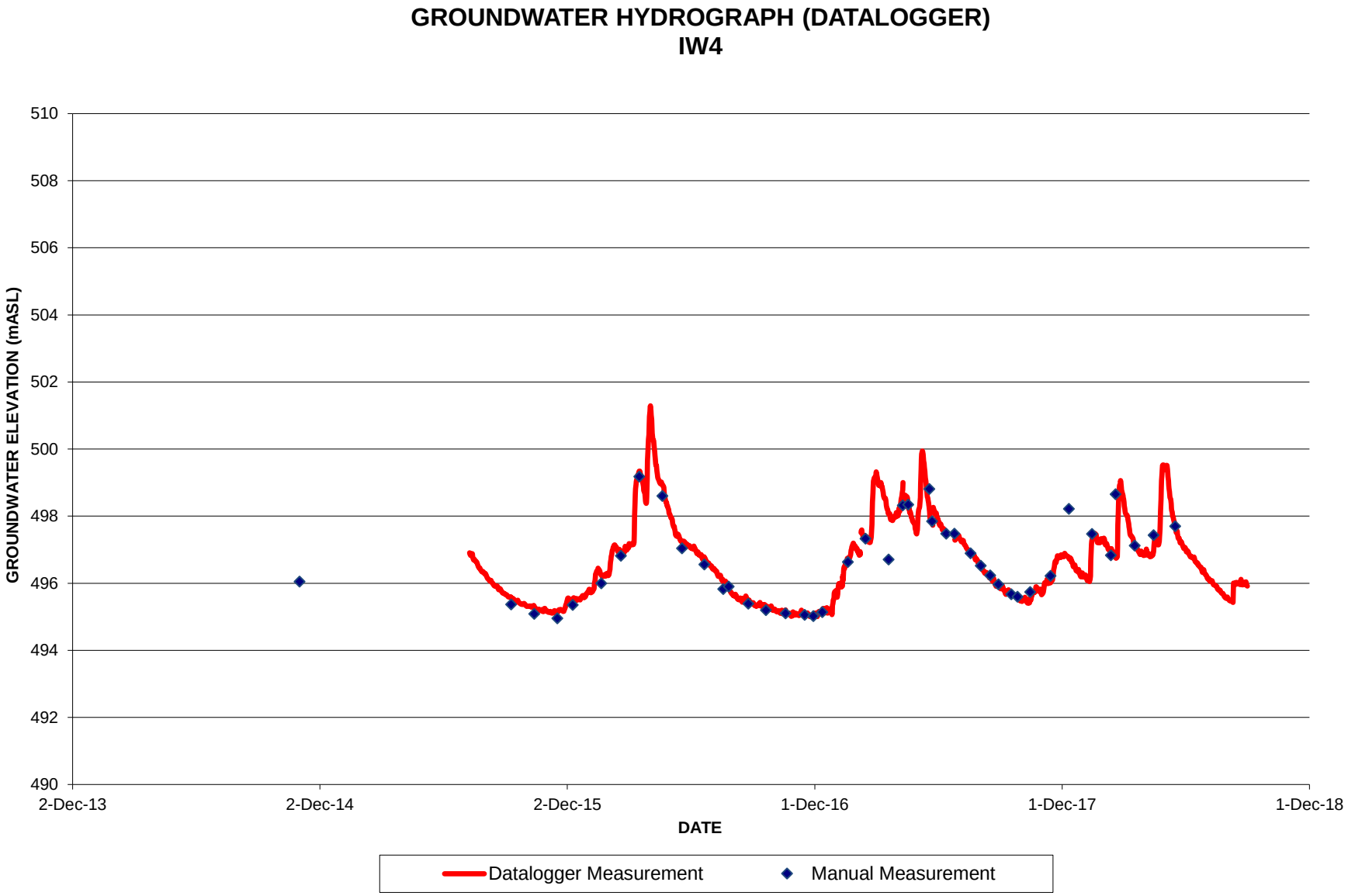

GROUNDWATER HYDROGRAPH (DATALOGGER)
IW4
510
508
506
504
502
500
498
496
494
492
490
GROUNDWATER ELEVATION (mASL)
2-Dec-13
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
DATE
Datalogger Measurement
Manual Measurement

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH02-1	BH02-2	BH02-3	BH02-4	BH02-5 (deep)	BH02-5 (mid)	BH02-5 (shallow)	BH02-6	BH03-7-I	BH03-7-II	BH03-7-III	BH03-8	BH08-1	BH08-2	BH08-3
28-Mar-03		521.1	526.3	526.4	511.1			521.8							
02-May-03	514.5	517.8	Dry	521.9	510.6			519.5	510.3	510.1		514.9			
16-May-03	514.3	517.3	521.2	521.0	510.4			519.1	510.2	510.0		514.7			
25-Jun-03	515.0	517.1	Dry	520.4	509.1			518.6	510.0	509.9		514.4			
22-Jul-03	514.7	516.8	Dry	519.6	509.7			517.8	510.7	510.7					
20-Aug-03	513.2	516.3	Dry	518.8	509.1			517.3	509.2	509.4		513.9			
25-Sep-03	511.6	515.8	Dry	518.2	508.7			516.8	508.7	508.9		513.6			
22-Oct-03	512.8	515.5	Dry	517.9	509.2			516.9	509.2	509.6		513.7			
25-Nov-03	514.4	518.0	522.9	522.6	510.5			519.6	510.2	510.1		514.4			
22-Dec-03	514.5	518.0	522.5	522.2	510.5			519.1	510.2	510.1		514.8			
09-Feb-04	514.2	517.3	521.0	520.8	510.2			518.4	Frozen	509.9		514.7			
16-Mar-04	514.8	518.2	523.1	522.9	510.7			519.8	Frozen	510.1		515.2			
20-Apr-04	515.3	518.5	523.5	523.4	511.0			520.5	510.5	510.1		515.9			
18-May-04	515.8	517.6	522.0	521.7	510.5			520.7	510.2	510.0		515.1			
22-Jun-04	514.3	517.3	521.3	521.1	510.2			518.6	510.2	510.1		514.7			
28-Jul-04	513.6	516.7	Dry	519.4	509.8			517.6	509.7	509.8		514.2			
25-Aug-04	512.5	516.2	Dry	517.8	508.9			517.1	509.1	509.2		513.9			
22-Sep-04	512.5	515.8	Dry	518.2	508.8			516.6	508.8	509.0		513.7			
19-Oct-04	512.2	515.5	Dry	517.9	508.5			516.3	508.5	508.8		513.5			
16-Nov-04	512.1	515.2	Dry	517.6	508.6			516.0	508.6	509.0		Frozen			
16-Dec-04	512.0	515.1	Dry	517.5	509.1			515.9	509.1	509.5		513.3			
31-Jan-05	514.4	517.5	521.7	521.4	510.4			518.5	Frozen	510.0		514.6			
24-Feb-05	514.1	517.3	520.8	520.5	510.2			518.0	509.8	510.0		514.7			
22-Mar-05	Frozen	517.2	520.6	520.4	510.2			Frozen	509.9	510.0		514.5			
20-Apr-05	517.7	521.5	526.3	526.1	511.5			522.0	510.8	510.2		Frozen			
25-May-05	514.3	517.5	521.9	521.7	510.4			519.0	510.2	510.0		515.0			
29-Jun-05	513.6	517.0	520.0	519.8	510.0			517.9	509.9	509.9		514.4			
13-Jul-05	513.3	516.8	520.3	519.4	509.6			517.5	509.5	509.6		514.2			
23-Aug-05	512.2	516.0	Dry	518.4	508.9			516.6	508.9	509.0		513.8			
26-Sep-05	511.7	515.6	Dry	517.9	508.4			516.0	508.4	508.5		513.6			
26-Oct-05	511.3	515.2	Dry	517.6	508.2			515.7	508.3	508.5		513.4			
16-Nov-05	511.2	515.1	Dry	517.4	508.3			515.6	508.4	509.3		513.3			
14-Dec-05	510.7	515.1	Dry	517.7	509.0			515.9	509.1	509.4		513.3			
20-Jan-06	510.7	517.7	521.8	523.1	510.1			517.8	510.0	509.9		514.1			
14-Feb-06	Frozen	517.8	522.2	521.9	510.4			517.8	510.2	510.1		514.7			
19-Mar-06	515.4	519.4	524.3	524.3	511.0			520.4	Frozen	510.1		515.6			
17-Apr-06	515.4	518.6	523.6	523.4	511.1			520.7	510.1	510.1		516.0			
19-May-06	513.4	517.3	521.5	521.3	510.4			518.8	510.2	510.1		514.9			
19-Jun-06	511.5	516.9	Dry	519.7	510.0			517.8	509.9	509.9		514.4			
10-Jul-06	510.6	516.5	Dry	519.0	509.5			517.2	509.5	509.5		514.1			
22-Aug-06	509.8	515.7	Dry	518.1	508.7			516.1	508.7	508.7		513.7			
18-Sep-06	509.3	515.4	Dry	517.7	508.4			515.7	508.4	508.5		513.6			
17-Oct-06	508.8	515.1	Dry	517.4	508.5			515.5	508.5	509.0		513.5			
20-Nov-06	509.2	517.7	522.2	523.3	510.3			518.8	510.2	510.0		514.2			
15-Dec-06	511.7	518.7	523.4	523.7	510.7			520.3	510.4	510.1		514.9			
22-Jan-07	512.1	517.5	521.6	521.4	510.4			518.6	510.2	510.0		514.9			
19-Feb-07	Frozen	516.6	520.3	520.1	510.2			517.7	510.0	510.0		514.5			
18-Mar-07	512.1	518.8	523.7	523.3	510.7			519.9	Frozen	510.1		515.1			
17-Apr-07	513.2	518.3	523.0	522.8	510.8			520.1	510.2	510.1		515.6			
17-May-07	512.2	517.2	521.0	520.7	510.3			518.4	510.2	510.0		514.7			
21-Jun-07	510.0	516.9	Dry	519.5	509.8			517.6	509.8	509.8		514.3			
17-Jul-07	508.8	516.3	Dry	518.7	509.3			516.8	509.2	509.3		514.0			
21-Aug-07	508.0	515.6	Dry	518.0	508.6			515.9	508.6	508.6		513.7			
12-Sep-07	507.6	N/A	N/A	517.6	N/A			N/A	N/A	508.5		513.6			
18-Sep-07	507.5	515.2	Dry	517.5	508.3			515.6	508.3	508.4		513.5			
14-Oct-07	507.1	514.9	Dry	517.2	508.1			515.1	508.2	508.3		513.3			
18-Nov-07	506.7	514.8	Dry	517.1	508.5			514.8	508.6	508.3		513.2			
9-Dec-07	506.5	514.7	Dry	517.2	509.0			514.7	509.1	509.5		513.4			

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH02-1	BH02-2	BH02-3	BH02-4	BH02-5 (deep)	BH02-5 (mid)	BH02-5 (shallow)	BH02-6	BH03-7-I	BH03-7-II	BH03-7-III	BH03-8	BH08-1	BH08-2	BH08-3
20-Jan-08	513.9	518.5	523.2	523.0	510.7			519.8	Frozen	510.1		514.9			
21-Feb-08	512.7	518.3	522.2	522.0	510.5			518.7	Frozen	510.1		514.9			
19-Mar-08	512.5	518.0	522.0	521.9	510.3			519.8	Frozen	510.1		515.0			
7-Apr-08	513.8	522.0	526.4	526.3	510.7			520.8	510.4	510.2		515.7			
20-Apr-08	515.6	519.3	524.5	524.4	511.2			522.2	510.7	510.2		516.1			
20-May-08	513.1	517.4	521.8	520.8	510.5			519.1	510.2	510.0		515.1			
16-Jun-08	511.1	517.0	Dry	519.9	509.8			517.8	510.0	509.9		514.5			
14-Jul-08	509.2	516.8	521.5	519.6	509.6			516.9	509.8	509.8		514.2			
18-Aug-08	508.1	516.2	Dry	518.7	509.9			517.3	509.9	509.8		514.3			
4-Sep-08	507.6	516.0	N/A	518.4	N/A			516.9	N/A	N/A		514.2			
14-Sep-08	507.5	515.9	Dry	518.3	509.7			516.8	509.8	509.8		514.1			
19-Oct-08	507.5	517.0	Dry	520.0	510.6			517.3	509.8	509.8		514.4			
23-Nov-08	508.7	N/A	Dry	523.1	510.9			520.1	510.0	509.9		515.4			
14-Dec-08	N/A	516.3	524.6	523.4	511.3			520.5	510.3	510.3		514.1			
18-Jan-09	516.5	515.9	522.6	522.4	510.2			519.4	Frozen	Frozen		Frozen	508.9	508.9	509.4
08-Feb-09	516.4	N/A	520.8	520.7	510.5			518.1	510.2	510.2		514.7	508.1	508.0	508.5
15-Mar-09	514.3	516.6	524.5	524.3	511.0			520.8	510.6	510.1		515.9	509.2	509.3	509.8
12-Apr-09	513.8	517.2	524.7	524.7	511.1			520.8	510.7	510.7		515.7	510.4	510.4	510.7
17-May-09	513.0	517.3	525.0	524.9	511.3			521.1	510.6	510.7		515.2	509.7	509.6	510.0
14-Jun-09	510.9	517.1	520.5	520.3	510.1			518.1	510.0	510.1		514.4	508.4	508.4	508.6
12-Jul-09	509.1	516.8	Dry	519.1	509.5			517.2	509.7	509.8		514.2	507.3	507.1	507.4
09-Aug-09	507.5	516.6	520.0	519.1	509.3			516.3	509.7	509.7		513.9	506.4	506.2	506.6
13-Sep-09	506.6	515.4	Dry	517.6	508.9			515.4	508.8	509.0		513.7	505.9	505.6	506.1
11-Oct-09	506.4	515.0	520.2	517.4	509.1			515.6	509.2	509.6		513.5	506.4	506.0	506.6
15-Nov-09	506.1	515.2	520.3	517.5	509.2			515.2	509.4	509.7		513.5	507.1	506.8	507.2
29-Nov-09	506.0	N/A	N/A	518.2	N/A			N/A	N/A	509.6		514.0	N/A	N/A	N/A
13-Dec-09	506.0	515.3	Dry	519.1	509.7			515.9	509.7	509.8		513.8	507.6	507.5	507.7
17-Jan-10	506.0	516.6	Dry	519.3	509.8			516.4	509.8	509.8		514.1	507.8	507.6	507.7
07-Feb-10	506.2	517.0	520.4	520.1	509.9			516.8	509.8	509.9		514.3	507.7	507.6	507.8
14-Mar-10	509.3	519.2	521.5	520.4	510.9			520.7	510.6	510.5		514.8	509.6	509.6	509.5
18-Apr-10	513.4	518.1	522.3	522.0	510.7			520.1	510.1	510.4		515.6	510.1	510.0	510.4
16-May-10	511.3	517.7	521.7	521.4	510.9			519.8	510.1	510.4		515.2	508.9	508.9	509.1
8-Jun-10	510.8	N/A	N/A	520.8	N/A			N/A	510.1	510.4		515.0	509.0	N/A	N/A
13-Jun-10	510.6	516.9	520.3	521.0	509.6			518.9	510.0	510.3		515.3	508.8	508.7	508.9
21-Jul-10	509.9	517.0	520.4	520.3	510.3			518.4	510.0	510.3		514.6	508.3	508.1	508.4
16-Aug-10	509.1	516.9	520.2	520.0	509.6			517.8	510.0	510.2		514.4	507.4	507.3	507.5
12-Sep-10	507.5	N/A	Dry	518.8	509.5			516.8	509.4	509.6		514.1	506.5	506.3	506.6
26-Sep-10	507.0	N/A	N/A	518.5	N/A			N/A	N/A	509.7		514.0	506.4	N/A	N/A
17-Oct-10	506.8	516.8	520.2	519.5	509.9			517.0	509.8	509.8		514.0	507.0	506.7	507.3
14-Nov-10	506.8	516.9	Dry	519.5	510.1			518.6	509.9	509.9		514.6	508.4	508.3	508.5
19-Dec-10	507.4	517.0	521.5	521.2	510.4			518.5	510.2	510.0		514.9	508.8	508.7	508.9
16-Jan-11	N/A	517.3	522.2	521.0	510.6			519.3	Frozen	Frozen		515.4	509.3	509.2	509.4
20-Feb-11	507.2	517.2	522.3	522.1	510.5			518.8	Frozen	Frozen		515.1	508.8	508.8	508.9
13-Mar-11	507.0	517.9	522.5	522.2	510.6			519.4	510.0	510.1		515.3	509.1	509.1	509.2
20-Mar-11	N/A	N/A	N/A	N/A	N/A			N/A	N/A	510.1		N/A	510.4	N/A	N/A
17-Apr-11	514.3	518.2	523.4	523.2	511.1			520.7	510.6	510.1		515.9	510.7	510.7	511.0
15-May-11	513.4	518.3	523.5	523.5	511.0			521.3	510.6	510.1		515.8	510.4	510.3	510.6
13-Jun-11	512.6	517.0	522.1	521.9	510.5			519.5	510.6	510.0		515.0	509.5	509.4	509.7
17-Jul-11	509.7	516.9	Dry	520.2	509.8			517.8	509.7	509.7		514.4	507.5	507.4	507.6
14-Aug-11	507.7	N/A	Dry	518.7	509.4			517.7	509.6	509.6		514.1	506.5	506.3	506.6
18-Sep-11	507.3	516.7	Dry	516.1	507.3			517.5	507.5	507.5		513.8	505.8	505.5	506.9
17-Oct-11	507.1	515.9	Dry	516.1	507.1			515.0	507.7	507.7		513.6	506.2	505.8	506.8
20-Nov-11	505.9	515.8	Dry	518.6	509.7			516.0	509.7	509.8		513.8	507.3	507.1	507.4
18-Dec-11	505.9	516.0	522.1	521.8	509.8			515.6	510.3	510.0		514.8	509.1	509.0	509.2
15-Jan-12	506.2	516.0	521.7	520.9	510.8			518.4	510.2	510.0		514.9	508.6	508.6	508.9
19-Feb-12	505.2	516.0	521.4	521.2	510.3			518.4	510.2	510.0		514.6	508.3	508.2	508.4
26-Feb-12	509.7	-	-	520.5	-			-	-	510.0		514.6	508.2	-	-
18-Mar-12	511.8	519.9	525.1	524.7	511.3			521.4	510.8	510.2		515.8	510.8	510.6	511.1
15-Apr-12	512.7	518.0	521.4	521.3	510.3			518.7	510.0	510.1		514.9	509.4	509.4	509.6

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH02-1	BH02-2	BH02-3	BH02-4	BH02-5 (deep)	BH02-5 (mid)	BH02-5 (shallow)	BH02-6	BH03-7-I	BH03-7-II	BH03-7-III	BH03-8	BH08-1	BH08-2	BH08-3
13-May-12	510.0	517.6	520.4	520.1	510.2			518.3	510.0	510.1		514.7	508.5	508.4	508.6
17-Jun-12	508.1	517.3	Dry	519.0	509.1			517.3	509.8	509.8		514.3	507.3	507.2	507.4
1-Jul-12	507.2	-	-	515.8	-			-	-	509.5		514.1	506.6	-	-
15-Jul-12	506.7	516.5	Dry	518.1	509.3			516.4	509.4	509.4		514.0	506.3	506.1	506.4
12-Aug-12	507.8	517.5	Dry	518.1	509.8			516.3	509.9	509.9		513.9	507.1	507.2	507.2
16-Sep-12	505.9	515.8	Dry	518.4	509.3			516.2	509.3	509.5		514.1	506.4	506.8	506.6
9-Oct-12	505.7			518.3						509.4		515.1	506.4		
14-Oct-12	506.3	515.7	Dry	518.2	509.3			516.1	509.5	509.4		514.2	506.7	506.5	506.9
18-Nov-12	509.4	516.3	522.9	523.1	510.8			520.4	510.0	510.6		515.2	509.4	509.3	509.5
16-Dec-12	510.2	517.7	523.8	523.9	511.0			519.2	510.2	510.7		515.0	509.0	508.9	509.1
13-Jan-13	511.2	519.7	524.5	524.0	511.3			520.9	510.6	510.1		515.1	509.6	509.6	509.5
17-Feb-13	510.7	518.9	524.6	524.1	511.1			521.6	510.6	510.1		515.3	509.4	509.3	509.6
17-Mar-13	510.8	518.9	524.6	524.1	511.0			521.6	510.6	510.1		515.3	509.3	509.3	509.4
31-Mar-13	510.8	-	-	521.5	-			-	-	510.1		515.0	509.0	-	-
14-Apr-13	513.2	519.3	524.8	522.1	511.2			521.3	510.7	510.1		515.9	510.2	510.1	510.4
12-May-13	513.5	517.6	522.2	522.1	511.0			519.5	510.0	510.3		515.5	509.7	509.7	510.0
2-Jun-13	511.4	-	-	521.7	-			-	-	510.1		514.9	509.2	-	-
16-Jun-13	510.8	517.4	525.6	521.2	510.7			518.9	510.0	510.1		514.8	508.8	508.7	508.9
14-Jul-13	509.1	516.9	522.3	520.4	510.6			518.2	509.8	508.9		514.4	508.0	508.0	508.1
18-Aug-13	507.5	516.8	522.2	520.4	510.5			517.2	509.8	509.8		514.2	507.1	507.0	507.2
15-Sep-13	506.7	516.7	522.1	518.2	510.4			516.4	509.7	509.8		514.0	506.5	506.3	506.6
13-Oct-13	506.9	516.5	520.2	520.6	510.2			518.1	510.1	510.0		514.6	508.1	508.0	508.2
17-Nov-13	507.3	518.0	520.3	520.9	510.2			518.3	510.3	510.2		515.3	509.1	509.0	509.2
15-Dec-13	507.2	517.8	520.3	520.8	510.2			518.3	510.4	510.3		515.1	509.0	508.9	509.1
19-Jan-14	507.2	517.8	520.2	520.8	510.2			518.4	Frozen	Frozen		514.8	508.4	508.3	508.5
16-Feb-14	507.4	517.9	520.3	522.1	510.3			518.5	Frozen	Frozen		514.5	507.7	507.5	507.8
17-Mar-14	507.5	517.9	520.4	522.0	510.4			518.5	Frozen	Frozen		514.3	507.4	507.2	507.5
13-Apr-14	515.9	522.2	527.4	526.7	512.0			522.6	510.6	510.7		516.0	511.3	511.2	511.8
11-May-14	513.2	516.9	522.6	521.9	510.4			519.7	510.3	510.3		515.8	510.1	510.0	510.4
15-Jun-14	509.8	516.8	Dry	520.0	509.8			517.6	509.9	510.0		514.6	508.1	508.0	508.2
13-Jul-14	510.0	516.7	520.1	519.9	509.7			517.0	510.0	510.0		514.3	507.2	507.0	507.3
17-Aug-14	506.1	516.2	DRY	517.5	509.6			515.5	509.5	509.7		514.0	506.6	506.3	506.7
7-Sep-14	505.5	515.0	DRY	517.2	509.5			515.2	509.5	509.6		513.9	506.3	506.1	506.4
12-Sep-14	505.6	-	-	517.2	-			-	-	509.7		514.0	506.7	-	-
19-Sep-14	-	-	-	-	-			-	-	-		514.1	-	-	-
19-Oct-14	505.3	515.3	Dry	518.0	509.5			514.9	510.2	510.2		514.4	507.4	507.3	507.5
2-Nov-14	505.5	-	-	-	-			-	-	-		-	-	-	-
16-Nov-14	506.3	516.5	521.7	520.9	510.5			518.1	510.0	510.3		515.1	508.8	508.8	508.9
14-Dec-14	506.4	516.5	522	521.0	510.6			518.1	510.3	510.4		514.9	509.0	508.9	509.1
18-Jan-15	508.7	516.7	521.3	521.1	510.4			517.8	Frozen	Frozen		Frozen	Frozen	Frozen	Frozen
15-Feb-15	N/A	N/A	N/A	N/A	N/A			N/A	N/A	N/A		N/A	N/A	N/A	N/A
15-Mar-15	507.0	516.2	Dry	518.5	510.0	510.2	510.1	516.0	510.0	509.8		514.4	507.5	507.2	507.6
19-Apr-15	513.8	518.4	522.2	521.8	511.0	511.1		520.2	510.1	510.6	511.0	515.8	510.2	510.2	510.5
17-May-15	510.2	517.0	Dry	520.0	510.3	510.4	510.4	517.7	510.0	510.1	510.6	514.8	508.8	508.7	509.0
14-Jun-15	508.1	517.1	Dry	519.0	510.2	510.3		516.5	510.0	510.1		-	507.9	507.7	508.0
19-Jul-15	507.3	517.1	520.4	520.2	510.8	510.4		517.4	510.0	510.1		-	507.8	507.7	507.9
9-Aug-15	506.4	516.9	Dry	519.0	509.9	510.0		516.2	509.8	509.9		-	506.9	506.7	507.0
6-Sep-15	505.7	515.8	Dry	518.0	509.5	509.6	509.6	515.2	509.5	509.5	509.9	-	506.2	506.0	506.3
11-Oct-15	505.1	514.8	Dry	517.1	509.0	509.2	509.1	512.8	509.1	509.0	509.5	513.8	505.6	505.4	505.7
15-Nov-15	504.9	514.6	Dry	516.9	509.5	509.7	509.5	511.3	509.7	509.6	510.0	513.7	505.3	505.9	507.3
9-Dec-15	504.7	515.8	Dry	517.7	509.8	510.0	509.9	510.5	509.8	509.8	510.2	513.7	507.3	507.1	507.4
17-Jan-16	505.4	517.2	520.5	520.1	510.3	510.4	510.4	509.6	510.1	510.0	510.6	514.5	508.2	508.1	508.2
14-Feb-16	507.6	517.5	520.9	520.6	510.4	510.6	510.5	509.7	510.2	510.1	510.7	515.0	508.9	508.6	508.7
13-Mar-16	514.8	520.2	523.4	523.3	511.5	511.6	511.7	516.0	510.9	510.2	511.4	516.0	510.9	511.0	512.2
17-Apr-16	514.0	518.6	523.1	523.0	511.0	511.2	511.2	514.5	510.6	510.3	510.8	516.0	510.3	510.3	510.6
1-May-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
15-May-16	511.5	517.2	520.5	520.3	510.2	510.8	510.6	512.6	510.2	510.1	510.7	514.8	509.2	509.1	509.3
5-Jun-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19-Jun-16	508.8	516.7	Dry	518.3	509.9	510.1	510.0	511.0	509.9	509.9	510.3	514.4	507.5	507.4	507.6

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH02-1	BH02-2	BH02-3	BH02-4	BH02-5 (deep)	BH02-5 (mid)	BH02-5 (shallow)	BH02-6	BH03-7-I	BH03-7-II	BH03-7-III	BH03-8	BH08-1	BH08-2	BH08-3
3-Jul-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17-Jul-16	506.7	515.3	DRY	516.8	509.4	509.6	509.5	509.8	509.4	509.4	509.8	514.0	506.3	506.1	506.4
24-Jul-16	506.3	-	-	516.6	-	-	-	-	-	509.2	-	514.0	506.1	-	-
7-Aug-16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21-Aug-16	505.2	514.5	DRY	516.0	508.9	509.1	509.0	509.2	508.9	509.1	509.4	513.7	505.5	505.3	505.7
18-Sep-16	504.7	514.2	DRY	515.5	508.6	508.8	508.7	508.9	508.6	508.8	509.1	513.5	505.2	505.0	505.4
29-Sep-16	504.6	-	-	515.3	-	-	-	-	-	508.7	-	513.4	-	-	-
16-Oct-16	504.5	513.8	DRY	514.9	508.4	508.5	508.5	508.6	508.4	508.6	508.9	513.3	505.1	504.8	505.2
13-Nov-16	504.2	513.5	DRY	514.4	508.4	508.6	508.5	508.3	508.4	508.8	508.9	513.3	505.0	504.7	505.2
27-Nov-16	504.1	-	-	514.2	-	-	-	-	-	509.3	-	513.2	505.0	-	-
11-Dec-16	504.0	513.3	Dry	514.1	508.8	508.9	508.8	508.1	508.8	509.3	509.3	513.1	505.5	505.1	505.7
15-Jan-17	504.0	517.2	Dry	518.9	510.4	510.5	510.5	510.1	510.2	510.0	510.7	513.8	508.1	508.0	508.2
12-Feb-17	505.2	517.1	Dry	517.4	510.3	510.5	510.5	509.8	510.2	510.0	510.6	514.4	508.3	508.2	508.3
19-Mar-17	511.9	517.5	Dry	519.6	510.6	510.8	510.8	510.3	510.1	510.1	510.8	515.2	509.7	509.6	509.9
9-Apr-17	512.7	-	-	523.4	-	-	-	-	-	510.2	-	515.6	510.2	-	-
16-Apr-17	512.8	518.3	521.2	521.0	511.0	511.1	511.2	511.8	510.5	510.1	510.9	515.6	510.0	509.9	510.2
11-May-17	513.3	517.9	521.4	521.2	510.7	511.0	511.1	513.6	510.4	510.1	510.9	515.9	510.2	510.1	510.5
21-May-17	513.0	-	-	520.7	-	-	-	-	-	510.1	-	515.4	509.8	-	-
13-Jun-17	511.1	518.6	-	-	-	-	-	-	-	-	-	-	-	-	-
25-Jun-17	510.5	517.4	Dry	518.8	510.7	510.9	510.9	513.2	510.4	510.1	510.8	515.2	509.1	509.1	509.2
19-Jul-17	510.5	517.4	Dry	518.8	510.7	510.5	510.5	513.2	510.4	510.1	510.6	515.2	508.3	508.2	508.4
3-Aug-17	509.0	-	-	516.3	-	-	-	-	-	510.3	-	514.4	507.6	-	-
17-Aug-17	508.1	514.9	Dry	515.4	509.9	510.0	510.0	511.3	509.9	509.9	510.3	514.2	507.1	507.0	507.2
29-Aug-17	507.2	-	-	514.5	-	-	-	-	-	509.8	-	514.1	506.7	-	-
17-Sep-17	506.3	513.6	Dry	513.6	509.6	509.8	509.7	510.1	509.6	509.7	510.1	513.9	506.5	506.2	506.6
26-Sep-17	-	-	-	-	-	-	-	-	-	509.7	-	-	506.4	-	-
15-Oct-17	505.3	513.2	Dry	512.8	509.9	510.0	509.9	509.1	509.9	509.9	510.3	514.1	507.2	506.9	507.3
14-Nov-17	505.2	514.8	Dry	512.9	510.2	510.3	510.2	513.2	510.1	510.0	510.5	514.6	506.8	507.6	507.8
11-Dec-17	507.6	515.9	Dry	513.5	510.3	510.4	510.4	509.8	510.1	510.0	510.6	514.9	508.4	508.3	508.5
14-Jan-18	509.1	518.1	Dry	514.2	510.8	511.0	511.0	510.4	Frozen	Frozen	Frozen	514.2	508.9	508.9	509.0
11-Feb-18	509.8	-	-	514.1	-	-	-	-	-	Frozen	-	514.8	508.6	-	-
18-Feb-18	510.2	519.4	520.3	516.5	510.7	510.9	510.8	520.3	510.6	510.2	511.0	515.4	510.2	510.1	510.3
18-Mar-18	511.4	516.9		514.5	510.5	510.6	510.6	512.2			510.7	515.0	509.4	509.3	509.6
18-Apr-18	511.1	517.2		514.1	510.7	510.8	510.8	517.2				515.2	509.3	509.3	509.4
17-May-18	512.5	517.0	520.4	515.4	510.7	511.0	510.8	513.0	510.4	510.1	510.8	515.5	509.7	509.7	509.9
18-Jun-18	509.6	514.3	520.3	512.6	510.0	510.2	510.1	511.8	509.9	509.9	510.4	514.5	507.9	507.8	508.0
17-Jul-18	507.3	513.0	520.2	511.7	509.5	509.6	509.5	511.0	509.3	509.4	509.8	514.1	506.6	506.5	506.8
22-Aug-18	505.9	512.2	520.3	511.6	508.9	509.0	509.0	509.4	509.0	509.5	509.4	513.7	505.7	505.5	505.8
18-Sep-18	504.7	511.8	520.3	510.2	508.6	508.8	508.7	508.9	508.8	508.8	509.1	513.6	505.4	505.1	505.5
23-Oct-18	504.1	511.2	520.3	509.6	508.6	508.7	508.8	508.1	508.6	508.9	509.0	513.3	505.1	504.8	505.2
19-Nov-18	504.0	512.7	520.3	509.6	509.7	509.8	509.7	507.9	509.7	509.8	510.1	513.7	507.0	506.7	507.2
10-Dec-18	504.6	516.3		510.9	510.2	510.4	510.2		510.0	510.0	510.5	514.2	507.9	507.7	507.9

NOTE: **NOTE:** • Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
• Dry indicates no water detected in monitor.
• Frozen indicates monitor lid frozen and or snow covered.

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	NW1	NW2	NW3	NW4	NW5	NW6	NW7	NW8	NW9	NW10DP	NW10-I (shallow)	NW10-II (deep)
28-Mar-03												
02-May-03												
16-May-03												
25-Jun-03												
22-Jul-03												
20-Aug-03												
25-Sep-03												
22-Oct-03												
25-Nov-03												
22-Dec-03												
09-Feb-04												
16-Mar-04												
20-Apr-04												
18-May-04												
22-Jun-04												
28-Jul-04												
25-Aug-04												
22-Sep-04												
19-Oct-04												
16-Nov-04												
16-Dec-04												
31-Jan-05												
24-Feb-05												
22-Mar-05												
20-Apr-05												
25-May-05												
29-Jun-05												
13-Jul-05												
23-Aug-05												
26-Sep-05												
26-Oct-05												
16-Nov-05												
14-Dec-05												
20-Jan-06												
14-Feb-06												
19-Mar-06												
17-Apr-06												
19-May-06												
19-Jun-06												
10-Jul-06												
22-Aug-06												
18-Sep-06												
17-Oct-06												
20-Nov-06												
15-Dec-06												
22-Jan-07												
19-Feb-07												
18-Mar-07												
17-Apr-07												
17-May-07												
21-Jun-07												
17-Jul-07												
21-Aug-07												
12-Sep-07												
18-Sep-07												
14-Oct-07												
18-Nov-07												
9-Dec-07												

NO DATA

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	NW1	NW2	NW3	NW4	NW5	NW6	NW7	NW8	NW9	NW10DP	NW10-I (shallow)	NW10-II (deep)
20-Jan-08												
21-Feb-08												
19-Mar-08												
7-Apr-08												
20-Apr-08												
20-May-08												
16-Jun-08												
14-Jul-08												
18-Aug-08												
4-Sep-08												
14-Sep-08												
19-Oct-08												
23-Nov-08												
14-Dec-08												
18-Jan-09												
08-Feb-09												
15-Mar-09												
12-Apr-09												
17-May-09												
14-Jun-09												
12-Jul-09												
09-Aug-09												
13-Sep-09												
11-Oct-09												
15-Nov-09												
29-Nov-09												
13-Dec-09												
17-Jan-10												
07-Feb-10												
14-Mar-10												
18-Apr-10								40314.0	515.9	516.1	515.9	516.1
16-May-10								40337.0	N/A	N/A	N/A	N/A
8-Jun-10								40342.0	515.8	516.1	515.9	515.6
13-Jun-10								40380.0	515.8	516.0	515.8	515.2
21-Jul-10								40406.0	515.8	515.9	515.8	515.7
16-Aug-10								40433.0	515.7	515.8	515.8	515.7
12-Sep-10								40447.0	N/A	N/A	N/A	N/A
26-Sep-10								40468.0	515.8	515.9	515.7	515.7
17-Oct-10								40496.0	515.8	515.9	515.8	515.8
14-Nov-10								40531.0	515.9	516.0	515.9	515.9
19-Dec-10								40559.0	516.1	516.1	515.9	516.0
16-Jan-11								40594.0	516.0	516.1	515.9	516.0
20-Feb-11								40615.0	516.1	516.2	516.0	516.0
13-Mar-11								40650.0	515.9	516.5	516.1	516.0
20-Mar-11								40678.0	516.0	516.6	516.1	516.1
17-Apr-11								40707.0	515.8	516.1	515.8	516.1
15-May-11								40741.0	515.7	515.8	515.7	515.7
13-Jun-11								40769.0	N/A	515.8	515.7	515.7
17-Jul-11								40804.0	515.6	515.9	515.8	515.7
14-Aug-11								40833.0	515.6	515.7	515.5	515.6
18-Sep-11								40867.0	515.7	515.8	515.7	515.7
17-Oct-11								40895.0	515.7	515.8	515.8	515.7
20-Nov-11								40923.0	515.8	515.9	515.8	515.8
18-Dec-11								40958.0	515.8	516.0	515.8	515.7
15-Jan-12								40965.0	-	-	-	-
19-Feb-12								40986.0	516.0	516.7	517.3	516.0
26-Feb-12								41014.0	516.1	516.0	515.8	515.7
18-Mar-12								41042.0	515.7	515.9	515.8	515.8
15-Apr-12												

NO DATA

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	NW1	NW2	NW3	NW4	NW5	NW6	NW7	NW8	NW9	NW10DP	NW10-I (shallow)	NW10-II (deep)
13-May-12												
17-Jun-12												
1-Jul-12												
15-Jul-12												
12-Aug-12												
16-Sep-12												
9-Oct-12												
14-Oct-12												
18-Nov-12												
16-Dec-12												
13-Jan-13												
17-Feb-13												
17-Mar-13												
31-Mar-13												
14-Apr-13												
12-May-13												
2-Jun-13												
16-Jun-13												
14-Jul-13												
18-Aug-13												
15-Sep-13												
13-Oct-13												
17-Nov-13												
15-Dec-13												
19-Jan-14												
16-Feb-14												
17-Mar-14												
13-Apr-14												
11-May-14												
15-Jun-14												
13-Jul-14												
17-Aug-14												
7-Sep-14												
12-Sep-14												
19-Sep-14												
19-Oct-14												
2-Nov-14	-	-	-	520.3	516.1	515.4	-	527.9	516.5	510.0	-	-
16-Nov-14												
14-Dec-14												
18-Jan-15												
15-Feb-15												
15-Mar-15												
19-Apr-15			512.1						517.2			
17-May-15			511.9						516.4			
14-Jun-15												
19-Jul-15												
9-Aug-15	-	-	-	-	-	-	-	-	-	-	-	-
6-Sep-15	513.3	505.1	510.0	518.9	516.1	514.3	517.6	527.5	515.9	509.1	508.8	508.9
11-Oct-15	512.5	N/A	509.5	518.2	515.3	513.8	516.7	527.2	515.7	509.0	508.2	508.3
15-Nov-15	512.0	N/A	509.6	517.4	515.1	513.9	515.5	527.0	516.0	509.1	508.9	509.1
9-Dec-15	511.8	504.4	510.6	517.6	515.3	514.5	515.4	527.1	516.0	509.1	508.9	509.1
17-Jan-16	512.2	505.2	511.7	519.1	516.4	515.5	515.7	527.7	516.3	509.2	509.3	509.5
14-Feb-16	513.1	507.1	512.2	519.4	517.2	515.6	515.6	527.8	516.5	509.4	509.4	509.5
13-Mar-16	516.4	513.0	514.4	522.7	519.1	519.3	517.7	528.1	517.4	509.5	509.7	509.6
17-Apr-16	516.7	514.3	513.6	520.9	520.2	517.7	516.4	528.0	517.0	509.4	509.4	509.6
1-May-16	-	-	-	-	-	-	-	-	-			-
15-May-16	514.3	509.9	512.1	519.1	518.2	515.9	515.8	527.8	516.4	509.3	509.3	509.5
5-Jun-16	-	-	-	-	-	-	-	-	-	-	-	-
19-Jun-16	512.3	506.8	511.2	517.8	516.7	514.6	515.4	527.6	516.0	509.1	508.8	508.9

NO DATA

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- NA indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	NW1	NW2	NW3	NW4	NW5	NW6	NW7	NW8	NW9	NW10DP	NW10-I (shallow)	NW10-II (deep)
3-Jul-16	-	-	-	-	-	-	-	-	-	-	-	-
17-Jul-16	511.2	505.3	510.2	516.6	515.5	513.9	515.3	527.1	515.7	509.1	508.5	508.6
24-Jul-16	510.9	505.0	509.9	516.4	515.3	513.8	515.3	527.0	515.6	509.0	508.3	508.4
7-Aug-16	-	-	-	-	-	-	-	-	-	-	-	-
21-Aug-16	510.0	504.6	509.3	515.7	514.8	513.5	515.2	526.6	515.4	509.0	508.0	508.2
18-Sep-16	509.1	504.2	509.0	515.1	514.5	513.2	515.1	526.4	515.2	509.0	507.7	507.9
29-Sep-16	508.9	-	508.9	-	-	-	-	-	-	-	-	-
16-Oct-16	508.5	504.1	508.8	514.6	514.3	513.0	515.1	526.2	515.1	509.1	507.6	507.7
13-Nov-16	507.9	503.9	508.7	514.1	514.1	512.9	515.0	526.0	515.0	509.1	507.7	507.8
27-Nov-16	507.5	503.8	508.6	513.9	514.0	512.9	514.9	526.0	515.1	509.1	507.9	508.0
11-Dec-16	507.1	503.7	508.7	513.8	514.0	513.0	514.9	525.9	515.1	509.1	508.1	508.3
15-Jan-17	507.5	504.6	511.3	522.3	514.8	516.4	516.1	527.7	516.4	509.1	509.1	509.3
12-Feb-17	506.8	503.5	511.7	521.0	515.5	515.3	515.5	527.7	516.3	509.4	509.4	509.5
19-Mar-17	509.5	508.7	512.4	518.2	516.9	516.1	515.7	527.9	516.7	509.4	509.4	509.5
9-Apr-17	517.0	509.3	513.1	523.7	517.5	518.5	517.1	528.2	517.4	509.5	509.5	509.7
16-Apr-17	510.5	509.9	512.8	519.0	517.6	517.5	515.8	527.9	517.0	509.4	509.4	509.6
11-May-17	509.9	512.5	513.5	519.0	518.6	517.0	515.7	527.9	516.8	509.4	509.4	509.6
21-May-17	-	511.0	512.6	518.6	518.5	516.0	515.7	527.9	516.7	509.5	509.5	509.6
13-Jun-17	-	508.5	-	516.9	-	-	-	-	-	509.4	509.5	509.6
25-Jun-17	504.9	508.5	514.3	517.9	517.3	516.8	516.0	527.9	516.7	509.3	509.5	509.6
19-Jul-17	504.0	506.8	511.7	516.6	516.6	515.1	515.4	527.8	516.3	509.2	509.2	509.4
3-Aug-17	-	505.5	511.2	515.6	516.0	514.6	515.3	527.7	516.1	509.1	508.9	509.0
17-Aug-17	503.3	504.8	510.7	514.9	515.3	514.2	515.3	527.6	516.1	509.1	509.1	509.2
29-Aug-17	-	504.3	510.3	514.4	514.7	513.7	-	527.4	515.9	509.1	508.8	508.9
17-Sep-17	502.7	503.9	509.8	513.8	514.3	513.6	515.2	527.3	515.9	509.1	508.9	509.0
26-Sep-17	-	503.9	509.8	513.6	514.1	513.4	515.1	527.2	515.8	-	508.7	508.9
15-Oct-17	-	508.9	510.0	513.6	514.0	514.1	515.4	527.6	516.2	509.2	509.2	509.4
14-Nov-17	502.3	503.8	511.1	516.0	514.0	514.7	515.6	527.8	516.3	509.2	509.2	509.4
11-Dec-17	502.3	504.4	511.8	514.7	514.3	514.6	515.4	527.8	516.2	509.3	509.3	509.5
14-Jan-18	502.4	505.3	512.4	516.8	514.4	516.3	515.9	527.9	516.7	509.4	509.4	509.6
11-Feb-18	502.6	505.0	511.8	515.4	514.7	514.9	518.8	527.8	513.0	509.3	509.3	509.4
18-Feb-18	511.4	505.6	512.6	524.0	514.7	516.1	516.6	528.2	517.2	509.5	509.5	509.7
18-Mar-18	502.6	506.3	512.0	515.6	515.3	515.2	515.5	527.8	516.4	509.3	509.3	509.4
18-Apr-18	503.0	505.7	512.4	517.8	514.9	516.2	516.1	527.9	516.7	509.4	509.5	509.6
17-May-18	502.9	507.2	512.2	516.8	516.0	516.1	515.7	527.9	516.7	509.3	509.4	509.5
18-Jun-18	502.7	503.9	511.1	514.1	514.7	514.3	515.3	527.7	515.9	509.1	508.8	508.9
17-Jul-18	502.3		510.0	513.1	513.8	513.3	515.2	527.3	515.5	509.0	508.5	508.6
22-Aug-18	502.0		508.9	512.8	513.3	512.8	514.9	526.6	515.3	509.0	508.1	508.2
18-Sep-18	502.0		508.6	512.5	513.1	512.6	514.7	526.1	514.8	509.0	507.8	507.9
23-Oct-18	501.7		509.0	512.2	512.8	512.3	514.4	525.8	514.7	509.1	507.9	508.0
19-Nov-18	501.6		510.0	512.5	512.8	513.2	514.2	527.0	515.8	509.8	508.9	508.4
10-Dec-18	501.6		511.5	513.2	512.9	514.7	515.5	527.7	516.0	509.1	509.1	509.2

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH03-9	TW04-1	TW04-2	TW04-3
28-Mar-03				
02-May-03	515.9			
16-May-03	515.8			
25-Jun-03	515.8			
22-Jul-03	515.8			
20-Aug-03	515.8			
25-Sep-03	515.7			
22-Oct-03	515.8			
25-Nov-03	515.9			
22-Dec-03	515.9			
09-Feb-04	515.8			
16-Mar-04	515.9			
20-Apr-04	515.9			
18-May-04	515.8			
22-Jun-04	515.8			
28-Jul-04	515.7			
25-Aug-04	515.7			
22-Sep-04	515.7			
19-Oct-04	515.7			
16-Nov-04	Frozen	515.7	515.7	515.7
16-Dec-04	Frozen	516.0	515.9	515.8
31-Jan-05	Frozen	515.9	515.9	515.8
24-Feb-05	Frozen	515.9	515.9	515.8
22-Mar-05	Frozen	516.9	516.7	516.2
20-Apr-05	Frozen	516.1	515.9	515.8
25-May-05	515.8	515.9	515.8	515.8
29-Jun-05	515.8	515.8	515.8	515.8
13-Jul-05	515.7	515.8	515.7	516.7
23-Aug-05	515.7	515.7	515.7	515.7
26-Sep-05	515.7	515.7	515.7	515.7
26-Oct-05	515.7	515.8	515.8	515.7
16-Nov-05	515.7	515.7	515.8	515.7
14-Dec-05	515.7	516.1	516.0	515.9
20-Jan-06	515.8	516.1	515.9	515.9
14-Feb-06	Frozen	Frozen	Frozen	Frozen
19-Mar-06	Frozen	516.5	516.2	516.0
17-Apr-06	516.0	516.0	515.9	515.8
19-May-06	515.8	515.8	515.8	515.8
19-Jun-06	515.8	515.8	515.8	515.7
10-Jul-06	515.7	515.7	515.7	515.7
22-Aug-06	515.7	515.7	515.7	515.7
18-Sep-06	515.7	515.7	515.7	515.7
17-Oct-06	515.7	516.1	516.0	515.9
20-Nov-06	515.9	516.3	516.1	516.0
15-Dec-06	515.9	516.1	515.9	515.8
28-Dec-06	515.8	516.1	515.9	515.8
5-Jan-07	515.8	516.1	515.9	515.8
12-Jan-07	515.8	516.1	515.9	515.8
19-Jan-07	515.8	516.0	515.9	515.8
22-Jan-07	515.8	516.0	515.9	515.8
26-Jan-07	515.3	516.0	515.8	515.8
2-Feb-07	515.8	515.9	515.8	515.7
9-Feb-07	515.7	515.9	515.8	515.7
16-Feb-07	515.7	515.9	515.8	515.8
19-Feb-07	515.8	515.9	515.8	515.7
22-Feb-07	515.7	Frozen	515.8	515.7
16-Mar-07	516.0	516.3	516.1	516.0
19-Mar-07	515.9	516.3	515.9	515.9

DATE	BH03-9	TW04-1	TW04-2	TW04-3
5-Apr-07	516.1	516.7	516.3	516.1
13-Apr-07	515.9	516.3	516.0	515.9
17-Apr-07	515.9	516.3	516.0	515.9
20-Apr-07	515.0	516.2	515.9	515.9
27-Apr-07	515.8	516.2	515.9	515.8
4-May-07	515.8	516.0	515.8	515.8
11-May-07	515.8	516.0	515.8	515.8
18-May-07	515.8	516.0	515.8	515.8
25-May-07	515.8	515.9	515.8	515.8
1-Jun-07	515.7	515.9	515.8	515.8
8-Jun-07	515.8	515.9	515.8	515.8
14-Jun-07	515.7	515.9	515.8	515.7
21-Jun-07	515.7	515.8	515.8	515.7
29-Jun-07	515.7	515.8	515.7	515.7
6-Jul-07	515.7	515.8	515.7	515.7
17-Jul-07	515.7	515.8	515.7	515.7
20-Jul-07	515.7	515.8	515.7	515.7
27-Jul-07	515.7	515.7	515.7	515.7
3-Aug-07	515.7	515.7	515.7	515.7
10-Aug-07	515.7	515.7	515.7	515.7
17-Aug-07	515.7	515.7	515.7	515.7
21-Aug-07	515.7	515.7	515.7	515.7
30-Aug-07	515.7	515.7	515.7	515.7
7-Sep-07	515.7	515.7	515.7	515.7
14-Sep-07	515.7	515.7	515.7	515.7
18-Sep-07	515.7	515.6	515.7	515.7
28-Sep-07	515.7	515.7	515.7	515.7
5-Oct-07	515.6	515.6	515.6	515.6
12-Oct-07	515.7	515.7	515.7	515.7
19-Oct-07	515.7	515.9	515.7	515.7
26-Oct-07	515.7	515.6	515.6	515.6
2-Nov-07	515.7	515.6	515.6	515.6
9-Nov-07	515.7	515.6	515.7	515.7
16-Nov-07	515.7	515.6	515.7	515.7
22-Nov-07	515.7	515.7	515.7	515.7
2-Dec-07	515.7	515.7	515.7	515.7
13-Dec-07	515.7	515.7	515.7	516.3
28-Dec-07	515.7	515.9	515.8	515.8
4-Jan-08	515.7	515.8	515.8	515.7
11-Jan-08	516.4	517.0	516.8	516.4
18-Jan-08	516.0	516.5	516.2	516.0
24-Jan-08	515.7	516.3	516.8	515.4
4-Feb-08	515.8	516.1	515.9	515.8
8-Feb-08	516.1	516.1	515.9	515.5
15-Feb-08	515.8	516.0	515.8	515.8
21-Feb-08	515.5	516.1	515.8	515.8
29-Feb-08	515.8	516.1	515.9	515.8
7-Mar-08	515.8	516.2	515.9	515.8
14-Mar-08	515.9	516.2	516.0	515.9
19-Mar-08	515.8	516.0	515.7	515.8
28-Mar-08	Frozen	516.0	515.8	515.8
4-Apr-08	516.2	516.8	516.6	516.3
11-Apr-08	516.3	517.0	516.7	516.4
18-Apr-08	516.1	516.8	516.4	516.2
21-Apr-08	516.0	516.6	516.2	516.1
3-May-08	515.8	516.2	515.9	515.9

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- N/A indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH03-9	TW04-1	TW04-2	TW04-3
8-May-08	515.9	516.2	515.9	515.9
20-May-08	515.8	516.1	515.9	515.8
25-May-08	515.8	516.0	515.8	515.8
6-Jun-08	515.8	515.9	515.8	515.8
13-Jun-08	515.8	515.9	515.8	515.8
16-Jun-08	515.9	515.9	515.7	515.7
20-Jun-08	515.7	515.9	515.8	515.7
27-Jun-08	515.7	515.8	515.8	515.7
4-Jul-08	515.7	515.8	515.8	515.7
11-Jul-08	515.7	515.8	515.8	515.7
14-Jul-08	515.7	515.8	515.8	515.7
25-Jul-08	515.7	515.8	515.7	515.7
1-Aug-08	515.9	515.8	515.8	515.7
3-Aug-08	515.8	515.9	515.8	515.8
15-Aug-08	515.7	515.9	515.8	515.7
18-Aug-08	515.7	515.9	515.8	515.7
5-Sep-08	515.7	515.8	515.8	515.7
12-Sep-08	515.7	515.8	515.8	515.7
15-Sep-08	515.7	515.8	515.8	515.7
3-Oct-08	515.8	515.9	515.9	515.8
10-Oct-08	515.8	515.9	515.8	515.8
20-Oct-08	515.8	515.9	515.8	515.8
16-Nov-08	515.9	516.1	516.0	515.9
23-Nov-08	515.8	515.9	515.8	515.8
30-Nov-08	515.9	516.1	516.0	Frozen
7-Dec-08	515.5	516.1	515.9	515.8
14-Dec-08	N/A	Frozen	515.8	Frozen
28-Dec-08	N/A	N/A	N/A	N/A
04-Jan-09	515.9	516.4	516.1	516.4
18-Jan-09	515.3	516.1	515.9	515.9
8-Feb-09	515.9	516.0	515.9	515.7
15-Feb-09	515.9	516.4	516.1	515.9
1-Mar-09	515.9	516.2	516.0	515.9
15-Mar-09	516.0	516.5	516.1	515.9
26-Mar-09	516.0	516.5	516.1	516.0
29-Mar-09	515.9	516.3	516.0	515.9
26-Apr-09	515.94	516.42	516.09	515.96
3-May-09	515.9	515.4	516.9	515.9
10-May-09	515.8	516.2	515.9	515.8
17-May-09	515.8	516.1	515.9	515.8
24-May-09	515.8	516.1	515.9	515.8
7-Jun-09	515.7	515.9	515.8	515.8
14-Jun-09	515.7	515.9	515.8	515.8
21-Jun-09	515.7	515.9	515.8	515.7
28-Jun-09	515.7	515.9	515.8	515.7
12-Jul-09	515.7	515.8	515.8	515.7
19-Jul-09	515.7	515.8	515.8	515.7
9-Aug-09	515.7	515.6	515.8	515.7
16-Aug-09	515.7	515.8	515.8	515.7
23-Aug-09	515.7	515.7	515.7	515.7
13-Sep-09	515.7	515.7	515.7	515.7
20-Sep-09	515.8	515.8	515.7	515.7
11-Oct-09	515.7	515.8	515.8	515.7
15-Nov-09	515.7	515.7	515.7	515.7
13-Dec-09	515.9	516.0	515.7	515.8
17-Jan-10	515.7	515.8	515.6	515.8
7-Feb-10	515.8	515.9	515.8	515.7
14-Mar-10	516.2	516.5	516.3	516.1
18-Apr-10	515.9	516.2	515.9	516.0

DATE	BH03-9	TW04-1	TW04-2	TW04-3
16-May-10	515.9	516.1	515.9	516.1
8-Jun-10	N/A	N/A	N/A	N/A
13-Jun-10	515.8	516.1	515.9	515.6
21-Jul-10	515.8	516.0	515.8	515.2
16-Aug-10	515.8	515.9	515.8	515.7
12-Sep-10	515.7	515.8	515.8	515.7
26-Sep-10	N/A	N/A	N/A	N/A
17-Oct-10	515.8	515.9	515.7	515.7
14-Nov-10	515.8	515.9	515.8	515.8
19-Dec-10	515.9	516.0	515.9	515.9
16-Jan-11	516.1	516.1	515.9	516.0
20-Feb-11	516.0	516.1	515.9	516.0
13-Mar-11	516.1	516.2	516.0	516.0
17-Apr-11	515.9	516.5	516.1	516.0
15-May-11	516.0	516.6	516.1	516.1
13-Jun-11	515.8	516.1	515.8	516.1
17-Jul-11	515.7	515.8	515.7	515.7
14-Aug-11	N/A	515.8	515.7	515.7
18-Sep-11	515.6	515.9	515.8	515.7
17-Oct-11	515.6	515.7	515.5	515.6
20-Nov-11	515.7	515.8	515.7	515.7
18-Dec-11	515.7	515.8	515.8	515.7
15-Jan-12	515.8	515.9	515.8	515.8
19-Feb-12	515.8	516.0	515.8	515.7
26-Feb-12	-	-	-	-
18-Mar-12	516.0	516.7	517.3	516.0
15-Apr-12	516.1	516.0	515.8	515.7
13-May-12	515.7	515.9	515.8	515.8
13-May-12	515.6	515.8	515.7	515.6
15-Jul-12	515.5	515.8	515.7	515.5
15-Jul-12	515.9	515.9	515.7	515.4
12-Aug-12	515.7	515.8	515.7	515.7
16-Sep-12				
9-Oct-12	515.6	516.0	515.8	515.8
14-Oct-12	515.8	516.4	516.2	515.8
18-Nov-12	515.8	516.0	516.3	515.8
16-Dec-12	516.2	516.4	516.2	516.2
13-Jan-13	516.3	516.5	516.3	516.3
17-Mar-13	516.2	516.5	516.3	516.2
17-Mar-13	-	-	-	-
31-Mar-13	516.0	516.6	516.2	516.0
14-Apr-13	516.3	516.5	516.1	516.0
2-Jun-13	-	-	-	-
2-Jun-13	516.1	516.0	515.8	515.7
16-Jun-13	515.7	516.0	515.8	515.7
18-Aug-13	515.6	515.9	515.7	515.6
15-Sep-13	515.4	515.8	515.8	515.3
13-Oct-13	515.4	515.8	515.8	515.3
17-Nov-13	515.7	516.0	515.9	515.4
17-Nov-13	515.5	515.9	515.8	515.4
15-Dec-13	515.6	516.0	515.8	515.3
19-Jan-14	515.6	516.0	515.8	515.4
16-Feb-14	515.6	515.0	515.7	515.4
17-Mar-14	516.8	516.2	517.7	516.5
13-Apr-14	515.5	516.1	515.7	515.3
11-May-14	515.7	515.5	515.7	515.6
15-Jun-14	515.7	515.8	515.7	515.4
13-Jul-14	515.7	515.8	515.7	515.4
17-Aug-14	515.7	515.8	515.7	515.4

NOTE:
- Dry indicates no water detected in monitor.
- Frozen indicates monitor lid frozen and or snow covered.
- N/A indicates water elevation not available

TABLE C-4
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
QUARRY EXPANSION LANDS- MONITORING WELLS
111-53312.01 A61

DATE	BH03-9	TW04-1	TW04-2	TW04-3
17-Aug-14	515.7	515.7	515.7	515.6
7-Sep-14	515.7	515.5	515.7	515.6
12-Sep-14	-	-	-	-
19-Sep-14	-	-	-	-
19-Oct-14	515.8	515.7	515.7	515.6
16-Nov-14	515.8	516.0	515.9	515.5
14-Dec-14	515.8	515.9	515.8	515.7
18-Jan-15	515.9	515.9	515.8	515.7
15-Feb-15	N/A	N/A	N/A	N/A
15-Mar-15	515.8	515.8	515.8	515.7
19-Apr-15	515.8	516.2	515.9	515.8
17-May-15	515.7	515.9	515.8	515.7
14-Jun-15	515.7	515.8	515.8	515.7
19-Jul-15	515.7	515.8	515.8	515.7
9-Aug-15	515.7	515.8	515.7	515.7
6-Sep-15	515.7	515.7	515.7	515.7
11-Oct-15	515.5	515.1	515.5	515.5
15-Nov-15	515.7	515.7	515.7	515.7
9-Dec-15	515.7	515.7	515.7	515.7
17-Jan-16	515.7	515.8	515.8	515.7
14-Feb-16	515.7	515.9	515.8	515.7
13-Mar-16	515.9	516.3	516.0	515.9
17-Apr-16	515.8	516.2	515.9	515.8
1-May-16	-	-	-	-
15-May-16	515.8	515.9	515.8	515.8
5-Jun-16	-	-	-	-
19-Jun-16	515.7	515.7	515.7	515.7
3-Jul-16	-	-	-	-
17-Jul-16	515.5	515.5	515.5	515.5
24-Jul-16	-	-	-	-
7-Aug-16	-	-	-	-
21-Aug-16	515.2	515.2	515.2	515.2
18-Sep-16	515.0	515.0	515.0	515.0
29-Sep-16	-	-	-	-
16-Oct-16	514.8	514.9	514.9	514.8
13-Nov-16	514.7	514.7	514.8	514.7
27-Nov-16	-	-	-	-
11-Dec-16	514.9	514.8	514.9	514.8
15-Jan-17	515.8	516.0	515.9	515.8
12-Feb-17	515.8	515.9	515.8	515.8
19-Mar-17	515.8	516.1	515.9	515.8
9-Apr-17	-	-	-	-
16-Apr-17	515.8	516.2	515.9	515.8
11-May-17	515.8	516.2	515.9	515.8
25-Jun-17	515.8	516.1	515.9	515.8
19-Jul-17	515.8	516.1	515.9	515.8
17-Aug-17	515.7	515.8	515.7	515.7
17-Sep-17	515.7	515.7	515.7	515.7
15-Oct-17	515.8	515.8	515.8	515.8
14-Nov-17	515.8	515.9	515.8	515.8
11-Dec-17	515.8	515.9	515.8	515.8
14-Jan-18	515.8	516.0	515.9	515.8
11-Feb-18	-	-	-	-
18-Feb-18	516.1	516.4	516.5	516.2
18-Mar-18	515.8	516.0	515.8	515.8
15-Apr-18	515.9	516.1	515.9	515.9
17-May-18	515.9	516.1	515.9	515.9
18-Jun-18	515.7	515.8	515.8	515.7
17-Jul-18	515.4	515.4	515.4	515.4

DATE	BH03-9	TW04-1	TW04-2	TW04-3
22-Aug-18	515.2	515.2	515.2	515.2
18-Sep-18	514.3	514.7	514.7	514.7
23-Oct-18	514.5	514.5	514.6	514.5
19-Nov-18	515.7	515.6	515.7	515.7
10-Dec-18	515.7	515.8	515.8	515.7

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Frozen indicates monitor lid frozen and or snow covered.
- N/A indicates water elevation not available

FIGURE C-10

GROUNDWATER HYDROGRAPH
BH02-1

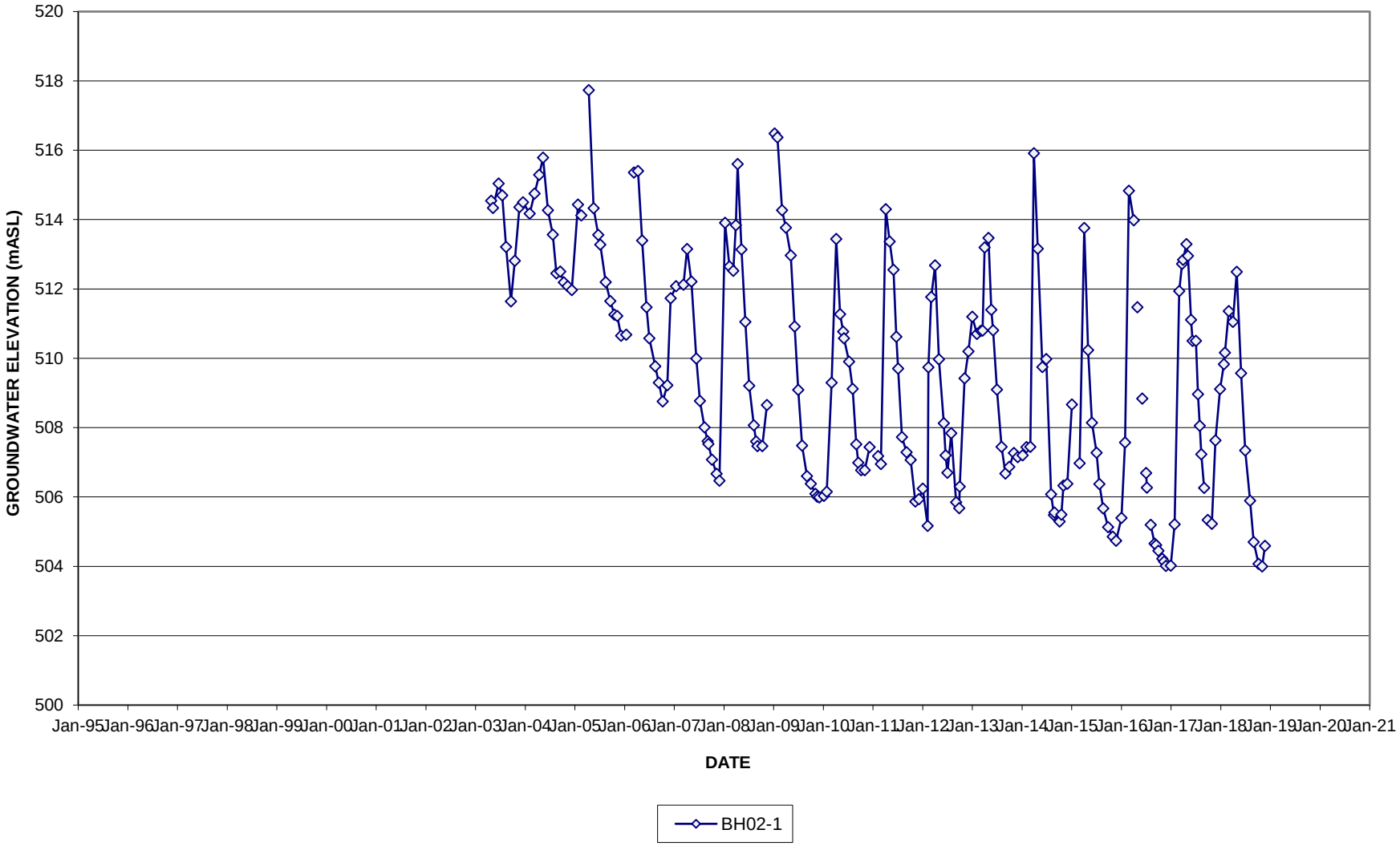


FIGURE C-10 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
BH02-1

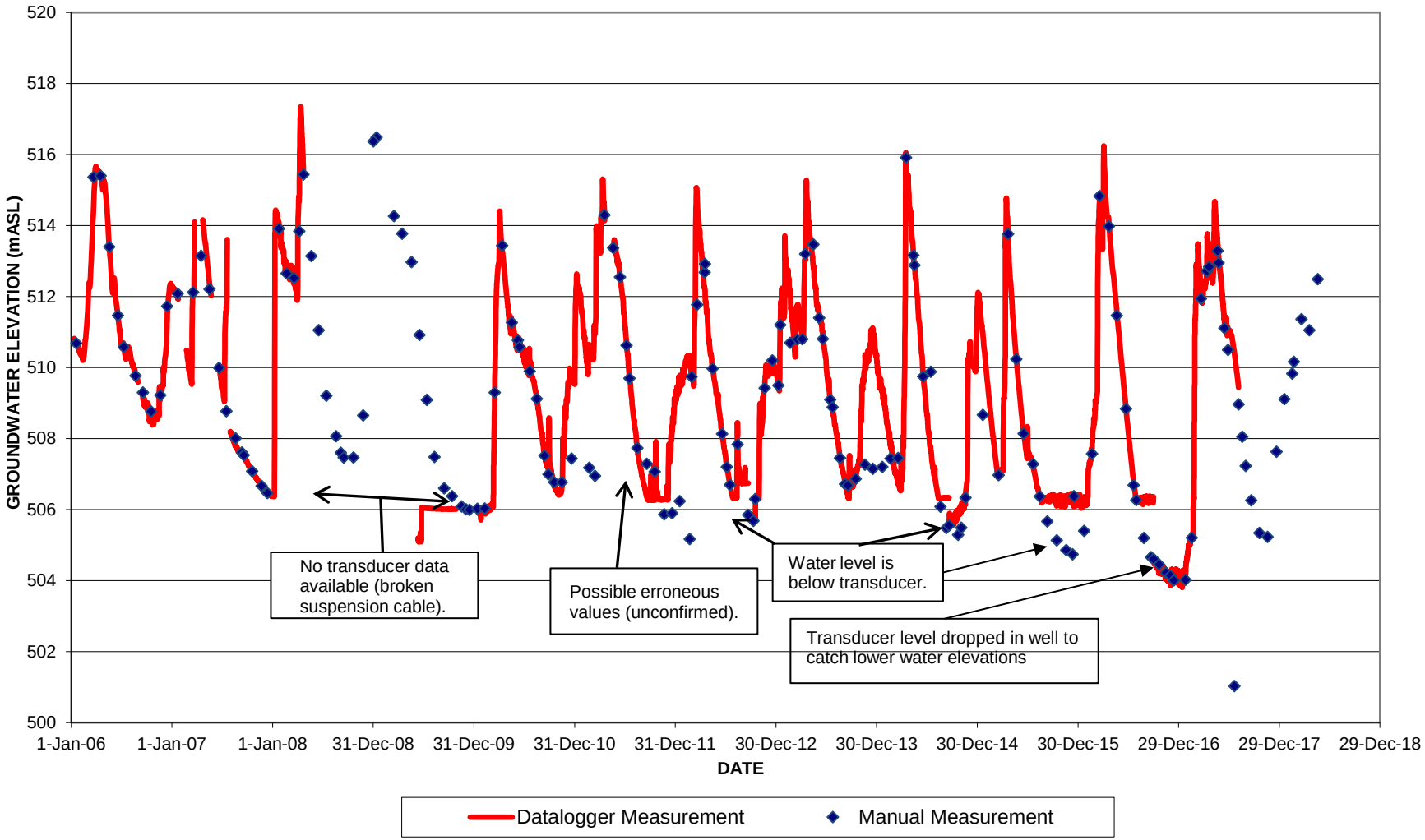


FIGURE C-11

GROUNDWATER HYDROGRAPH
BH02-2

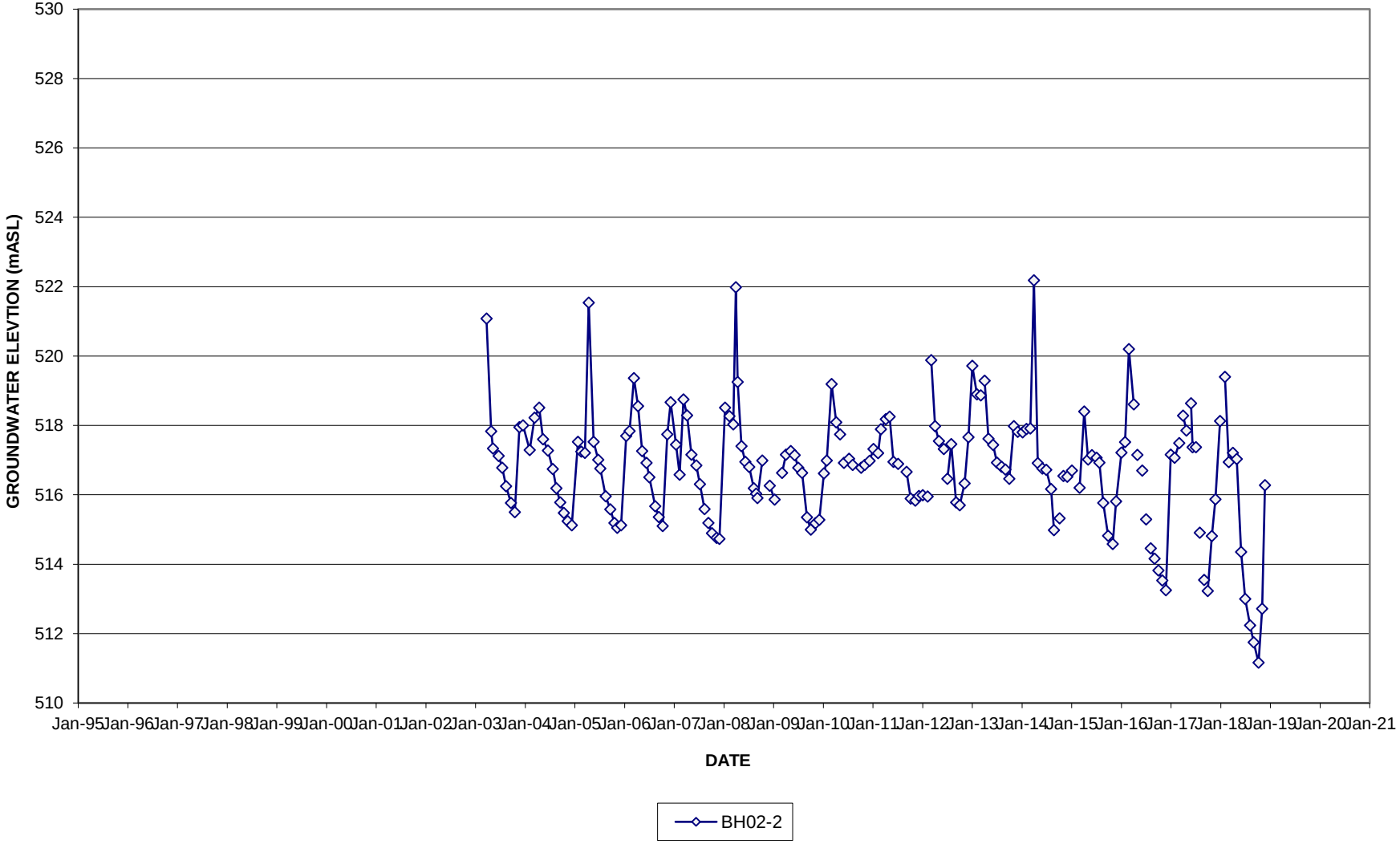


FIGURE C-12

GROUNDWATER HYDROGRAPH
BH02-3

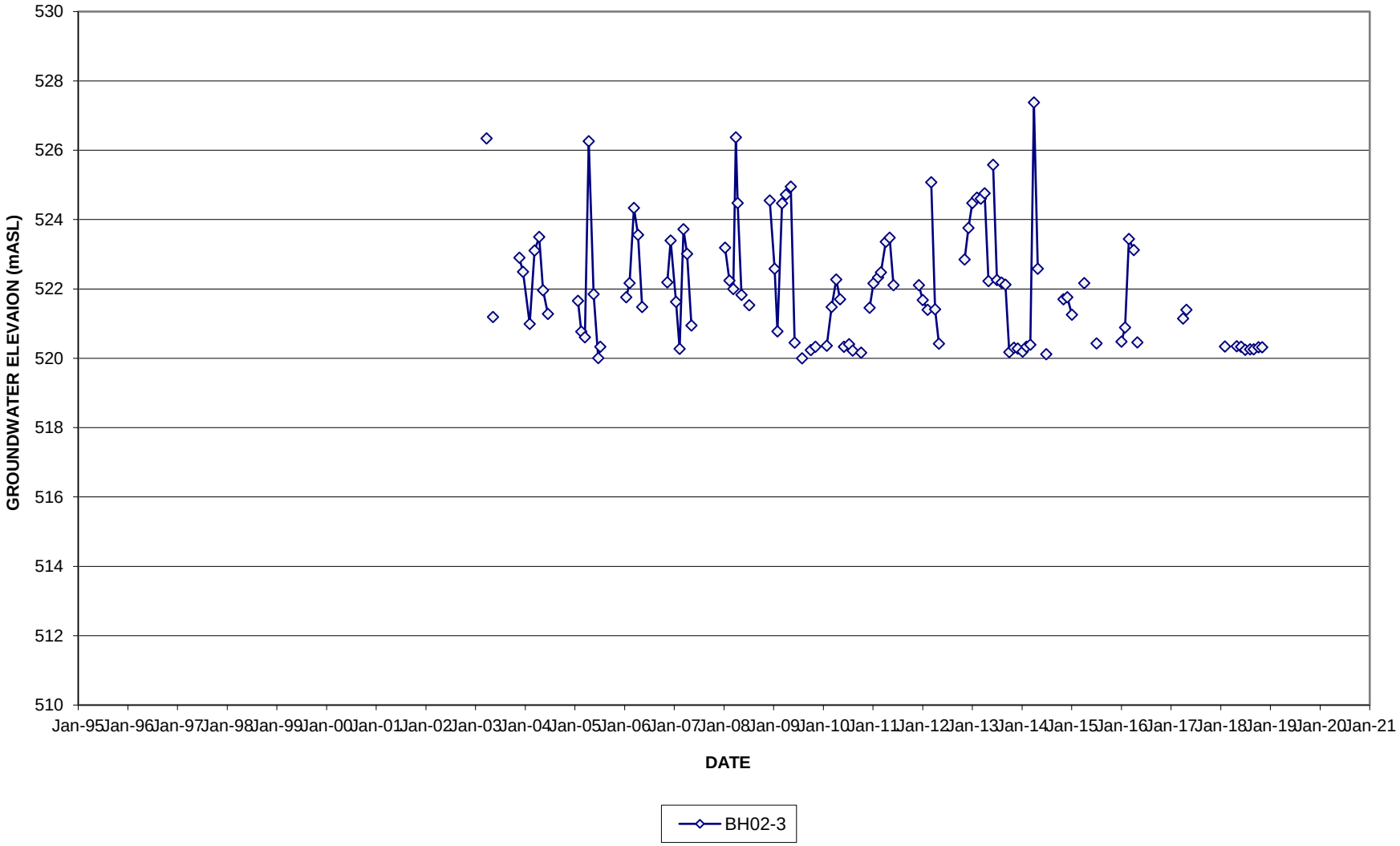


FIGURE C-13

GROUNDWATER HYDROGRAPH
BH02-4

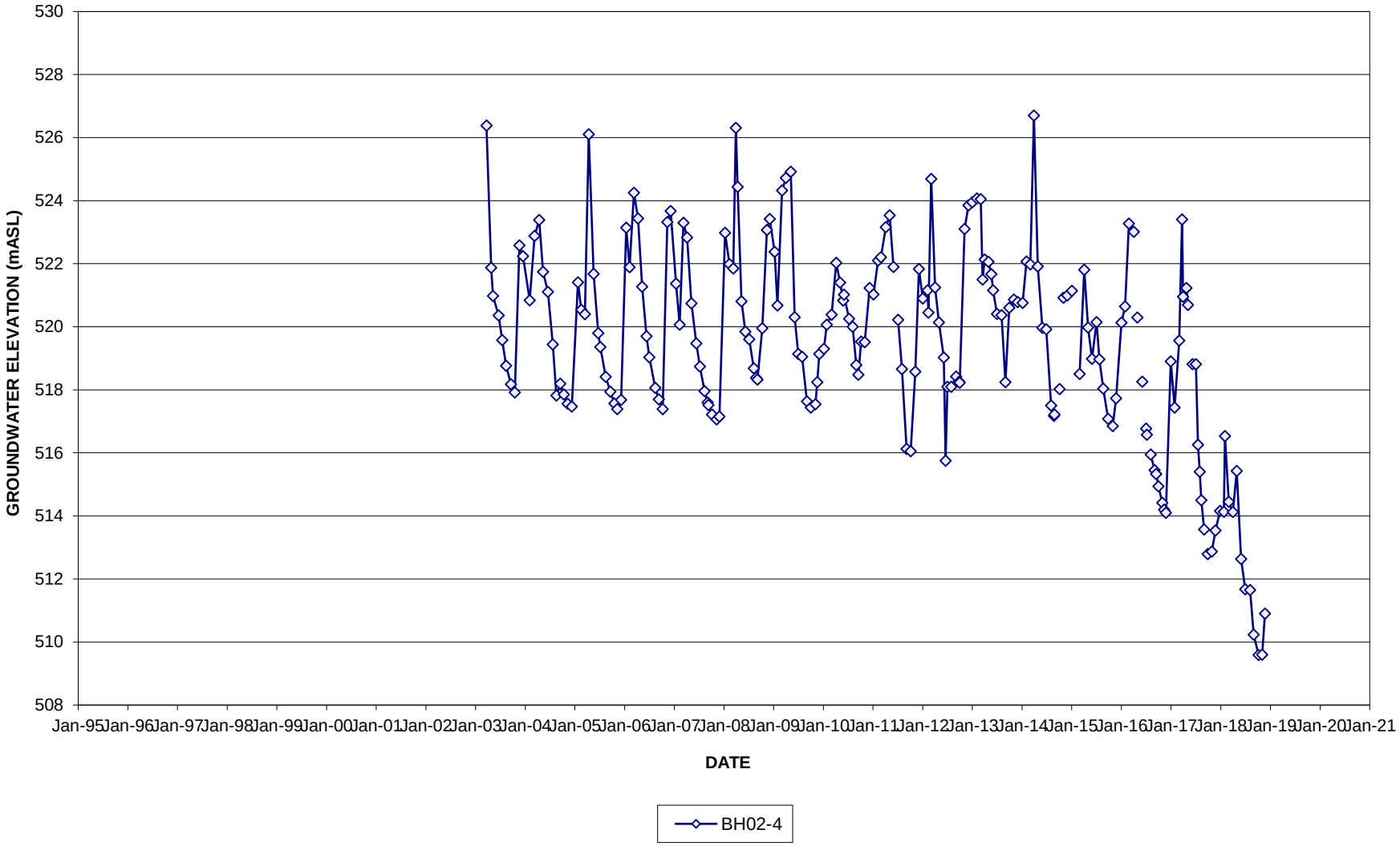


FIGURE C-13 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
BH02-4

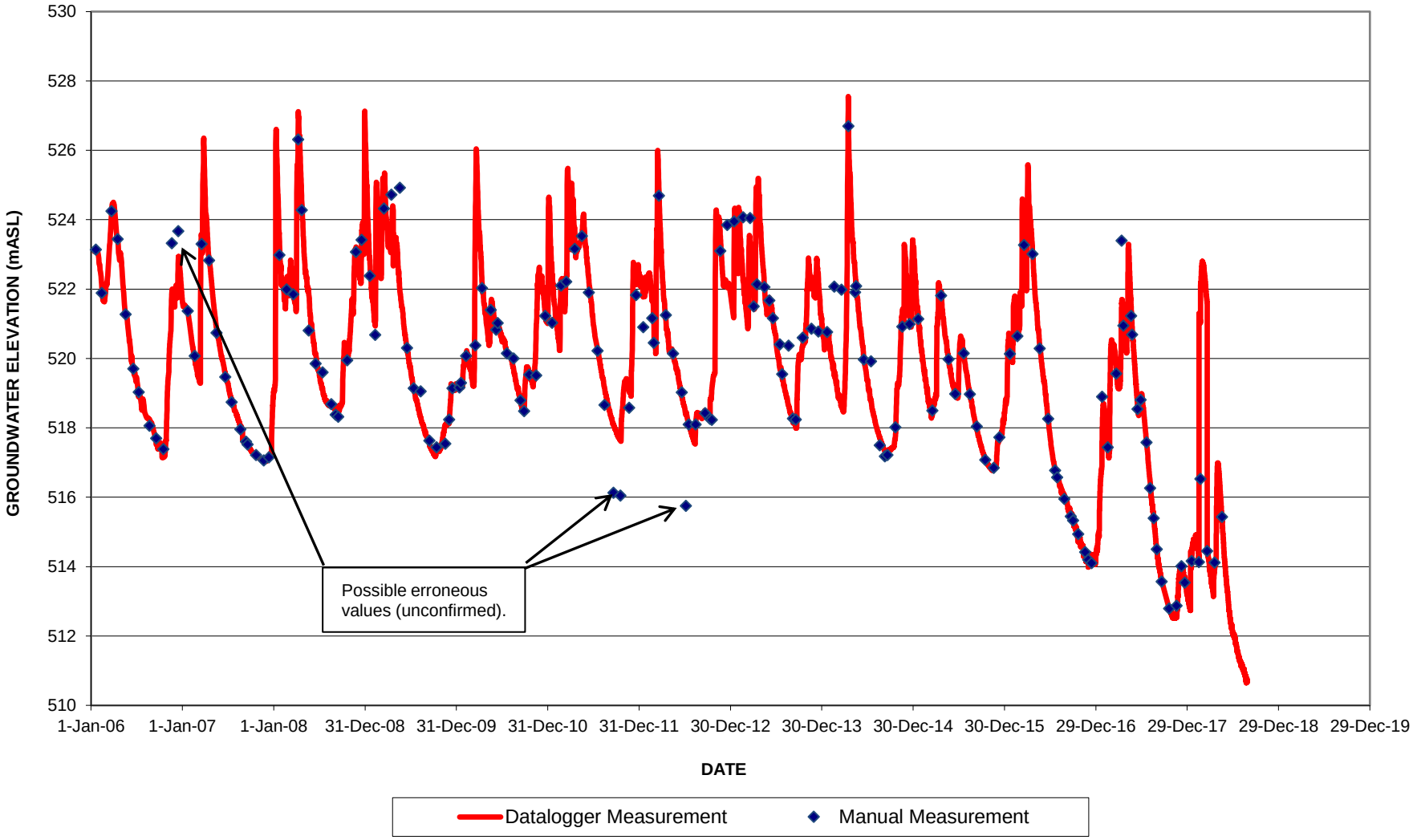


FIGURE C-14

GROUNDWATER HYDROGRAPH
BH02-5, BH02-5-II and BH02-5-III

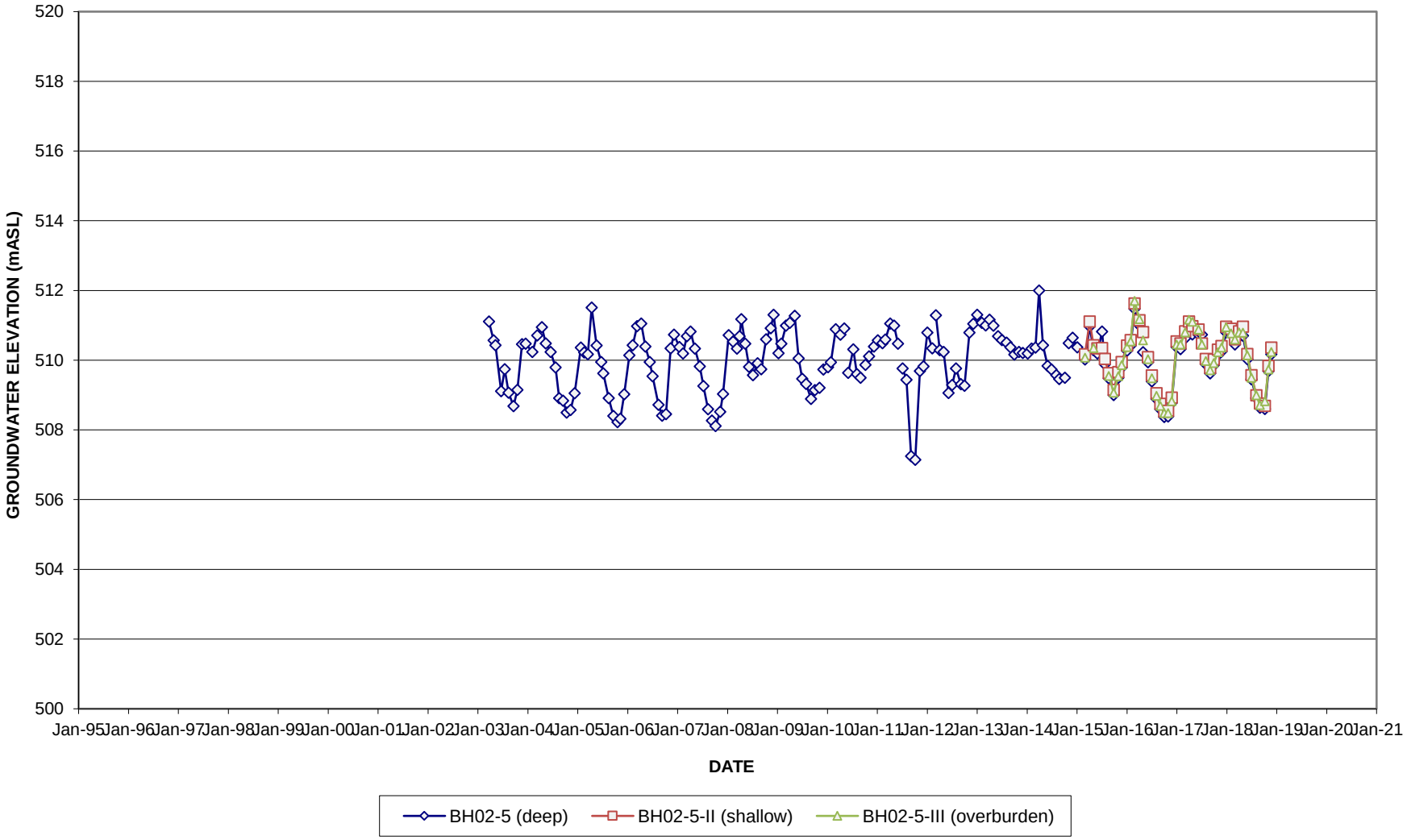


FIGURE C-15

GROUNDWATER HYDROGRAPH
BH02-6

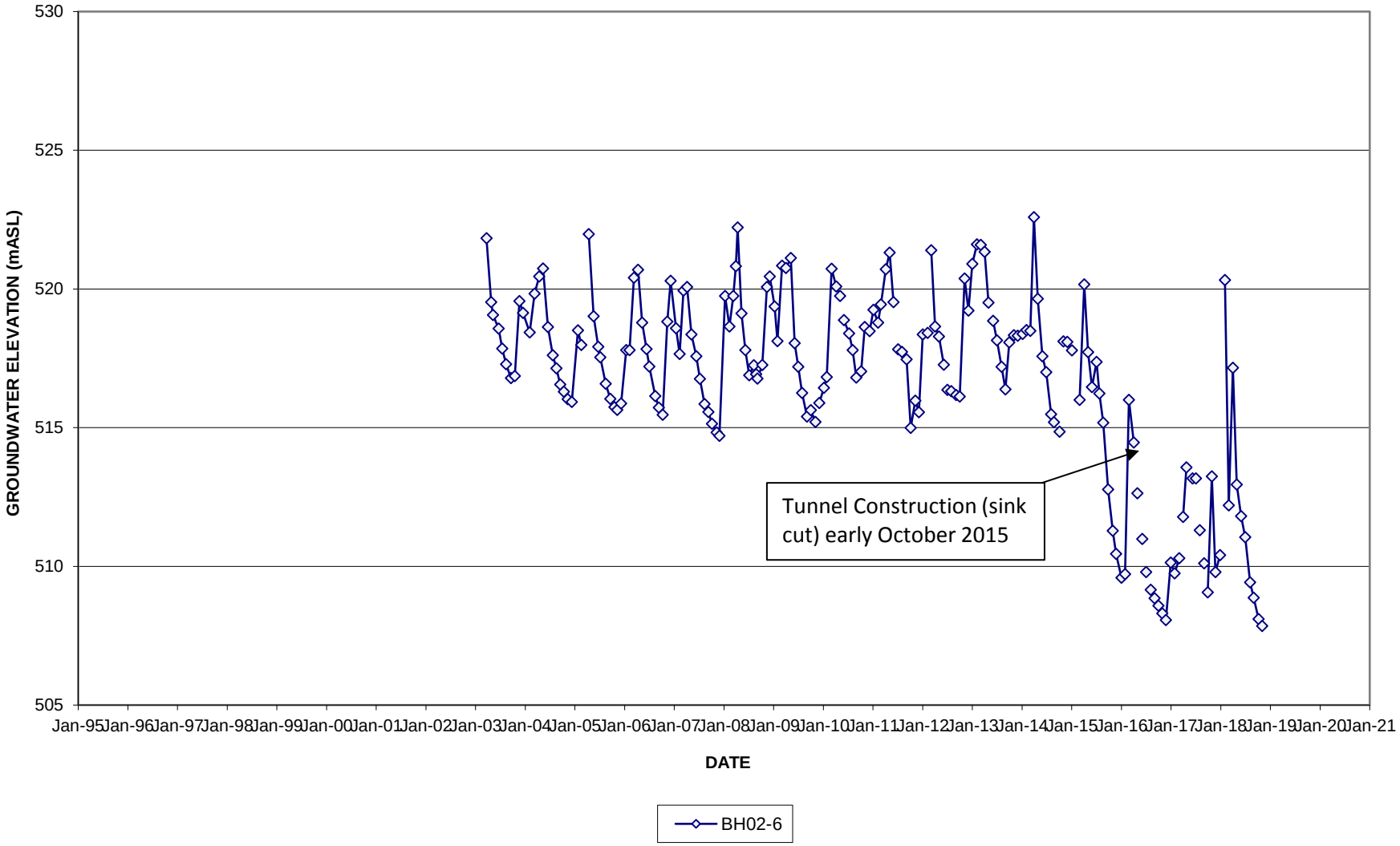


FIGURE C-16

GROUNDWATER HYDROGRAPH
BH03-7-I, BH03-7-II and BH03-7-III

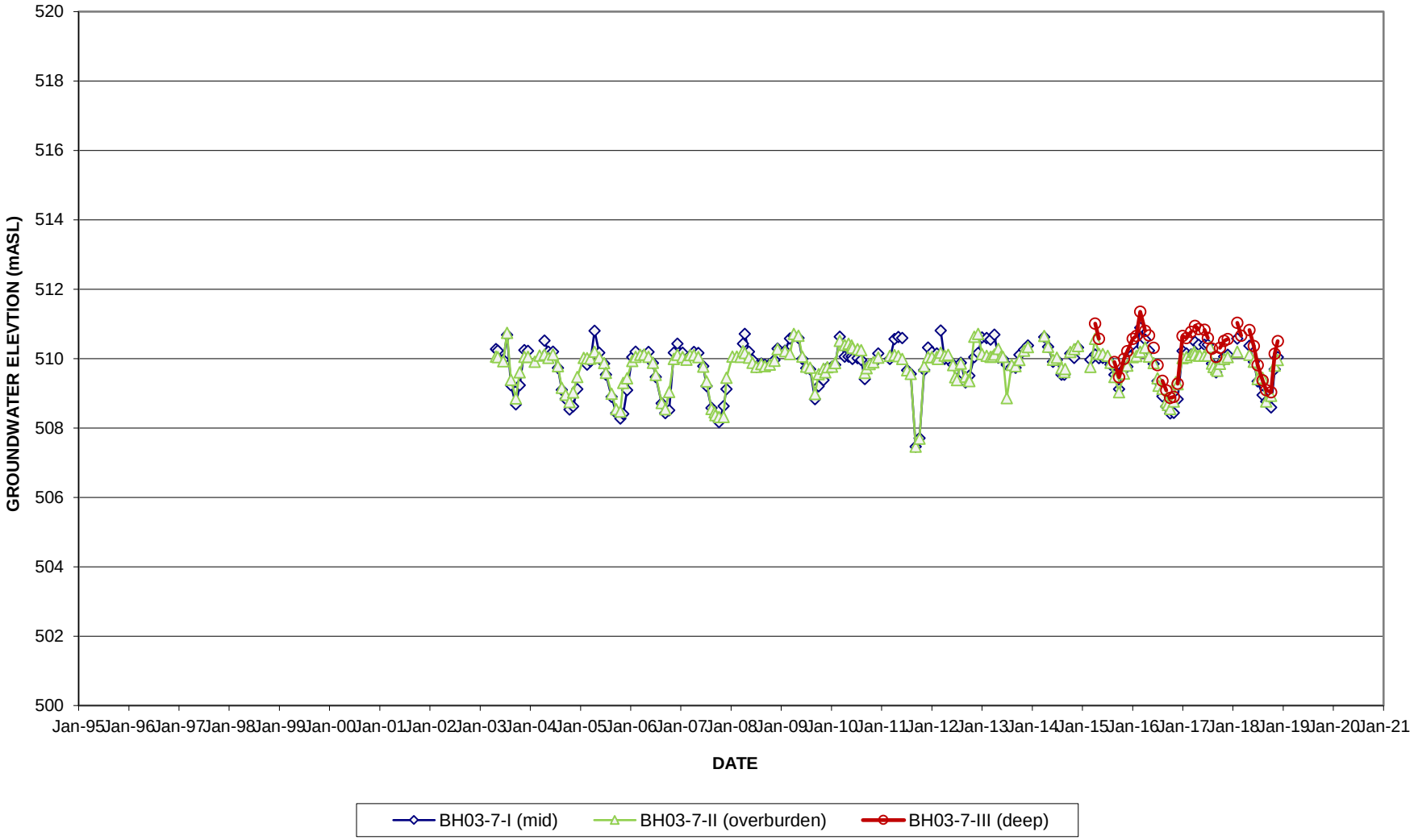


FIGURE C-16 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
BH03-7-II

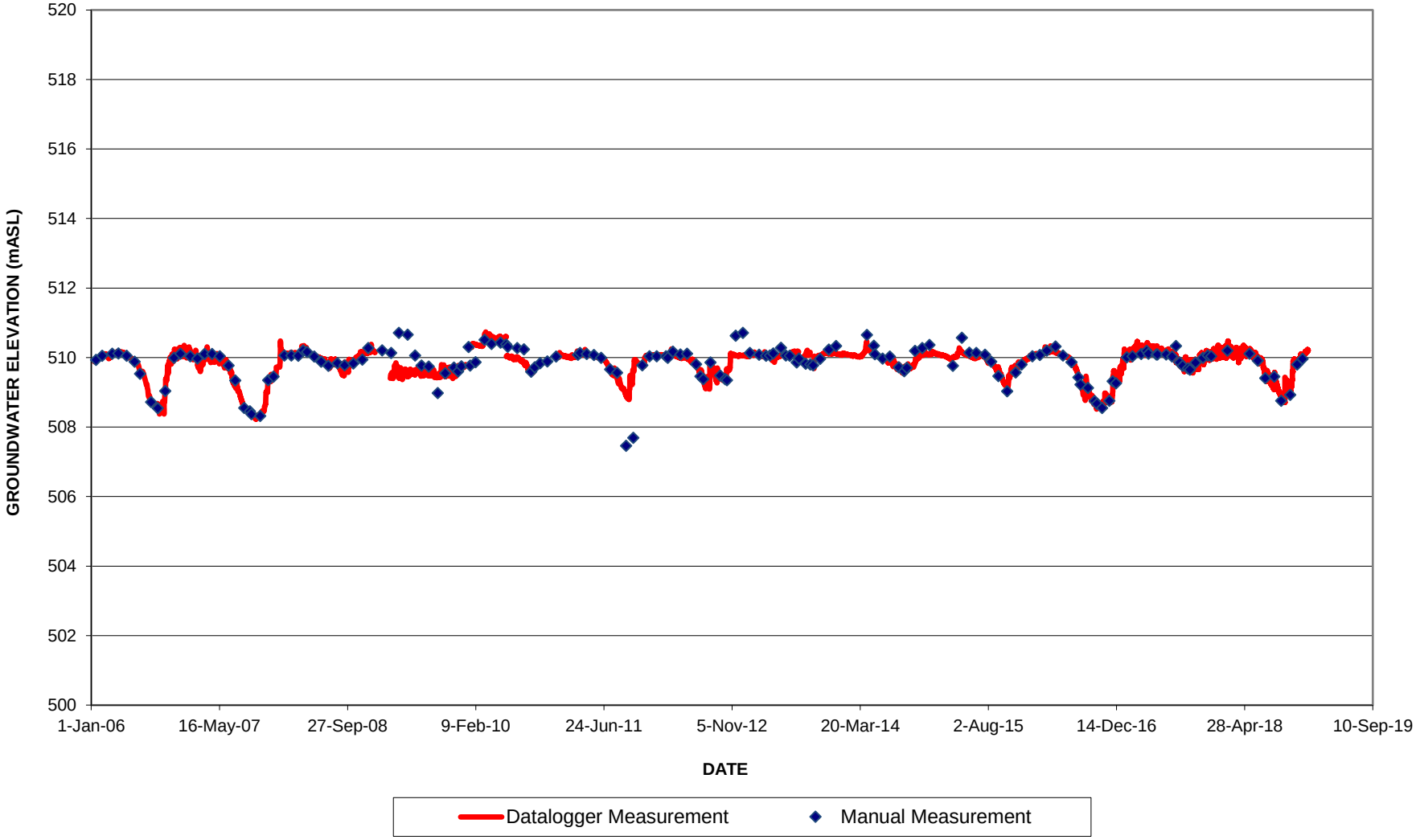


FIGURE C-17

GROUNDWATER HYDROGRAPH
BH03-8

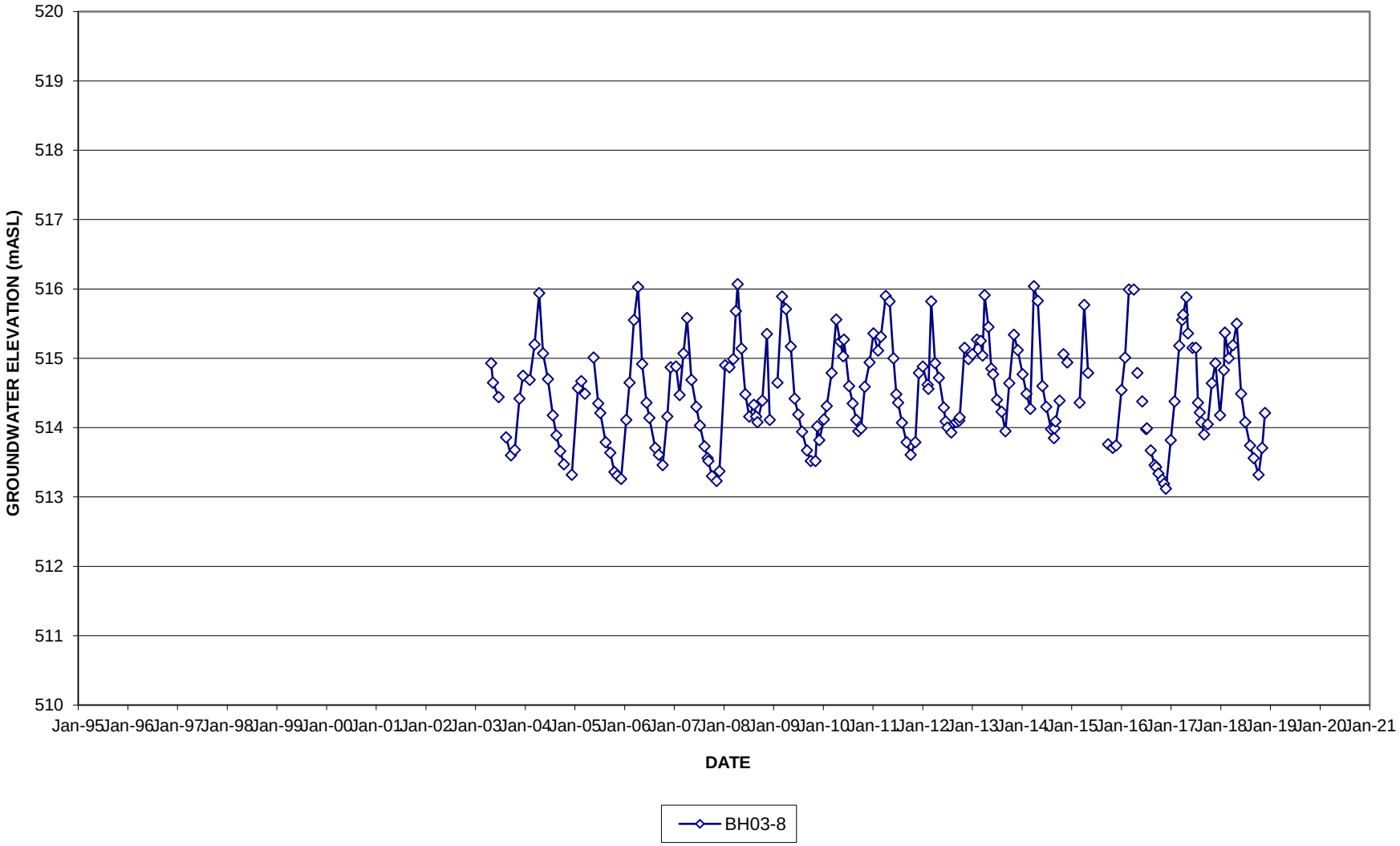


FIGURE C-17 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
BH03-8

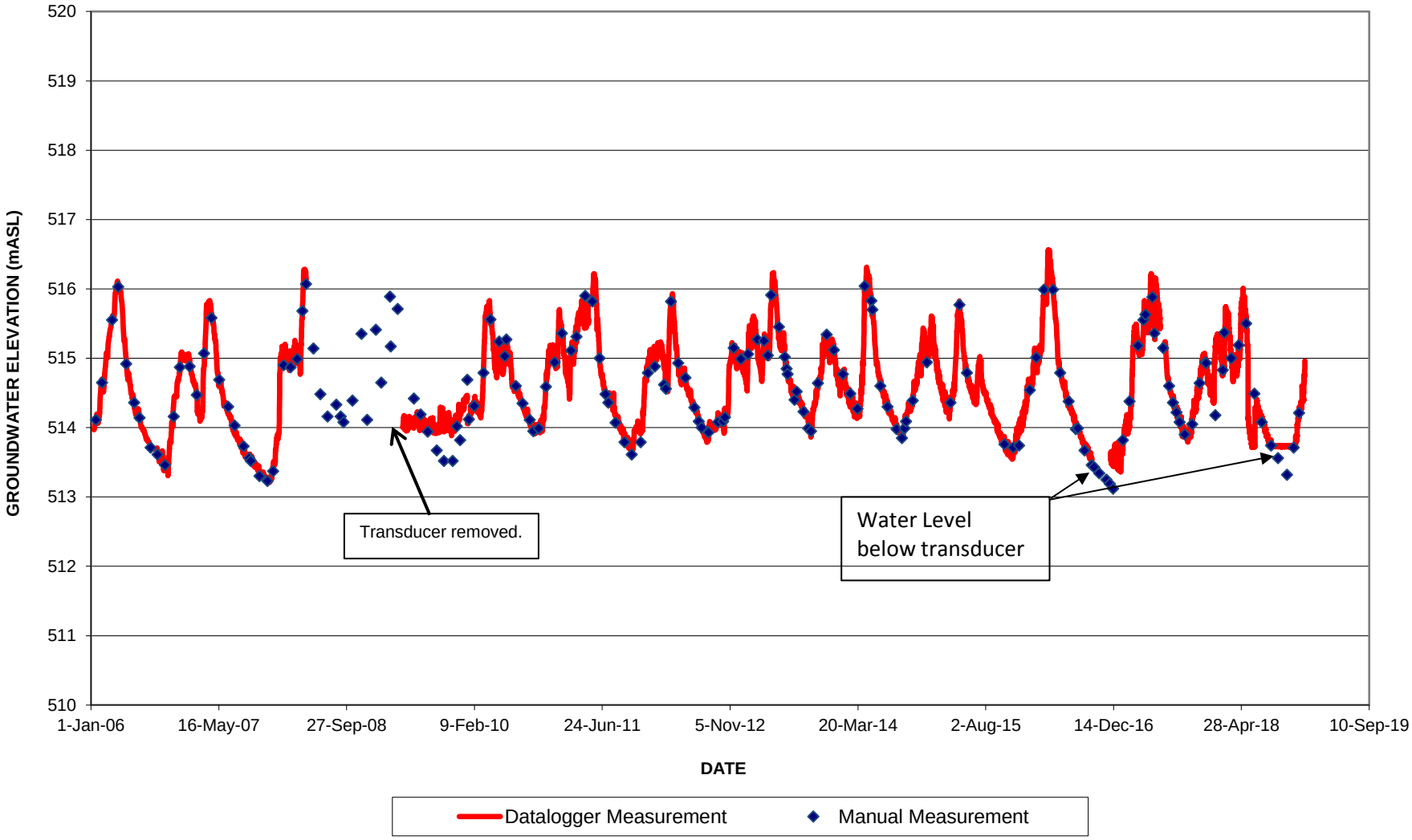


FIGURE C-18

GROUNDWATER HYDROGRAPH
BH08-1

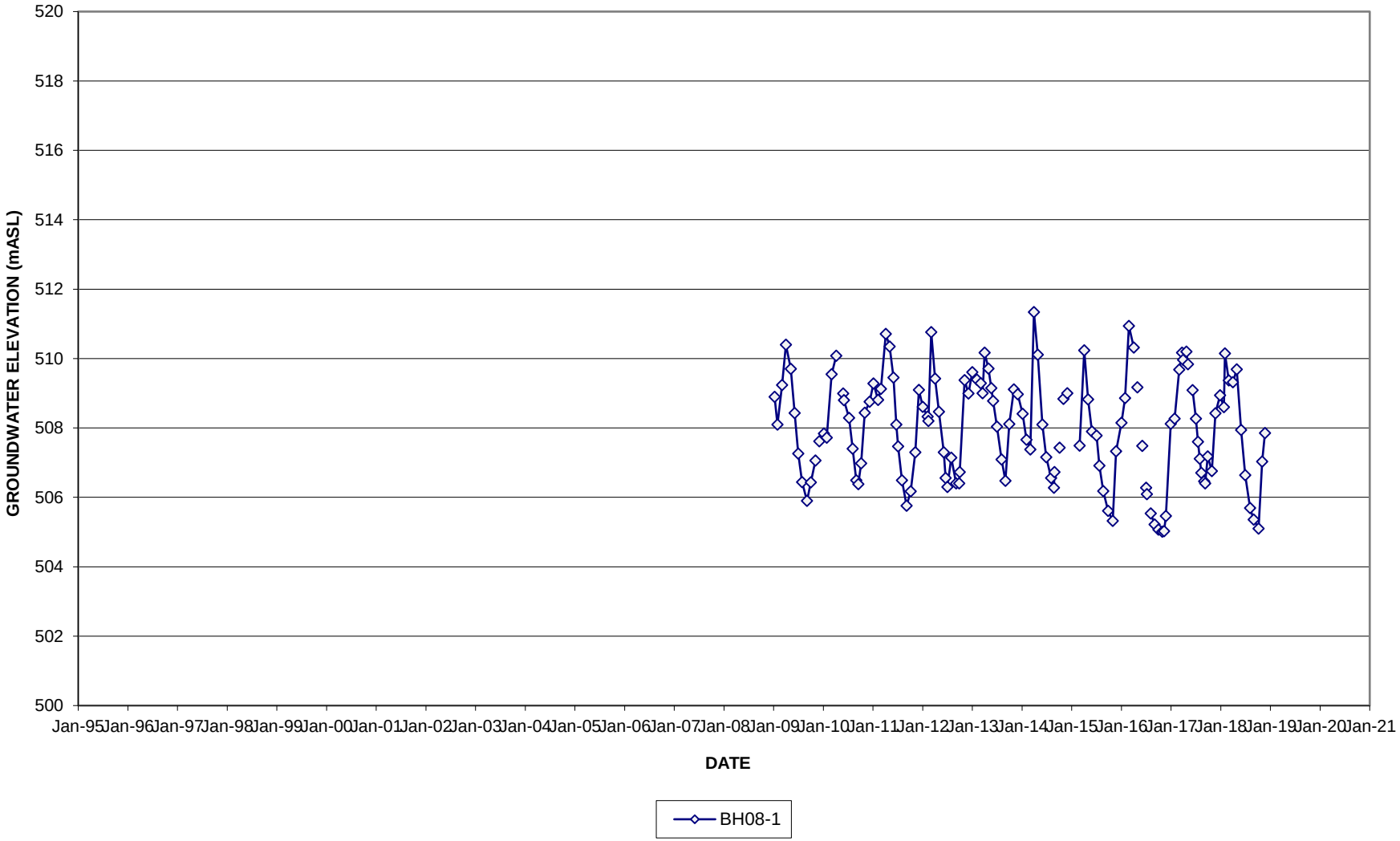


FIGURE C-18 (a)

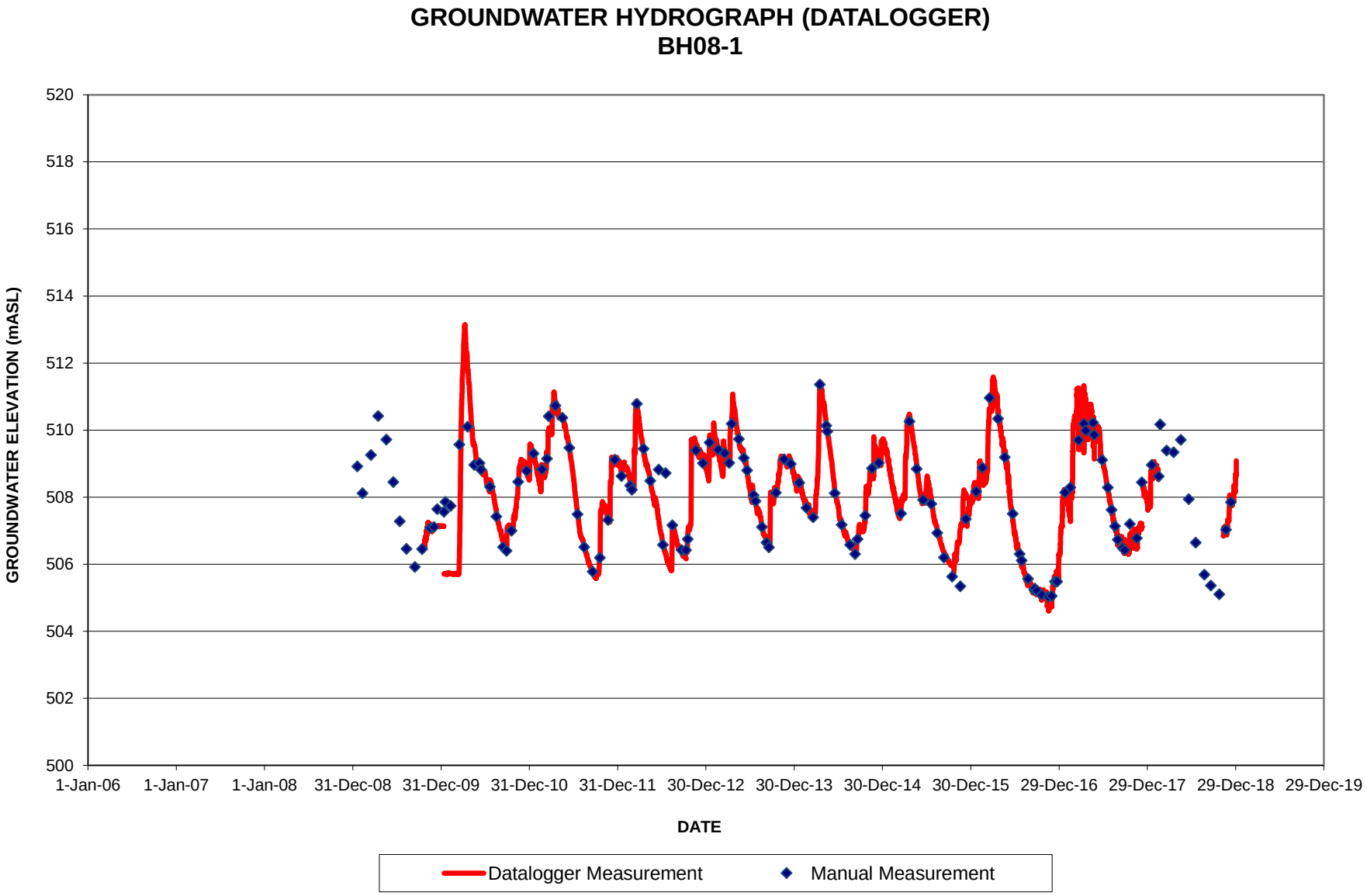

GROUNDWATER HYDROGRAPH (DATALOGGER)
BH08-1
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
1-Jan-06
1-Jan-07
1-Jan-08
31-Dec-08
31-Dec-09
31-Dec-10
31-Dec-11
30-Dec-12
30-Dec-13
30-Dec-14
30-Dec-15
29-Dec-16
29-Dec-17
29-Dec-18
29-Dec-19
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-19

GROUNDWATER HYDROGRAPH
BH08-2

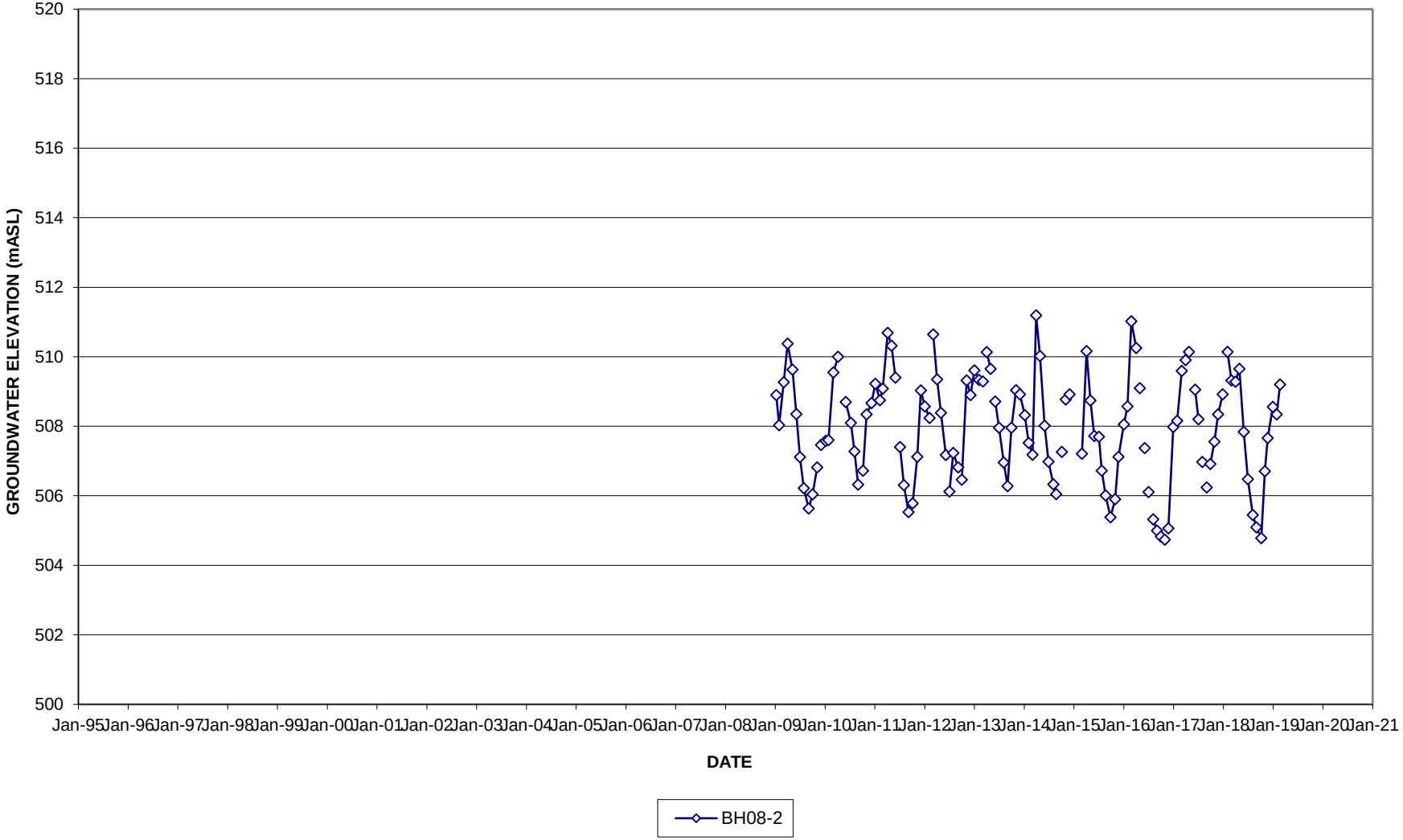


FIGURE C-20

GROUNDWATER HYDROGRAPH
BH08-3

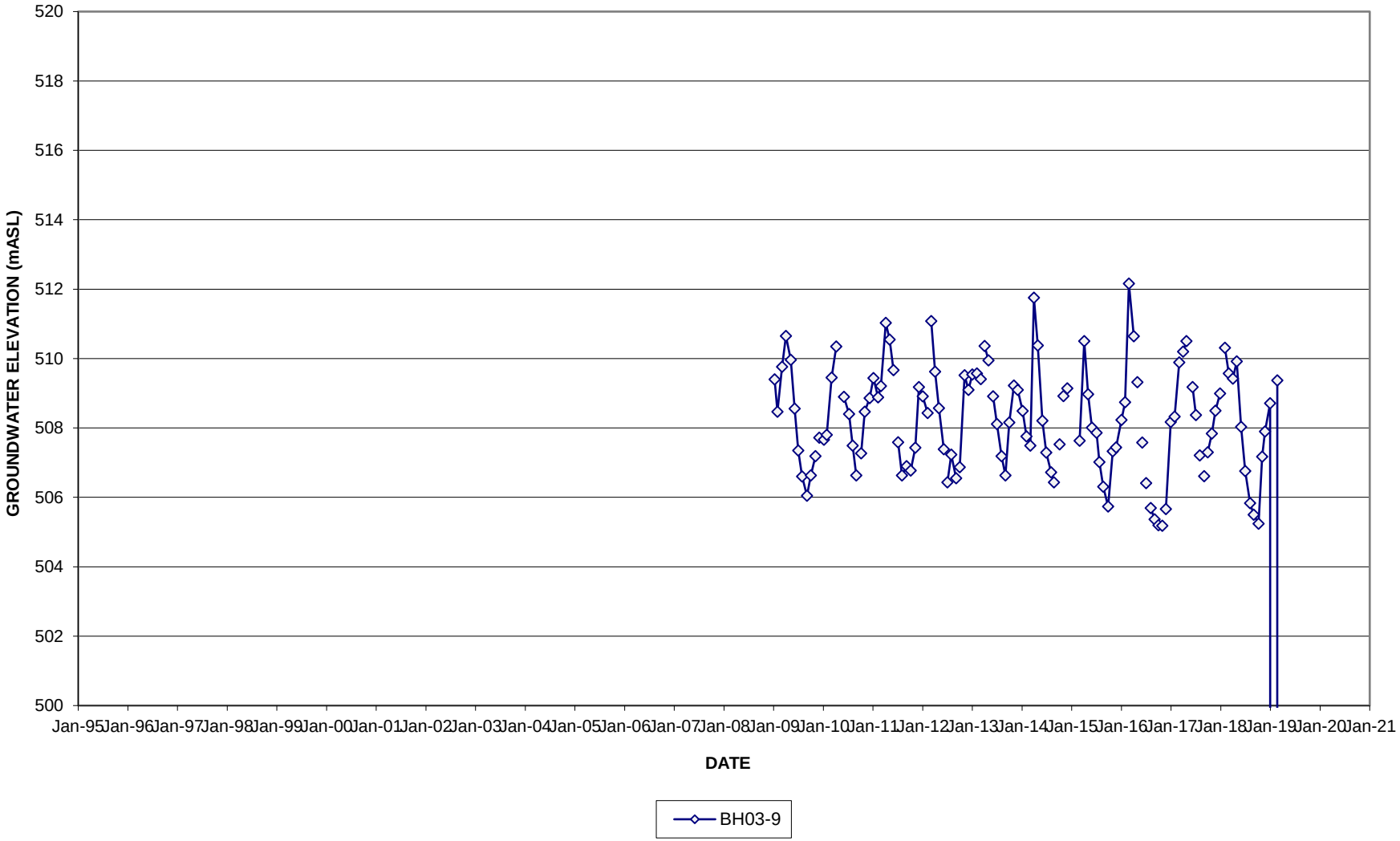


FIGURE C-21

GROUNDWATER HYDROGRAPH
NW1

FIGURE C-21 (a)

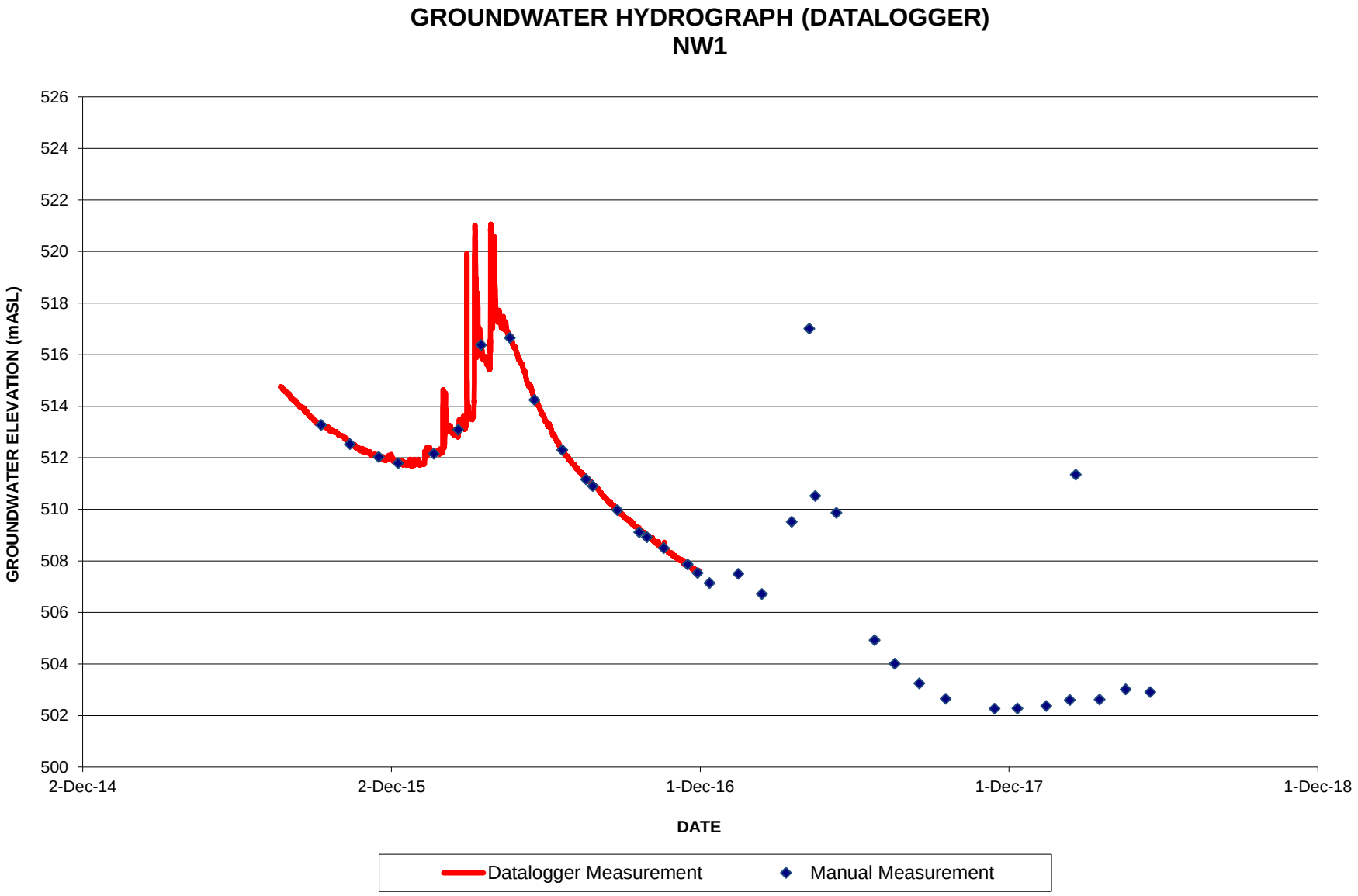

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW1
GROUNDWATER ELEVATION (mASL)
526
524
522
520
518
516
514
512
510
508
506
504
502
500
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-22

GROUNDWATER HYDROGRAPH
NW2

FIGURE C-22 (a)

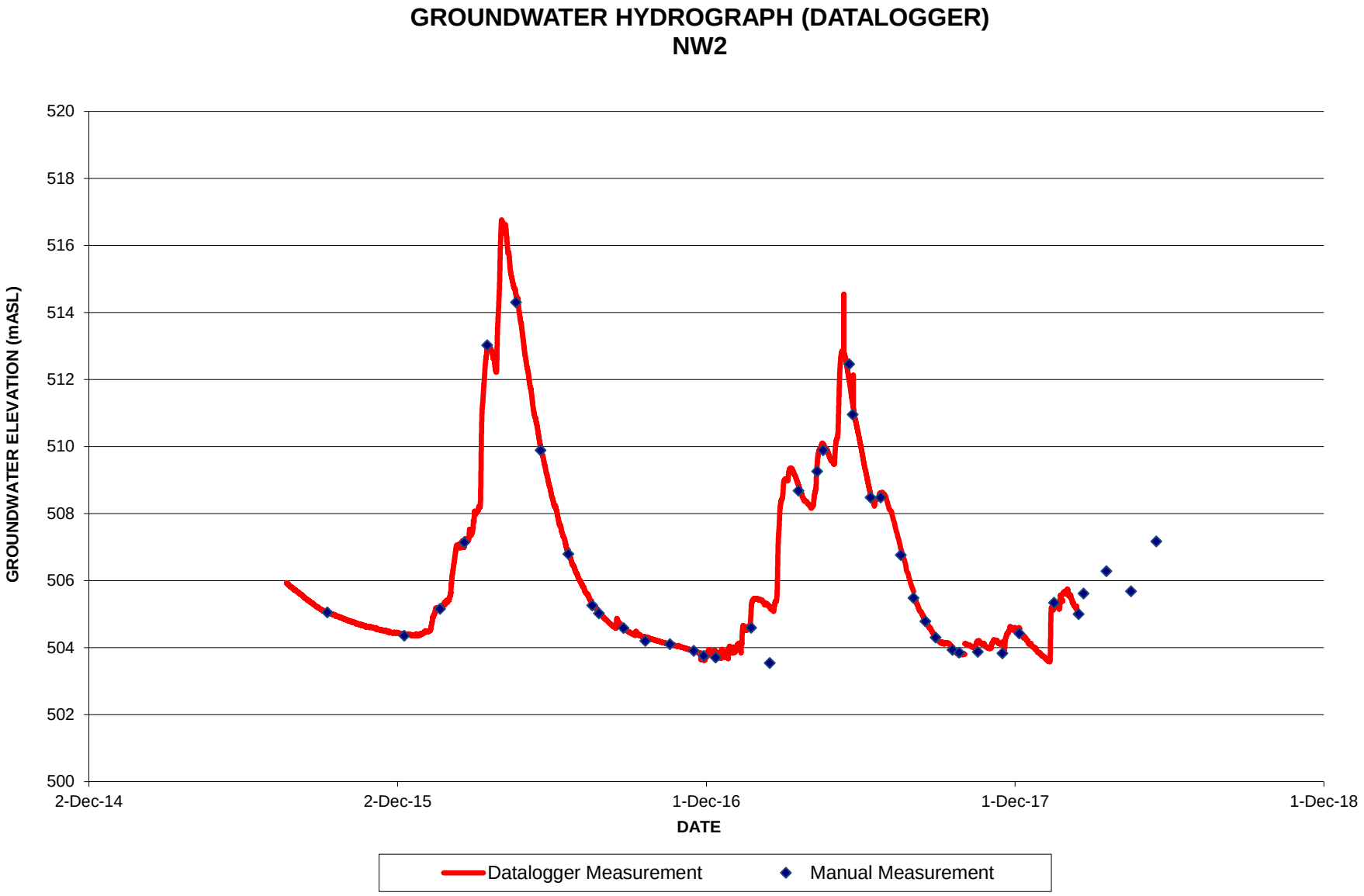

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW2
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-23

GROUNDWATER HYDROGRAPH
NW3

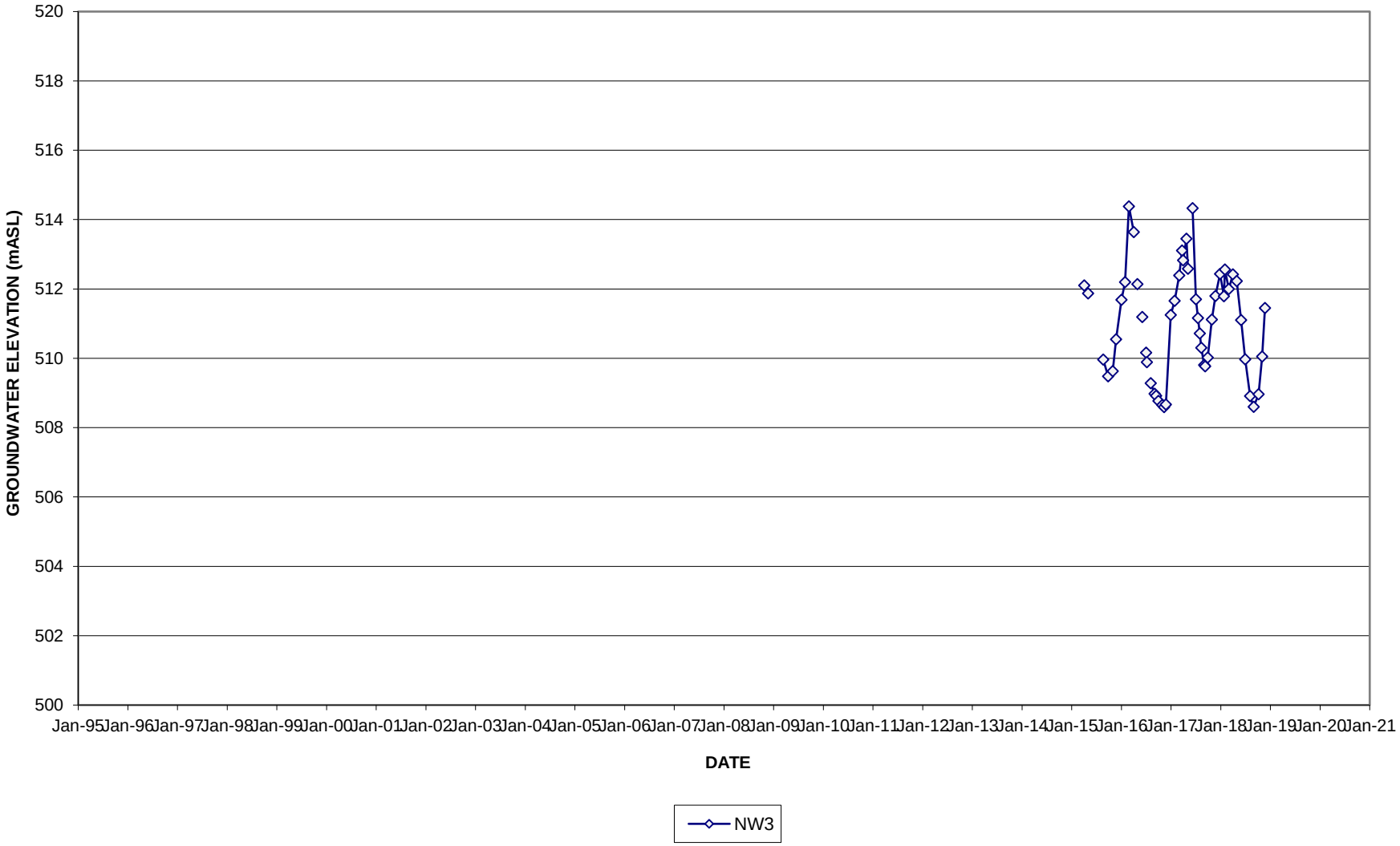


FIGURE C-23 (a)

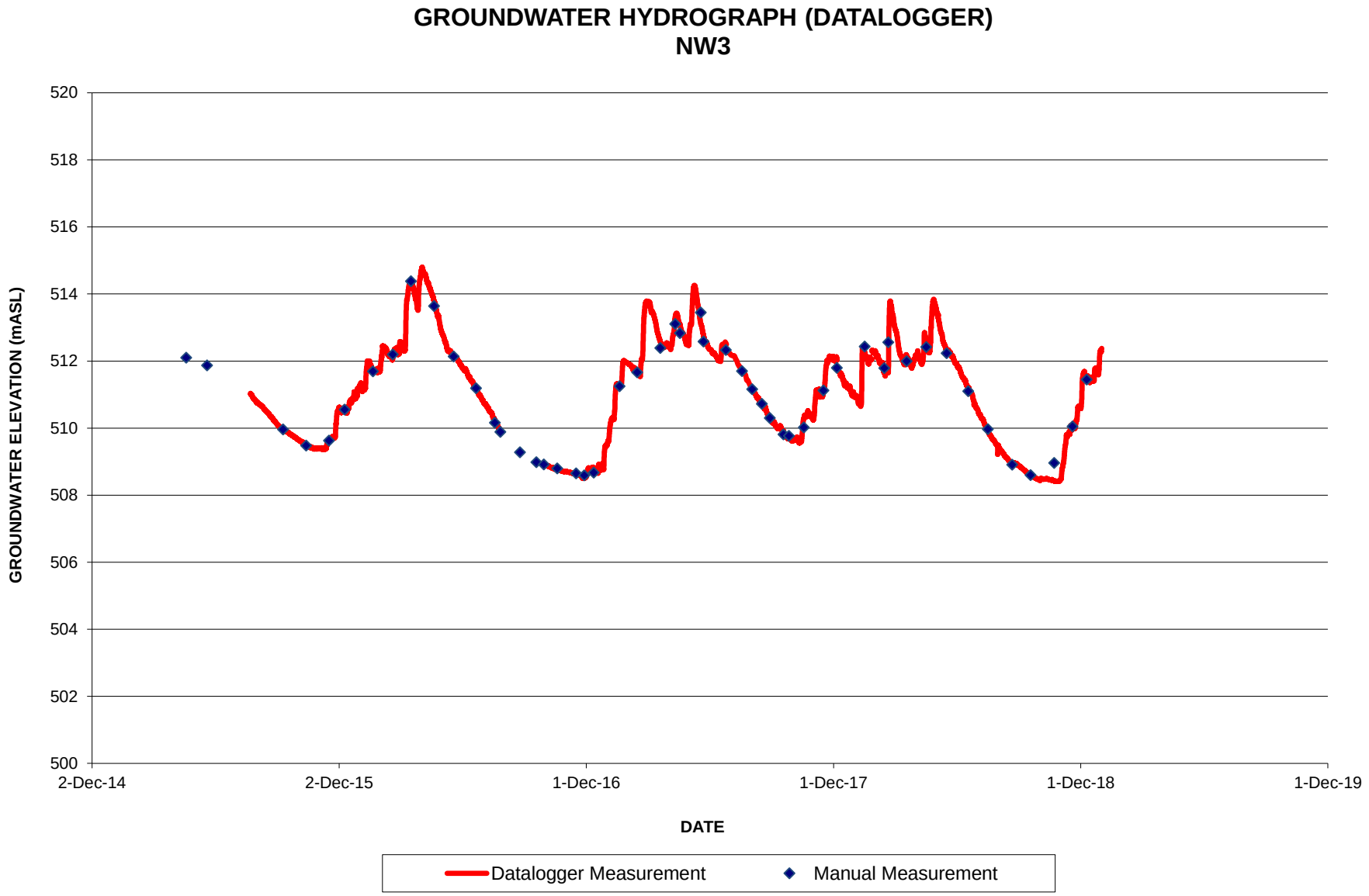

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW3
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
1-Dec-19
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-24

GROUNDWATER HYDROGRAPH
NW4

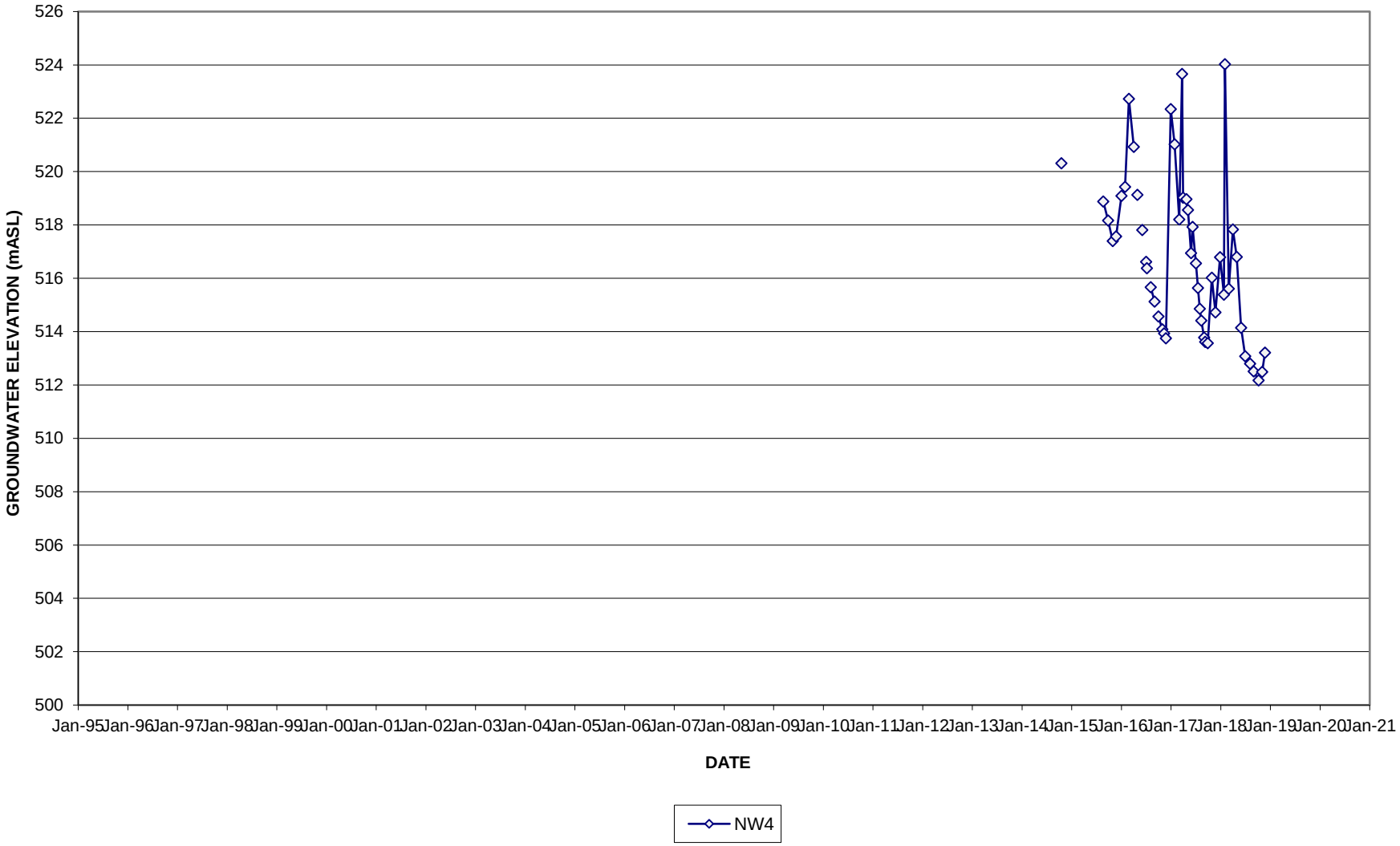


FIGURE C-24 (a)

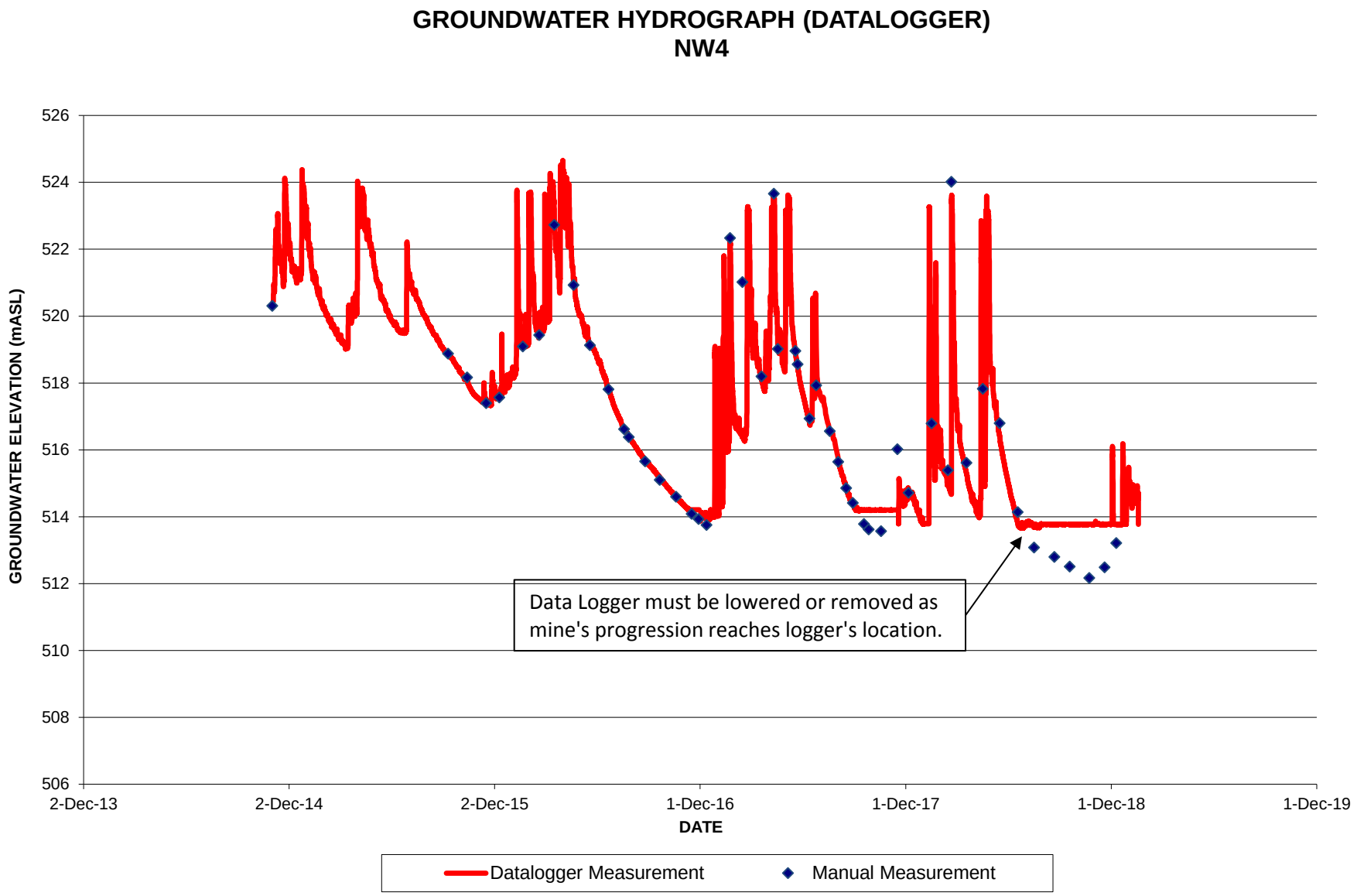

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW4
GROUNDWATER ELEVATION (mASL)
526
524
522
520
518
516
514
512
510
508
506
2-Dec-13
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
1-Dec-19
DATE
Data Logger must be lowered or removed as mine's progression reaches logger's location.
Datalogger Measurement
Manual Measurement

FIGURE C-25

GROUNDWATER HYDROGRAPH
NW5

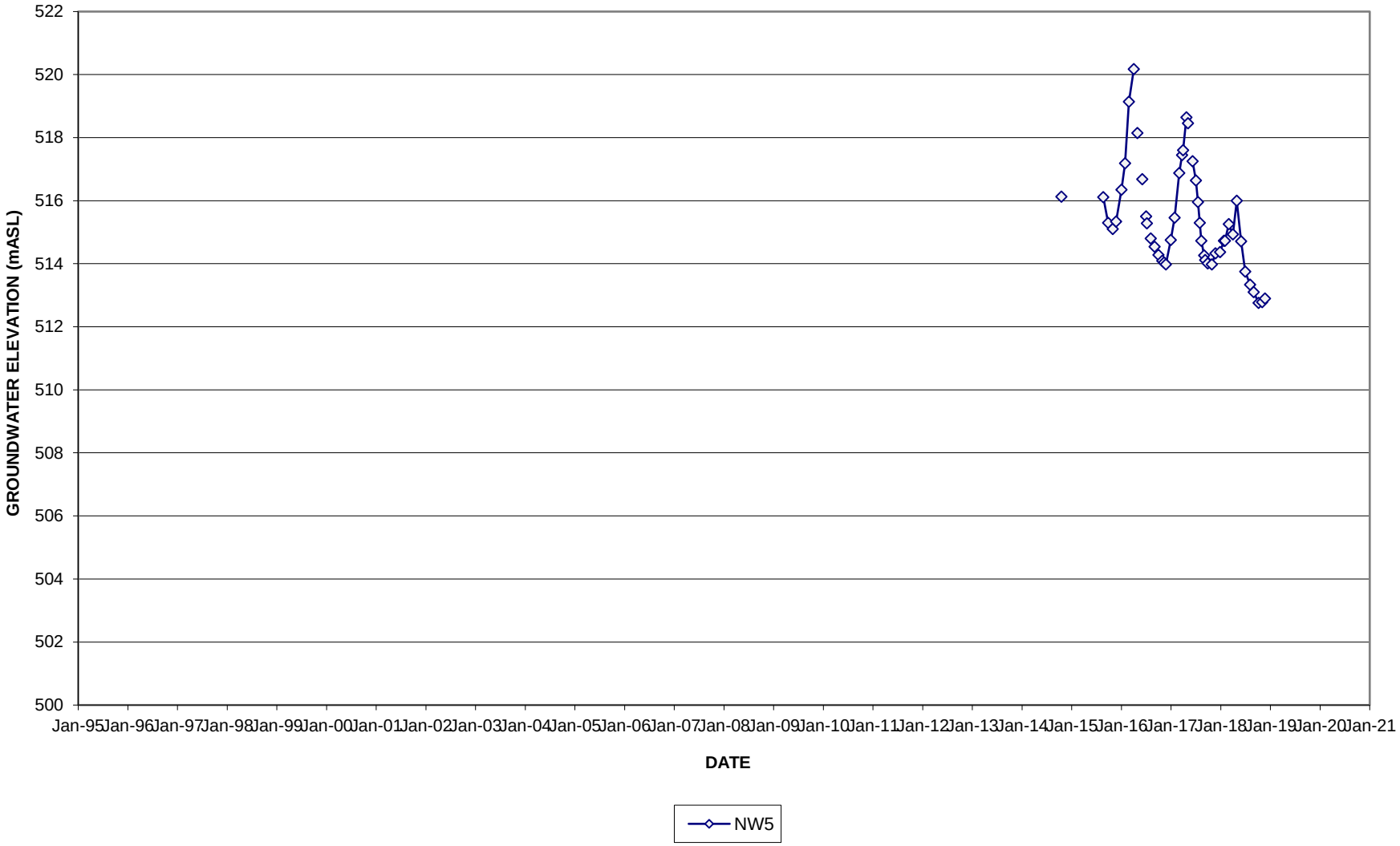


FIGURE C-25 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW5

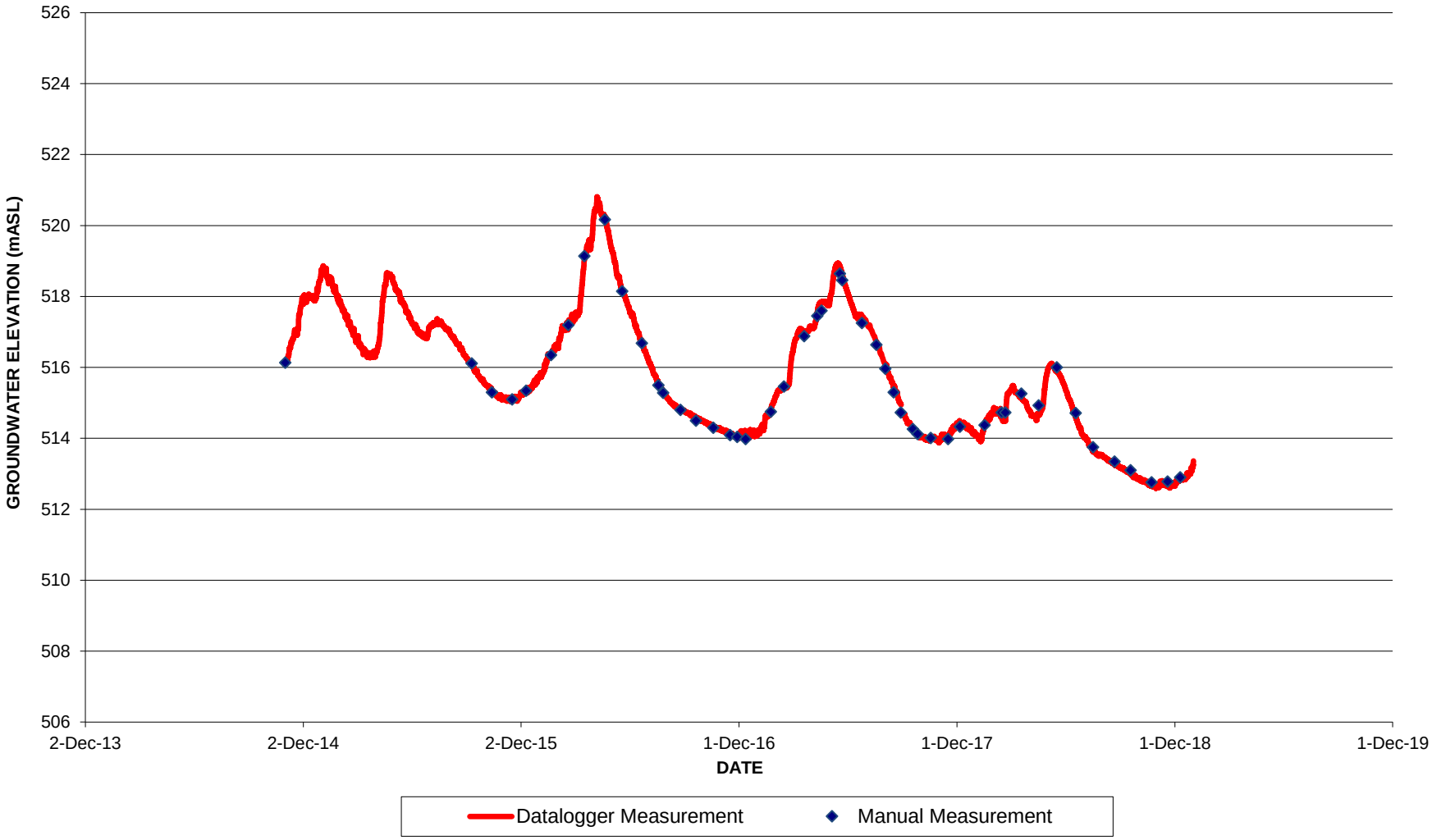


FIGURE C-26

GROUNDWATER HYDROGRAPH
NW6

FIGURE C-26 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW6

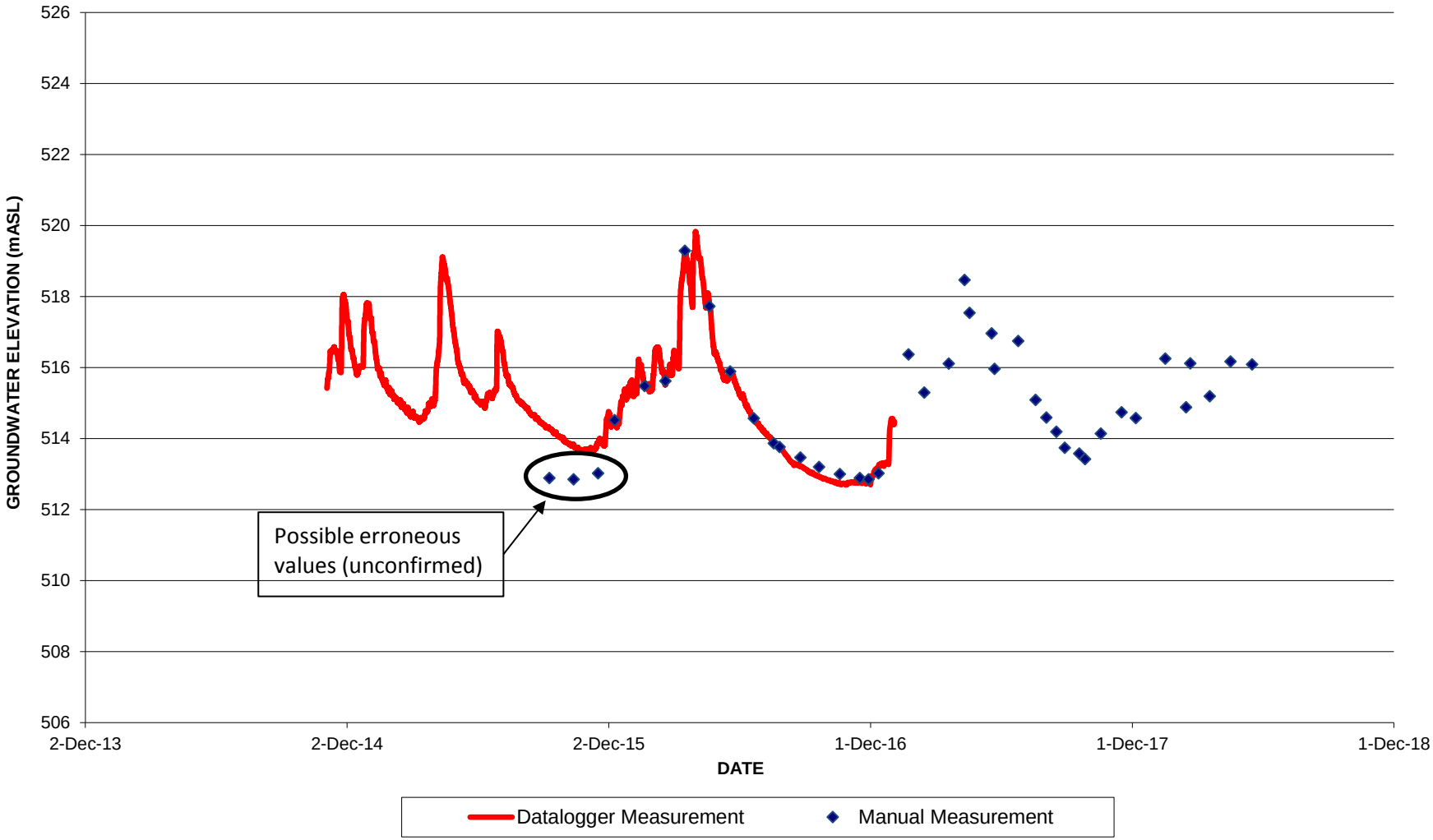


FIGURE C-27

GROUNDWATER HYDROGRAPH
NW7

FIGURE C-27 (a)

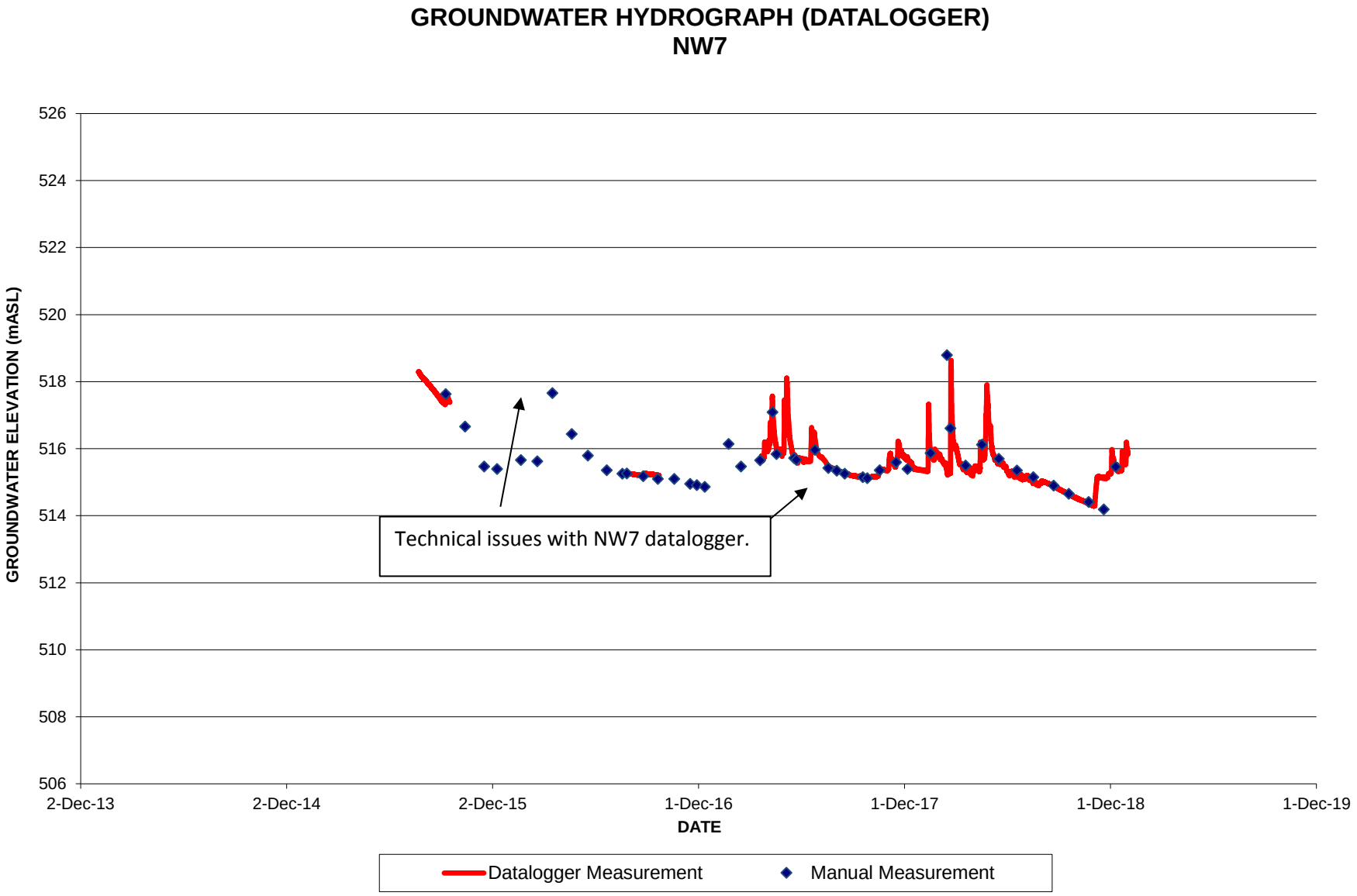

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW7
GROUNDWATER ELEVATION (mASL)
526
524
522
520
518
516
514
512
510
508
506
2-Dec-13
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
1-Dec-19
DATE
Technical issues with NW7 datalogger.
Datalogger Measurement
Manual Measurement

FIGURE C-28

GROUNDWATER HYDROGRAPH
NW8

FIGURE C-28 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW8

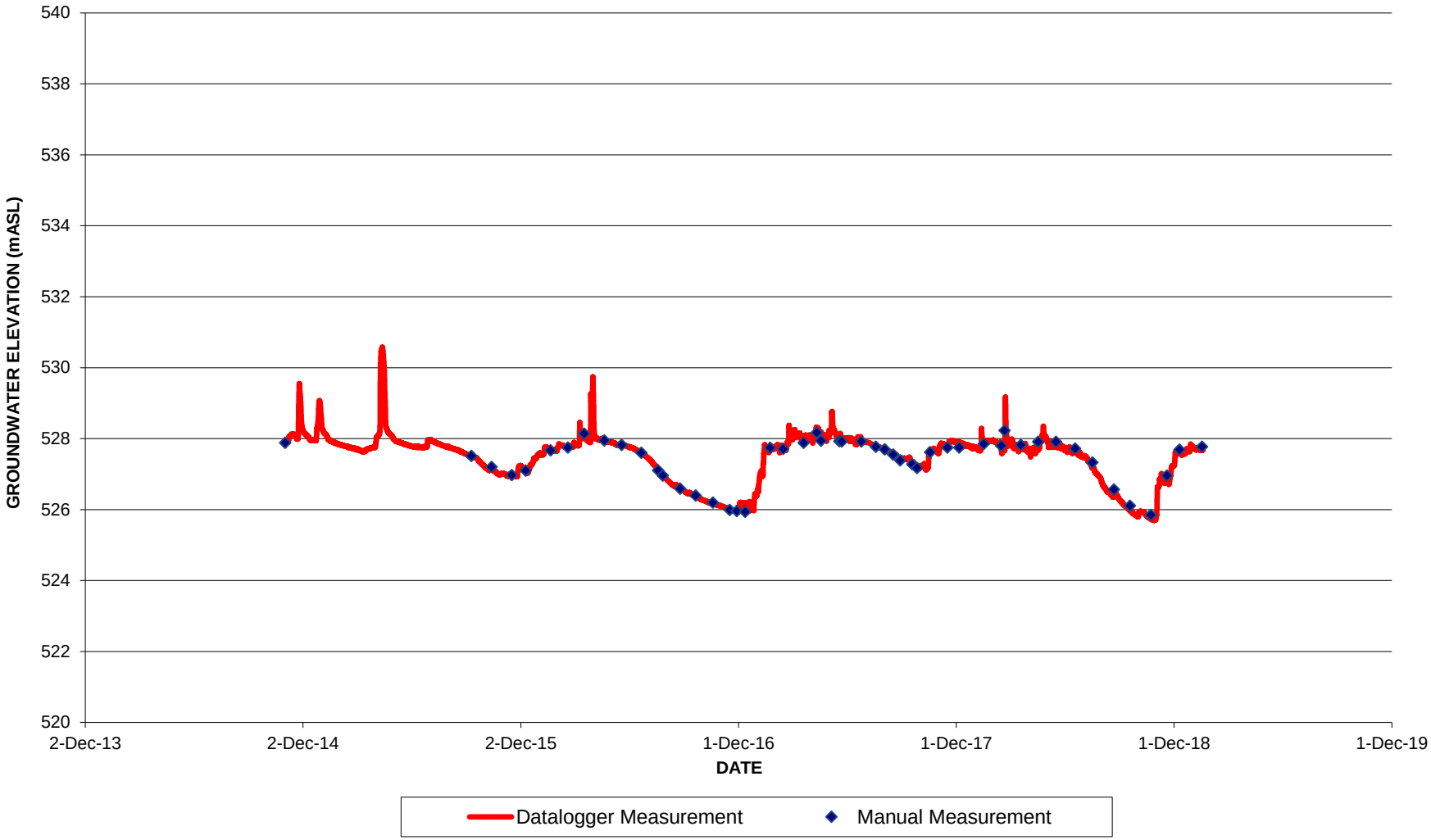


FIGURE C-29

GROUNDWATER HYDROGRAPH
NW9

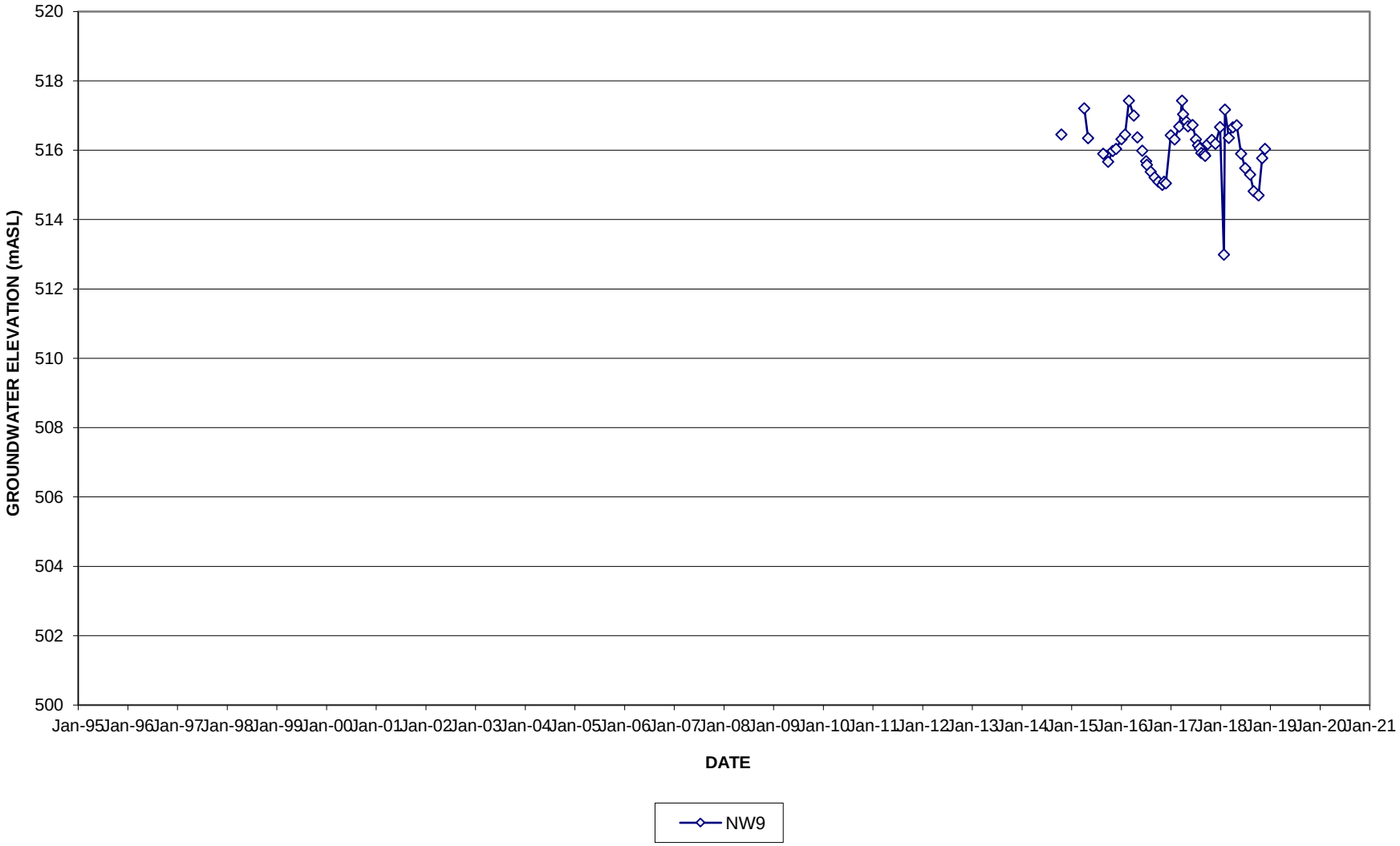


FIGURE C-29 (a)

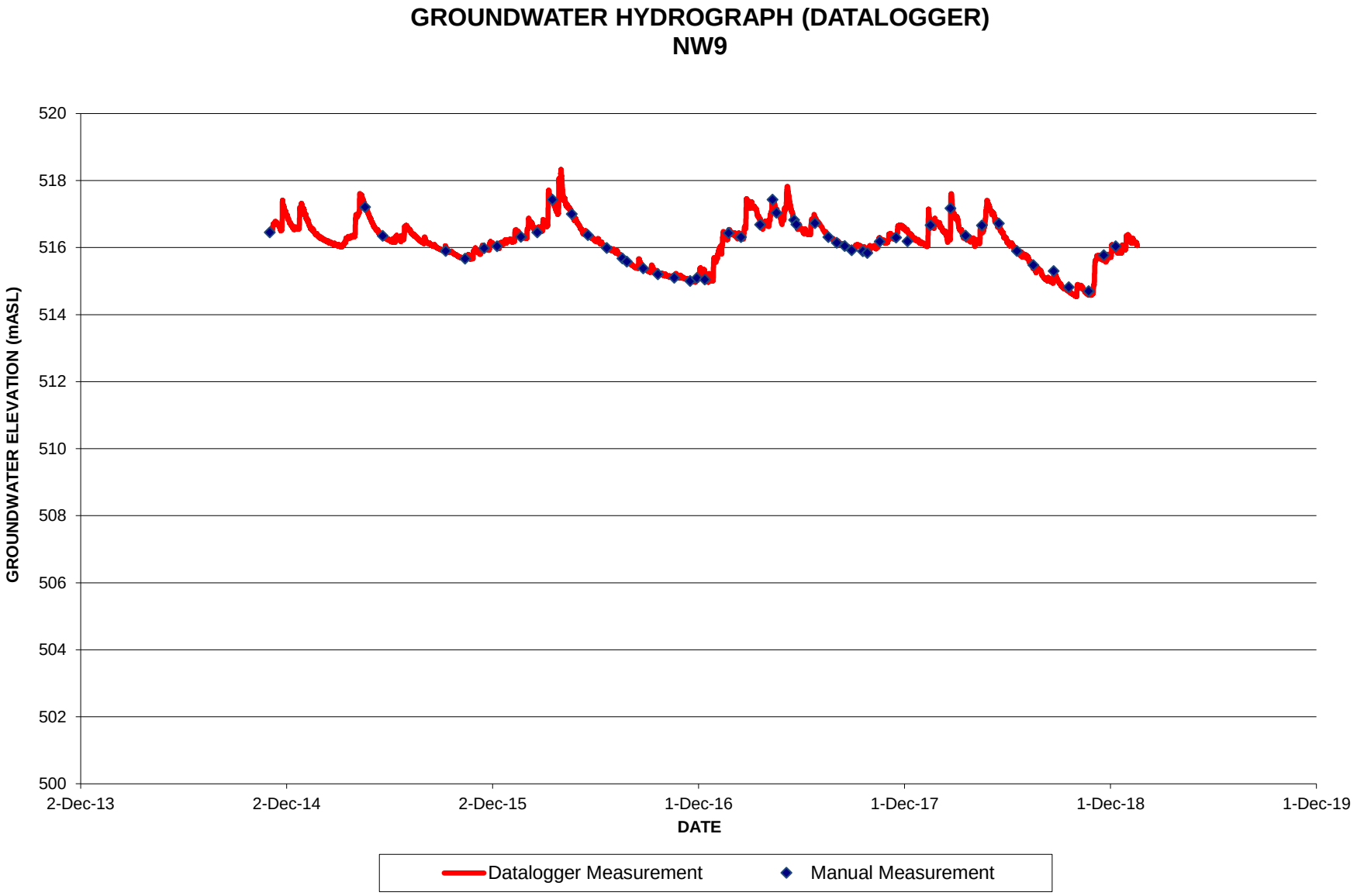

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW9
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
2-Dec-13
2-Dec-14
2-Dec-15
1-Dec-16
1-Dec-17
1-Dec-18
1-Dec-19
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-30

GROUNDWATER HYDROGRAPH
NW10DP, NW10 shallow and NW10 deep

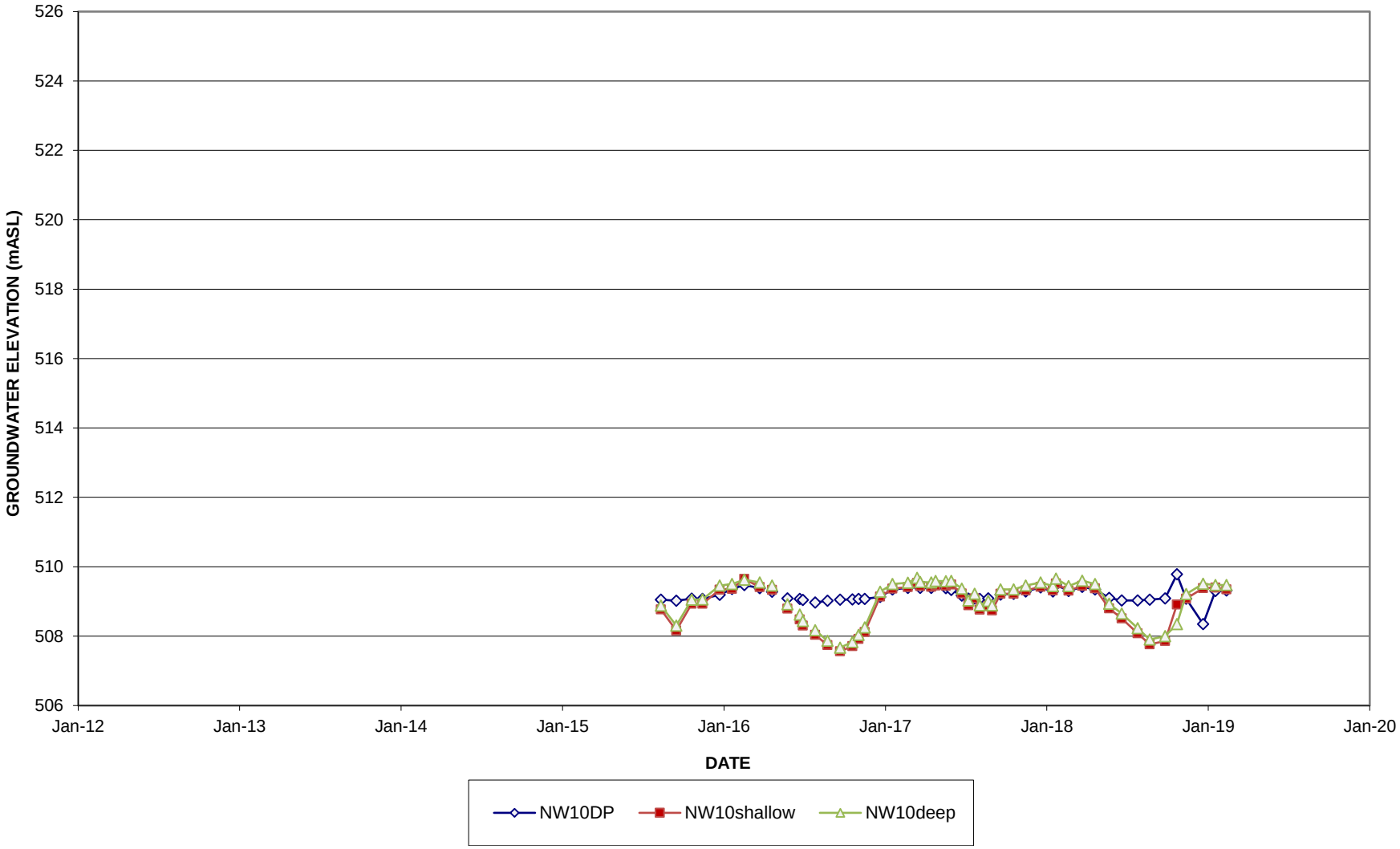


FIGURE C-30 (b)

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW10 MID

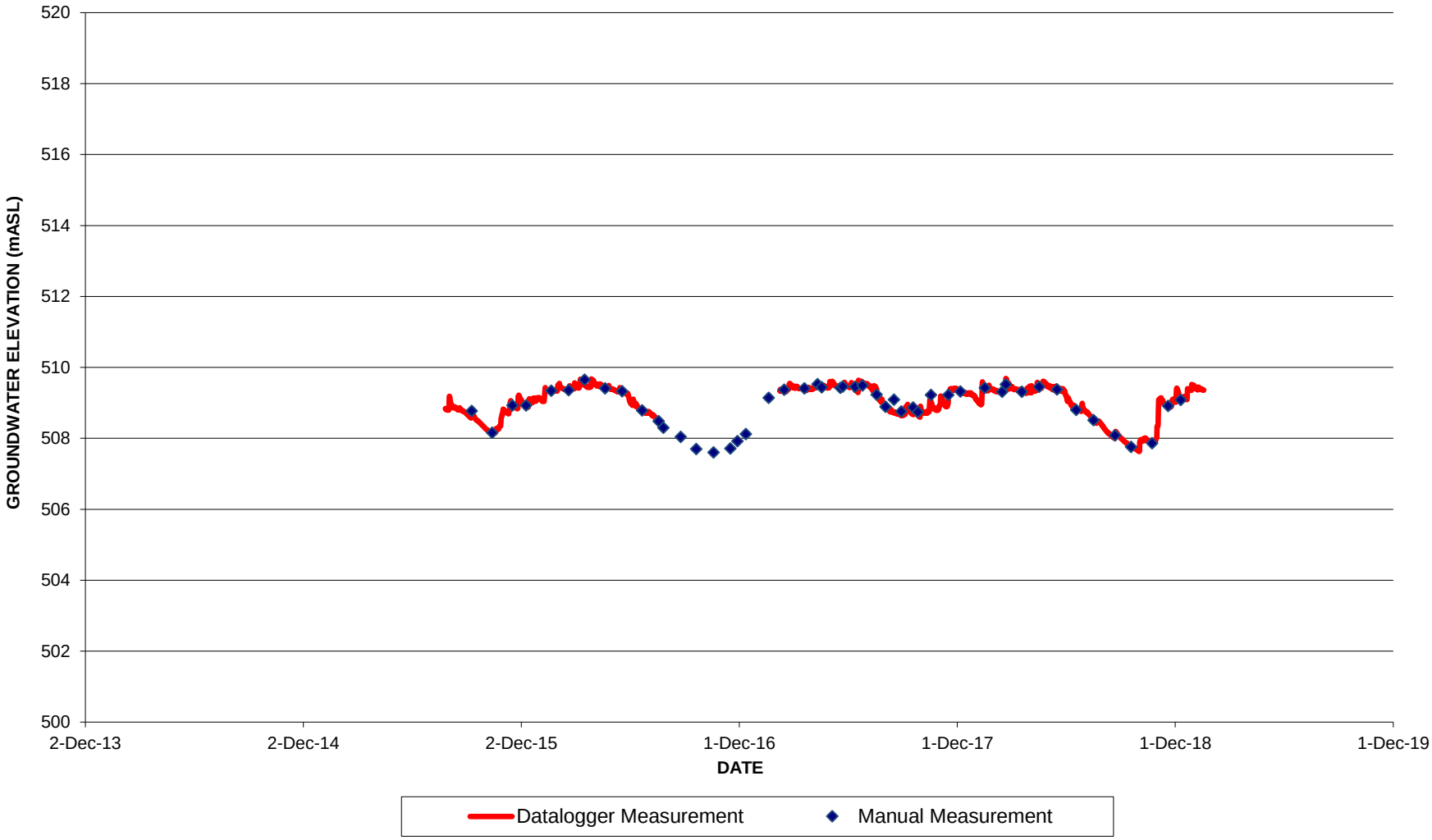


FIGURE C-30 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW10 DP

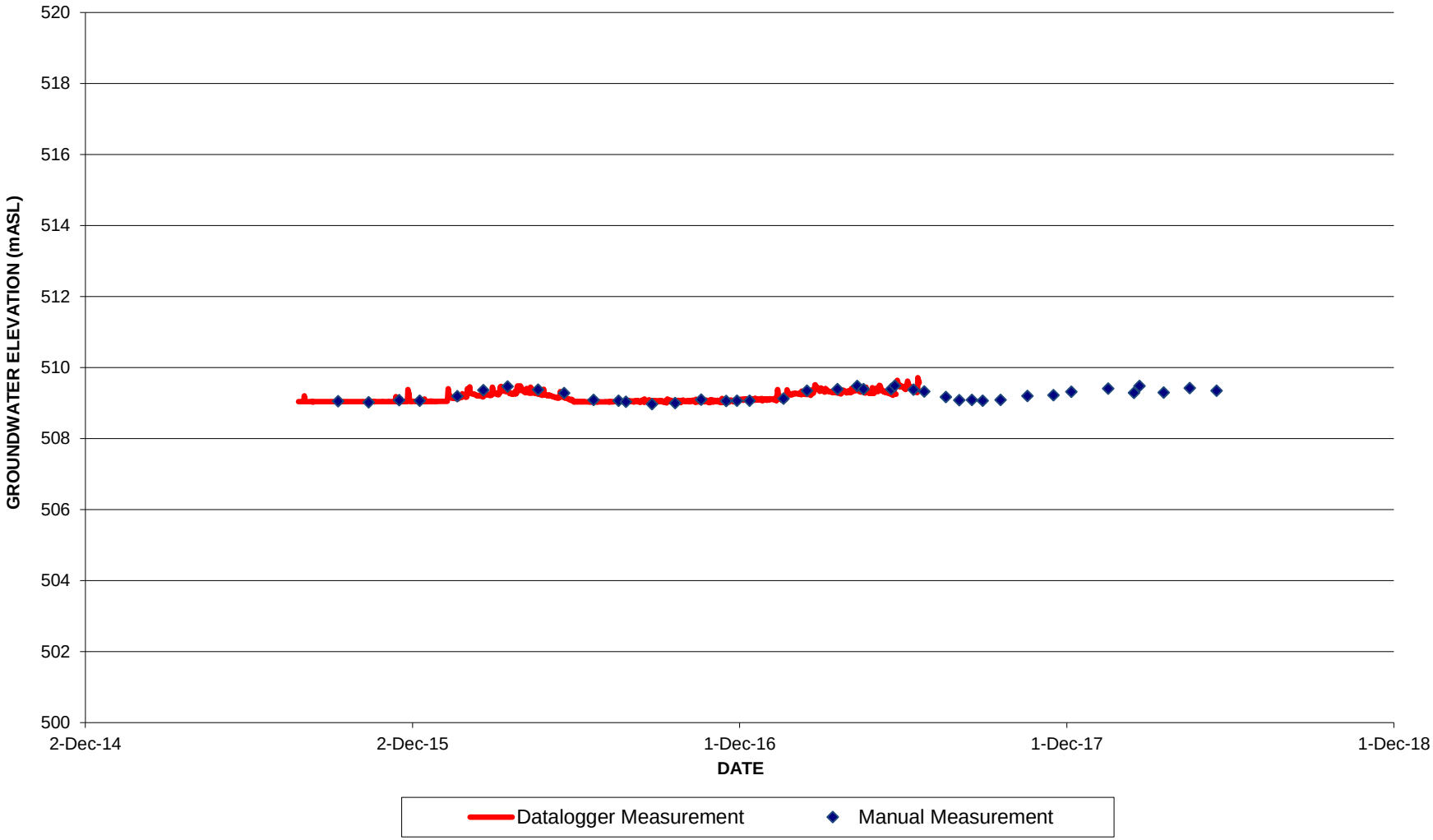
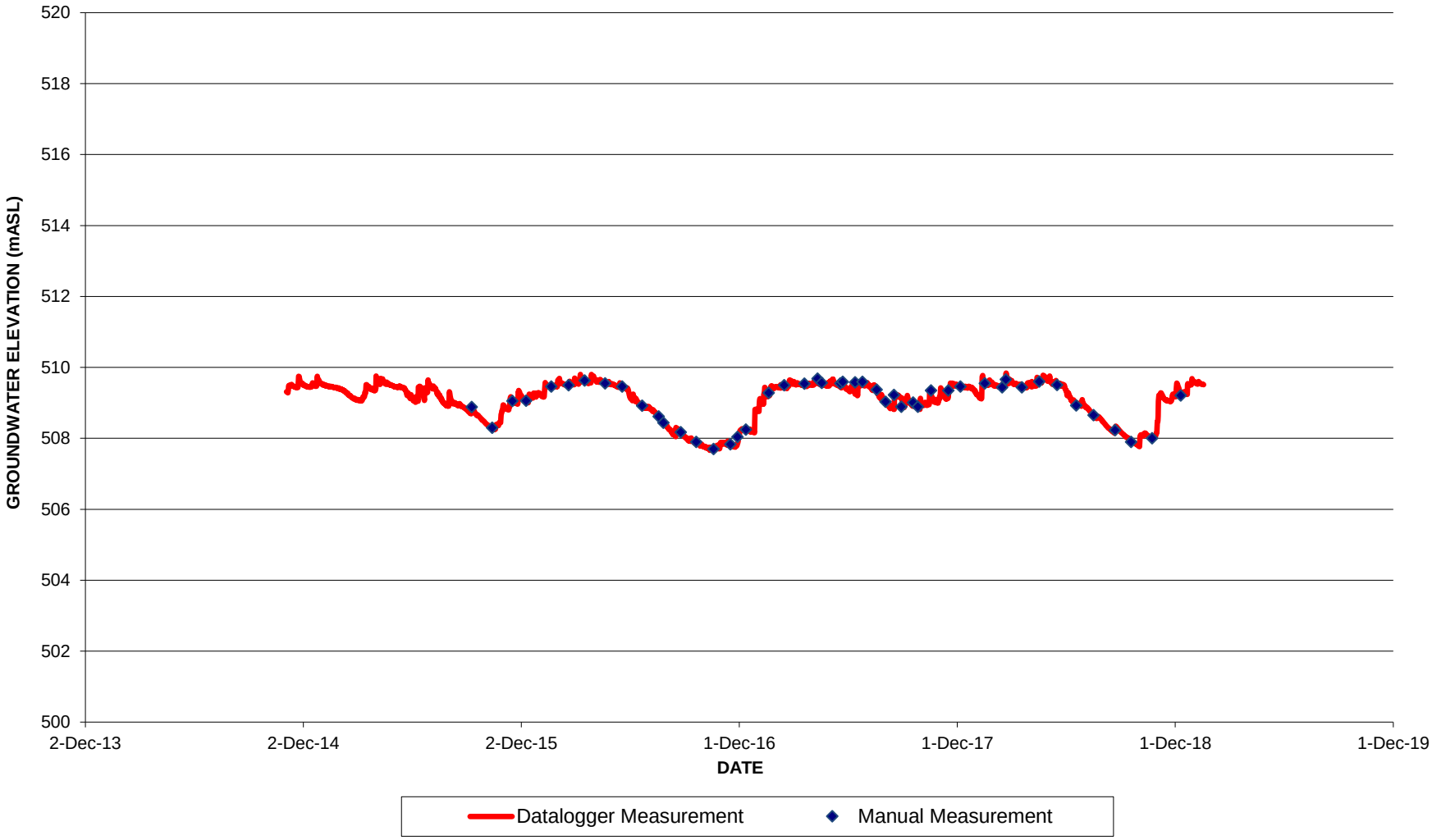


FIGURE C-30 (c)

GROUNDWATER HYDROGRAPH (DATALOGGER)
NW10 DEEP



G:\EPD\01-WAI\Duntroon Quarry\AMP\05 Annual Monitoring Results\Historical Flow Values\Level Logger Data\Hydrograph data\Figure C-30 c NW10deep Datalogger Summary.xlsx

FIGURE C-31

GROUNDWATER HYDROGRAPH
BH03-9

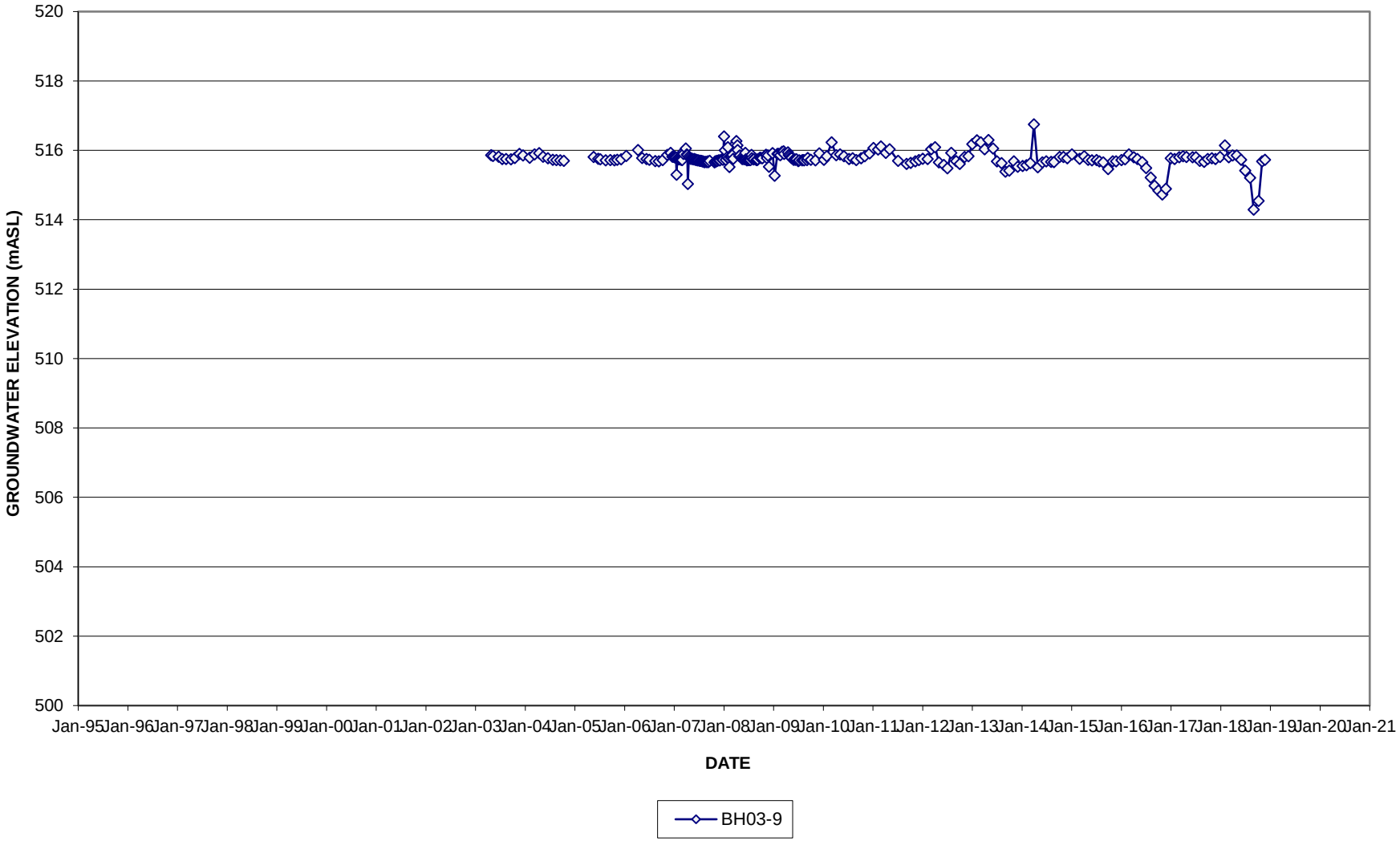


FIGURE C-32

GROUND WATER HYDROGRAPH
TW04-1

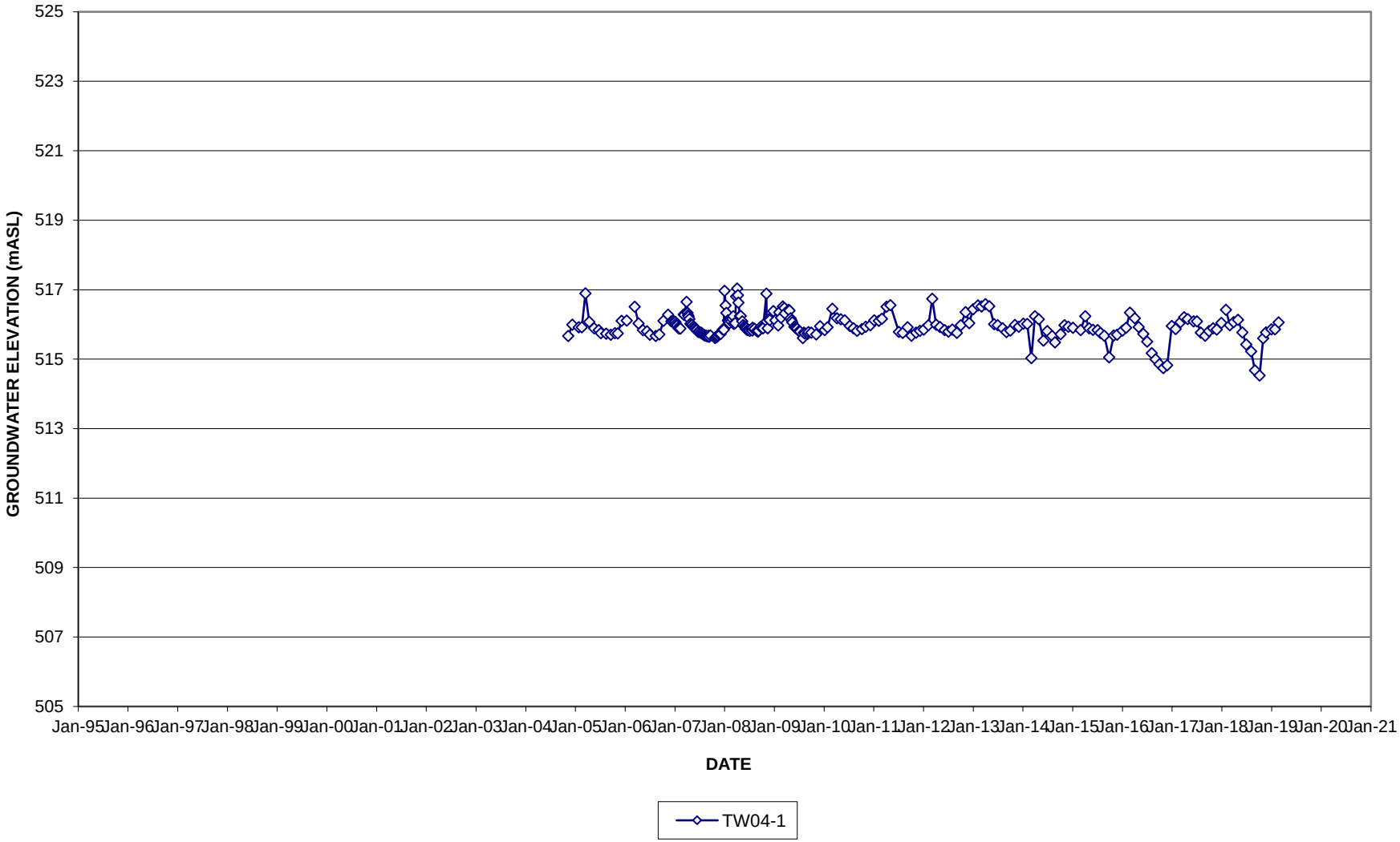


FIGURE C-33

GROUND WATER HYDROGRAPH
TW04-2

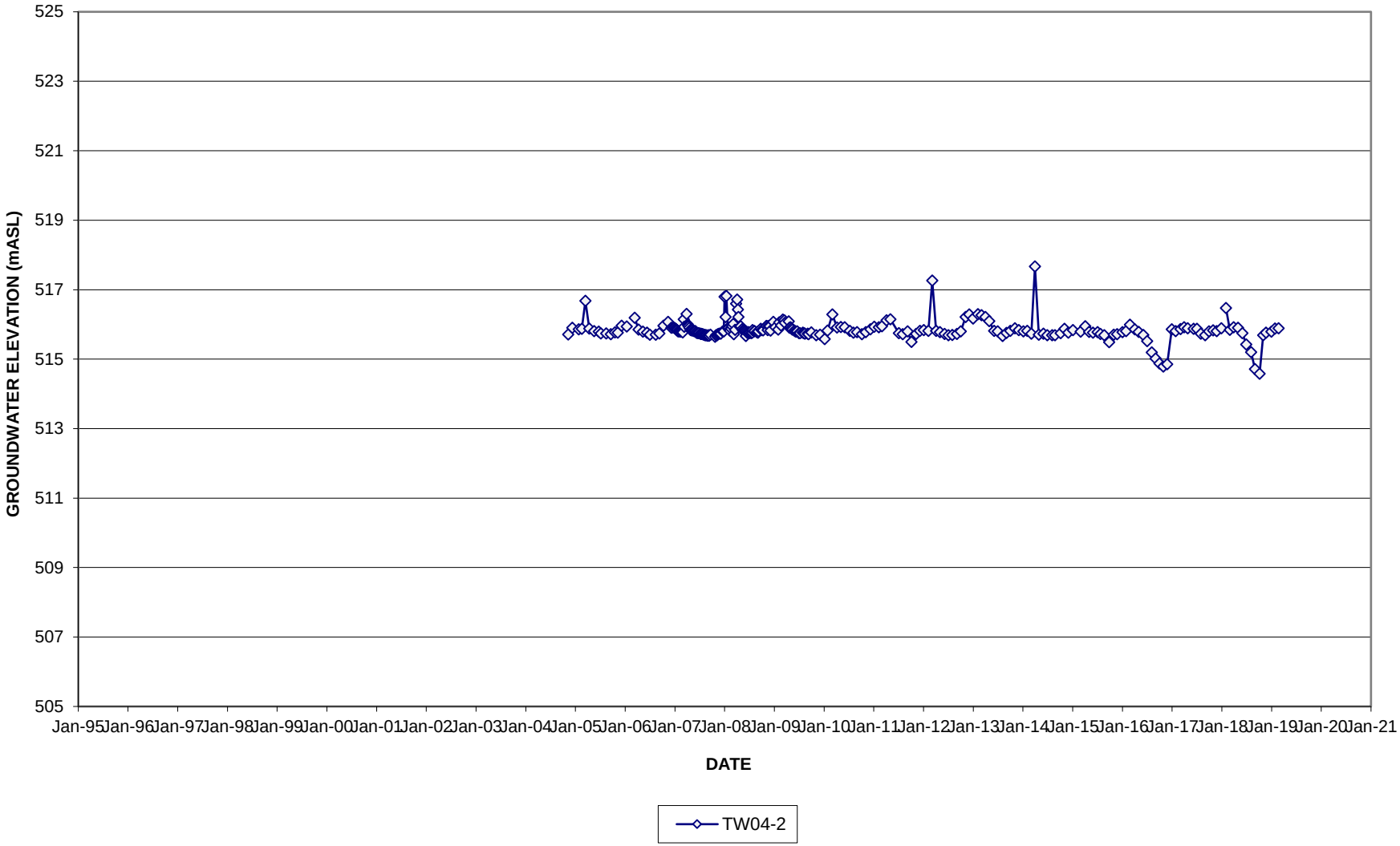


FIGURE C-34

GROUND WATER HYDROGRAPH
TW04-3

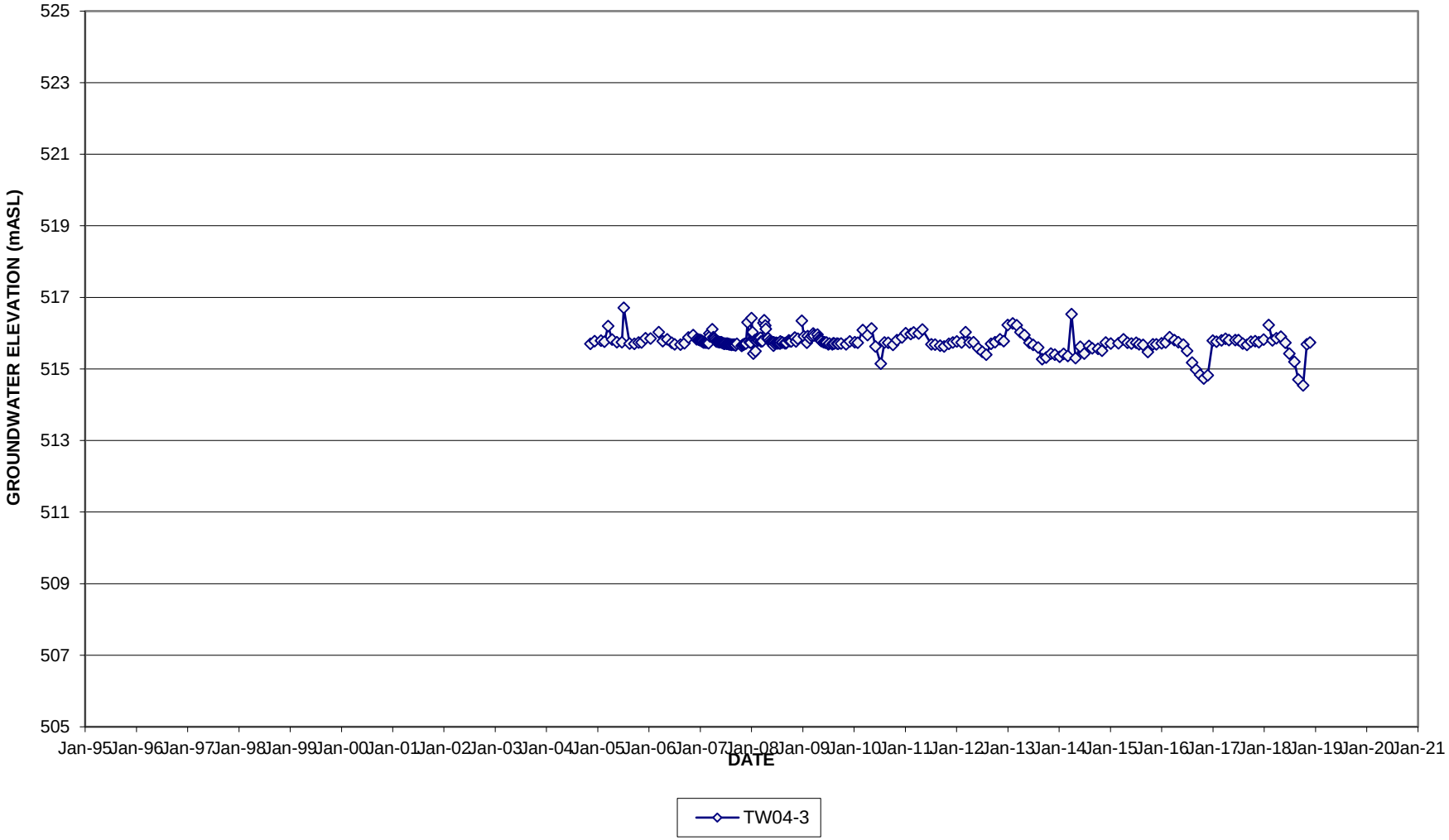


TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
17-Apr-99	500.9	510.3	512.0	513.6	511.8	505.3	502.2	510.5
28-Apr-99	500.5	509.9	512.0	513.1	511.6	504.8	501.8	510.2
26-May-99	500.3	510.2	512.0	512.6	511.7	504.8	501.5	510.4
29-Jun-99	500.1	509.9	511.7	511.9	511.4	504.7	501.3	510.1
26-Jul-99	500.0	509.7	511.4	511.4	511.2	504.4	501.2	510.0
17-Aug-99	499.9	509.7	511.4	511.2	511.2	504.3	501.1	510.0
17-Sep-99	499.7	509.5	511.2	510.8	511.0	503.9	500.9	509.9
21-Nov-99	500.7	510.2	511.6	511.0	511.4	505.0	502.0	510.4
29-Feb-00	500.9	510.3	511.9	511.7	511.5	505.2	502.1	510.5
31-Mar-00	500.8	510.3	511.8	513.3	511.5	505.2	502.0	510.5
2-Jun-00	500.8	510.2	511.8	513.7	511.3	505.2	502.0	510.3
7-Jul-00	500.8	510.0	511.6	513.4	511.1	505.3	502.0	510.2
29-Aug-00	500.4	509.9	510.9	512.0	510.7	504.8	501.6	510.1
9-Nov-00	500.3	509.9	510.5	511.3	510.3	504.6	501.5	510.0
26-Apr-01	501.1	510.2	512.0	514.3	511.7	505.2	502.3	510.4
5-Jul-01	500.3	509.8	510.3	511.7	510.3	504.8	501.5	509.9
1-Aug-01	500.1	509.5	510.1	511.0	510.0	504.2	501.2	509.6
11-Oct-01	500.2	510.0	510.0	510.1	510.0	504.1	501.5	510.1
14-Dec-01	500.8	510.1	510.9	512.6	510.7	505.1	502.0	510.2
7-Feb-02	500.7	510.0	510.7	512.6	510.5	505.1	501.9	510.1
18-Apr-02	501.3	510.3	512.0	513.0	511.5	505.3	502.5	510.4
13-Jun-02	500.6	509.7	511.0	511.6	510.4	505.1	501.8	509.6
8-Aug-02	500.0	509.3	510.0	510.2	509.9	504.4	501.2	509.5
11-Oct-02	499.8	509.4	509.8	509.9	509.7	505.1	500.9	509.5
9-Dec-02	500.0	509.9	Frozen	509.8	509.7	Frozen	501.2	510.0

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
14-Feb-03	Frozen	509.8	Frozen	513.6	509.9	506.6	501.4	510.0
9-Apr-03	501.3	510.1	Frozen	513.4	511.3	Frozen	Frozen	510.3
15-May-03	500.7	510.1	Frozen	512.9	511.0	506.5	502.0	510.3
17-Jun-03	500.7	509.8	N/A	N/A	510.9	506.3	501.8	510.1
25-Jun-03	500.5	509.7	510.9	512.7	510.7	506.2	501.6	510.0
22-Jul-03	500.3	509.7	510.5	511.9	510.5	506.0	501.4	509.8
20-Aug-03	500.0	509.4	510.0	511.1	510.0	505.4	500.9	509.4
25-Sep-03	499.9	509.5	509.6	510.4	509.6	505.1	501.1	509.6
22-Oct-03	500.2	510.2	510.0	510.0	510.0	506.1	501.5	510.3
25-Nov-03	501.2	510.3	511.6	511.9	511.2	506.4	502.5	510.4
22-Dec-03	501.0	510.2	511.6	512.9	511.0	505.6	502.2	510.4
9-Feb-04	500.5	510.0	Frozen	512.9	510.5	505.4	501.7	510.1
16-Mar-04	501.4	510.2	511.5	513.6	510.7	505.5	502.6	510.3
20-Apr-04	501.1	510.2	512.0	514.3	511.5	505.6	502.3	510.4
18-May-04	500.8	510.0	511.4	513.7	510.7	505.5	501.9	510.2
22-Jun-04	500.5	509.8	510.8	513.2	510.7	505.5	501.6	509.9
28-Jul-04	500.2	509.6	510.3	511.9	510.2	505.2	501.3	509.8
25-Aug-04	500.0	509.2	509.6	511.0	509.5	504.6	501.2	509.3
22-Sep-04	499.9	509.2	509.2	510.3	509.1	504.3	501.1	509.8
19-Oct-04	499.9	509.3	509.0	509.8	509.0	504.2	501.1	509.4
16-Nov-04	500.0	509.3	508.6	509.6	508.6	504.1	501.1	509.3
16-Dec-04	500.4	510.1	Frozen	509.5	510.0	505.6	501.7	510.3
31-Jan-05	501.0	510.0	511.2	512.4	510.7	505.5	Frozen	510.2
24-Feb-05	500.7	510.0	510.6	512.3	510.3	505.6	501.8	509.6
22-Mar-05	500.6	509.9	510.3	512.1	510.0	505.5	501.7	510.0

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
20-Apr-05	502.2	510.3	512.0	515.0	511.8	507.0	502.9	510.5
25-May-05	500.7	509.9	512.0	513.9	511.4	505.6	501.8	510.2
29-Jun-05	500.3	509.7	511.7	512.7	511.1	505.4	501.4	509.9
13-Jul-05	500.2	509.5	511.5	512.3	510.9	505.3	501.3	509.8
23-Aug-05	499.9	509.4	511.1	511.3	510.8	505.0	500.5	509.7
26-Sep-05	499.7	509.5	511.1	510.8	510.9	504.6	500.7	509.8
26-Oct-05	499.8	509.7	511.1	510.4	511.1	504.4	500.9	510.0
16-Nov-05	499.9	510.2	511.3	510.2	511.2	504.8	501.0	510.3
14-Dec-05	500.4	510.1	511.2	510.3	511.0	505.4	501.6	510.2
20-Jan-06	501.4	510.3	511.9	512.3	511.4	505.9	502.6	510.4
14-Feb-06	501.1	510.2	Frozen	512.8	511.3	505.6	502.3	510.3
19-Mar-06	501.6	510.2	512.0	514.3	511.6	505.6	Frozen	510.4
17-Apr-06	501.2	510.2	512.0	514.3	511.6	505.5	502.5	510.4
19-May-06	500.6	510.2	512.0	513.6	511.3	505.5	501.8	510.3
19-Jun-06	500.4	509.8	511.2	512.6	510.7	505.4	501.5	510.0
10-Jul-06	500.2	509.6	511.0	511.9	510.7	505.3	501.3	509.8
21-Aug-06	499.9	509.4	510.4	510.9	510.2	504.9	501.0	509.5
18-Sep-06	499.9	509.6	510.4	510.4	510.2	504.7	501.1	509.7
17-Oct-06	500.0	510.2	510.3	510.0	510.2	504.6	501.2	510.2
20-Nov-06	501.2	510.2	511.8	511.8	511.2	505.7	502.5	510.4
15-Dec-06	501.5	510.4	512.0	514.1	511.7	506.1	502.7	510.5
22-Jan-07	500.8	510.1	511.7	513.1	510.9	505.6	502.0	510.3
19-Feb-07	Frozen	510.0	511.2	512.3	510.7	505.5	501.6	509.2
18-Mar-07	501.9	510.2	512.0	513.3	511.5	505.9	Frozen	510.4
15-Apr-07	501.3	510.3	512.0	514.3	511.6	505.7	502.5	510.4

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
17-May-07	500.6	510.3	511.7	513.2	511.1	505.6	501.7	510.4
21-Jun-07	500.3	509.5	510.6	512.1	510.2	505.3	501.4	509.5
17-Jul-07	500.0	509.3	510.5	511.4	510.3	505.2	500.4	509.5
21-Aug-07	499.7	508.7	510.2	510.6	509.9	504.5	500.7	508.8
18-Sep-07	499.8	509.5	510.3	510.2	510.2	504.4	500.9	509.6
19-Oct-07	499.9	509.7	510.3	510.0	510.2	504.3	501.0	509.8
22-Nov-07	500.1	510.2	510.7	510.0	510.5	505.2	501.4	510.3
13-Dec-07	500.6	510.1	511.0	510.2	510.7	505.6	501.8	510.3
24-Jan-08	501.2	510.1	512.0	513.6	511.4	505.5	502.4	510.3
21-Feb-08	501.3	510.3	512.0	513.7	511.6	505.7	502.4	510.4
19-Mar-08	Frozen	510.3	512.0	513.6	511.5	505.8	502.2	510.2
7-Apr-08	502.4	510.4	512.0	515.1	512.0	507.4	503.0	510.5
21-Apr-08	501.4	510.2	512.0	514.8	511.6	505.5	502.5	510.4
20-May-08	500.7	510.0	512.0	513.9	511.4	505.6	501.9	510.3
16-Jun-08	500.5	509.9	511.7	Obstructed	511.1	505.5	501.6	510.2
14-Jul-08	500.3	509.6	511.1	Obstructed	510.7	505.3	501.3	509.8
18-Aug-08	500.3	509.8	511.5	511.5	511.0	505.3	501.4	510.0
15-Sep-08	500.1	510.3	511.2	511.1	511.1	505.3	501.3	510.3
20-Oct-08	500.5	509.8	511.3	511.0	510.9	505.3	501.5	510.0
16-Nov-08	501.4	510.3	511.8	Obstructed	511.6	506.0	502.6	510.4
23-Nov-08	Frozen	510.3	Frozen	Obstructed	511.5	505.8	502.5	Frozen
14-Dec-08	501.5	510.0	511.7	513.1	510.5	505.0	502.5	510.5
18-Jan-09	500.9	510.1	512.0	514.0	511.4	505.6	502.1	510.4
8-Feb-09	500.8	510.3	512.0	513.4	511.4	505.8	502.0	510.4
15-Mar-09	501.7	510.3	512.0	514.7	511.6	505.7	Frozen	510.4

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available
- Broken indicates that the PVC casing was broken off at ground level.

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
12-Apr-09	501.4	510.3	512.0	514.6	511.7	505.9	502.6	510.4
17-May-09	500.8	509.9	512.0	513.8	511.3	505.6	502.0	510.2
14-Jun-09	500.4	509.8	511.7	512.9	511.0	505.4	501.5	510.0
12-Jul-09	500.2	509.6	511.2	512.1	510.7	505.2	501.3	509.8
9-Aug-09	500.1	510.0	511.1	511.5	510.8	505.0	501.2	510.2
13-Sep-09	500.0	509.6	510.9	510.8	510.7	504.6	501.1	509.8
11-Oct-09	500.2	510.1	511.3	510.8	511.0	504.9	501.4	510.2
15-Nov-09	500.5	509.8	511.0	510.6	510.7	505.4	501.5	510.0
13-Dec-09	500.6	510.1	511.3	510.8	511.0	505.5	501.8	510.3
17-Jan-10	500.6	510.2	511.3	511.2	510.9	505.6	501.7	510.2
7-Feb-10	500.7	510.0	511.3	511.7	510.7	505.5	501.8	510.1
14-Mar-10	502.4	510.3	512.0	514.6	511.9	507.2	503.0	510.5
18-Apr-10	500.9	510.0	511.9	513.5	511.3	505.5	502.1	510.3
16-May-10	501.0	509.9	511.9	513.4	511.1	506.4	502.0	510.1
8-Jun-10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
13-Jun-10	500.7	510.1	511.9	512.9	511.3	505.7	501.9	510.3
21-Jul-10	500.6	510.0	511.9	512.5	511.3	505.7	501.8	510.2
16-Aug-10	500.4	509.8	511.5	512.1	511.0	505.4	501.4	510.0
12-Sep-10	500.2	509.7	511.2	511.5	510.8	505.2	501.2	509.9
17-Oct-10	500.5	509.9	511.3	511.4	511.0	505.3	501.5	510.1
14-Nov-10	500.9	510.1	511.8	512.0	511.3	505.6	502.1	510.3
19-Dec-10	500.8	510.2	512.0	512.9	511.4	505.7	502.0	510.4
16-Jan-11	501.0	510.2	512.0	513.6	511.4	505.6	502.2	510.4
20-Feb-11	501.5	510.2	512.0	513.4	511.5	506.0	Frozen	510.4

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
13-Mar-11	501.3	510.3	512.0	513.8	511.5	505.7	502.5	510.4
17-Apr-11	501.2	510.3	512.0	514.3	511.6	505.6	502.5	510.5
15-May-11	501.4	510.3	512.0	514.4	511.8	506.1	502.7	510.5
13-Jun-11	500.8	510.0	512.0	513.8	511.4	505.7	502.0	510.3
17-Jul-11	500.3	509.6	511.4	512.7	510.7	505.3	501.4	509.9
14-Aug-11	500.1	509.6	511.0	511.9	510.7	505.1	501.2	509.8
18-Sep-11	500.0	509.5	510.6	511.0	510.4	504.7	501.1	509.7
17-Oct-11	500.4	510.2	511.0	510.8	511.2	505.6	501.5	510.2
20-Nov-11	500.4	510.0	511.2	510.9	510.9	505.4	501.5	510.2
18-Dec-11	501.1	510.3	512.0	512.3	511.4	505.8	502.3	510.4
15-Jan-12	500.8	510.1	511.8	512.6	511.1	505.6	502.0	510.3
19-Feb-12	500.7	509.8	511.6	512.7	511.0	505.3	501.6	510.0
18-Mar-12	501.8	510.3	512.0	514.5	511.7	506.0	502.8	510.5
15-Apr-12	500.6	509.9	512.0	513.5	511.3	505.5	501.7	510.2
13-May-12	500.7	509.9	511.8	513.0	511.2	505.6	501.8	510.1
17-Jun-12	500.3	509.7	511.3	512.1	510.8	505.4	501.4	509.9
15-Jul-12	500.4	509.5	510.9	511.4	510.7	504.9	501.1	509.7
12-Aug-12	500.1	510.1	511.3	510.9	511.1	505.4	501.4	510.2
16-Sep-12	500.1	509.8	510.9	510.6	510.7	504.7	501.2	509.9
14-Oct-12	500.4	510.2	511.3	510.9	511.1	505.5	501.6	510.3
18-Nov-12	501.1	510.1	511.9	512.7	511.4	505.6	502.4	510.3
16-Dec-12	500.8	510.3	512.0	513.0	511.4	505.8	502.1	510.4
13-Jan-13	502.2	510.3	512.0	514.4	511.8	506.4	502.9	510.5
17-Feb-13	500.8	510.1	512.0	513.8	511.4	505.6	502.0	510.3
17-Mar-13	501.5	510.2	512.0	512.8	511.6	505.7	502.8	510.4
14-Apr-13	502.1	510.4	512.0	513.8	511.7	506.2	502.9	510.5
12-May-13	500.8	510.1	512.0	513.9	511.5	505.6	502.0	510.3
16-Jun-13	500.7	510.0	512.0	513.4	511.3	505.6	501.7	510.2
14-Jul-13	500.6	509.9	511.8	512.7	511.2	505.5	501.7	510.1

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
18-Aug-13	500.3	509.8	511.5	512.0	511.1	505.3	501.6	510.0
15-Sep-13	500.3	509.6	511.3	511.4	511.0	505.2	501.4	509.6
13-Oct-13	500.8	510.1	511.8	512.1	511.3	505.5	501.9	510.3
17-Nov-13	501.0	510.4	512.0	513.5	511.7	506.1	502.4	510.5
16-Dec-13	500.9	510.1	512.0	513.7	511.4	505.7	502.1	510.3
19-Jan-14	500.9	510.2	512.0	513.4	511.4	505.7	502.0	510.4
16-Feb-14	Buried	510.0	511.8	512.5	511.2	Buried	501.5	510.2
16-Mar-14	buried	510.1	511.7	512.1	511.2	Buried	501.5	510.3
13-Apr-14	502.4	510.4	512.0	515.1	512.0	508.0	503.0	510.6
11-May-14	501.1	510.1	512.0	514.2	511.5	505.7	502.3	510.3
15-Jun-14	500.4	509.8	511.8	513.1	511.2	505.5	501.5	510.0
13-Jul-14	500.3	509.8	511.7	512.2	511.2	505.3	501.4	510.1
17-Aug-14	500.1	510.0	511.5	511.5	511.2	505.1	501.2	510.1
7-Sep-14	500.1	509.9	511.3	511.1	511.1	505.0	501.3	510.1
19-Oct-14	500.7	510.3	511.8	511.1	511.4	505.6	501.9	510.4
16-Nov-14	501.0	510.1	512.0	512.2	511.4	505.5	502.2	510.3
14-Dec-14	500.7	510.1	511.9	512.9	511.4	505.5	501.9	510.3
18-Jan-15	500.6	510.0	511.9	513.3	511.4	505.5	501.8	510.3
15-Mar-15	500.5	510.3	512.0	512.6	511.6	506.0	501.7	510.4
19-Apr-15	501.4	510.3	512.0	514.1	511.6	505.7	502.7	510.5
17-May-15	500.6	509.8	511.9	513.0	511.4	505.5	501.6	510.1
14-Jun-15	500.3	510.1	511.7	512.3	511.3	505.4	501.4	510.2
19-Jul-15	500.5	509.8	511.7	512.3	511.3	505.4	501.6	510.0
9-Aug-15	500.2	509.7	511.6	511.8	511.2	505.3	501.3	510.0
6-Sep-15	500.1	509.8	511.4	511.4	511.3	505.0	501.2	510.1
11-Oct-15	500.0	509.7	511.3	511.0	511.3	504.8	501.7	509.9
15-Nov-15	500.8	510.1	511.6	510.7	511.3	Destroyed	501.8	510.3
6-Dec-15	500.7	510.0	511.6	510.8	511.3		501.8	510.1

NOTE:
- Frozen / buried indicates monitor frozen and/or snow covered.
- N/A indicates water level not available
- Destroyed indicates that the monitor is no longer accessible for monitoring

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
17-Jan-16	500.8	510.0	511.8	511.9	511.3		502.0	510.2
14-Feb-16	501.0	510.1	512.0	512.8	511.4		502.2	510.3
13-Mar-16	502.1	510.4	512.0	515.0	511.8		502.9	510.5
17-Apr-16	501.6	510.5	512.0	514.7	511.6		502.3	510.4
15-May-16	500.7	510.0	512.0	513.7	511.4		501.9	510.2
19-Jun-16	500.4	509.6	511.7	512.6	511.2		501.4	509.9
17-Jul-16	500.1	509.5	511.4	511.8	511.1		501.1	509.8
21-Aug-16	499.9		511.3	511.1	511.1		501.0	
18-Sep-16	499.9	509.7	511.3	510.8	511.1		501.0	509.9
16-Oct-16	500.0	509.9	511.2	510.6	511.2		501.1	510.0
13-Nov-16	500.0	509.8	511.2	510.4	511.1		501.2	510.0
11-Dec-16	500.4	510.0	511.4	510.3	511.2		501.5	510.1
15-Jan-17	501.3	510.3	512.0	512.1	511.5		502.5	510.4
12-Feb-17	500.8	510.0	512.0	512.5	511.4		502.0	510.3
19-Mar-17	500.9	510.1	512.0	513.8	511.5		502.1	510.3
16-Apr-17	501.4	510.2	512.0	514.3	511.6		502.6	510.4
11-May-17	501.4	510.1	512.0	514.7	511.6		502.5	510.4
25-Jun-17	501.3	510.1	512.0	514.0	511.6		502.5	510.4
19-Jul-17	501.6	509.8	512.0	513.2	511.4		501.7	510.1
17-Aug-17	500.4	509.9	511.8	512.4	511.3		501.5	510.0
17-Sep-17	500.3	510.0	511.7	511.8	511.3		501.3	510.2
15-Oct-17	500.9	510.2	511.9		511.5		502.0	510.3
14-Nov-17	500.8	510.3	512.0				502.1	510.4
11-Dec-17	501.8	509.7	511.9	513.0	511.4		501.9	510.2
14-Jan-18	Frozen	510.3	512.0	513.5	511.7		Frozen	510.4
18-Feb-18	502.4	510.4	512.1	514.8	512.1		503.0	510.6
18-Mar-18	500.7	510.0	512.0	513.6	511.5		501.8	510.2
15-Apr-18	501.5	510.3	512.0	514.0	511.7		502.6	510.5

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

TABLE C-5
GROUNDWATER ELEVATIONS

DUNTROON QUARRY - 2017 AMP SUMMARY REPORT

OSPREY PROPERTY MONITORS

111-53312-01 A61

DATE	101-B	102-C	103-D	104-A	OW1-4	OW3-1	OW5-2	OW6-3
17-May-18	500.9	510.1	512.0	513.9	511.5		502.1	510.3
18-Jun-18	500.4	509.6	512.2	512.9	511.2		501.3	509.8
17-Jul-18	500.1	509.5	511.6	512.1	511.2		501.1	510.0
22-Aug-18	499.9	509.6		511.4	511.2		501.0	509.8
18-Sep-18	499.9	509.6	511.3	511.0	511.1		500.9	509.8
23-Oct-18	500.0	509.7	511.3	510.6	511.2		501.1	509.9
19-Nov-18	500.6	510.5	511.7	511.0	511.4		501.8	509.8
10-Dec-18	501.2	510.1	511.9	512.0	511.4		502.3	510.3

NOTE:
- Frozen indicates monitor frozen and/or snow covered.
- N/A indicates water level not available

FIGURE C-35

GROUNDWATER HYDROGRAPH
101-B

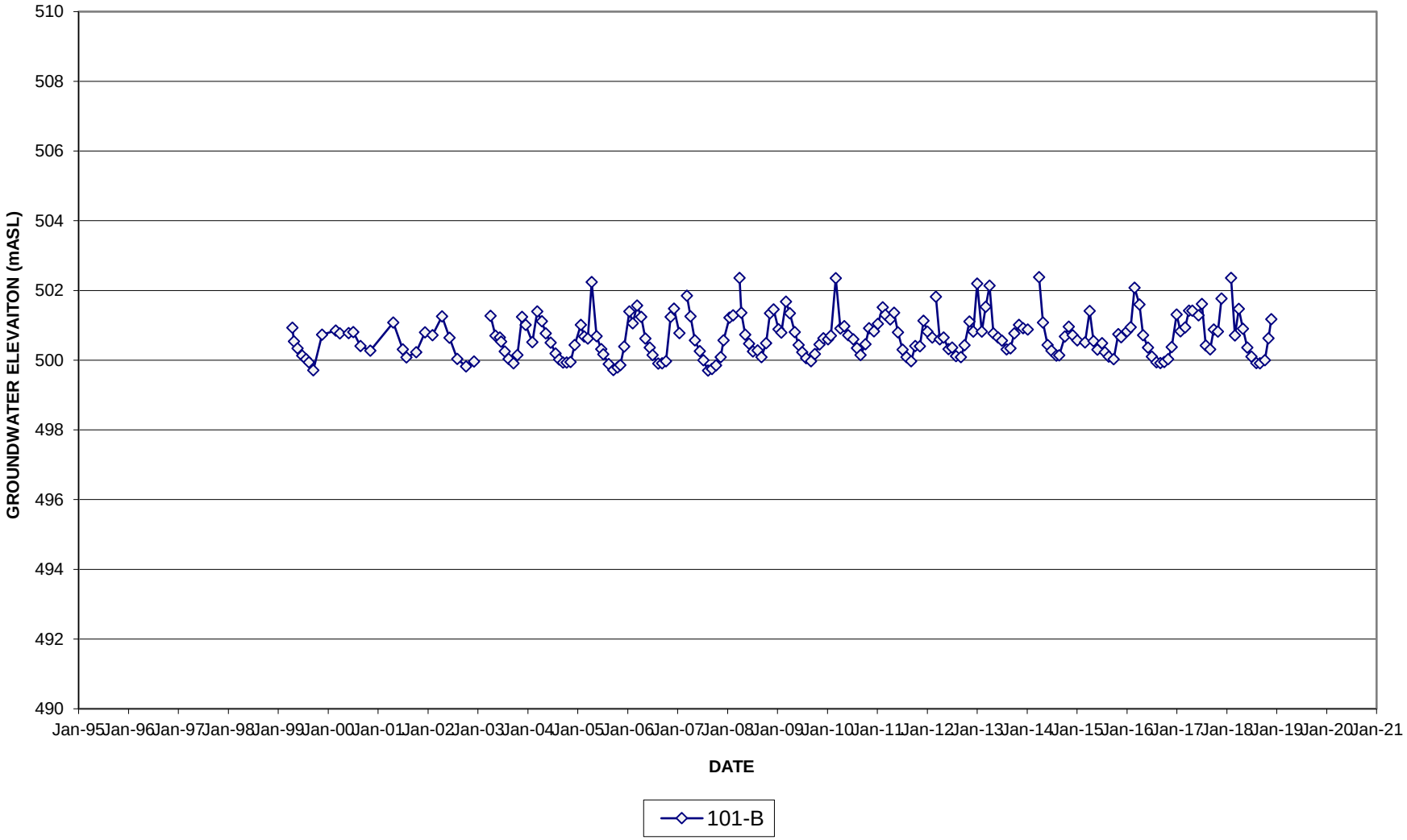


FIGURE C-36

GROUNDWATER HYDROGRAPH
102-C

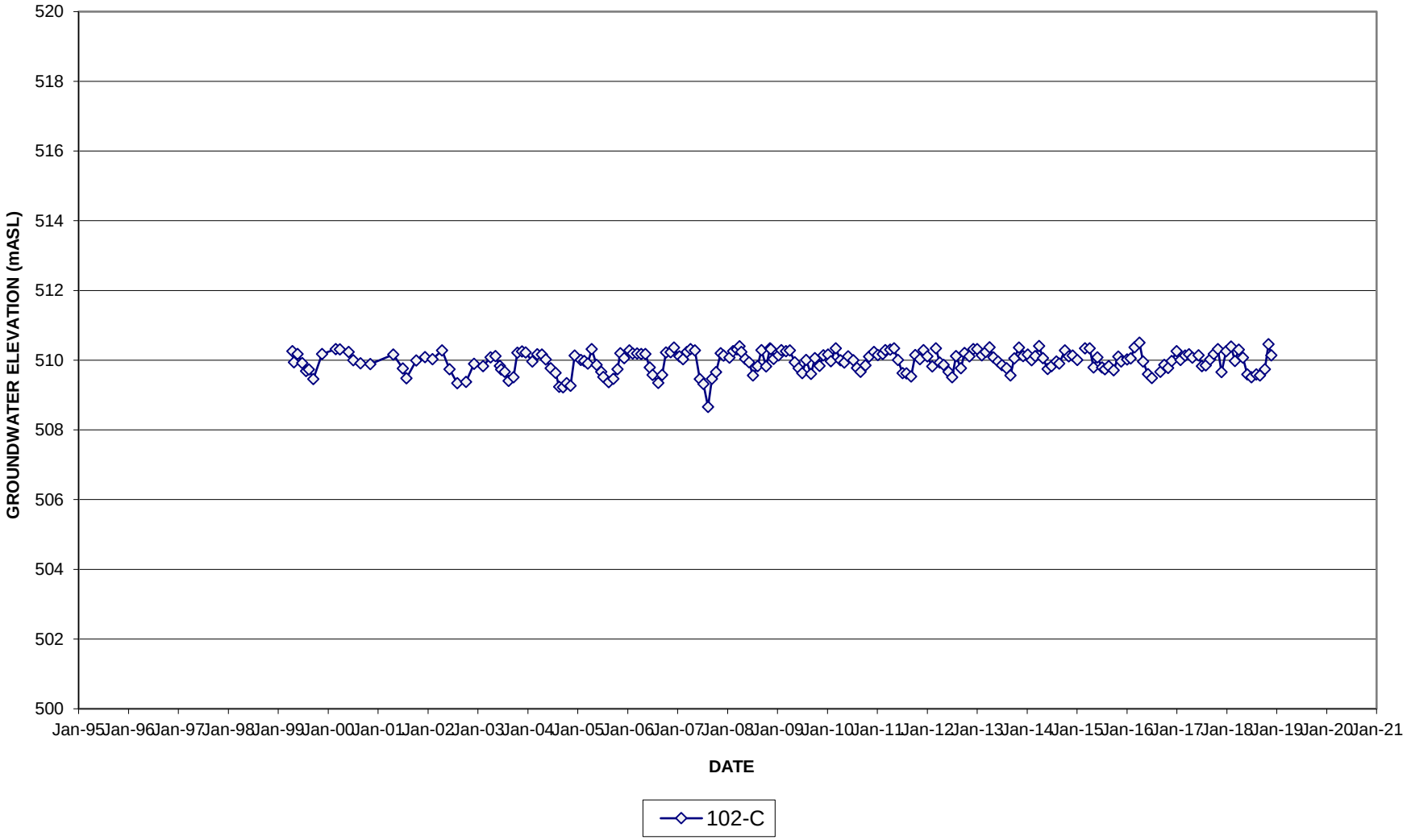


FIGURE C-37

GROUNDWATER HYDROGRAPH
103-D

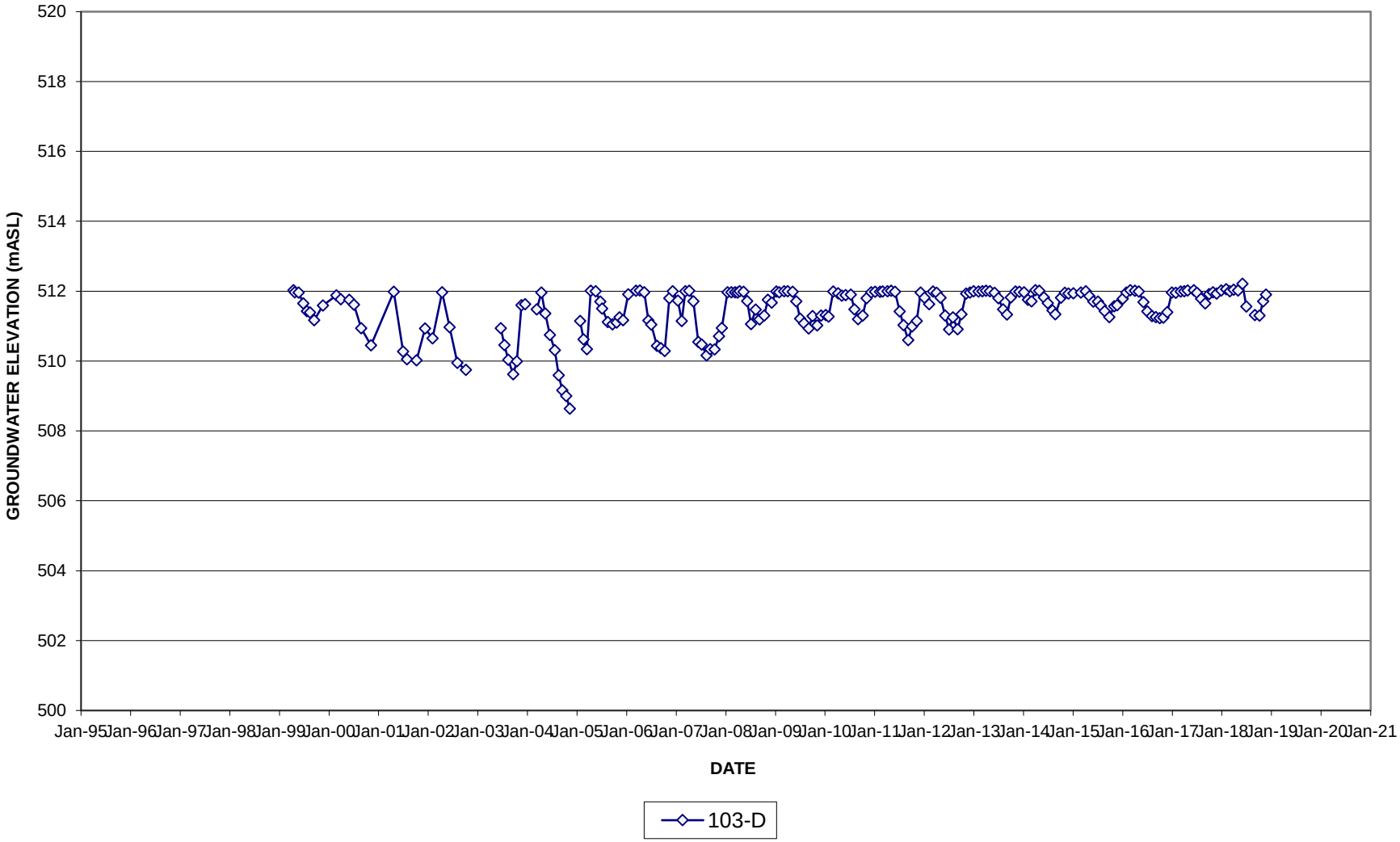


FIGURE C-38

GROUNDWATER HYDROGRAPH
104-A

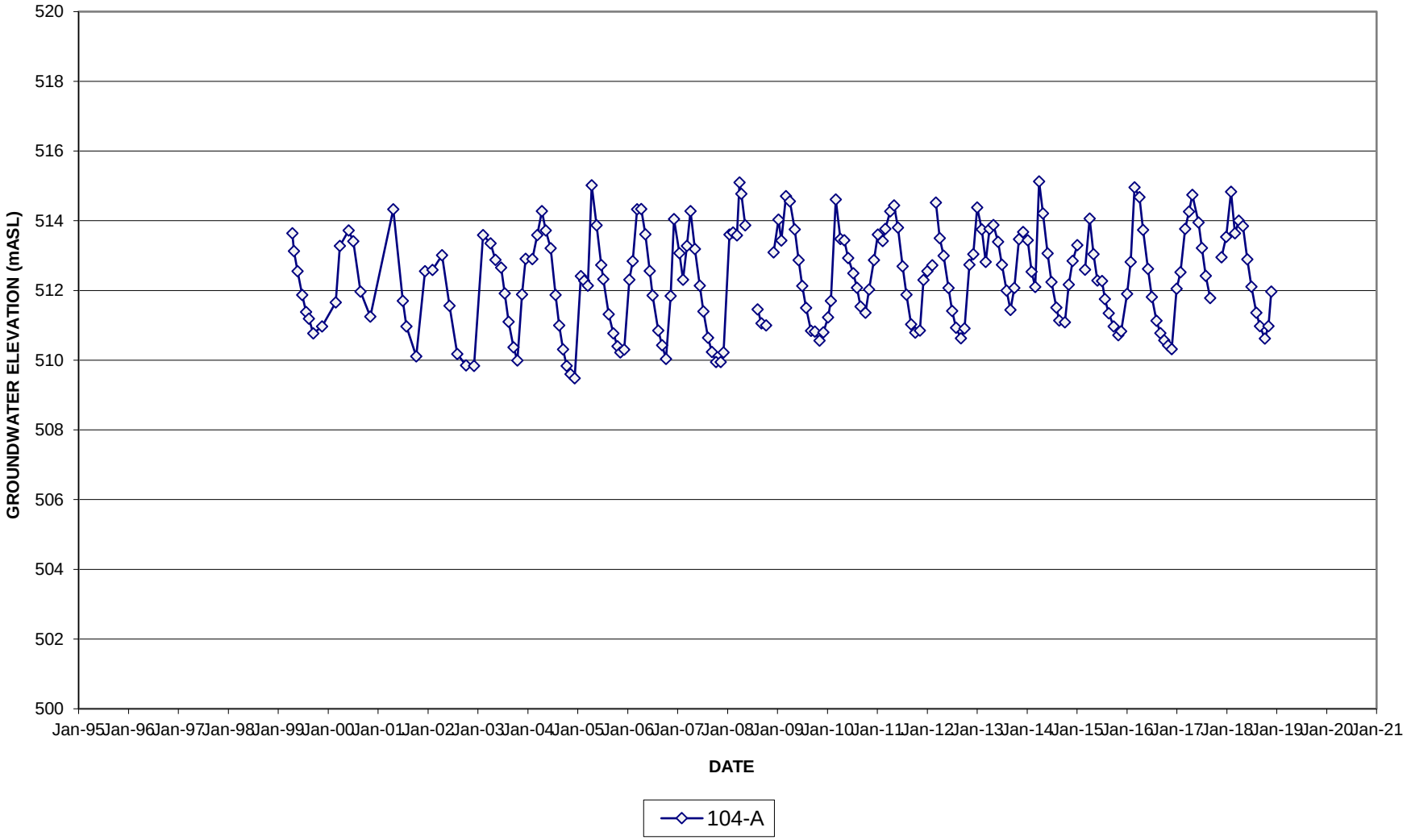


FIGURE C-39

GROUNDWATER HYDROGRAPH
OW1-4

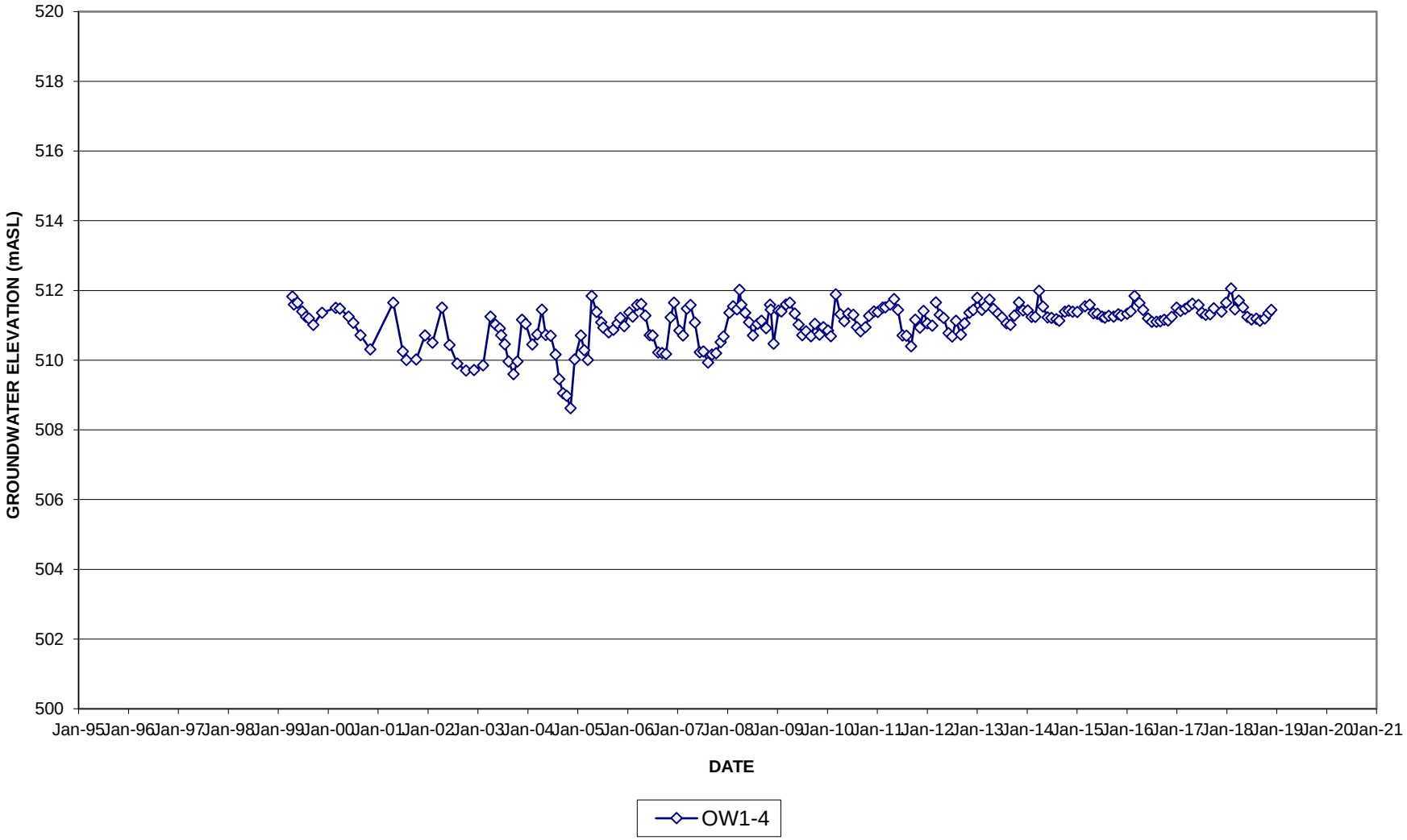


FIGURE C-40

GROUNDWATER HYDROGRAPH
OW3-1

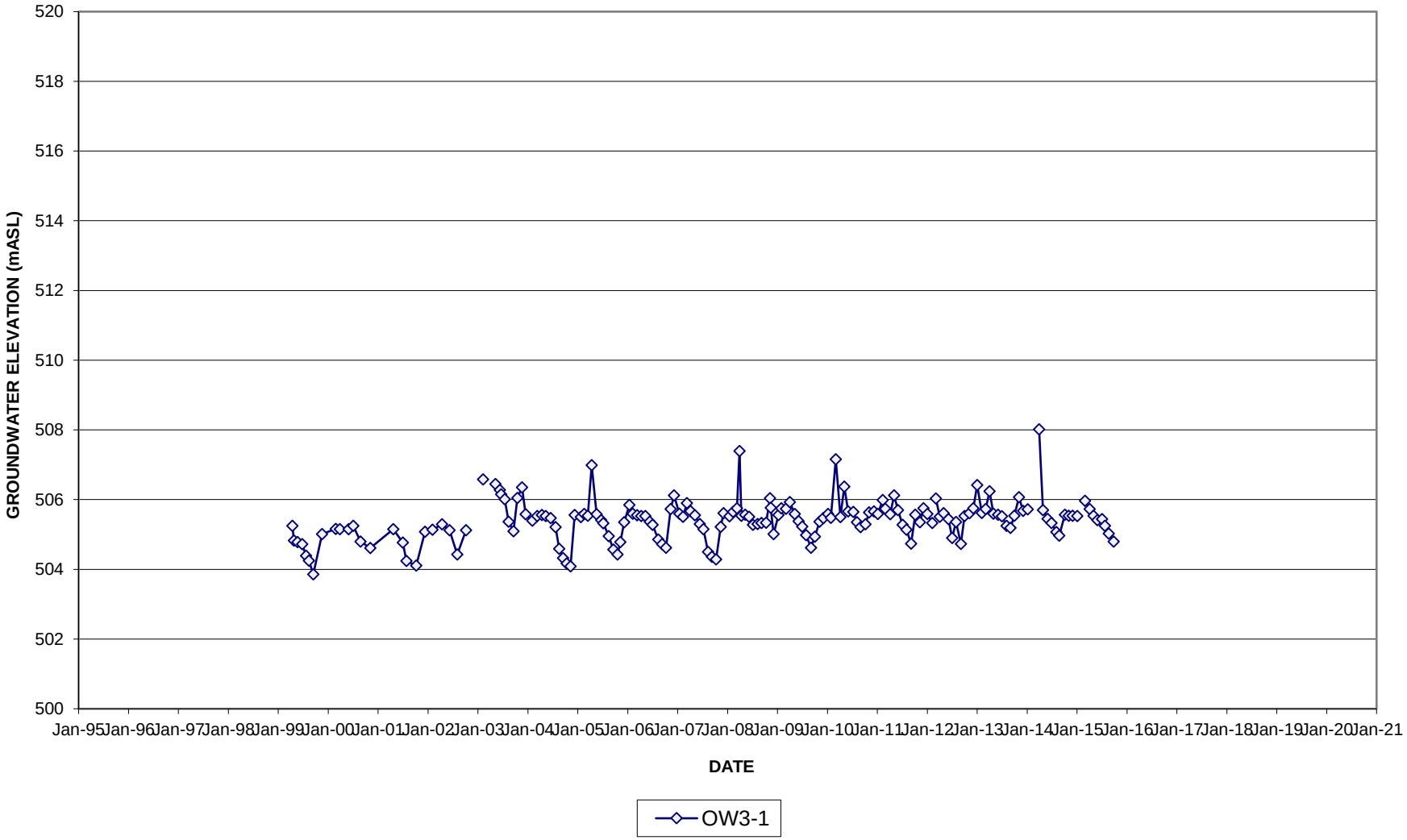


FIGURE C-41

GROUNDWATER HYDROGRAPH
OW5-2

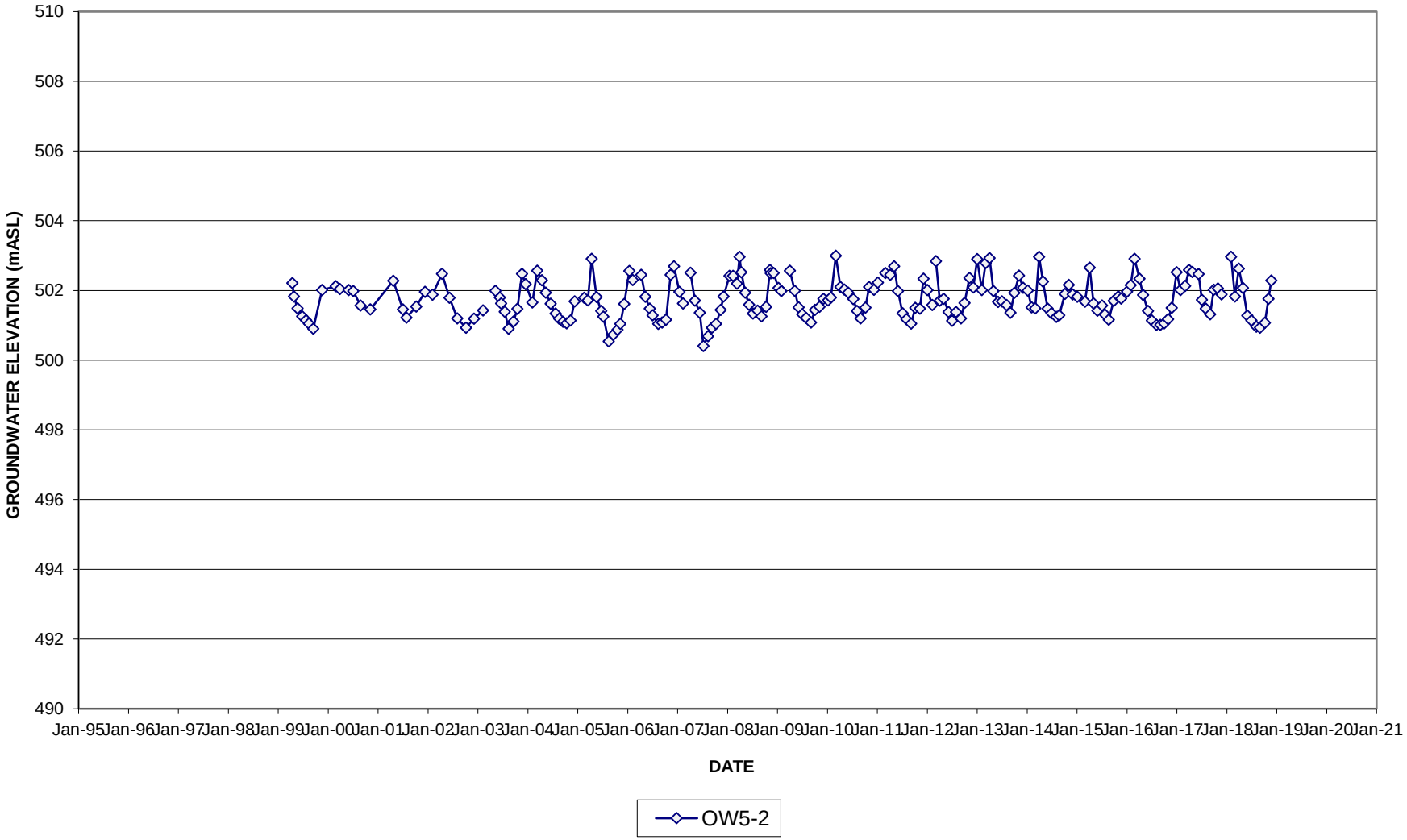


FIGURE C-42

GROUNDWATER HYDROGRAPH
OW6-3

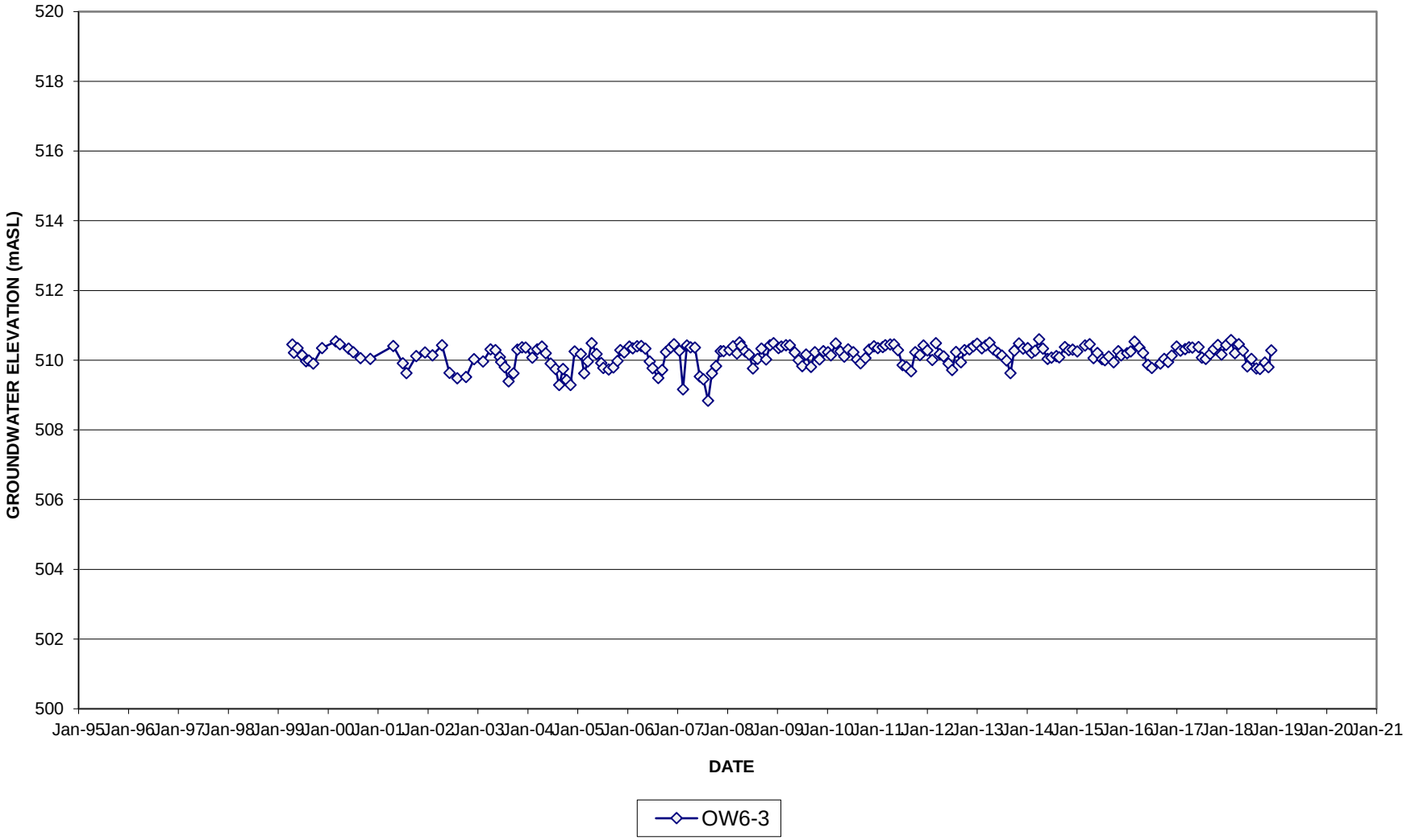


TABLE A-6
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
CARMARTHEN LAKE FARMS WELLS
111-53312-00 A52.1

DATE	CLF1	CLF2	CLF3	CLF4	CLF5
08-Jun-96	511.8	N/A	507.5	507.5	507.5
06-Sep-96	511.7	511.7	507.2	507.2	507.3
23-Dec-96	512.0	512.1	508.3	508.1	507.9
26-Feb-97	512.1	512.1	Frozen	509.1	508.4
08-May-97	512.0	512.0	508.3	509.1	508.1
26-Aug-97	511.9	511.9	507.5	508.7	507.5
19-Dec-97	511.9	511.9	507.8	509.0	507.7
27-Feb-98	Frozen	514.8	Frozen	509.0	Frozen
08-Apr-98	N/A	510.3	509.5	509.1	508.7
10-May-98	511.6	511.6	507.3	507.3	507.3
29-Dec-98	Frozen	Frozen	Frozen	508.7	Frozen
24-Feb-99	Frozen	Frozen	Frozen	508.8	Frozen
28-Apr-99	511.8	510.6	507.7	508.6	506.9
26-May-99	512.0	510.1	507.5	508.4	507.5
29-Jun-99	N/A	510.3	507.4	507.4	507.4
26-Jul-99	N/A	N/A	507.3	507.3	507.4
17-Aug-99	510.3	511.5	507.2	507.3	507.7
27-Sep-99	511.8	511.2	507.1	507.2	507.3
25-Oct-99	510.8	511.0	507.2	507.2	507.3
21-Nov-99	511.1	511.3	507.4	507.4	507.4
21-Dec-99	511.2	511.4	507.5	507.7	507.5
25-Jan-00	Frozen	Frozen	507.8	508.6	507.6
29-Feb-00	Frozen	Frozen	509.5	509.0	508.6
31-Mar-00	Frozen	Frozen	507.9	509.0	507.8
02-Jun-00	511.0	511.2	508.0	508.7	507.8
07-Jul-00	510.7	510.8	507.8	508.8	507.7
27-Aug-00	510.6	510.6	507.4	508.4	507.4
28-Sep-00	510.9	510.9	507.6	508.7	507.5
03-Nov-00	511.0	511.0	507.7	508.8	507.6
22-Feb-01	Frozen	Frozen	Frozen	Frozen	Frozen
22-Mar-01	Frozen	Frozen	Frozen	Frozen	Frozen
02-May-01	510.5	N/A	508.3	508.7	N/A
07-Jun-01	N/A	N/A	507.5	508.6	507.5
12-Jul-01	509.2	N/A	507.3	507.6	506.9
01-Aug-01	509.7	N/A	507.3	507.3	507.3
04-Oct-01	509.8	509.8	507.3	507.4	507.3
01-Nov-01	510.6	510.8	508.2	509.0	507.9
14-Dec-01	510.4	510.5	508.0	508.9	507.8

NOTE:
- Frozen / Buried indicates well lid frozen or well buried in snow.
- N/A indicates water elevation not available

TABLE A-6
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
CARMARTHEN LAKE FARMS WELLS
111-53312-00 A52.1

DATE	CLF1	CLF2	CLF3	CLF4	CLF5
10-Jan-02	510.4	510.4	507.8	509.0	507.6
14-Mar-02	Frozen	Frozen	Frozen	509.0	Frozen
16-May-02	510.7	510.9	508.1	509.2	507.8
20-Jun-02	509.9	510.5	507.7	508.7	507.6
11-Jul-02	506.5	509.5	507.8	507.7	507.5
13-Sep-02	508.9	509.6	507.2	507.2	507.3
01-Nov-02	510.9	510.3	507.0	507.1	507.2
16-Jan-03	Frozen	Frozen	507.3	508.5	Frozen
11-Apr-03	510.8	511.1	Frozen	509.2	Frozen
15-May-03	510.5	513.7	507.8	508.9	507.6
24-Jun-03	510.4	510.6	507.5	508.4	507.4
22-Jul-03	510.1	510.3	507.4	507.3	507.4
20-Aug-03	509.8	509.9	507.3	507.3	507.4
25-Sep-03	509.3	509.6	507.2	507.2	506.8
22-Oct-03	509.3	508.3	507.3	508.7	507.4
25-Nov-03	510.4	509.7	508.3	509.0	508.0
11-Dec-03	510.5	510.2	Frozen	Frozen	Frozen
22-Dec-03	510.6	510.7	508.3	509.0	508.0
09-Feb-04	509.5	509.5	Frozen	508.8	Frozen
16-Mar-04	510.3	510.5	508.4	509.0	508.0
02-Apr-04	512.0	512.4	Frozen	Frozen	Frozen
20-Apr-04	510.9	511.1	508.9	509.0	508.2
18-May-04	510.2	510.4	507.9	508.9	507.7
22-Jun-04	509.6	510.0	507.7	508.8	507.6
28-Jul-04	509.4	509.7	507.4	508.4	507.4
25-Aug-04	509.2	509.6	507.0	507.3	507.3
22-Sep-04	509.5	509.6	507.2	507.2	507.3
19-Oct-04	509.4	509.6	507.1	507.2	507.2
16-Nov-04	508.2	508.3	507.2	507.2	507.3
16-Dec-04	Frozen	509.2	507.3	508.7	507.4
31-Jan-05	Frozen	509.2	507.8	508.7	Frozen
24-Feb-05	Frozen	508.9	507.6	508.9	507.5
22-Mar-05	508.8	508.5	Frozen	508.8	Frozen
22-Apr-05	511.4	511.9	510.2	509.2	508.8
25-May-05	510.7	510.9	508.0	508.7	507.7
29-Jun-05	510.2	510.5	507.5	508.4	506.3
13-Jul-05	510.3	510.4	507.4	507.5	507.4
23-Aug-05	510.2	510.3	507.3	507.3	507.3

NOTE:
- Frozen / Buried indicates well lid frozen or well buried in snow.
- N/A indicates water elevation not available

TABLE A-6
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
CARMARTHEN LAKE FARMS WELLS
111-53312-00 A52.1

DATE	CLF1	CLF2	CLF3	CLF4	CLF5
26-Sep-05	510.2	510.3	507.2	507.2	507.3
26-Oct-05	510.4	510.4	507.2	507.2	507.3
16-Nov-05	510.6	510.6	507.2	507.2	507.3
14-Dec-05	Frozen	510.3	507.4	508.5	507.4
20-Jan-06	510.5	510.6	508.1	509.0	507.9
12-Feb-06	510.5	510.6	508.0	508.9	507.8
19-Mar-06	511.2	511.3	509.0	509.0	508.3
16-Apr-06	511.0	511.1	509.2	509.0	508.5
14-May-06	510.3	510.5	507.8	508.9	507.3
18-Jun-06	509.7	509.8	507.4	507.7	506.6
09-Jul-06	509.8	509.7	507.3	507.3	506.3
20-Aug-06	509.5	509.6	507.2	507.2	506.3
17-Sep-06	509.4	509.6	507.1	507.1	507.2
15-Oct-06	509.3	509.2	507.2	507.2	507.3
19-Nov-06	510.4	510.5	508.1	508.9	507.8
10-Dec-06	510.6	510.7	510.4	509.2	508.0
21-Jan-07	511.9	Frozen	507.8	508.9	507.6
18-Feb-07	Frozen	Frozen	507.5	508.7	507.5
18-Mar-07	510.3	510.6	508.7	509.1	508.0
15-Apr-07	511.3	510.8	508.5	509.2	508.0
17-May-07	509.9	509.9	507.7	509.0	507.6
21-Jun-07	509.1	509.2	507.4	508.2	507.4
17-Jul-07	509.2	508.4	507.3	507.3	507.3
21-Aug-07	509.2	509.4	507.1	507.2	507.2
18-Sep-07	509.6	509.7	507.0	507.1	507.2
22-Oct-07	509.6	509.7	507.0	507.1	507.2
23-Nov-07	509.7	509.8	507.3	507.5	507.3
13-Dec-07	509.6	509.8	Frozen	508.8	Frozen
24-Jan-08	509.7	509.8	507.3	508.8	507.9
21-Feb-08	509.5	509.6	507.5	509.1	508.3
18-Mar-08	510.5	510.7	Frozen	509.0	Frozen
7-Apr-08	511.6	511.8	Frozen	509.4	508.8
21-Apr-08	510.5	511.2	509.5	509.1	508.5
20-May-08	510.7	510.8	507.9	508.9	508.3
16-Jun-08	510.3	510.3	507.5	508.7	507.8
14-Jul-08	509.6	509.9	505.0	507.7	507.0
18-Aug-08	509.5	510.5	507.1	508.4	507.8
15-Sep-08	509.0	510.3	507.5	508.4	507.7

NOTE:
- Frozen / Buried indicates well lid frozen or well buried in snow.
- N/A indicates water elevation not available

TABLE A-6
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
CARMARTHEN LAKE FARMS WELLS
111-53312-00 A52.1

DATE	CLF1	CLF2	CLF3	CLF4	CLF5
20-Oct-08	509.8	509.4	507.4	N/A	507.8
23-Nov-08	510.4	510.2	507.6	508.7	508.3
14-Dec-08	512.7	511.5	507.6	509.4	Frozen
18-Jan-09	512.0	510.8	507.0	509.0	Frozen
8-Feb-09	510.1	508.4	507.2	509.1	Frozen
15-Mar-09	510.8	510.9	507.3	509.2	N/A
12-Apr-09	510.8	510.5	507.3	509.2	N/A
17-May-09	510.6	510.5	508.0	508.8	507.7
14-Jun-09	510.4	510.3	507.9	508.8	507.5
12-Jul-09	509.7	508.8	507.4	507.4	506.7
9-Aug-09	509.8	509.0	507.1	507.3	506.5
13-Sep-09	509.8	509.9	507.2	507.3	506.5
11-Oct-09	510.2	510.3	507.4	508.8	507.9
15-Nov-09	509.8	510.0	507.4	508.7	507.9
13-Dec-09	509.9	510.2	507.5	509.1	508.3
17-Jan-10	509.9	510.1	507.5	509.1	508.2
07-Feb-10	510.0	510.1	507.7	509.1	508.3
14-Mar-10	511.5	511.5	509.0	509.5	508.6
18-Apr-10	N/A	510.8	508.3	509.0	507.9
16-May-10	510.6	510.9	507.9	508.9	507.7
08-Jun-10	N/A	N/A	N/A	N/A	N/A
13-Jun-10	511.1	510.8	507.6	508.9	507.8
21-Jul-10	510.5	510.7	507.4	509.0	508.0
16-Aug-10	510.2	510.3	507.5	508.9	507.7
12-Sep-10	510.2	510.3	507.2	507.3	507.4
17-Oct-10	510.3	510.4	507.5	508.5	507.4
14-Nov-10	510.3	510.5	507.5	508.6	507.6
19-Dec-10	510.4	510.7	508.2	509.1	508.0
16-Jan-11	510.6	510.6	508.2	509.3	508.2
20-Feb-11	510.5	510.4	508.1	509.1	508.2
13-Mar-11	510.7	510.7	N/A	509.2	508.3
17-Apr-11	511.1	511.1	509.0	509.2	508.2
15-May-11	511.2	511.3	508.6	509.2	508.2
13-Jun-11	511.0	511.0	508.2	508.9	507.8
17-Jul-11	510.0	510.1	507.4	507.5	506.6
14-Aug-11	509.4	509.4	507.3	508.1	506.2
18-Sep-11	509.1	509.3	507.2	508.0	506.1
17-Oct-11	508.6	508.8	507.3	507.8	506.5

NOTE:
- Frozen / Buried indicates well lid frozen or well buried in snow.
- N/A indicates water elevation not available

TABLE A-6
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
CARMARTHEN LAKE FARMS WELLS
111-53312-00 A52.1

DATE	CLF1	CLF2	CLF3	CLF4	CLF5
20-Nov-11	510.2	509.2	507.3	508.6	507.3
18-Dec-11	510.3	509.3	507.4	508.8	507.5
15-Jan-12	510.4	509.5	507.6	509.0	507.8
19-Feb-12	510.5	509.6	buried	508.9	508.0
26-Feb-12	-	-	-	-	-
18-Mar-12	512.1	511.3	509.7	509.0	508.0
15-Apr-12	510.6	510.7	507.8	508.9	507.9
13-May-12	510.5	510.5	507.7	508.8	507.8
17-Jun-12	510.02	510.13	507.39	508.54	507.54
15-Jul-12	509.8	510.0	507.3	508.5	507.5
12-Aug-12	510.5	510.9	507.5	508.5	507.5
16-Sep-12	510.0	510.1	507.3	507.3	507.3
14-Oct-12	510.2	510.7	507.5	507.8	507.8
18-Nov-12	510.5	511.1	508.1	508.4	508.6
16-Dec-12	510.7	510.8	507.6	508.7	508.3
13-Jan-13	511.1	511.1	508.3	509.2	508.6
17-Feb-13	511.3	511.2	508.3	509.3	508.7
17-Mar-13	511.0	510.8	508.2	509.0	508.4
14-Apr-13	511.3	510.0	509.0	509.2	508.5
12-May-13	510.5	508.9	508.1	508.9	508.2
16-Jun-13	N/A	510.9	507.9	508.8	508.1
14-Jul-13	-	510.9	507.6	508.7	507.9
18-Aug-13	-	510.4	507.4	508.2	507.6
15-Sep-13	-	510.4	507.4	508.3	507.6
13-Oct-13	-	509.9	507.5	508.6	508.0
17-Nov-13	-	510.3	507.7	509.5	508.7
16-Dec-13	-	510.2	507.6	509.5	508.7
19-Jan-14	-	510.2	507.6	509.4	508.6
16-Feb-14	-	510.3	507.6	509.5	508.7
17-Mar-14	-	510.7	Buried	509.4	508.7
13-Apr-14	-	510.8	Buried	509.3	508.5
11-May-14	-	510.6	508.5	508.9	508.1
18-Jun-14	-	510.6	507.6	507.6	506.8
13-Jul-14	-	510.7	507.3	508.3	507.6
17-Aug-14	-	510.7	507.3	508.5	507.7
7-Sep-14	-	510.6	507.2	507.4	507.4
19-Oct-14	-	510.8	507.5	509.4	508.5
16-Nov-14	-	511.1	508.1	509.1	508.2

NOTE:
- Frozen / Buried indicates well lid frozen or well buried in snow.
- N/A indicates water elevation not available

TABLE A-6
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
CARMARTHEN LAKE FARMS WELLS
111-53312-00 A52.1

DATE	CLF1	CLF2	CLF3	CLF4	CLF5
14-Dec-14	-	511.0	-	509.1	508.3
18-Jan-15	-	511.0	508.9	509.1	508.3
15-Feb-15	-	Frozen	Buried	Buried	Buried
15-Mar-15	-	Buried	Buried	509.2	Buried
19-Apr-15	-	510.8	509.0	509.3	508.4
17-May-15	-	510.9	507.7	508.6	507.6
14-Jun-15	-	510.8	507.5	508.8	507.5
19-Jul-15	-	510.8	507.5	508.4	507.5
9-Aug-15	-	510.8	507.4	507.4	507.2
6-Sep-15	-	510.7	507.3	507.3	507.0
11-Oct-15	-	510.6	507.2	507.3	507.3
15-Nov-15	-	510.8	507.4	508.6	507.4
6-Dec-15	-	510.7	507.5	508.6	507.5
17-Jan-16	-	510.5	507.8	508.9	507.7
14-Feb-16	-	510.8	507.9	509.0	507.7
13-Mar-16	-	511.3	509.6	509.3	508.6
17-Apr-16	-	510.9	508.9	509.0	508.3
15-May-16	-	510.9	507.8	508.9	507.7
19-Jun-16	-	510.6	507.5	507.5	507.4
17-Jul-16	-	510.7	507.3	507.4	507.4
21-Aug-16	-	510.7	507.2	507.3	507.3
18-Sep-16	-	510.7	507.2	507.3	507.3
16-Oct-16	-	510.7	507.2	507.2	507.3
13-Nov-16	-	510.7	507.2	507.3	507.3
11-Dec-16	-	Frozen	507.3	507.3	Buried
15-Jan-17	-	510.8	508.1	509.2	507.9
12-Feb-17	-	510.9	Buried	Buried	Buried
19-Mar-17	-	510.7	508.1	508.8	507.9
16-Apr-17	-	511.1	508.9	509.1	508.2
19-May-17	-	511.1	508.7	509.0	508.0
25-Jun-17	-	511.2	508.3	509.1	508.0
19-Jul-17	-	510.9	507.9	508.9	507.7
17-Aug-17	-	510.8	507.6	508.8	507.6
17-Sep-17	-	509.5	507.5	508.4	507.4
15-Oct-17	-	511.0	507.5	509.1	507.5
14-Nov-17	-	511.0	507.8	509.3	507.7
11-Dec-17	-	510.9	507.8	509.1	507.6
14-Jan-18	-	511.2	508.7	509.1	508.2
11-Feb-18	-	511.6	508.3	509.5	508.2
18-Feb-18	-	510.3	507.9	508.9	507.8
18-Mar-18	-	510.3	507.9	508.9	507.8
15-Apr-18	-	511.6	508.2	509.2	508.0
17-May-18	-	511.6	508.4	509.1	508.0
18-Jun-18	-		507.5	507.8	507.5
17-Jul-18	-	511.1	507.4	507.3	507.4
22-Aug-18	-	511.5	507.3	507.3	507.3
18-Sep-18	-	511.4	507.3	507.3	507.3
23-Oct-18	-	511.4	507.3	507.3	507.0
19-Nov-18	-		507.5	508.9	507.5
10-Dec-18	-	511.6	508.0	509.0	507.8

NOTE:
- Frozen / Buried indicates well lid frozen or well buried in snow.
- N/A indicates water elevation not available

FIGURE C-43

GROUNDWATER HYDROGRAPH
CLF1

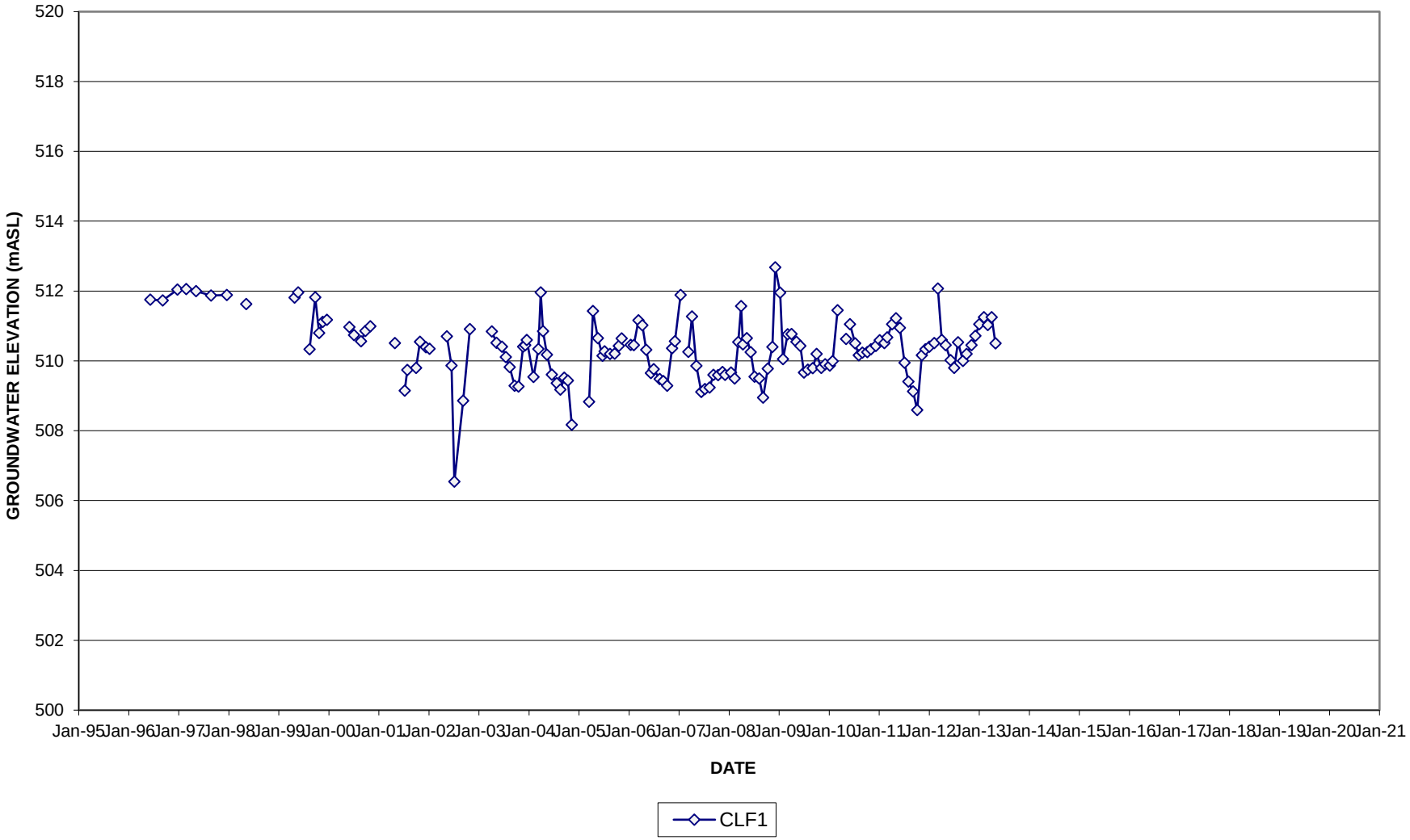


FIGURE C-44

GROUNDWATER HYDROGRAPH
CLF2

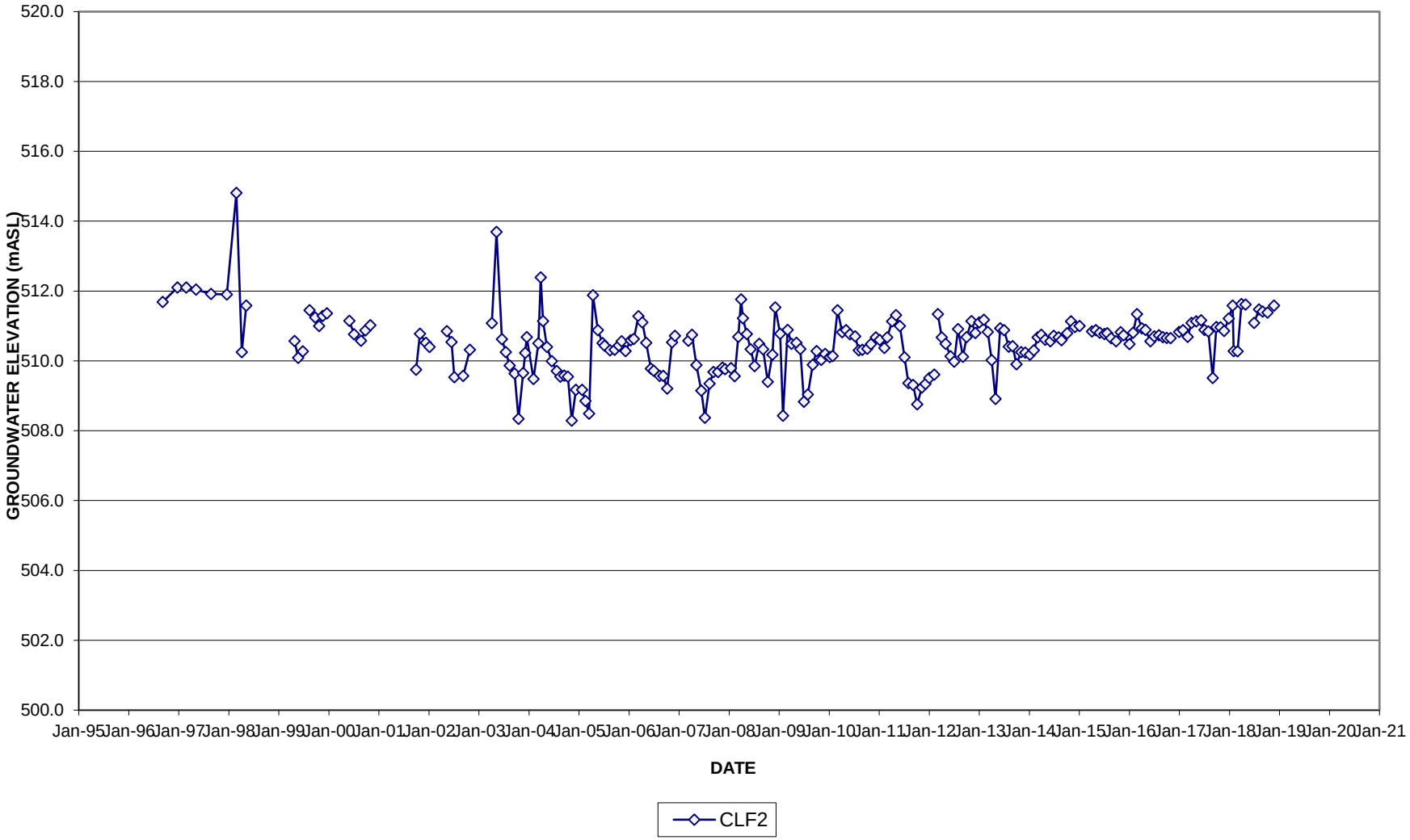


FIGURE C-45

GROUNDWATER HYDROGRAPH
CLF3

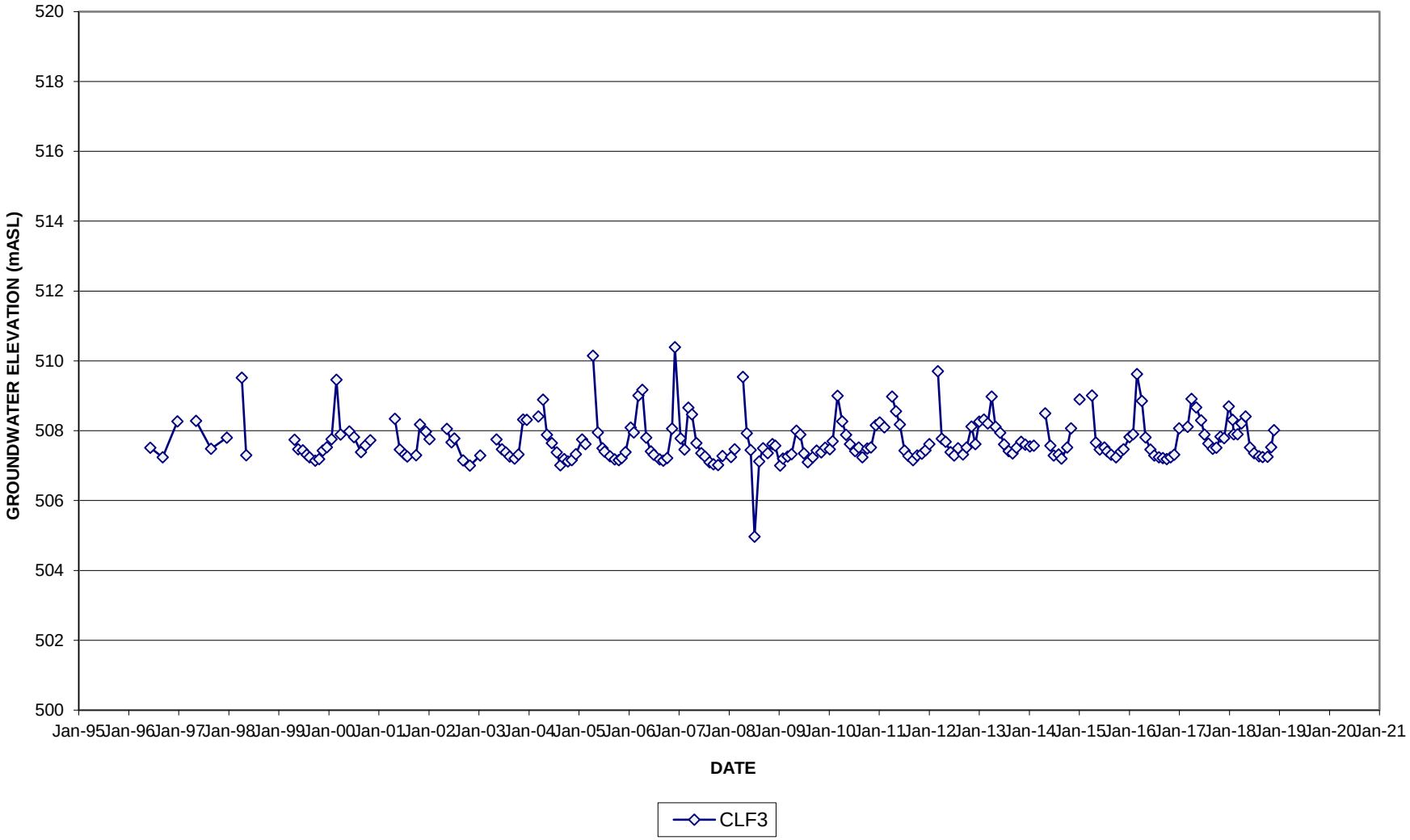


FIGURE C-46

GROUNDWATER HYDROGRAPH
CLF4

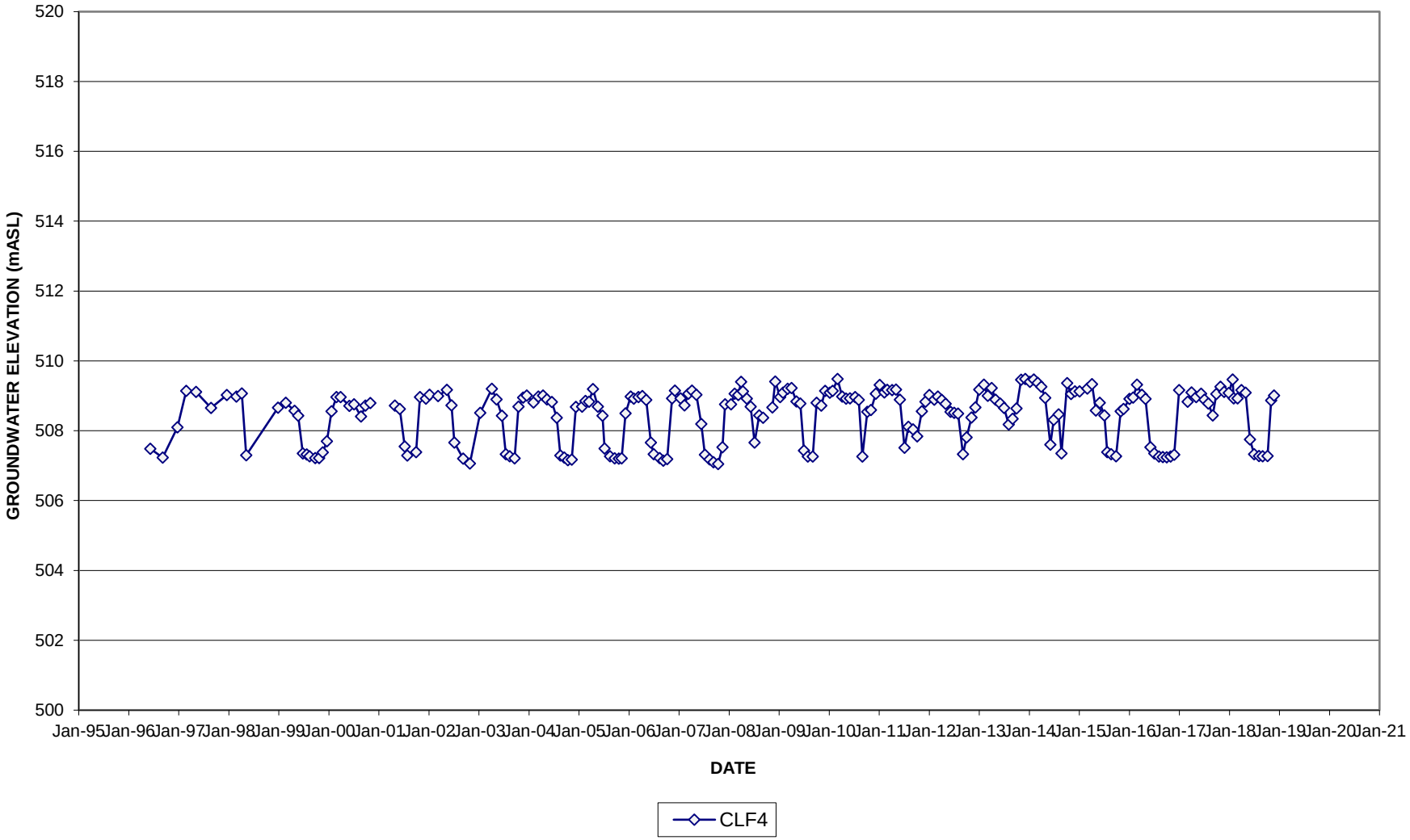


FIGURE C-47

GROUNDWATER HYDROGRAPH
CLF5

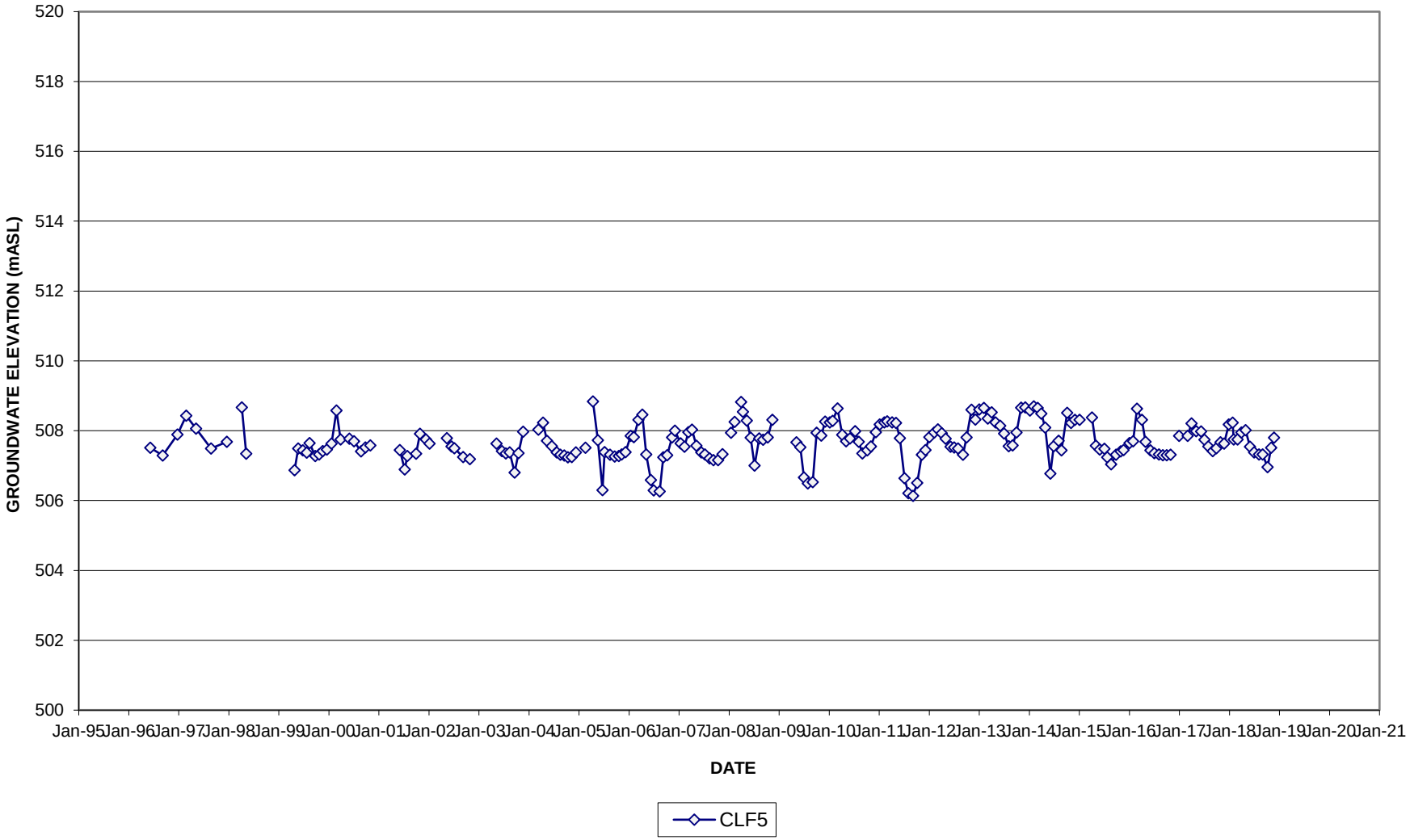


TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW1	RW2	RW3	RW4	RW5
16-May-03					
26-Jun-03			512.5		
24-Jul-03			511.9		459.9
21-Aug-03	502.2		511.4		459.6
25-Sep-03	501.5		510.7		459.0
22-Oct-03	502.9	485.1	510.8	508.8	459.6
25-Nov-03	506.0	485.7	512.1	509.8	460.4
22-Dec-03	505.7	485.9	512.5	509.7	460.8 (*)
09-Feb-04	Buried	486.7	Frozen	509.3	Frozen
16-Mar-04	506.0	485.9	Frozen	509.8	Frozen
21-Apr-04	506.3	486.1	513.8	510.0	461.1
18-May-04	505.3	486.0	513.2	507.9 (**)	461.0
22-Jun-04	504.1	485.9	512.7	508.9	460.7
28-Jul-04	503.2	485.3	511.9	508.6	460.3
25-Aug-04	502.1	485.0	511.3	508.0	459.7
24-Sep-04	501.1	484.9	510.9	507.6	459.6
19-Oct-04	501.3	485.0	510.5	507.4	459.5
16-Nov-04	501.3	485.0	510.4	507.8	458.7
16-Dec-04	502.4	485.2	510.6	508.7	Frozen
31-Jan-05	505.0	485.4	512.2	509.6	Frozen
24-Feb-05	504.9	485.6	512.1	509.5	Frozen
22-Mar-05	504.6	485.7	512.0	509.5	Frozen
20-Apr-05	506.9	486.1	513.8	510.3	461.1
25-May-05	505.1	486.0	513.2	509.4	461.0
29-Jun-05	503.6	486.2	512.2	508.8	460.5
13-Jul-05	502.9	486.6	511.9	507.2	459.0
23-Aug-05	501.8	485.8	511.0	507.5	459.5
26-Sep-05	501.9	485.0	510.4	507.1	459.5
26-Oct-05	500.5	484.9	510.2	507.1	459.2
16-Nov-05	501.8	485.2	510.1	507.6	459.3
14-Dec-05	501.7	484.5	510.3	508.3	
20-Jan-06	505.8	485.7	510.6	509.8	
14-Feb-06	505.0	486.4	512.1	509.6	
19-Mar-06	506.2	486.0	513.3	509.9	
17-Apr-06	505.7	486.0	514.0	510.0	461.0
19-May-06	504.8	485.9	513.0	509.4	460.8
19-Jun-06	503.1	485.6	512.2	507.0	460.4
10-Jul-06	502.1	485.3	511.7	507.4	460.0

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.
- ** Indicates water level is based on OBM map elevations and not surveyed.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW1	RW2	RW3	RW4	RW5
23-Aug-06	501.2	485.0	510.8	506.9	459.6
18-Sep-06	501.0	485.0	510.4	507.2	459.4
17-Oct-06	501.5	485.4	510.3	508.0	459.4
22-Nov-06	505.4	485.6	511.6	509.0	460.3
15-Dec-06	506.3	486.1	512.4	510.0	460.7
22-Jan-07	504.4	485.8	512.5	509.4	460.1
19-Feb-07	503.2	487.0	512.1	509.1	Frozen
18-Mar-07	505.9	485.7	512.4	509.8	Frozen
15-Apr-07	506.0	485.9	513.5	509.9	461.0
17-May-07	504.4	485.8	512.8	509.3	460.5
17-Jun-07	502.5	485.5	511.9	508.5	460.4
15-Jul-07	501.7	485.2	511.4	507.9	460.0
19-Aug-07	501.0	485.0	510.7	507.2	459.6
10-Sep-07	500.8	N/A	N/A	N/A	N/A
16-Sep-07	500.8	485.0	510.3	506.2	459.4
14-Oct-07	500.7	485.1	510.0	506.3	459.3
18-Nov-07	501.3	485.2	510.1	508.0	459.6
9-Dec-08	Frozen	485.5	510.3	Frozen	Buried
20-Jan-08	N/A	486.7	513.0	Frozen	Buried
17-Feb-08	Frozen	485.7	512.7	509.9	Buried
16-Mar-08	Frozen	485.8	512.7	Buried	Buried
6-Apr-08	502.2	486.0	513.6	510.3	Frozen
20-Apr-08	506.3	486.1	514.4	509.9	461.2
18-May-08	505.1	486.0	513.3	509.5	461.0
15-Jun-08	503.6	486.7	512.5	508.1	459.9
13-Jul-08	502.1	485.8	511.9	508.4	460.4
17-Aug-08	502.2	485.2	511.7	508.2	460.2
31-Aug-08	N/A	N/A	N/A	N/A	N/A
14-Sep-08	502.9	485.1	511.4	508.7	459.3
19-Oct-08	502.8	485.3	511.7	508.9	460.3
23-Nov-08	Frozen	485.6	512.7	Frozen	Buried
14-Dec-08	Frozen	Buried	511.6	Frozen	Buried
18-Jan-09	505.5	485.9	513.1	Frozen	Buried
8-Feb-09	Frozen	485.8	512.6	509.6	Buried
15-Mar-09	506.4	486.6	513.5	510.0	460.9
12-Apr-09	506.4	486.1	513.7	509.4	460.4
17-May-09	505.1	486.2	513.3	509.2	461.2
14-Jun-09	503.3	485.9	512.5	507.8	460.3

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW1	RW2	RW3	RW4	RW5
12-Jul-09	502.0	485.5	511.9	508.4	460.3
9-Aug-09	502.1	485.3	511.4	507.9	460.1
13-Sep-09	501.0	485.1	510.9	507.4	459.8
11-Oct-09	501.9	485.3	510.7	508.4	459.8
15-Nov-09	502.1	485.3	510.8	508.7	460.2
29-Nov-09	N/A	487.1	N/A	N/A	N/A
13-Dec-09	503.1	486.4	511.0	509.1	Buried
12-Jan-10	503.5	486.9	N/A	N/A	N/A
17-Jan-10	N/A	486.3	511.2	509.0	Buried
07-Feb-10	503.4	486.9	511.4	509.2	Buried
14-Mar-10	506.1	485.7	512.0	510.3	460.5
18-Apr-10	505.9	486.0	513.4	509.9	461.0
16-May-10	506.6	486.2	513.0	509.1	460.9
8-Jun-10	506.8	485.6	N/A	N/A	N/A
13-Jun-10	505.8	485.5	513.1	509.7	460.9
21-Jul-10	504.8	485.5	512.6	509.3	460.6
16-Aug-10	503.2	485.3	512.1	508.7	460.6
12-Sep-10	501.8	485.9	511.5	508.2	460.2
26-Sep-10	503.4		N/A	N/A	N/A
17-Oct-10	N/A	485.1	511.6	508.1	460.3
14-Nov-10	505.1	485.3	512.1	509.7	460.7
19-Dec-10	505.2	485.5	512.6	Frozen	Buried
16-Jan-11	505.6	485.6	512.9	Frozen	Buried
20-Feb-11	505.9	486.9	Frozen	Frozen	Buried
13-Mar-11	Frozen	485.6	512.7	509.8	Buried
17-Apr-11	506.9	485.8	514.1	510.0	461.0
15-May-11	507.2	485.9	513.7	509.7	461.0
13-Jun-11	505.4	485.8	513.1	509.4	461.2
3-Jul-11		485.54			
17-Jul-11	503.1	485.3	511.9	508.3	460.1
14-Aug-11	502.2	485.0	511.3	507.7	459.8
18-Sep-11	501.7	484.8	510.7	507.1	459.7
17-Oct-11	502.2	485.0	510.6	508.3	459.8
20-Nov-11	502.7	485.1	511.1	508.9	460.3
18-Dec-11	502.9	485.4	512.3	509.0	460.7

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW1	RW2	RW3	RW4	RW5
15-Jan-12	Frozen	485.4	512.5	N/A	Buried
19-Feb-12	Frozen	485.4	512.2	N/A	Buried
26-Feb-12	Frozen	487.0			
18-Mar-12	505.9	484.6	514.0	510.2	460.5
15-Apr-12	504.6	485.7	512.9	509.4	460.9
13-May-12	504.8	485.6	512.6	509.3	460.8
17-Jun-12	504.1	485.2	511.9	507.9	460.6
1-Jul-12	502.3	485.0			
15-Jul-12	502.1	486.6	511.3	507.4	460.3
12-Aug-12	504.1	486.6	511.1	507.6	460.3
16-Sep-12		485.0	510.9	506.1	460.3
7-Oct-12		487.3			
14-Oct-12	502.6	485.0	510.8	507.5	460.3
18-Nov-12	506.0	485.5	512.7	509.8	460.9
16-Dec-12	506.0	486.7	512.6	509.7	461.0
13-Jan-13	507.5	485.6	512.9	510.0	461.0
17-Feb-13	505.6	486.0	513.0	509.6	461.3
17-Mar-13	505.4	485.8	512.9	509.9	460.2
31-Mar-13	505.2	485.7			
14-Apr-13	507.4	485.9	513.5	510.0	461.4
12-May-13	505.6	485.9	513.3	509.6	461.4
2-Jun-13	505.4	485.8			
16-Jun-13	505.0	485.6	512.7	508.7	461.2
14-Jul-13	503.9	485.5	512.2	509.0	460.7
18-Aug-13	502.5	485.2	511.7	508.5	460.5
15-Sep-13	502.3	485.1	511.3	508.2	460.2
13-Oct-13	504.3	486.2	511.9	509.4	460.3
17-Nov-13	505.7	487.1	512.7	509.8	461.0
16-Dec-13	505.72	485.79	512.71	509.57	460.68
19-Jan-14	Frozen	485.9	512.3	509.4	Buried
16-Feb-14	Frozen	485.3	Buried	508.9	Buried
17-Mar-14	Frozen	485.2	Buried	508.3	Buried
13-Apr-14	507.8	486.3	514.0	510.4	461.1
11-May-14	506.6	487.4	513.6	509.9	460.4
15-Jun-14	503.3	485.6	512.4	508.8	460.8

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW1	RW2	RW3	RW4	RW5
13-Jul-14	503.2	487.1	511.9	508.5	460.5
17-Aug-14	502.8	486.8	511.4	508.1	460.3
7-Sep-14	502.5	486.2	511.1	508.0	460.3
12-Sep-14		485.2			
19-Sep-14	503.3				
19-Oct-14	502.9	486.3	511.2	508.9	460.6
2-Nov-14	504.7	485.3			460.8
16-Nov-14	505.6	485.5	512.0	509.7	461.0
14-Dec-14	505.3	485.6	512.5	509.6	461.1
18-Jan-15		485.7	512.6		
15-Feb-15		485.4	512.0		
15-Mar-15		485.4	511.7		
19-Apr-15	506.7	485.8	513.6	509.7	461.1
17-May-15	504.7	486.4	512.7	509.1	459.1
14-Jun-15	503.6	485.4	512.2	508.5	460.4
19-Jul-15	503.6	485.5	512.2	508.9	460.7
9-Aug-15	502.6	485.3	511.6	508.4	460.3
6-Sep-15	502.4	485.2	511.2	507.7	458.5
11-Oct-15	501.9	487.2	510.7	507.5	458.4
15-Nov-15	501.8	487.3	510.7	508.4	459.6
6-Dec-15	502.5	487.1	510.9	508.2	460.0
17-Jan-16	504.2	487.8	511.7	509.5	460.6
14-Feb-16	Frozen	487.1	512.2	509.6	460.9
13-Mar-16	505.6	488.1	513.8	510.2	461.3
17-Apr-16	506.5	486.1	513.8	509.7	461.3
15-May-16	506.2	486.7	513.0	509.2	460.9
19-Jun-16	502.3	487.3	512.1	508.7	460.2
17-Jul-16	502.0	487.1	511.4	508.0	459.6
24-Jul-16	502.2	487.3			
21-Aug-16	502.2	485.1	510.3	506.8	459.8
18-Sep-16	500.7	485.0	510.4	507.3	459.5
29-Sep-16					
16-Oct-16	501.4	486.0	510.2	507.3	459.5
13-Nov-16	500.2	485.1	510.2	507.8	459.4
27-Nov-16	501.5	486.1			
11-Dec-16	501.5	485.7	510.3	508.4	459.7

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW1	RW2	RW3	RW4	RW5
15-Jan-17	Frozen	485.4	511.1	509.7	460.4
12-Feb-17	504.6	486.6	511.8	509.6	459.7
19-Mar-17	Frozen	485.8	513.1	509.8	460.9
9-Apr-17	507.2	485.9			
16-Apr-17	506.5	485.9	513.6	509.9	461.1
11-May-17		485.9	513.9	509.9	459.7
21-May-17	506.7				
25-Jun-17			513.2	509.6	461.1
19-Jul-17			512.7	507.8	460.6
3-Aug-17					
17-Aug-17	505.7		512.1	503.5	460.5
29-Aug-17					
17-Sep-17			511.6	508.7	459.4
26-Sep-17					
15-Oct-17			511.5	509.0	460.1
14-Nov-17	Frozen		511.9	509.1	460.2
11-Dec-17	Frozen		512.4	509.5	460.8
14-Jan-18	506.3	486.6	512.6	509.9	460.9
11-Feb-18	504.9	-	-	-	-
18-Feb-18	507.5	486.6	513.6	510.2	461.1
18-Mar-18	505.4	-	513.0	509.5	461.1
15-Apr-18			512.9	509.9	459.8
17-May-18	506.1		513.5	509.7	461.3
18-Jun-18	503.4		512.4	508.5	460.8
17-Jul-18	502.3		511.6	508.0	459.3
22-Aug-18	500.6		511.0		459.9
18-Sep-18	501.1		510.6	507.4	458.5
23-Oct-18	501.0		510.4	507.0	459.6
19-Nov-18	502.5		511.0	509.0	460.3
10-Dec-18	503.8		511.7		460.6

NOTE:
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- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW6	RW7	RW8	RW9	RW12
16-May-03					
26-Jun-03	444.7			517.8	
24-Jul-03	444.5			517.3	
21-Aug-03	444.2	446.2	428.6	517.1	
25-Sep-03	443.9	445.9	428.4	516.7	
22-Oct-03	443.9	445.9	428.2	516.9	
25-Nov-03	444.9	446.8	Frozen	519.3	
22-Dec-03	445.0	447.0	Frozen	518.8	
09-Feb-04	Frozen	Frozen	Frozen	517.8	
16-Mar-04	Frozen	447.3	430.2	519.5	
21-Apr-04	445.7	447.6	430.3	519.7	
18-May-04	445.1	447.1	429.9	518.5	
22-Jun-04	444.9	447.1	429.6	517.9	
28-Jul-04	444.5	446.5	428.7	517.3	
25-Aug-04	444.3	446.3	428.6	517.0	
24-Sep-04	444.2	446.2	428.4	516.7	
19-Oct-04	444.0	446.0	428.1	516.5	
16-Nov-04	443.8	446.0	427.9	516.4	
16-Dec-04	Frozen	Frozen	Frozen	516.4	
31-Jan-05	Frozen	446.9	Frozen	518.4	
24-Feb-05	Frozen	447.0	Frozen	517.9	
22-Mar-05	Frozen	446.6	Frozen	517.9	
20-Apr-05	446.1	448.2	430.7	521.8	
25-May-05	445.1	446.8	429.9	518.2	
29-Jun-05	444.6	446.7	429.1	517.6	
13-Jul-05	444.5	446.5	428.9	517.4	
23-Aug-05	444.2	446.2	428.6	516.9	
26-Sep-05	443.9	445.9	428.2	516.6	
26-Oct-05	443.8	445.8	427.9	516.4	
16-Nov-05	443.7	445.7	427.8	516.3	
14-Dec-05	443.7	445.7	Frozen	516.9	
20-Jan-06	444.5	446.5	Frozen	518.8	
14-Feb-06	444.8	446.8	Frozen	518.7	
19-Mar-06	445.6	447.7	Frozen	520.4	
17-Apr-06	445.6	447.6	430.5	520.1	
19-May-06	444.9	446.9	429.7	517.7	
19-Jun-06	444.5	446.5	429.1	517.5	
10-Jul-06	444.4	446.4	428.7	517.2	

NOTE: • Frozen / Buried indicates well lid frozen or buried in snow.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW6	RW7	RW8	RW9	RW12
23-Aug-06	444.0	446.0	428.5	516.7	
18-Sep-06	443.8	445.8	428.2	516.5	
17-Oct-06	443.8	445.8	428.1	516.5	
22-Nov-06	444.6	446.6	429.2	518.7	
15-Dec-06	445.0	447.0	429.7	519.6	
22-Jan-07	Frozen	446.8	Frozen	518.2	
19-Feb-07	Frozen	Frozen	Frozen	517.6	
18-Mar-07	Frozen	447.1	Frozen	519.6	
15-Apr-07	445.5	447.3	430.1	519.5	
17-May-07	444.8	446.8	429.5	517.8	
17-Jun-07	444.5	446.5	428.9	517.3	
15-Jul-07	444.3	446.2	428.6	517.0	
19-Aug-07	444.0	446.0	428.4	516.6	
10-Sep-07	N/A	N/A	N/A	N/A	
16-Sep-07	443.8	445.8	428.4	516.4	
14-Oct-07	443.6	445.6	427.9	516.2	
18-Nov-07	Buried	445.6	427.8	516.3	
9-Dec-08	Buried	445.7	Buried	516.9	
20-Jan-08	Buried	447.5	Buried	519.6	
17-Feb-08	Buried	447.1	Buried	518.8	
16-Mar-08	Buried	446.9	Buried	518.7	
6-Apr-08	446.2	448.2	430.6	521.5	
20-Apr-08	445.9	449.0	430.6	520.6	424.0
18-May-08	445.1	447.1	430.0	518.3	423.2
15-Jun-08	444.7	446.7	429.3	517.6	424.4
13-Jul-08	444.5	446.4	428.7	517.2	423.9
17-Aug-08	444.3	446.3	428.8	517.5	424.0
31-Aug-08	N/A	N/A	N/A	N/A	N/A
14-Sep-08	444.2	446.1	428.7	517.2	422.8
19-Oct-08	444.5	446.4	428.9	517.6	424.5
23-Nov-08	Buried	447.1	Buried	519.4	Buried
14-Dec-08	Buried	447.3	Buried	Frozen	Buried
18-Jan-09	Buried	447.2	N/A	Frozen	Frozen
8-Feb-09	Buried	446.8	N/A	Frozen	Frozen
15-Mar-09	445.7	447.7	430.4	519.6	424.1
12-Apr-09	445.5	447.5	430.4	519.7	425.0
17-May-09	445.2	447.2	430.1	518.6	424.6
14-Jun-09	444.8	446.7	429.3	517.6	423.1

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW6	RW7	RW8	RW9	RW12
12-Jul-09	444.6	446.5	428.8	517.3	423.9
9-Aug-09	444.4	446.3	428.7	517.1	423.7
13-Sep-09	444.2	446.1	428.5	516.3	422.6
11-Oct-09	444.1	446.1	428.3	516.1	423.1
15-Nov-09	444.3	446.2	428.4	517.2	422.6
29-Nov-09	N/A	N/A	N/A	N/A	N/A
13-Dec-09	Buried	446.3	Frozen	517.5	Frozen
12-Jan-10	N/A	N/A	N/A	N/A	N/A
17-Jan-10	N/A	446.4	N/A	517.4	N/A
07-Feb-10	N/A	446.5	N/A	517.5	N/A
14-Mar-10	445.4	447.4	429.5	520.3	424.6
18-Apr-10	445.3	447.2	430.2	519.1	423.1
16-May-10	445.4	447.5	430.2	519.0	424.1
8-Jun-10	N/A	N/A	N/A	N/A	N/A
13-Jun-10	444.8	446.7	430.1	518.6	423.7
21-Jul-10	444.7	446.6	429.5	518.0	423.9
16-Aug-10	444.5	446.5	429.0	517.6	423.0
12-Sep-10	444.3	446.3	428.7	517.3	422.8
26-Sep-10	N/A	N/A	N/A	N/A	N/A
17-Oct-10	444.4	446.3	428.7	517.5	424.6
14-Nov-10	444.7	446.7	429.4	518.5	424.0
19-Dec-10	Buried	446.8	Buried	518.2	Buried
16-Jan-11	Buried	447.1	Buried	Frozen	Buried
20-Feb-11	Buried	447.0	Buried	Frozen	Buried
13-Mar-11	Buried	447.0	Buried	N/A	Buried
17-Apr-11	445.5	447.5	430.5	520.4	N/A
15-May-11	445.7	447.6	430.6	520.0	N/A
13-Jun-11	445.2	447.1	429.9	518.6	N/A
3-Jul-11					
17-Jul-11	444.6	446.56	428.79	517.5	N/A
14-Aug-11	444.4	446.3	428.7	517.1	N/A
18-Sep-11	444.2	446.1	428.4	516.3	N/A
17-Oct-11	444.1	446.1	428.2	516.8	423.0
20-Nov-11	444.4	446.3	428.7	517.2	423.8
18-Dec-11	445.0	446.9	429.6	519.1	N/A

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TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW6	RW7	RW8	RW9	RW12
15-Jan-12	Buried	446.9		N/A	N/A
19-Feb-12	Buried	446.8		N/A	N/A
26-Feb-12					
18-Mar-12	445.9	447.9	430.6	521.2	425.1
15-Apr-12	445.0	446.9	429.6	518.2	424.4
13-May-12	444.7	446.7	429.4	518.1	424.6
17-Jun-12	444.5	446.4	428.9	517.5	423.0
1-Jul-12					
15-Jul-12	444.3	446.2	428.7	517.1	423.6
12-Aug-12	444.4	446.3	428.6	517.4	424.1
16-Sep-12	444.3	446.2	428.7	517.1	423.6
7-Oct-12					
14-Oct-12	444.2	446.1	428.6	517.3	423.8
18-Nov-12	445.2	447.1	429.8	519.7	424.5
16-Dec-12	444.9	446.9	429.6	518.7	424.4
13-Jan-13	445.3	447.3	Frozen	519.8	424.8
17-Feb-13	445.0	447.0	429.7	518.7	Frozen
17-Mar-13	445.2	447.3	Frozen	519.4	Frozen
31-Mar-13					
14-Apr-13	445.7	447.7	430.4	520.9	424.8
12-May-13	445.2	447.2	429.9	518.7	423.6
2-Jun-13					
16-Jun-13	444.9	446.9	429.6	518.3	423.7
14-Jul-13	444.7	446.6	429.0	518.1	424.1
18-Aug-13	444.5	446.4	428.8	517.6	424.0
15-Sep-13	444.3	446.3	428.7	517.4	422.9
13-Oct-13	444.7	446.7	428.8	518.3	423.8
17-Nov-13	445.0	447.0	429.5	519.0	423.9
16-Dec-13	444.94	446.97	Frozen	518.6	423.5
19-Jan-14	Buried	446.66	Frozen	518.1	Frozen
16-Feb-14	Buried	Buried	Frozen	517.5	Frozen
17-Mar-14	Buried	Buried	Frozen	517.3	Frozen
13-Apr-14	446.5	448.6	430.8	521.4	424.5
11-May-14	445.5	447.5	430.2	519.4	424.1
15-Jun-14	444.8	446.7	429.2	517.6	422.9

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TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW6	RW7	RW8	RW9	RW12
13-Jul-14	444.5	446.5	428.8	517.3	423.8
17-Aug-14	444.3	446.3	428.6	516.4	423.1
7-Sep-14	444.3	446.2	428.5	516.8	423.2
12-Sep-14					
19-Sep-14					
19-Oct-14	444.4	446.4	428.5	517.2	423.4
2-Nov-14		-			
16-Nov-14		446.9			
14-Dec-14		446.9			
18-Jan-15		446.9			
15-Feb-15		-			
15-Mar-15		446.5			
19-Apr-15	445.4	447.4	430.3		424.0
17-May-15	444.9	446.8	429.6		423.7
14-Jun-15	444.5	446.5	429.1		423.7
19-Jul-15	444.5	446.5	429.1		N/A
9-Aug-15	444.4	446.3	428.8		N/A
6-Sep-15	444.0	446.1	428.7		N/A
11-Oct-15	443.8	445.8	428.3		423.0
15-Nov-15	443.8	446.8	428.1		422.9
6-Dec-15	443.9	445.9	428.2		423.4
17-Jan-16	444.5	446.5	Frozen		Frozen
14-Feb-16	444.9	446.9	Frozen		Frozen
13-Mar-16	446.0	447.9	430.6		425.1
17-Apr-16	445.7	447.7	430.3		424.8
15-May-16	445.1	447.0	430.0		423.7
19-Jun-16	444.7	446.6	429.0		422.8
17-Jul-16	444.4	446.4	428.7		422.6
24-Jul-16					
21-Aug-16	444.2	446.1	428.5		422.9
18-Sep-16	444.0	446.0	428.2		422.9
29-Sep-16					
16-Oct-16	443.8	445.8	428.0		422.9
13-Nov-16	443.8	445.8	427.9		422.9
27-Nov-16					
11-Dec-16	443.7	445.7	Frozen		Frozen

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TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW6	RW7	RW8	RW9	RW12
15-Jan-17	444.4	446.4	Frozen		Frozen
12-Feb-17	Buried	Buried	Frozen		Frozen
19-Mar-17	445.2	447.2	Frozen		Frozen
9-Apr-17					
16-Apr-17	445.5	447.5	430.4		425.0
11-May-17	445.8	447.8	430.4		424.2
21-May-17					
25-Jun-17	445.0	447.0	430.0		424.1
19-Jul-17	444.8	446.8	429.5		423.4
3-Aug-17					
17-Aug-17	444.5	446.5	428.7		422.8
29-Aug-17					
17-Sep-17	444.4	446.4	428.8		422.7
26-Sep-17					
15-Oct-17	444.3	446.3	428.7		422.8
14-Nov-17	444.5	446.5	N/A		423.5
11-Dec-17	444.8	446.8	Frozen		Frozen
14-Jan-18	445.2	447.2	Frozen	-	Frozen
11-Feb-18	-	-	-	-	-
18-Feb-18	445.8	447.8	430.5	-	Frozen
18-Mar-18	445.0	447.0	429.7	-	Frozen
15-Apr-18	445.2	447.2	430.0		
17-May-18	445.4	447.3	430.1		424.1
18-Jun-18	444.8	446.7	429.2		422.8
17-Jul-18	444.5	446.4	428.6		422.5
22-Aug-18	444.1	446.2	428.5		423.2
18-Sep-18	444.1	446.1	428.2		423.2
23-Oct-18	444.0	445.9	428.0		423.5
19-Nov-18	444.1	446.2	428.4		424.6
10-Dec-18	444.8	446.7	428.9		423.6

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW13	RW16	RW17	RW18 (Dug)	RW19 (Drilled)
16-May-03				512.8	
26-Jun-03				512.7	
24-Jul-03				512.6	
21-Aug-03		508.2		512.2	
25-Sep-03		507.6		511.9	
22-Oct-03		508.8		512.4	
25-Nov-03		510.1		Frozen	
22-Dec-03		510.4		512.8	
09-Feb-04		Frozen		Frozen	
16-Mar-04		Frozen		Frozen	
21-Apr-04		511.6		512.9	
18-May-04		510.6		512.7	
22-Jun-04		510.2		512.7	
28-Jul-04		509.2		512.5	
25-Aug-04		508.2		512.2	
24-Sep-04		507.6		511.8	
19-Oct-04		507.2		511.5	
16-Nov-04		507.4		511.7	
16-Dec-04		Frozen		Frozen	
31-Jan-05		Frozen		Frozen	
24-Feb-05		Frozen		Frozen	
22-Mar-05		Frozen		Frozen	
20-Apr-05		511.6		512.9	
25-May-05		510.7		512.6	
29-Jun-05		509.6		512.6	
13-Jul-05		508.9		512.6	
23-Aug-05		507.4		512.1	
26-Sep-05		506.8		511.3	
26-Oct-05		506.6		511.3	
16-Nov-05		506.9		511.9	
14-Dec-05		507.5		Frozen	
20-Jan-06		509.0		Frozen	
14-Feb-06		509.5		Frozen	
19-Mar-06		511.3		Frozen	
17-Apr-06		511.6		512.8	
19-May-06		510.1		512.6	
19-Jun-06		508.5		512.5	
10-Jul-06		N/A		512.5	

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW13	RW16	RW17	RW18 (Dug)	RW19 (Drilled)
23-Aug-06		506.4		511.3	
18-Sep-06		506.2		511.2	
17-Oct-06		506.2		511.5	
22-Nov-06		509.1		512.6	
15-Dec-06		509.9		512.7	
22-Jan-07		Frozen		Frozen	
19-Feb-07		Frozen		Frozen	
18-Mar-07		Frozen		Frozen	
15-Apr-07		511.1		512.7	
17-May-07		509.6		512.5	
17-Jun-07		507.9		512.4	
15-Jul-07		506.8		N/A	
19-Aug-07		506.0		510.9	
10-Sep-07		N/A		N/A	
16-Sep-07		505.8		-	
14-Oct-07		505.6		-	
18-Nov-07		506.1		-	
9-Dec-08		Buried		-	
20-Jan-08		Buried		-	
17-Feb-08		Buried	511.2	-	
16-Mar-08		Buried	511.2	-	
6-Apr-08		Buried	511.6	512.9	
20-Apr-08	424.0	511.6	511.5	512.9	
18-May-08	423.2	510.2	511.1	512.8	
15-Jun-08	424.3	508.8	510.9	512.4	
13-Jul-08	423.9	507.5	510.7	512.3	
17-Aug-08	423.9	507.4	510.8	512.1	
31-Aug-08	N/A	N/A	N/A	511.7	
14-Sep-08	422.7	506.5	510.8	511.9	
19-Oct-08	424.5	507.8	510.8	512.5	518.8
23-Nov-08	Buried	Buried	Frozen	513.0	Frozen
14-Dec-08	Buried	Buried	510.2	Buried	Frozen
18-Jan-09	Frozen	Buried	Frozen	Buried	Buried
8-Feb-09	Frozen	509.4	511.1	Buried	Buried
15-Mar-09	424.1	510.7	511.3	513.4	Buried
12-Apr-09	424.9	510.8	511.3	512.7	515.1
17-May-09	424.5	510.0	511.1	512.8	514.6
14-Jun-09	423.0	508.6	510.9	512.4	N/A

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.
- Dry indicates that water level is not measurable in the well.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW13	RW16	RW17	RW18 (Dug)	RW19 (Drilled)
12-Jul-09	423.9	507.3	510.7	512.2	511.2
9-Aug-09	423.6	506.5	510.5	512.4	510.4
13-Sep-09	422.4	506.0	509.8	512.8	507.5
11-Oct-09	423.0	506.5	510.4	513.1	508.9
15-Nov-09	422.6	507.1	510.5	513.1	508.4
29-Nov-09	N/A	507.1	N/A	N/A	N/A
13-Dec-09	Frozen	507.7	Frozen	513.0	509.6
12-Jan-10	N/A	507.5	N/A	N/A	N/A
17-Jan-10	N/A	508.3	510.8	Frozen	509.3
07-Feb-10	N/A	N/A	510.8	Frozen	508.8
14-Mar-10	424.5	509.6	511.6	512.9	509.0
18-Apr-10	423.1	510.4	511.2	513.0	509.7
16-May-10	424.0	509.6	511.1	512.6	N/A
8-Jun-10	N/A	508.9	N/A	N/A	N/A
13-Jun-10	423.7	508.9	511.2	512.2	512.2
21-Jul-10	N/A	508.4	511.1	512.3	511.7
16-Aug-10	423.0	507.5	510.8	512.2	509.0
12-Sep-10	422.8	506.6	510.6	512.4	509.1
26-Sep-10	N/A	506.5	N/A	N/A	N/A
17-Oct-10	424.6	507.0	510.8	512.8	508.8
14-Nov-10	423.8	508.5	511.1	512.8	508.6
19-Dec-10	Buried	N/A	Frozen	512.4	508.8
16-Jan-11	Buried	N/A	Frozen	Frozen	509.5
20-Feb-11	Buried	508.9	511.2	Frozen	508.3
13-Mar-11	Buried	509.2	511.2	Frozen	509.2
17-Apr-11	423.4	511.2	511.4	Frozen	509.9
15-May-11	424.3	510.6	511.5	512.9	509.2
13-Jun-11	423.3	509.7	511.1	512.5	507.9
3-Jul-11		508.22	-	-	-
17-Jul-11	423.4	507.58	510.6	511.84	507.8
14-Aug-11	423.0	506.6	510.3	511.9	508.2
18-Sep-11	N/A	505.8	509.7	511.8	509.0
17-Oct-11	N/A	506.2	510.3	511.8	508.2
20-Nov-11	N/A	507.3	510.7	512.0	508.6
18-Dec-11	N/A	509.2	511.2	512.4	508.9

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.
- Dry indicates that water level is not measurable in the well.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW13	RW16	RW17	RW18 (Dug)	RW19 (Drilled)
15-Jan-12	N/A	508.9	511.1	N/A	N/A
19-Feb-12	N/A	508.6	510.8	512.6	509.2
26-Feb-12		508.2			
18-Mar-12	425.1	511.2	511.5	512.9	510.7
15-Apr-12	424.4	509.7	511.1	512.4	507.8
13-May-12	424.6	508.6	511.0	512.3	508.9
17-Jun-12	423.0	507.4	510.8	512.2	508.5
1-Jul-12		506.6			
15-Jul-12	423.6	506.4	510.3	511.9	508.3
12-Aug-12	424.1	507.1	510.9	512.3	509.0
16-Sep-12	423.5	506.5	510.4	510.9	507.8
7-Oct-12		506.3			
14-Oct-12	423.8	506.8	510.6	511.0	509.2
18-Nov-12	424.5	509.6	511.2	512.8	510.0
16-Dec-12	424.4	509.1	511.2	513.1	509.0
13-Jan-13	424.8	509.7	511.5	513.2	510.1
17-Feb-13	Frozen	509.3	511.2	Frozen	508.2
17-Mar-13	Frozen	509.5	511.2	Frozen	508.7
31-Mar-13		509.1			
14-Apr-13	424.8	510.5	511.4	512.9	509.3
12-May-13	423.6	510.0	511.2	512.7	508.6
2-Jun-13		509.3			
16-Jun-13	423.7	508.9	511.0	512.5	508.8
14-Jul-13	424.0	508.1	510.9	512.0	508.9
18-Aug-13	424.0	507.2	510.7	512.0	508.6
15-Sep-13	422.8	506.5	510.6	512.2	509.6
13-Oct-13	423.7	508.2	511.2	512.4	509.6
17-Nov-13	423.9	509.2	511.3	512.5	508.8
16-Dec-13	Frozen	509.12	511.2	Frozen	508.8
19-Jan-14	Frozen	508.47	511.1	Frozen	509.5
16-Feb-14	Frozen	507.7	510.9	Frozen	509.6
17-Mar-14	Frozen	507.4	510.9	Frozen	509.4
13-Apr-14	Frozen	511.9	512.2	Frozen	512.2
11-May-14	424.1	510.5	511.3	512.6	509.4
15-Jun-14	422.9	508.2	510.9	511.9	509.3

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW13	RW16	RW17	RW18 (Dug)	RW19 (Drilled)
13-Jul-14	423.8	507.2	510.8	512.0	509.3
17-Aug-14	423.1	506.6	510.6	511.9	509.2
7-Sep-14	423.2	506.3	510.5	512.0	509.2
12-Sep-14		506.8			
19-Sep-14					
19-Oct-14	423.3	507.5	510.8	512.9	509.2
2-Nov-14		508.2			507.7
16-Nov-14		508.9	511.2	512.9	509.2
14-Dec-14		509.2	511.1	512.8	509.2
18-Jan-15					
15-Feb-15					
15-Mar-15					507.9
19-Apr-15	424.0	510.6	511.4	512.9	513.1
17-May-15	423.7	509.0	511.0	512.6	509.8
14-Jun-15	423.7	507.9	511.0	512.3	508.5
19-Jul-15	N/A	507.9	510.9	512.1	508.0
9-Aug-15	N/A	507.0	510.8	511.6	507.2
6-Sep-15	N/A	506.2	510.5	511.0	506.5
11-Oct-15	423.0	505.6	509.9	Dry	506.0
15-Nov-15	422.8	506.3	510.6	510.8	506.4
6-Dec-15	423.3	507.3	510.8	511.0	506.4
17-Jan-16	424.7	Frozen	511.0	Frozen	507.6
14-Feb-16	Frozen	508.7	511.1	Frozen	508.9
13-Mar-16	425.1	512.5	511.7	513.0	514.9
17-Apr-16	424.8	510.7	511.3	512.9	514.4
15-May-16	423.7	509.4	511.1	512.6	511.0
19-Jun-16	422.8	507.6	510.7	512.2	508.9
17-Jul-16	422.6	506.3	510.3	511.2	507.2
24-Jul-16		506.1			
21-Aug-16	422.9	505.6	509.7	Dry	506.0
18-Sep-16	422.9	505.3	509.4	Dry	505.6
29-Sep-16		505.2			
16-Oct-16	422.9	505.1	509.2	Dry	505.3
13-Nov-16	422.9	505.1	509.3	Dry	505.2
27-Nov-16		505.1			
11-Dec-16	Frozen	506.0	509.8	Frozen	505.2

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

TABLE C-7
GROUNDWATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

RESIDENTIAL WELLS

111-53312-01 A61

DATE	RW13	RW16	RW17	RW18 (Dug)	RW19 (Drilled)
15-Jan-17	Frozen	508.1	510.9	Frozen	507.8
12-Feb-17	Frozen	508.3	510.9	Frozen	507.5
19-Mar-17	Frozen	509.9	511.2	Frozen	510.7
9-Apr-17		510.4			
16-Apr-17	425.0	510.3	511.3	512.7	512.0
11-May-17	424.2	510.6	511.3	512.7	512.8
21-May-17		510.1			
25-Jun-17	424.1	509.2	511.4	512.6	510.9
19-Jul-17	423.3	508.4	511.0	512.5	509.7
3-Aug-17		507.7			
17-Aug-17	422.8	507.2	510.8	511.7	507.9
29-Aug-17		506.8			
17-Sep-17	422.7	506.5	510.6	511.0	506.8
26-Sep-17		506.5			
15-Oct-17	422.8	507.2	510.8	511.3	506.7
14-Nov-17	423.5	507.8	511.0	511.5	507.0
11-Dec-17	Frozen	512.5	Frozen Lid	Frozen Lid	510.3
14-Jan-18	Frozen	509.0	511.3	Frozen	509.4
11-Feb-18	-	508.7	-	-	-
18-Feb-18	Frozen	510.4	N/A	Frozen	509.9
18-Mar-18	Frozen	509.6	511.1	Frozen	509.9
15-Apr-18		509.5	511.4		510.5
17-May-18	424.1	510.7	511.2	512.6	510.8
18-Jun-18	422.8	508.0	510.8	511.9	508.5
17-Jul-18	422.4	506.7	510.3	510.9	506.8
22-Aug-18	423.2	505.7	511.7	511.3	504.7
18-Sep-18	423.2	505.4	509.5	511.3	504.2
23-Oct-18	423.5	505.1	509.5	510.9	504.9
19-Nov-18	424.6	507.0	510.7	Frozen	505.7
10-Dec-18	423.6	507.0	511.0	Frozen	506.8

NOTE:
- Frozen / Buried indicates well lid frozen or buried in snow.
- N/A indicates well unaccessible.

FIGURE C-48

GROUNDWATER HYDROGRAPH
RW1

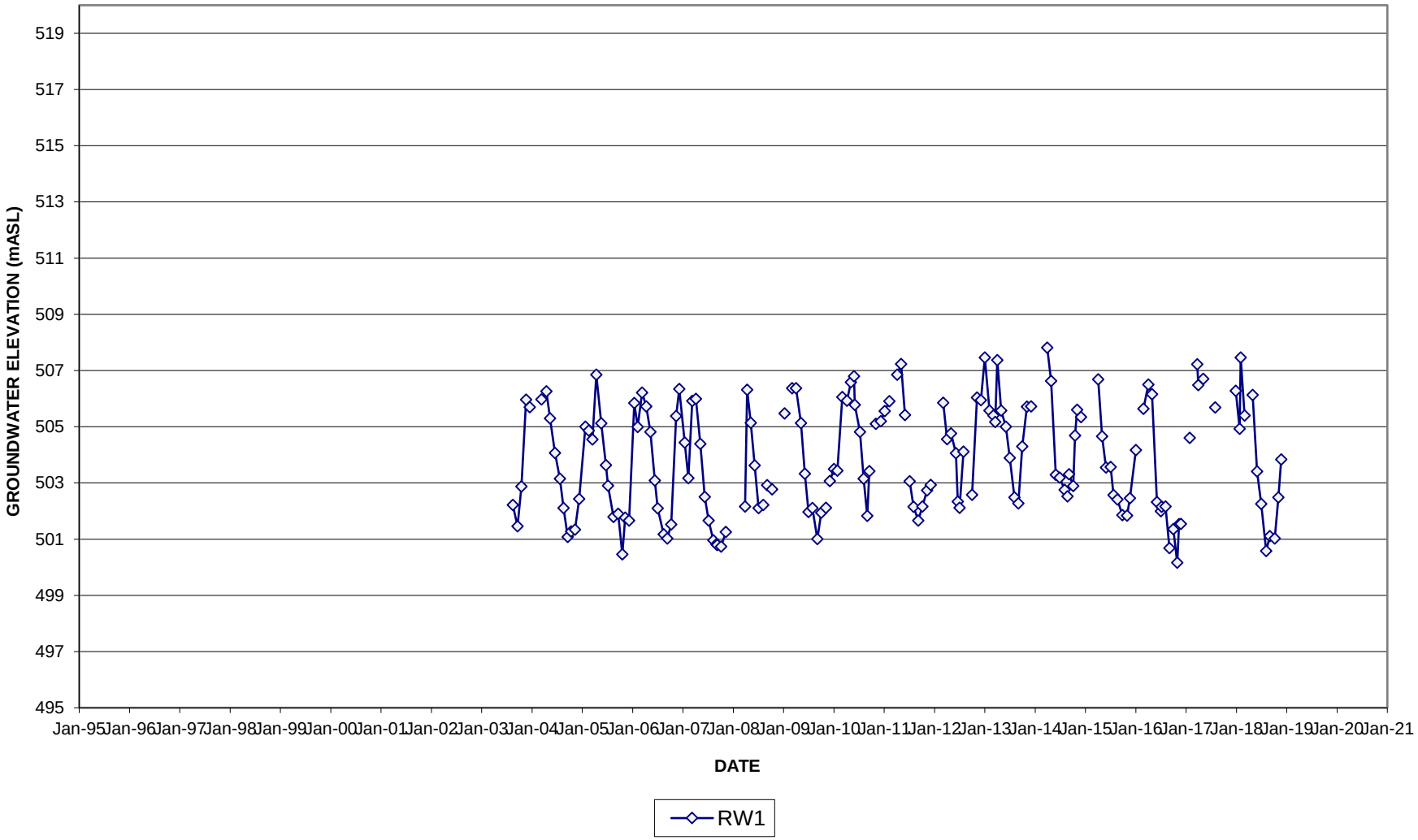


FIGURE C-48 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
RW1

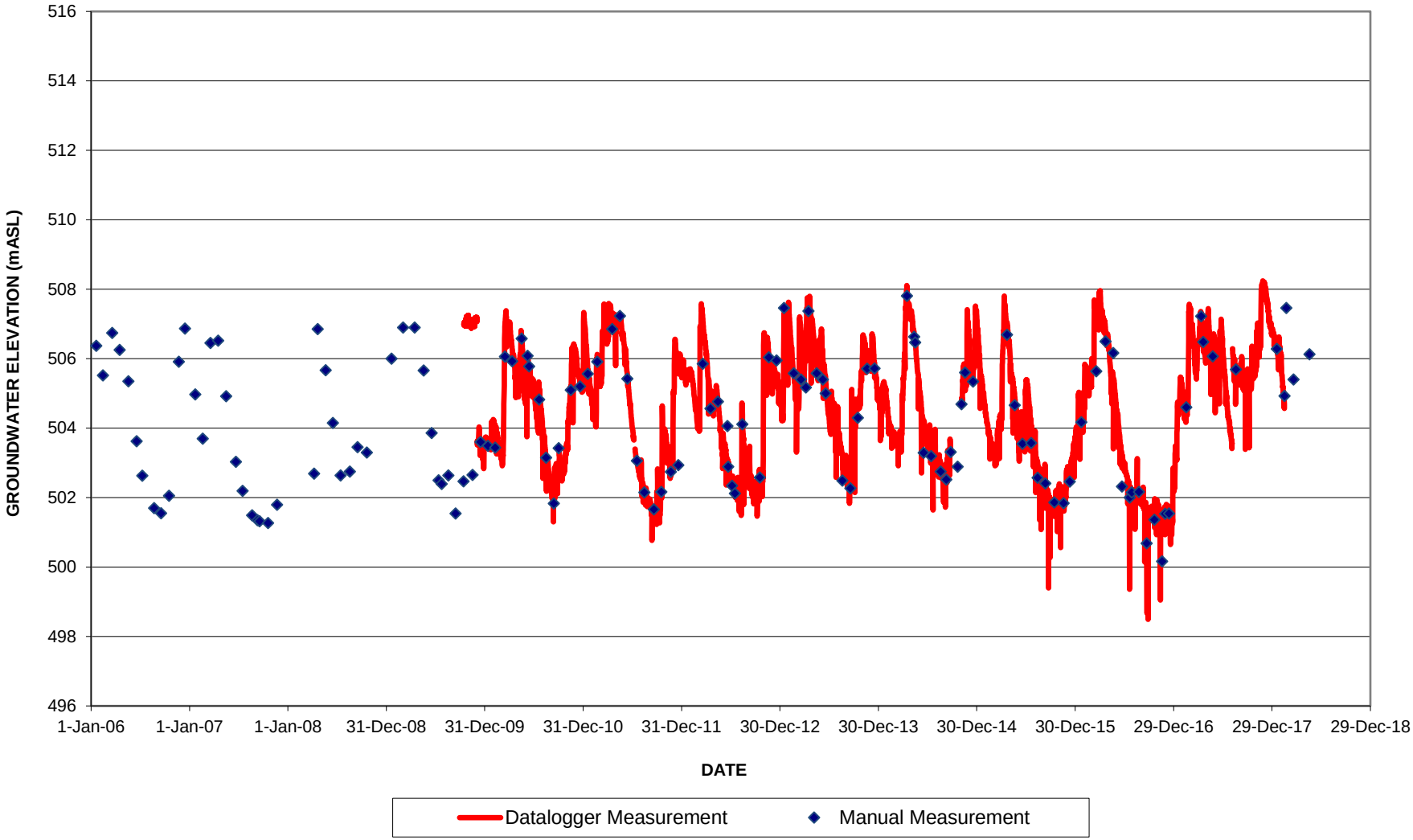


FIGURE C-49

GROUNDWATER HYDROGRAPH
RW2

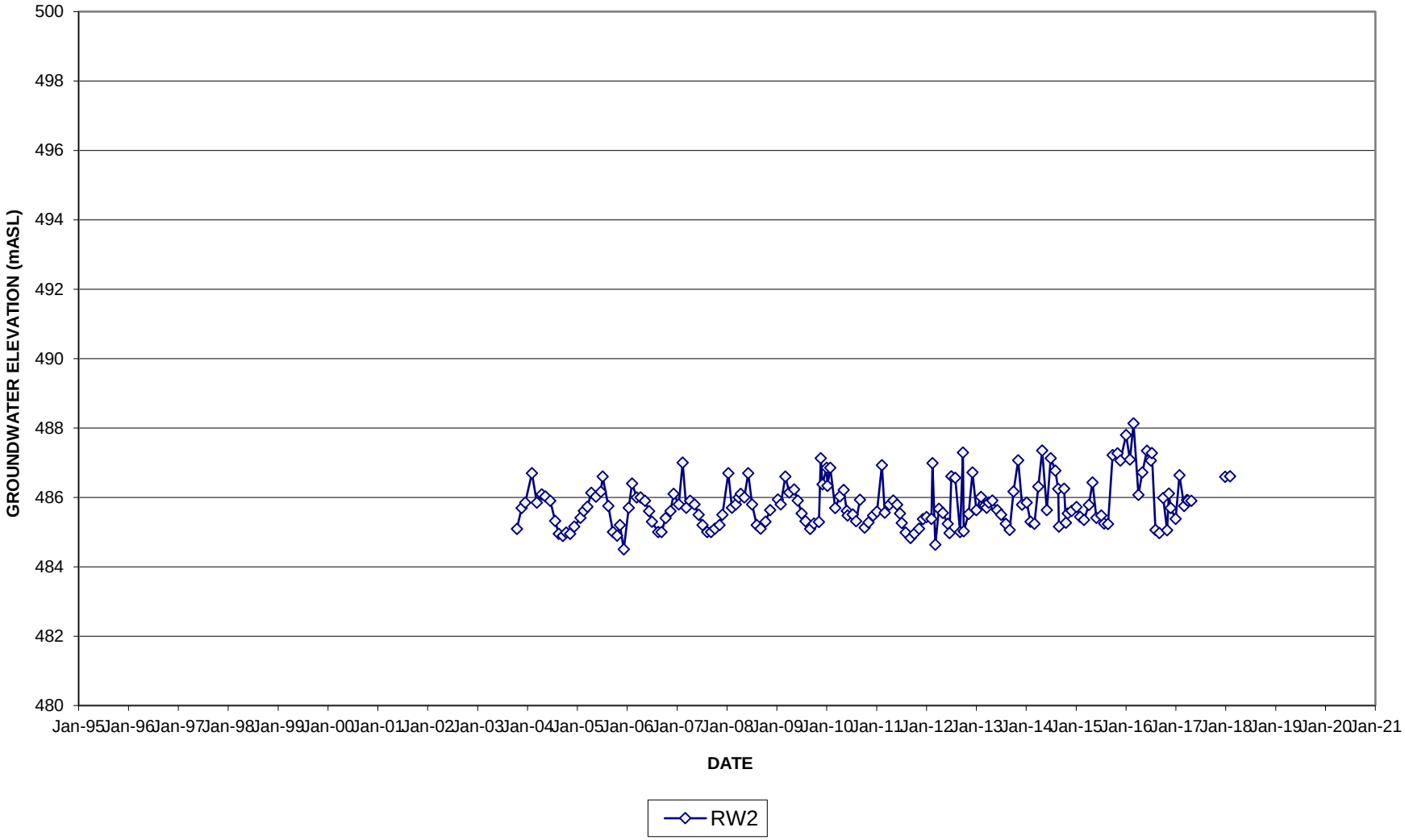
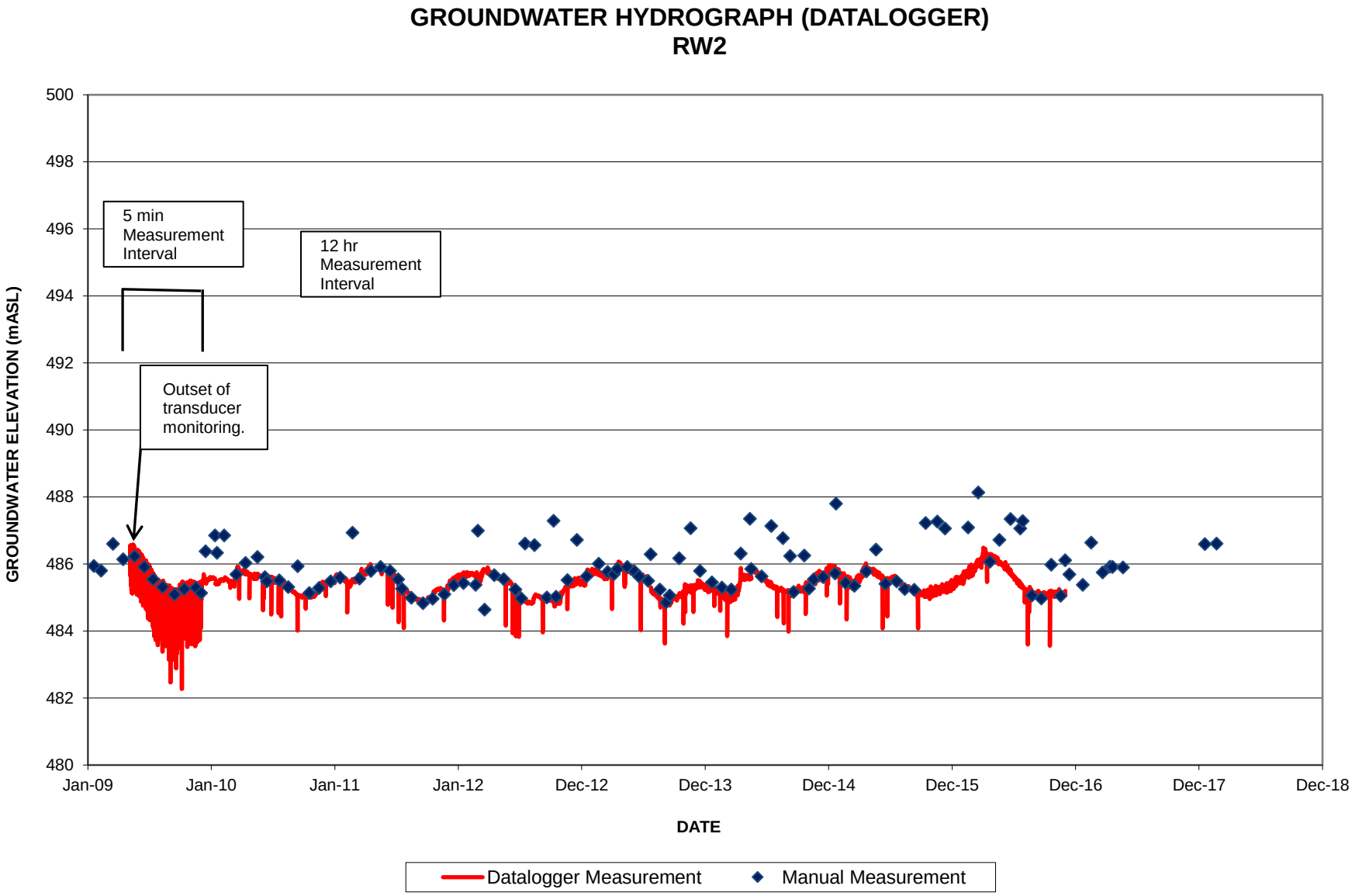


FIGURE C-49 (a)



G:\EPD\01-WAI\Duntroon Quarry\AMP\05 Annual Monitoring Results\Historical Flow Values\Level Logger Data\Hydrograph data\Figure C-49 RW2 Fabrizio Datalogger Summary.xlsx

FIGURE C-50

GROUNDWATER HYDROGRAPH
RW3

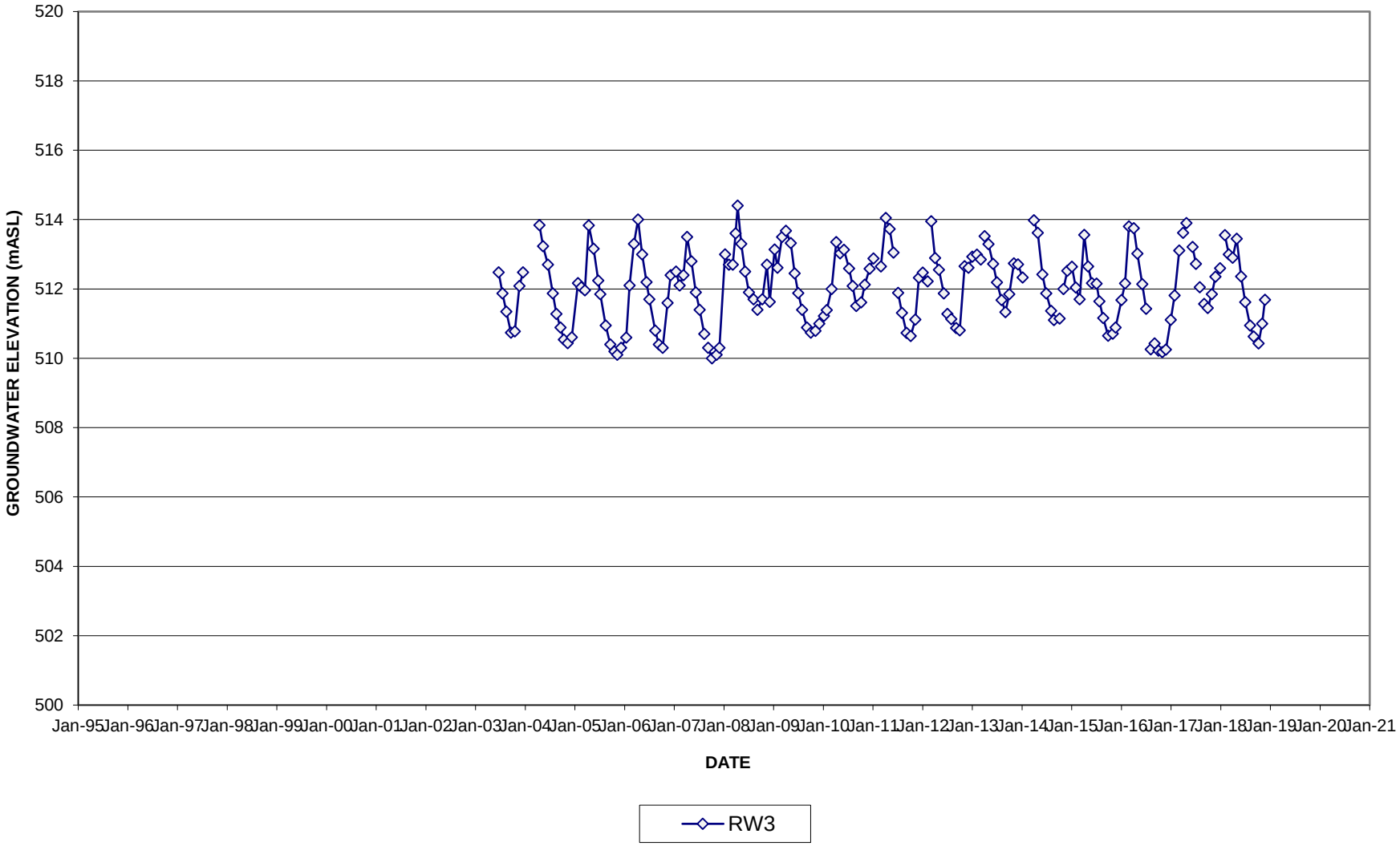


FIGURE C-51

GROUNDWATER HYDROGRAPH
RW4

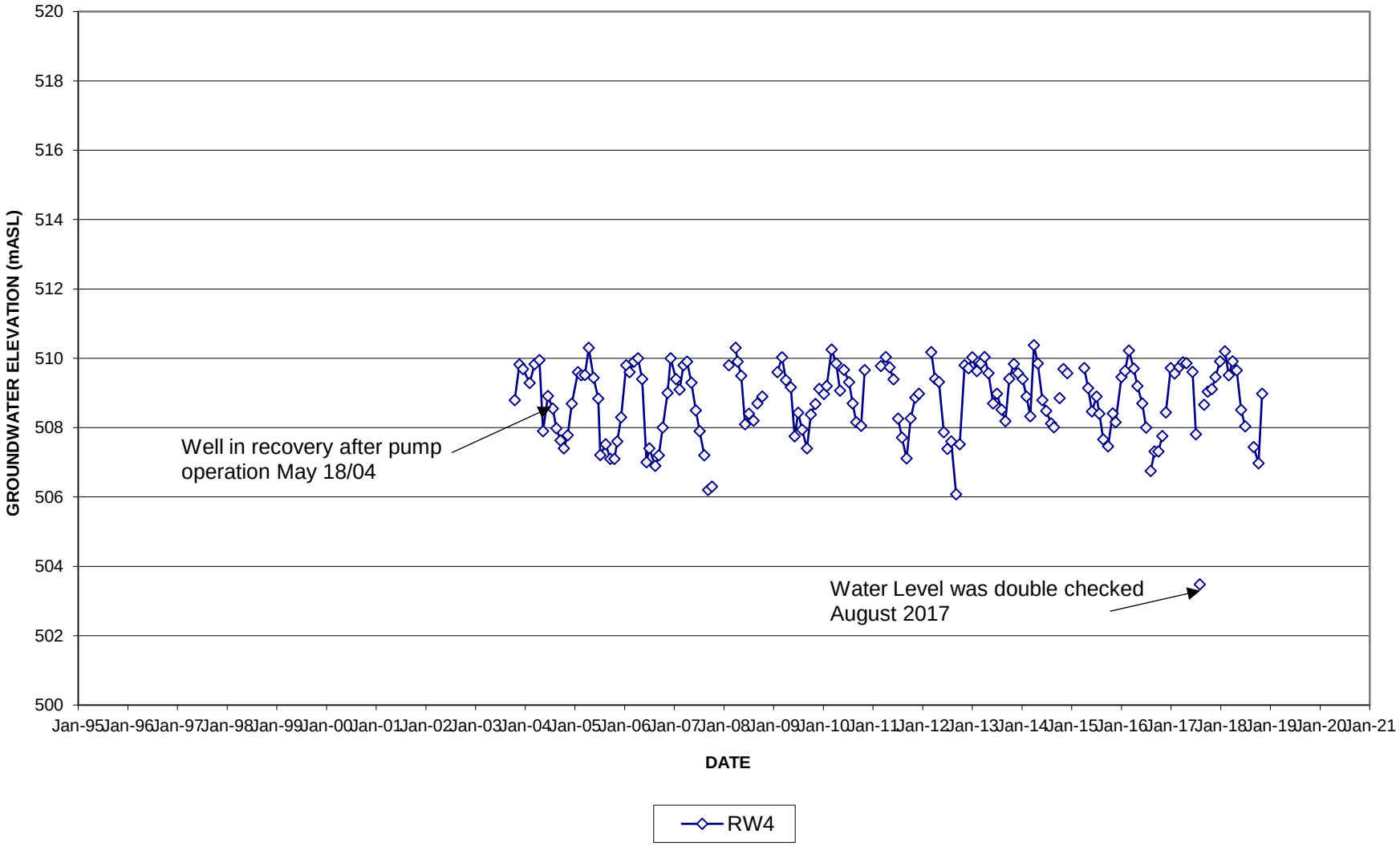


FIGURE C-52

GROUNDWATER HYDROGRAPH
RW5

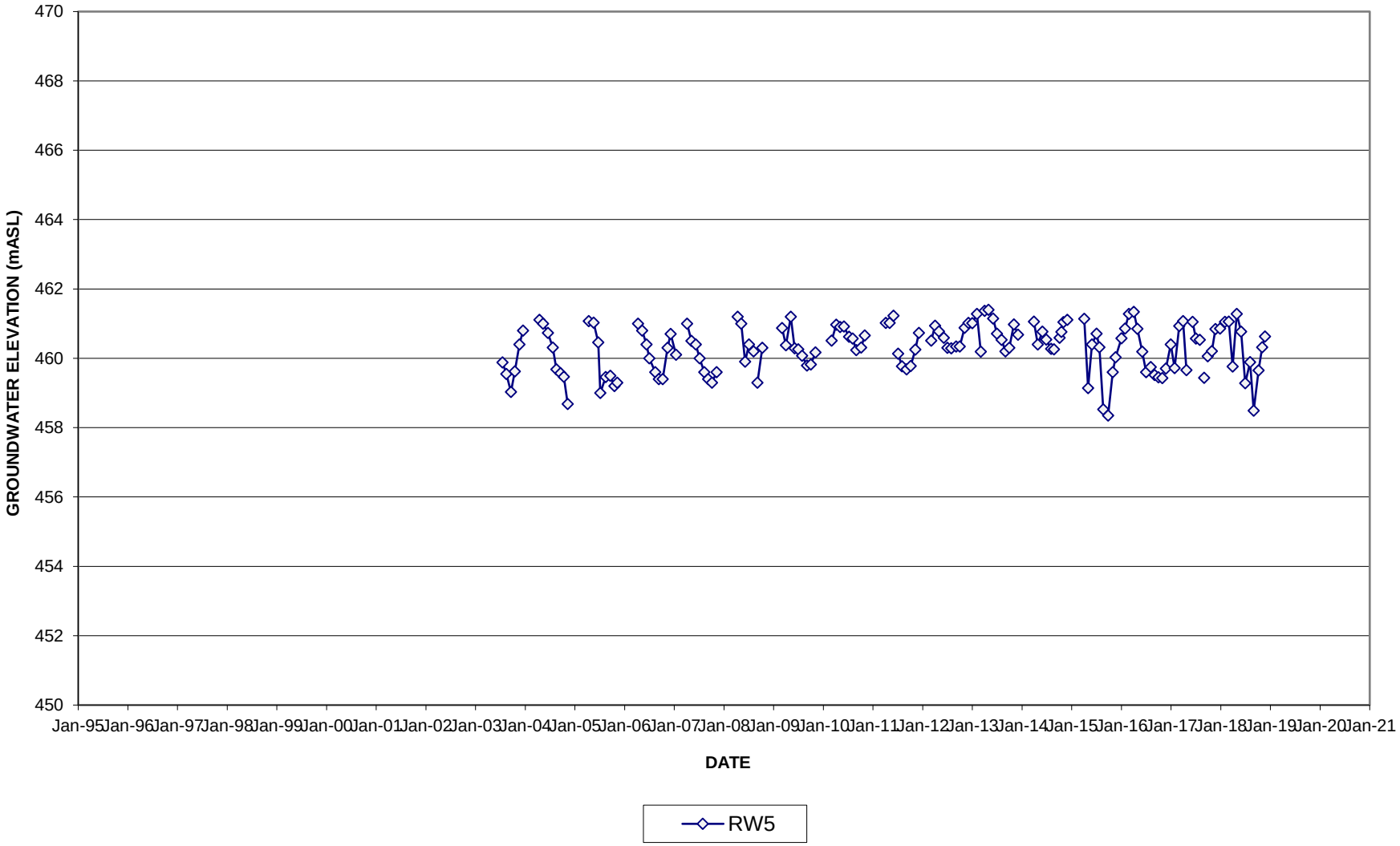


FIGURE C-53

GROUNDWATER HYDROGRAPH
RW6

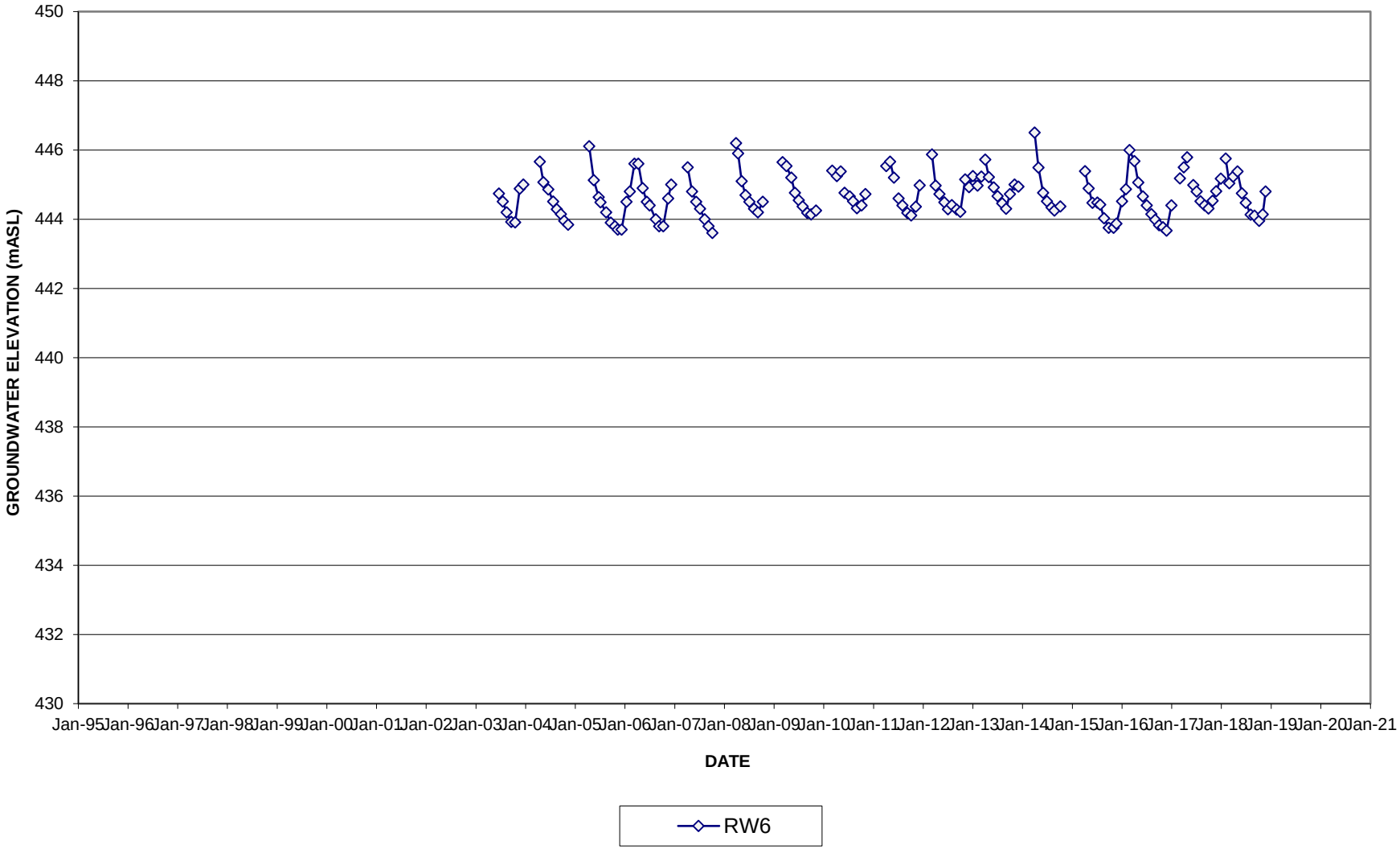


FIGURE C-54

GROUNDWATER HYDROGRAPH
RW7

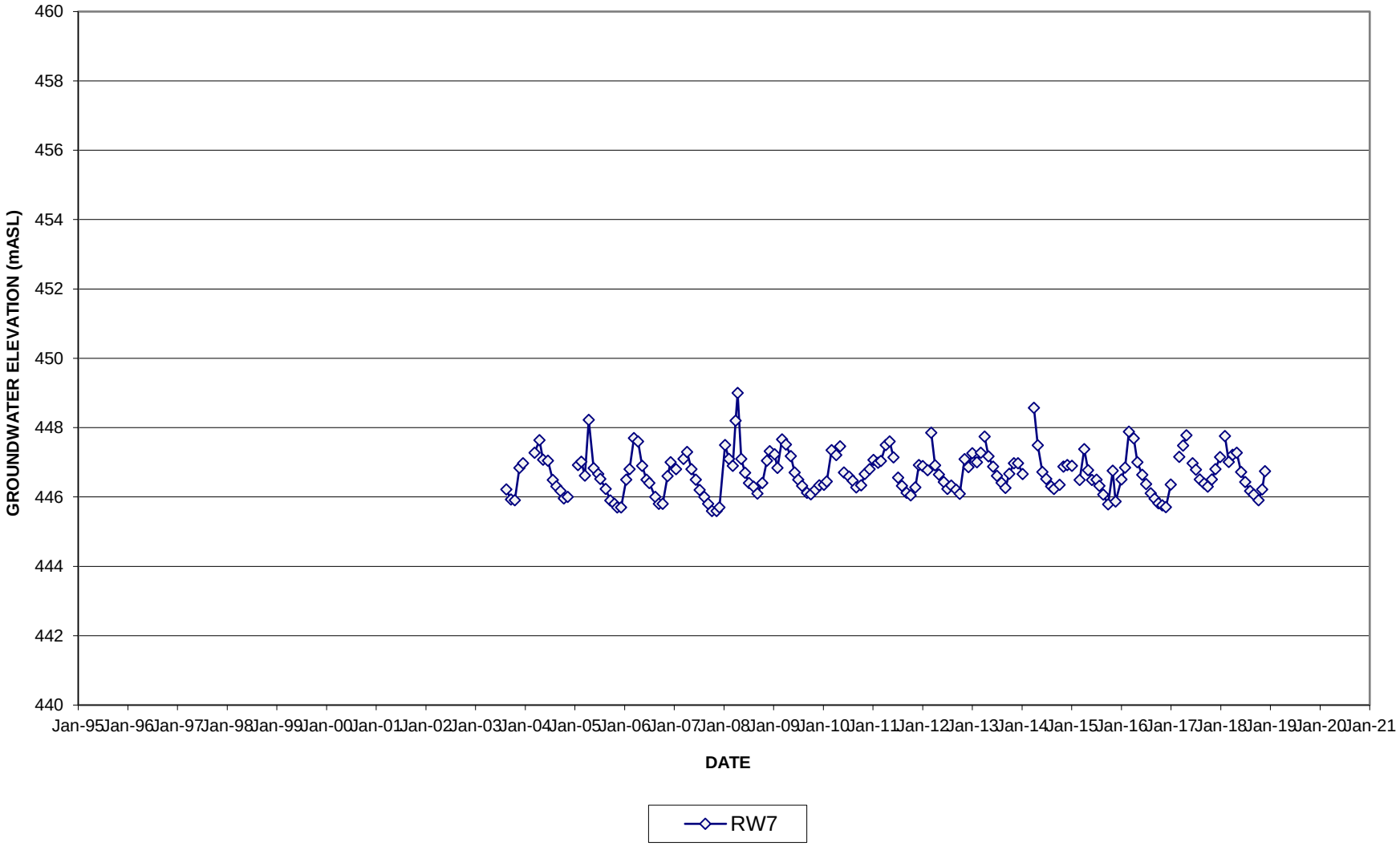


FIGURE C-55

GROUNDWATER HYDROGRAPH
RW8

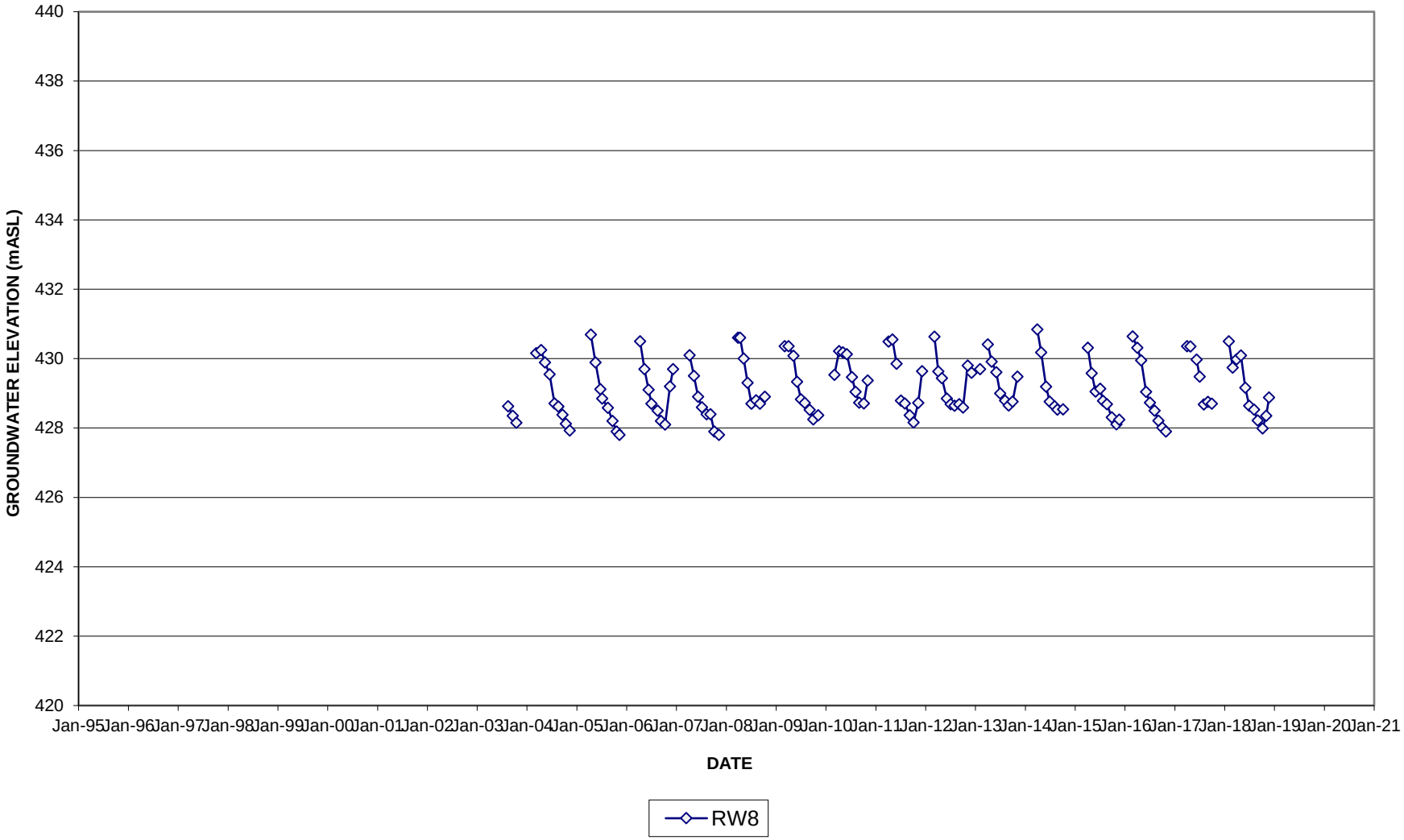


FIGURE C-56

GROUNDWATER HYDROGRAPH
RW9

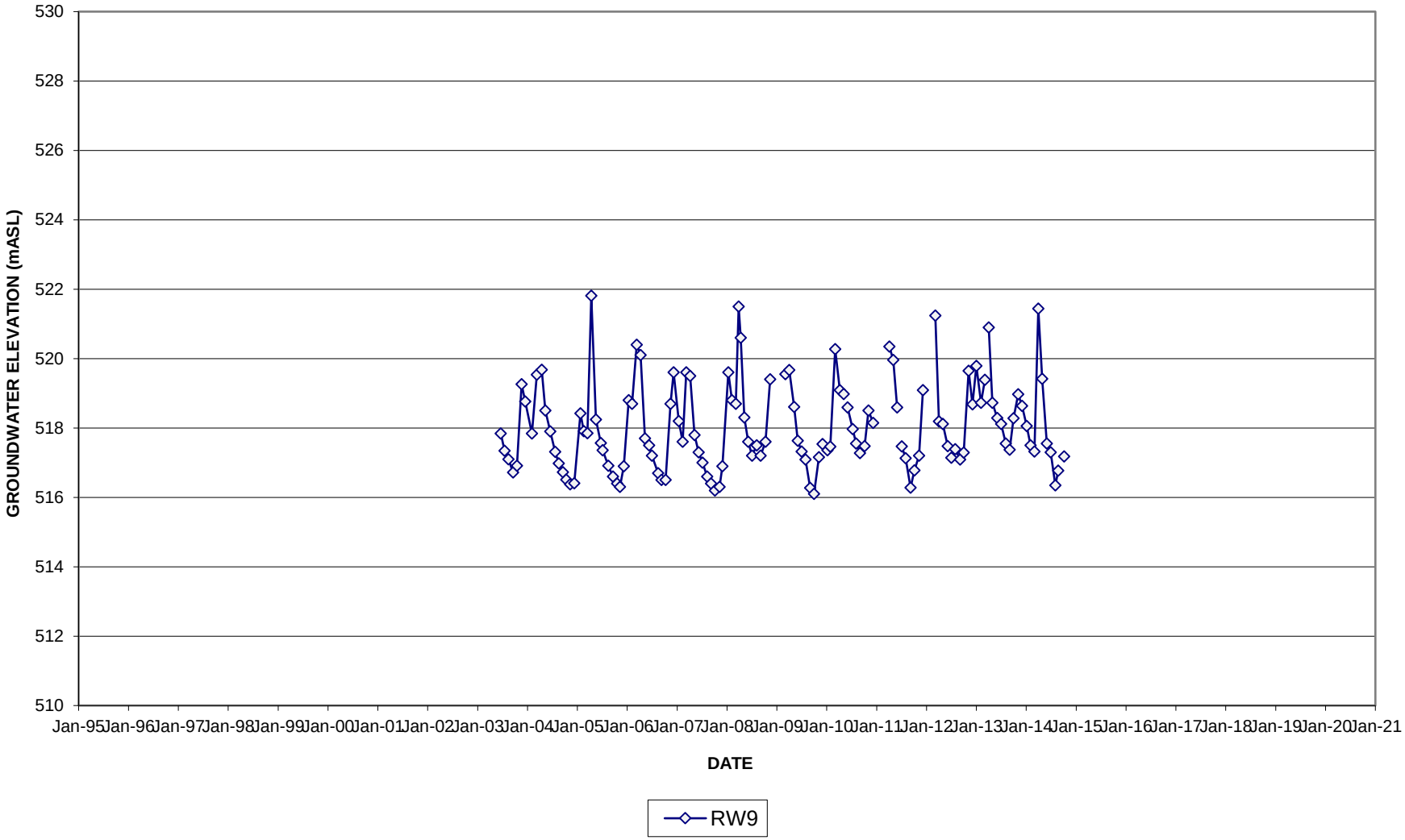


FIGURE C-57

GROUNDWATER HYDROGRAPH
RW12 (NORTH WELL)

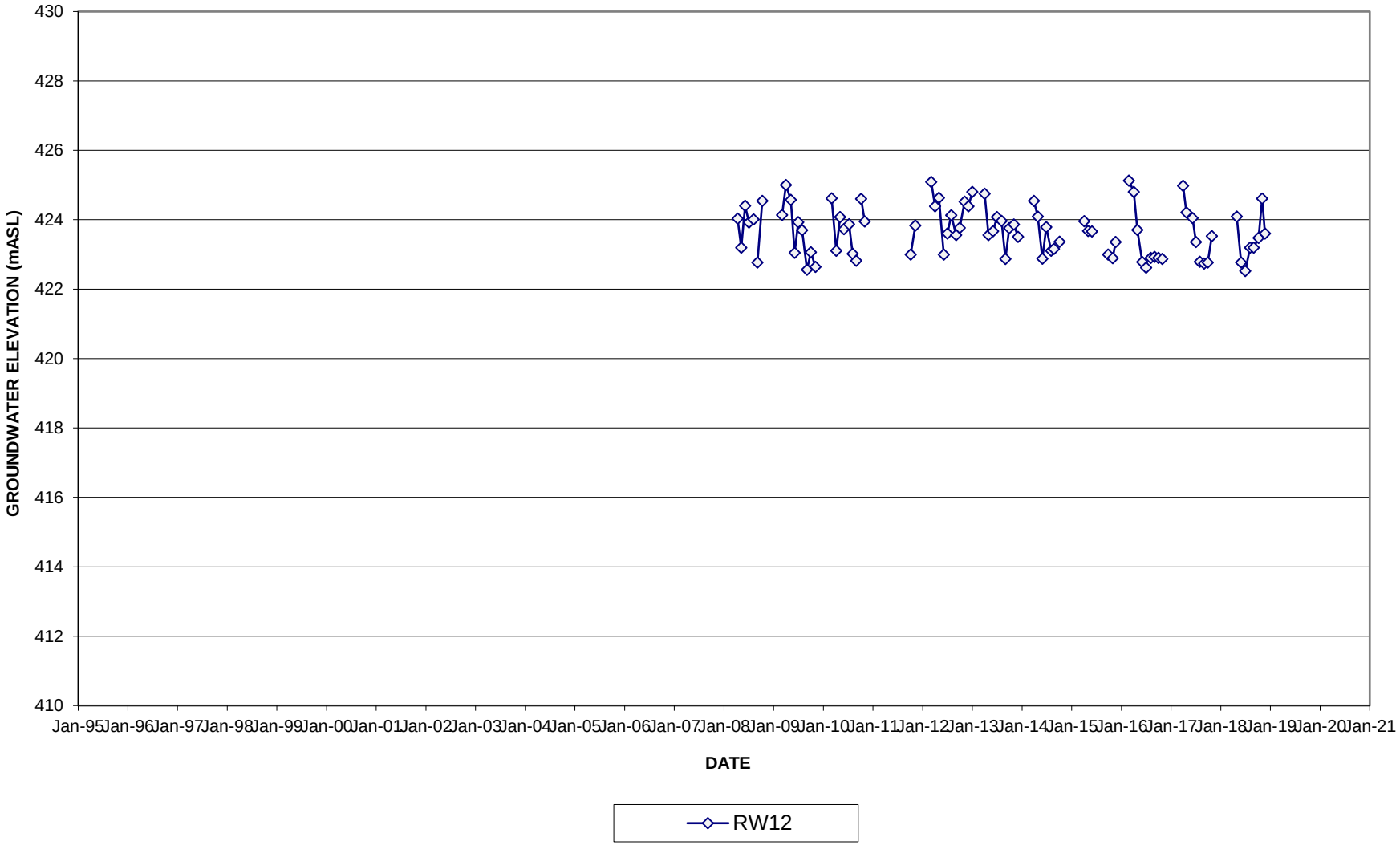


FIGURE C-58

GROUNDWATER HYDROGRAPH
RW13 (SOUTH WELL)

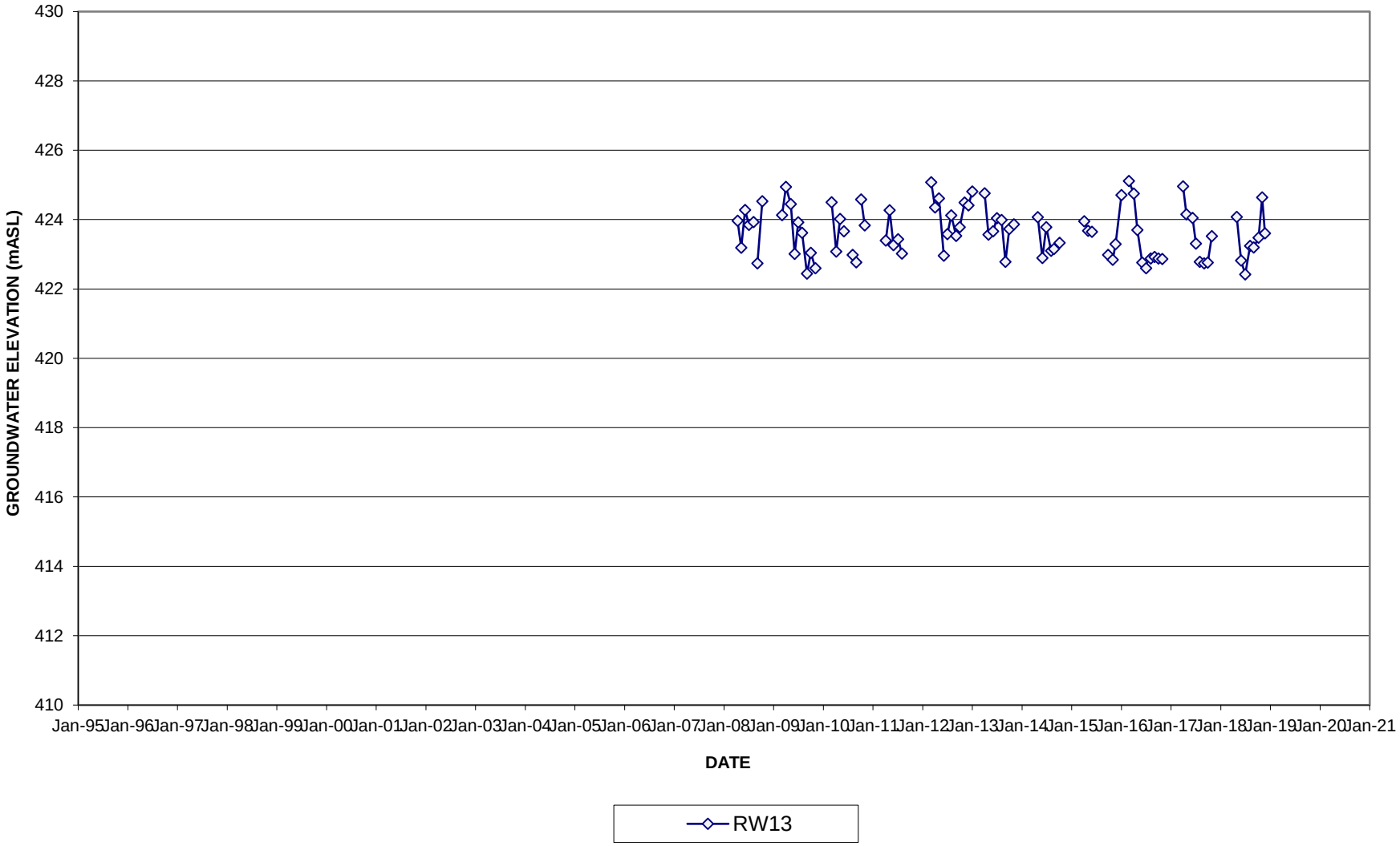


FIGURE C-59

GROUNDWATER HYDROGRAPH
RW16

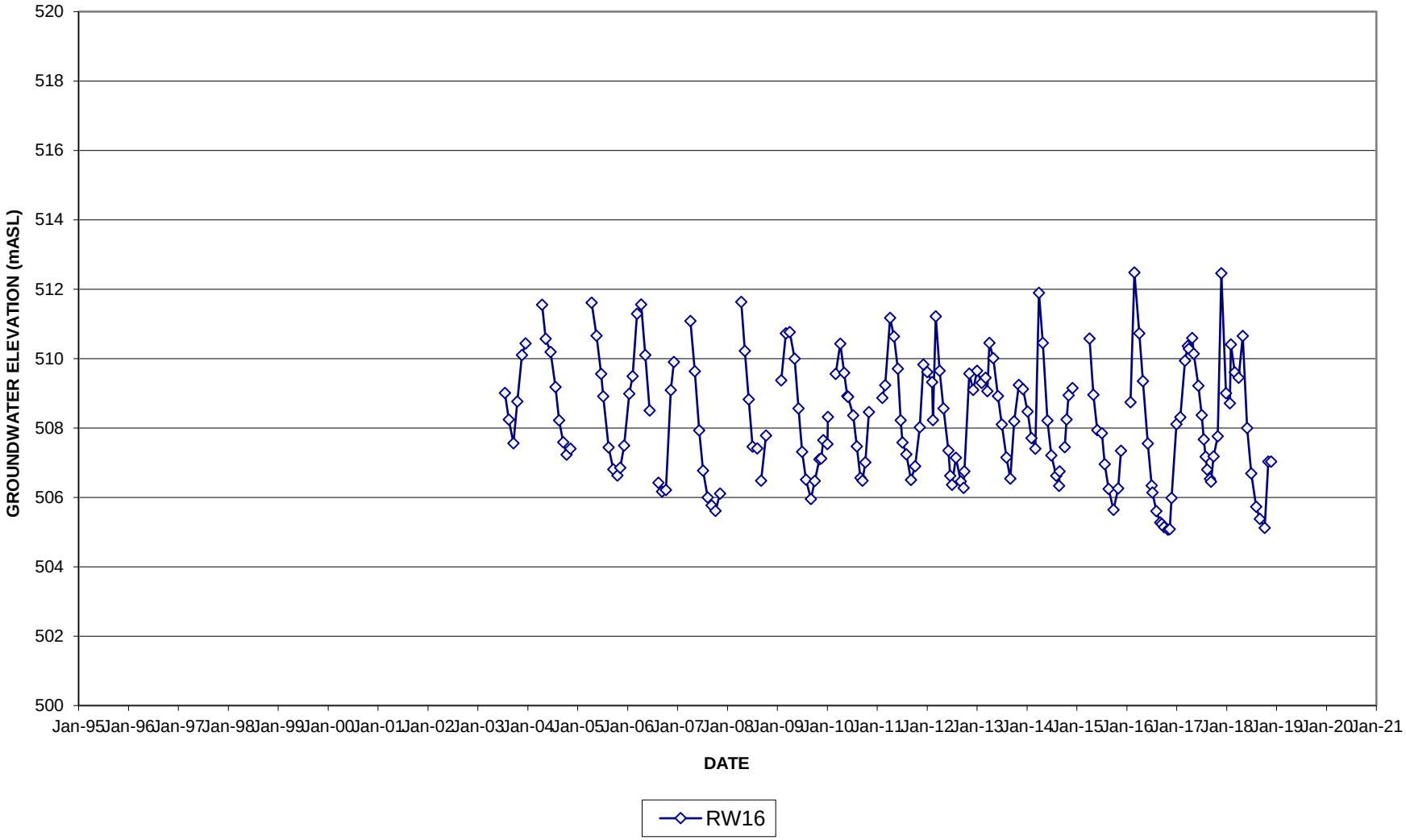


FIGURE C-59 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
RW16

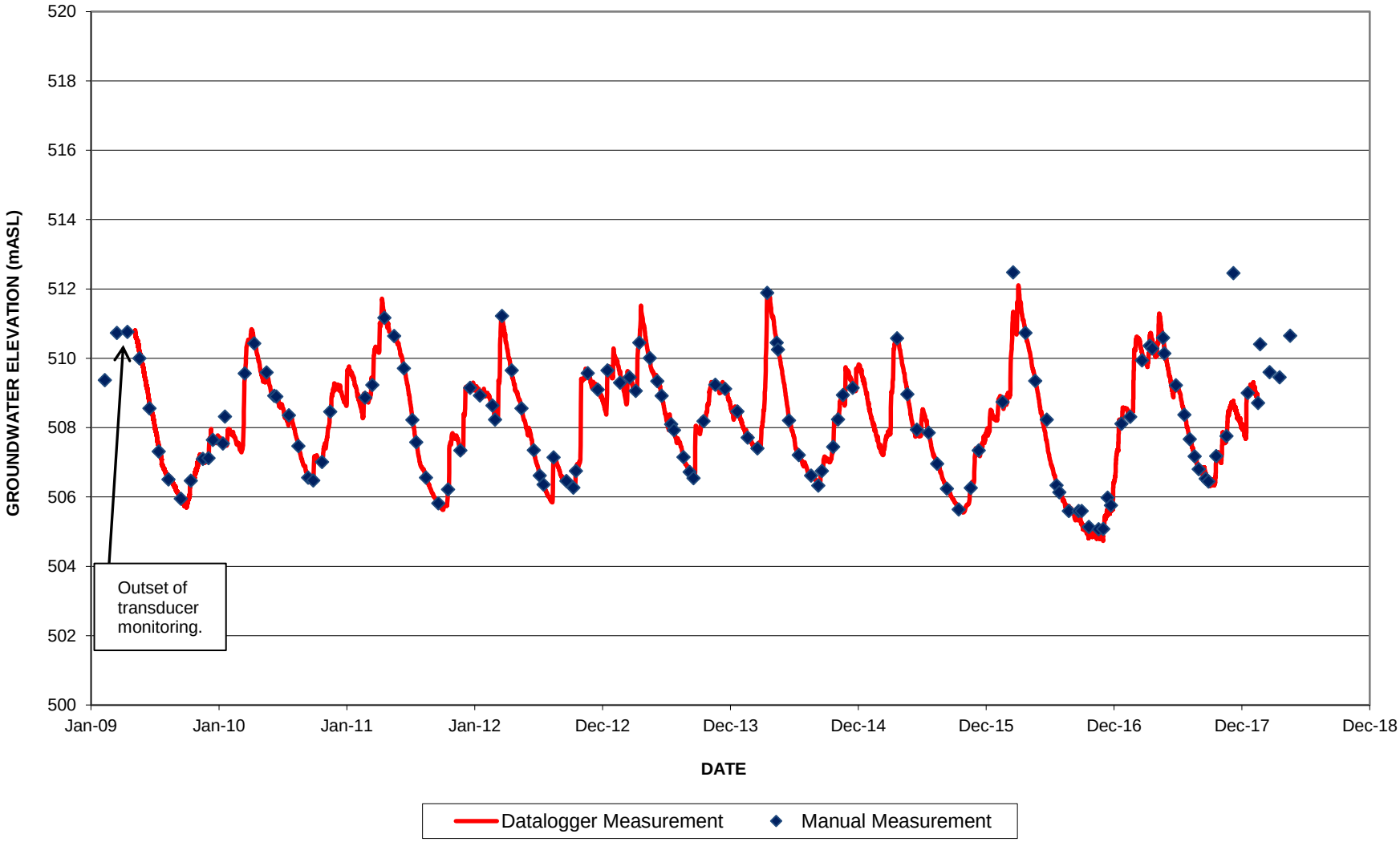


FIGURE C-60

GROUNDWATER HYDROGRAPH
RW17

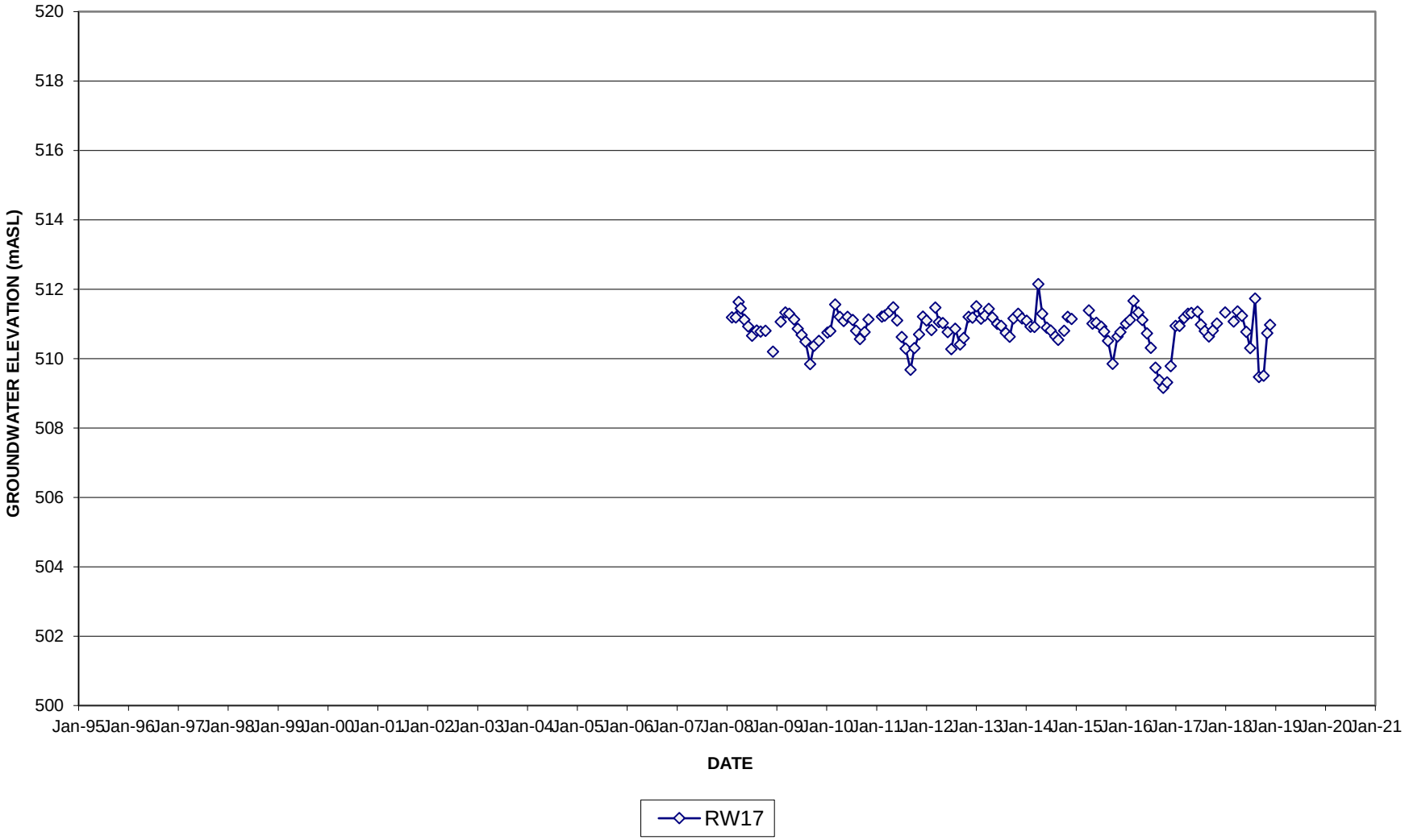


FIGURE C-61

GROUNDWATER HYDROGRAPH
RW18 (Dug)

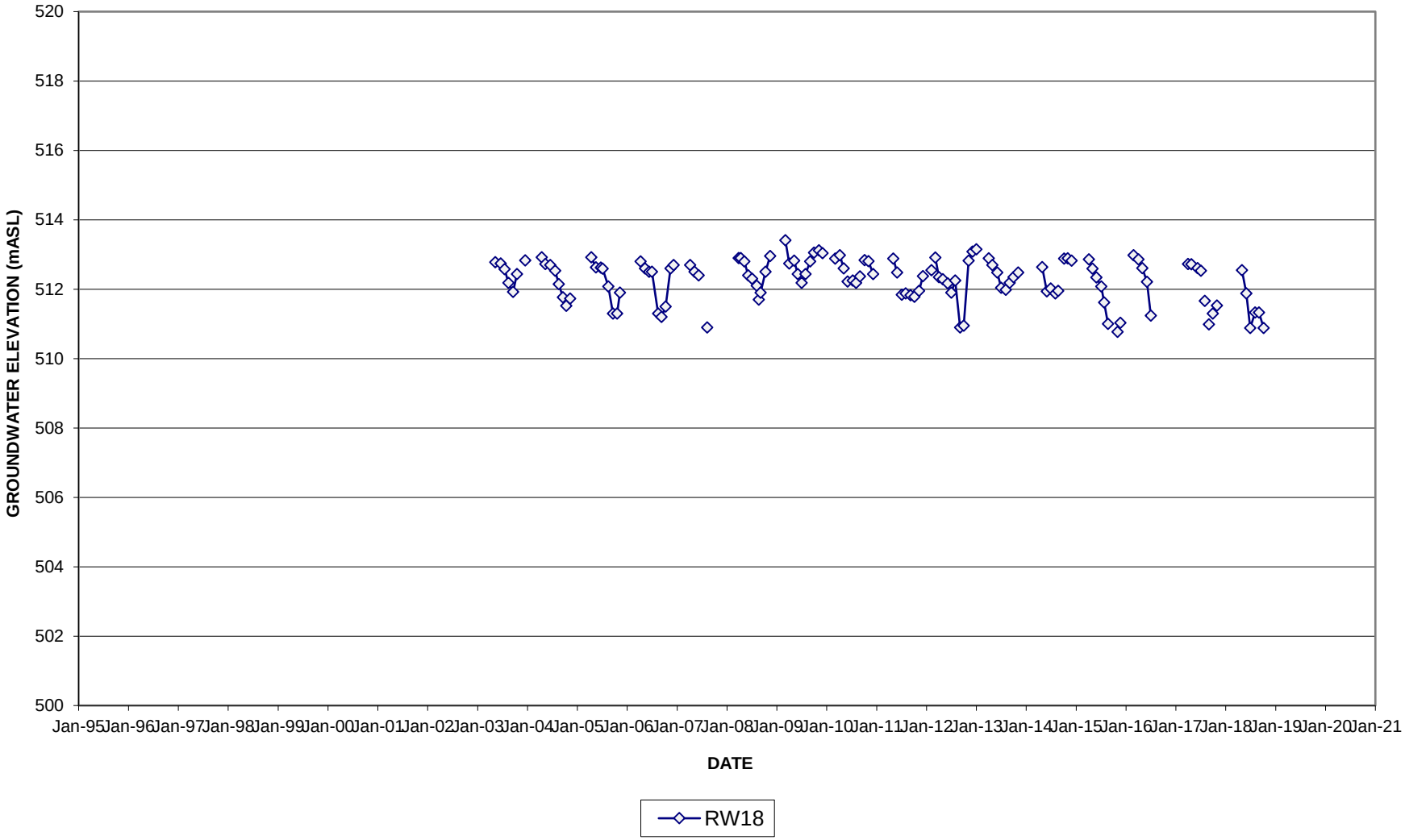


FIGURE C-62

GROUNDWATER HYDROGRAPH
RW19 (Drilled)

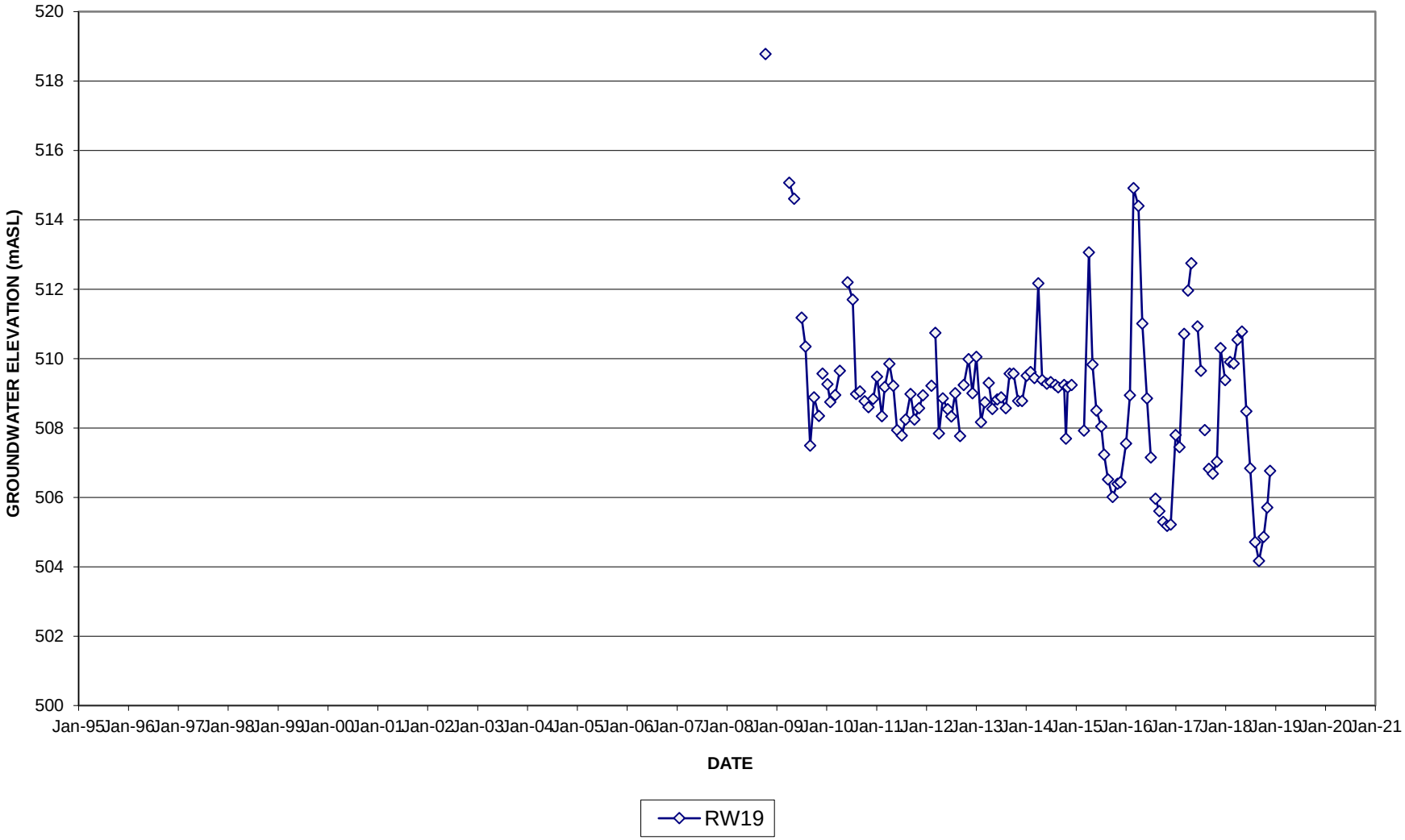


FIGURE C-79

GFOUNDWATER HYDROGRAPH
RW10

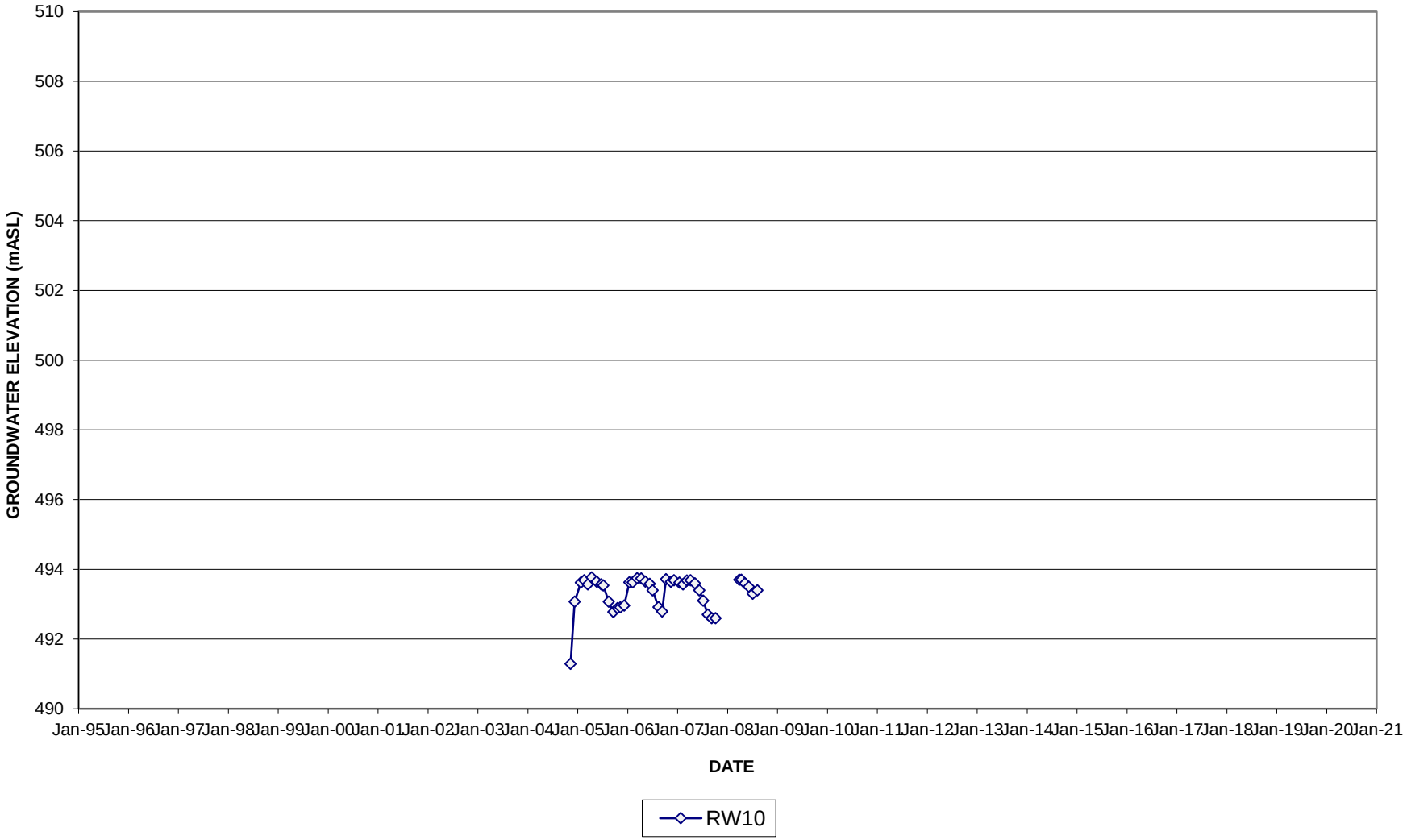


FIGURE C-83

GROUNDWATER HYDROGRAPH
RW11 (DUG WELL)

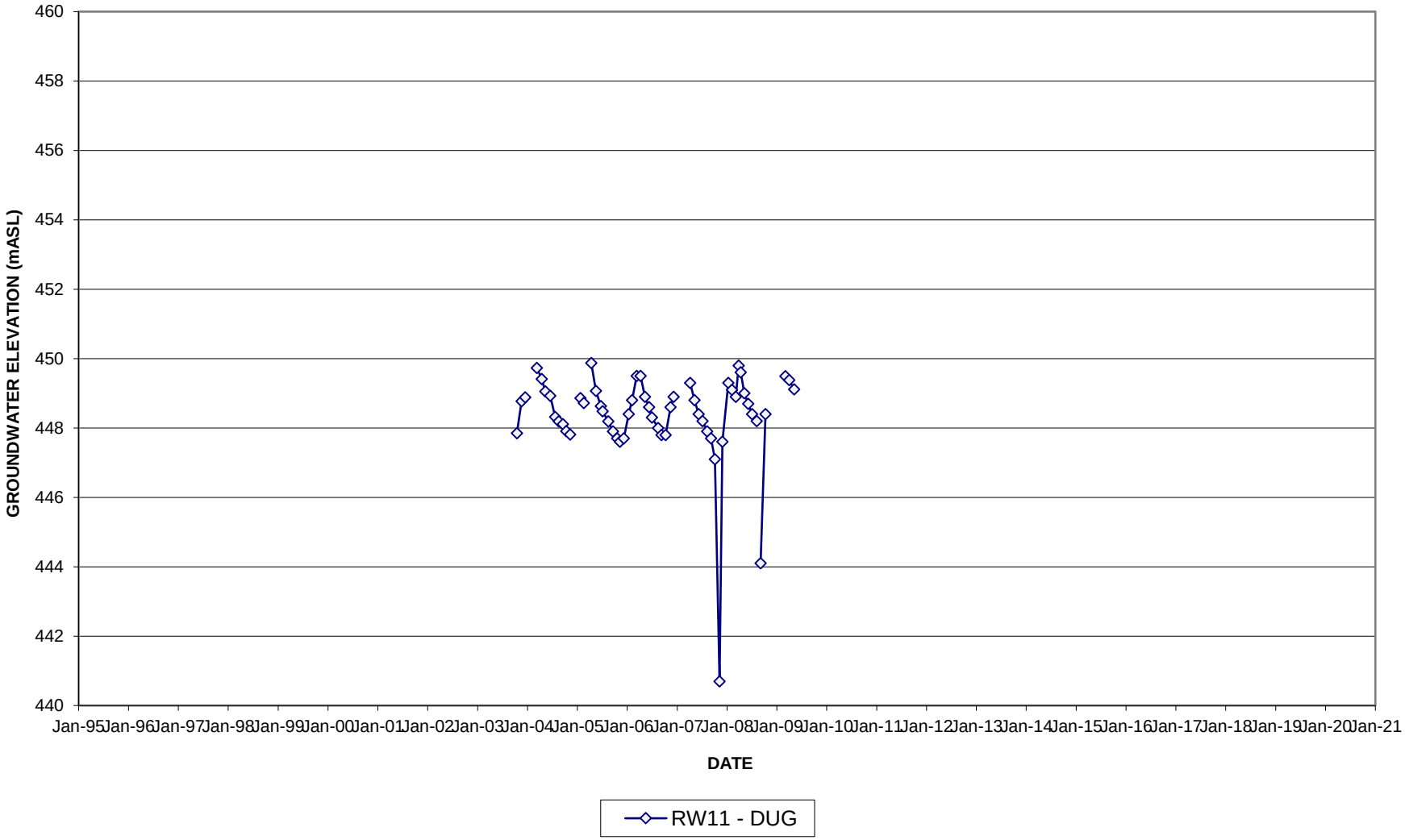


FIGURE C-82

GROUNDWATER HYDROGRAPH
RW11 (DRILLED WELL)

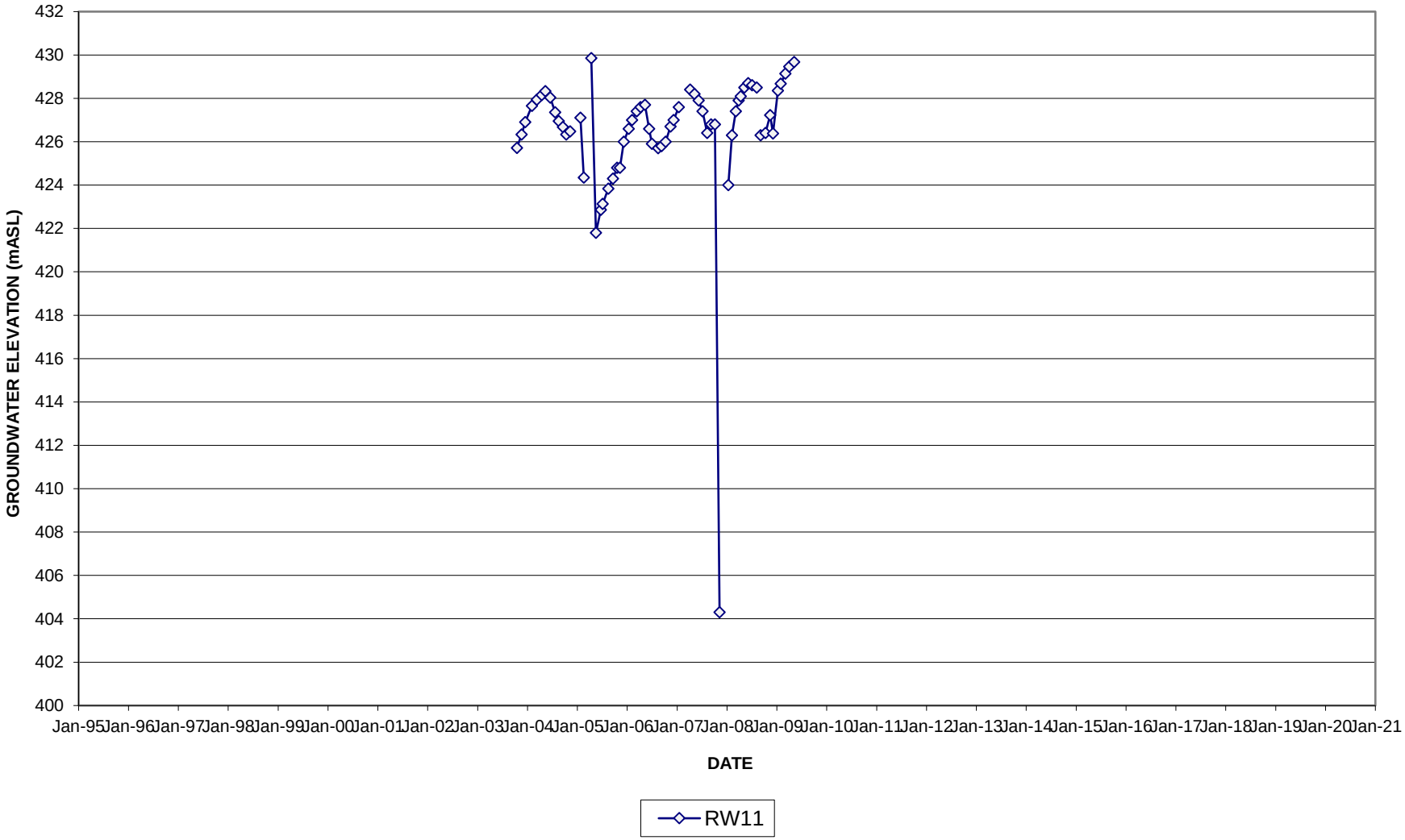


FIGURE C-77

GROUNDWATER HYDROGRAPH
RW15

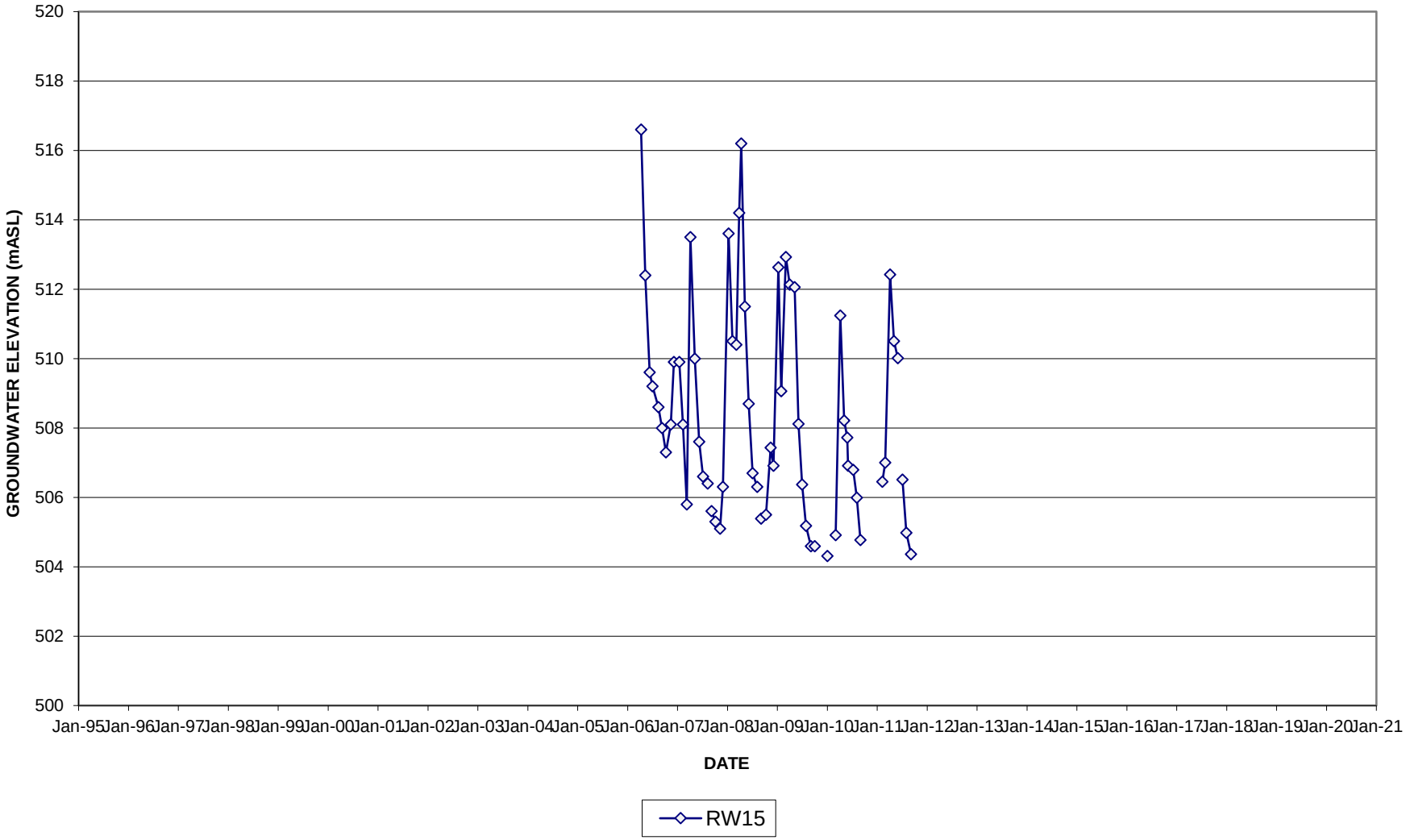


TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
26-Jul-99	511.7		511.8		514.0	
17-Aug-99						
27-Sep-99	511.2		511.4		512.5	
25-Oct-99	511.9		512.1		512.7	
21-Nov-99	512.0		512.1		512.7	
21-Dec-99	512.0		512.1		512.8	
25-Jan-00	512.0		512.0		512.8	
29-Feb-00	512.1		512.1		513.5	
31-Mar-00	512.0		512.1		513.5	
02-Jun-00	512.0		512.2		513.4	
07-Jul-00	512.0		512.2		513.1	
27-Aug-00	511.8		512.1		512.8	
28-Sep-00	511.5		512.0		512.7	
03-Nov-00	511.3		512.1		512.8	
22-Feb-01	Frozen		Frozen		Frozen	
22-Mar-01	Frozen		Frozen		Frozen	
26-Apr-01	Frozen		512.1			
31-May-01	511.3		511.8		513.6	
28-Jun-01	511.3		511.3		513.5	
01-Aug-01	511.4		Dry		513.0	
04-Oct-01	510.9		510.9		513.3	
01-Nov-01	511.2		511.2		513.5	
14-Dec-01	511.1		510.9		513.4	
10-Jan-02	510.9		510.8		513.4	
14-Mar-02	511.3		512.0		513.6	
16-May-02	511.3		512.2		513.6	
20-Jun-02	511.1		512.1		513.5	
11-Jul-02	511.5		512.1		513.1	
13-Sep-02	511.0		Dry		512.5	
01-Nov-02	511.4		512.1		512.5	
16-Jan-03	Frozen		Frozen		Frozen	
28-Mar-03	512.1		512.0		Frozen	
15-May-03	510.9		512.1		513.2	
23-Jun-03	511.7		Dry		513.2	
22-Jul-03	511.7		Dry		513.1	
20-Aug-03	511.1		Dry		513.0	
25-Sep-03	Dry		Dry		512.8	
22-Oct-03	511.0		510.8		513.2	
25-Nov-03	512.1		511.0		513.4	
22-Dec-03	511.0		512.1		513.4	
09-Feb-04	510.9		Frozen		513.3	
16-Mar-04	510.9		Frozen		513.5	
20-Apr-04	511.9		511.8		513.6	
18-May-04	512.0		Dry		513.4	
22-Jun-04	510.9		Dry		513.2	

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
28-Jul-04	510.9		Dry		513.2	
25-Aug-04	510.9		Dry		512.3	
22-Sep-04	510.9		Dry		512.7	
19-Oct-04	510.9	Dry	Dry	Dry	513.6	Dry
16-Nov-04	Dry	Dry	Dry	Dry	513.0	Dry
16-Dec-04	Dry		Dry		513.3	
31-Jan-05	Frozen	Frozen	Frozen	Frozen/Snow	513.3	Frozen/Snow
24-Feb-05	Frozen	Frozen	Frozen	Frozen/Snow	513.4	Frozen/Snow
22-Mar-05	Frozen	Frozen	Frozen	Frozen/Snow	513.3	Frozen/Snow
20-Apr-05	511.2	Snow	512.2	512.2	513.5	Snow Cover
25-May-05	512.1	512.2	512.2	512.2	513.2	Moist Ground
29-Jun-05	512.3	Dry	512.0	512.0	513.1	Dry
13-Jul-05	512.0	512.1	512.2	Dry	512.9	Dry
23-Aug-05	510.9	Dry	511.3	Dry	512.6	Dry
26-Sep-05	511.6	Dry	511.1	Dry	512.4	Dry
26-Oct-05	511.0		511.7		512.4	
16-Nov-05	512.0	512.0	511.9	Dry	512.8	Dry
14-Dec-05	510.9	Frozen	511.9	Frozen	512.6	Frozen
20-Jan-06	Frozen	Frozen	Frozen	Frozen	513.3	Frozen
14-Feb-06	Frozen	Frozen	510.8	Frozen	513.3	Frozen
19-Mar-06	512.1	512.1	512.0	Frozen	513.5	Frozen
17-Apr-06	512.0	512.0	512.0	512.0	513.5	513.6
19-May-06	511.0	Moist Ground	511.2	Moist Ground	513.4	Moist Ground
19-Jun-06	510.9	Dry	510.8	Moist Ground	513.1	Dry
10-Jul-06	510.9	Moist Ground	510.8	Moist Ground	512.5	Moist Ground
21-Aug-06	510.9	Dry	510.8	Dry	512.4	Dry
18-Sep-06	510.9	Dry	510.8	Dry	512.5	Dry
17-Oct-06	511.0		510.8		512.9	
20-Nov-06	510.9		511.1		513.3	
15-Dec-06	511.1		511.4		513.3	
22-Jan-07	510.9		510.8		513.3	
19-Feb-07	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
18-Mar-07	510.9	Frozen	510.9	Frozen	513.3	Frozen
17-Apr-07	511.0	Moist Ground	511.8	Moist Ground	513.5	Frozen
17-May-07	Dry	Moist Ground	Dry	Dry	513.4	Moist Ground
21-Jun-07	Dry	Dry	Dry	Dry	513.1	Dry
17-Jul-07	Dry	Dry	Dry	Dry	512.7	Dry
21-Aug-07	Dry	Dry	Dry	Dry	512.4	Dry
16-Sep-07	Dry	Dry	Dry	Dry	512.3	Dry
14-Oct-07	Dry	Dry	Dry	Dry	512.4	Dry
18-Nov-07	Frozen	Snow	Frozen	Snow	Frozen	Snow
13-Dec-07	Dry	Snow	Frozen	Snow	Frozen	Snow
20-Jan-08	511.1	Snow	Frozen	Frozen	513.4	Snow
17-Feb-08	511.1	Snow	511.5	Snow	513.4	Snow

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- Moist ground indicates that ground has moisture but no standing water.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
16-Mar-08	511.2	Snow	511.4	Snow	Frozen	
6-Apr-08	511.3	Snow	512.1	Snow	Frozen	Snow
20-Apr-08	512.1	512.1	512.1	512.1	513.6	Snow
18-May-08	511.2	Dry	511.5	Dry	513.4	Dry
15-Jun-08	Dry	Dry	511.1	Moist Ground	513.3	Dry
13-Jul-08	Dry	Dry	Dry	Dry	512.9	Dry
17-Aug-08	511.4	Dry	511.2	Dry	512.9	Dry
14-Sep-08	511.4	Dry	511.5	Dry	512.9	Dry
19-Oct-08	Dry	Dry	Dry	Dry	512.4	Dry
16-Nov-08	Frozen	Snow	Frozen	Snow	N/A	
23-Nov-08	Frozen		Frozen	Snow	512.6	Snow
14-Dec-08	Frozen	Snow	Frozen	Snow	Frozen	Snow
18-Jan-09	Frozen	Buried	Frozen	Snow	Frozen	Buried
08-Feb-09	512.5	Snow	Frozen	Snow	Frozen	
15-Mar-09	Frozen	Snow	Frozen	Snow	Frozen	Snow
12-Apr-09	511.0	Snow	511.9	Snow	512.6	Snow
17-May-09	Dry	Dry	511.6	Dry	512.8	513.5
14-Jun-09	511.0	Dry	511.4	Dry	512.4	513.5
12-Jul-09	Dry	Dry	510.8	Dry	512.3	513.5
9-Aug-09	510.9	Dry	Dry	Dry	512.9	513.5
13-Sep-09	511.1	Dry	511.2	Moist Ground	513.0	513.5
11-Oct-09	Dry	Dry	511.5	Moist Ground	513.2	Dry
15-Nov-09	511.4	Dry	511.3	Moist Ground	513.3	513.5
13-Dec-09	511.6	Snow	Frozen	Snow	513.4	Snow
17-Jan-10	511.7	512.7	Frozen	Snow	513.5	514.1
7-Feb-10	Frozen	Snow	Frozen	Snow	Frozen	Snow
14-Mar-10	512.1	512.5	512.1	Snow	513.5	Snow
18-Apr-10	511.0	511.9	512.0	512.0	513.5	Dry
16-May-10	511.0	Dry	512.0	512.0	513.5	Dry
13-Jun-10	510.9	Dry	512.0	512.0	513.4	Dry
21-Jul-10	511.0	Dry	512.0	512.0	513.5	Dry
16-Aug-10	510.9	Dry	511.9	Moist ground	513.4	Dry
12-Sep-10	Dry	Dry	511.7	Dry	513.5	Dry
17-Oct-10	Dry	Dry	512.0	512.0	513.2	513.5
14-Nov-10	511.4	511.2	512.0	512.0	513.2	Dry
19-Dec-10	Frozen	Snow	Frozen	Snow	513.4	Snow
16-Jan-11	Frozen	Snow	Frozen	Snow	Frozen	Snow
20-Feb-11	Frozen	Snow	Frozen	Snow	Frozen	Snow
13-Mar-11	510.9	Snow	Frozen	Snow	Frozen	Frozen
17-Apr-11	511.2	Dry	512.1	512.1	Frozen	Dry
15-May-11	512.0	512.0	512.1	512.1	513.2	513.5
13-Jun-11	511.6	Dry	512.1	512.1	513.1	Dry
17-Jul-11	511.2	Dry	512.0	Dry	512.7	Dry
14-Aug-11	Dry	Dry	512.0	512.0	512.2	Dry

NOTE:
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- Dry indicates no water detected in monitor.
- Moist ground indicates that ground has moisture but no standing water.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
18-Sep-11	511.1	Dry	512.0	512.0	512.2	Dry
16-Oct-11	511.2	Dry	512.1	512.0	512.2	Dry
20-Nov-11	Dry	Dry	512.1	512.1	512.2	Dry
18-Dec-11	511.3	Snow	Frozen	Frozen	512.5	Snow
15-Jan-12	Frozen	Snow	Frozen	Frozen	Frozen	Snow
19-Feb-12	Frozen	Snow	Frozen	Snow	Frozen	Snow
26-Feb-12	512.2	Moist ground	N/A		513.5	Dry
18-Mar-12	511.8	Dry	N/A		513.3	Dry
15-Apr-12	511.8	Dry	512.1	512.1	513.3	Dry
13-May-12	511.8	Dry	512.1	512.1	513.3	Dry
17-Jun-12	511.6	Dry	512.0	512.1	513.2	Dry
15-Jul-12	511.1	Dry	512.1	512.1	512.6	Dry
12-Aug-12	511.3	Dry	512.1	512.1	512.8	Dry
16-Sep-12	Dry	Dry	512.1	512.1	513.0	Moist Ground
14-Oct-12	511.2	Dry	512.0	512.0	513.0	Dry
18-Nov-12	511.6	Dry	512.08	512.1	513.3	Dry
16-Dec-12	512.0	Dry	512.10	512.1	513.4	Dry
13-Jan-13	Frozen	Snow	512.1	512.1	Frozen	Snow
17-Feb-13	Frozen	Snow	Frozen	Frozen	Frozen	Snow
17-Mar-13	Frozen	Snow	Frozen	Frozen	Frozen	Snow
14-Apr-13	511.83	Dry	512.25	512.3	513.50	513.45
12-May-13	511.89	Dry	512.12	512.1	513.43	Dry
16-Jun-13	511.9	Dry	512.1	512.1	513.4	Dry
14-Jul-13	511.8	511.8	512.2	512.1	513.4	Dry
18-Aug-13	511.8	Dry	512.2	512.2	513.3	Dry
15-Sep-13	511.8	Dry	512.2	512.1	513.4	Dry
13-Oct-13	511.9	Dry	512.2	512.2	513.7	Dry
17-Nov-13	512.1	511.7	512.1	512.1	513.9	Dry
16-Dec-13	Frozen	Snow	Frozen	Frozen	Frozen	Snow
19-Jan-14	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
16-Feb-14	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
17-Mar-14	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
13-Apr-14	Frozen	Frozen	512.3	Frozen	Frozen	Frozen
11-May-14	511.7	Dry	512.2	512.2	513.5	Dry
15-Jun-14	511.6	Dry	512.1	512.1	513.4	Dry
13-Jul-14	511.6	Dry	512.1	512.1	513.5	Dry
17-Aug-14	511.4	Dry	512.1	512.1	512.7	Dry
7-Sep-14	511.4	Dry	512.1	512.1	512.6	Dry
12-Sep-14				512.1		
19-Oct-14	511.4	Dry	512.1	512.1	512.8	Dry
16-Nov-14	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen

NOTE:
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- Dry indicates no water detected in monitor.
- Moist ground indicates that ground has moisture but no standing water.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
14-Dec-14	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
18-Jan-15	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
15-Feb-15	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
15-Mar-15	512.2	Frozen	Frozen	Frozen	513.2	Frozen
19-Apr-15	511.8	512.2	N/A	N/A	513.6	513.6
17-May-15	512.1	512.1	512.1	512.1	513.3	Dry
14-Jun-15	512.1	512.1	512.2	512.2	513.3	Dry
19-Jul-15	512.1	512.1	512.3	512.3	513.2	513.2
9-Aug-15	512.0	512.1	512.1	512.1	513.1	Dry
6-Sep-15	511.8	511.8	512.1	512.1	512.8	Dry
11-Oct-15	511.3	Dry	512.1	512.1	512.7	Dry
15-Nov-15	512.1	512.1	512.2	512.2	513.2	Dry
6-Dec-15	Frozen	Frozen	512.2	512.2	513.2	Dry
17-Jan-16	Frozen	Frozen	Frozen	Frozen	513.3	Frozen
14-Feb-16	Frozen	Frozen	Frozen	Frozen	513.3	Frozen
13-Mar-16	512.1	512.2	511.9	512.2	513.5	513.6
17-Apr-16	512.2	512.2	511.9	512.3	513.3	513.5
1-May-16			512.2	512.2		
15-May-16	512.1	512.2	512.2	512.2	513.6	513.6
5-Jun-16			512.2	512.2		
19-Jun-16	512.1	512.1	512.1	512.1	513.8	Dry
3-Jul-16			512.1	512.1		
17-Jul-16	512.0	512.1	512.1	512.1	512.7	Dry
24-Jul-16				512.1		
7-Aug-16			512.1	512.1		
21-Aug-16	512.1	512.1	512.2	512.1	512.7	Dry
18-Sep-16	512.1	512.1	512.2	512.2	512.7	Dry
16-Oct-16	512.1	512.1	512.2	512.2	512.5	Dry
13-Nov-16	512.1	512.1	512.2	512.2	512.8	Dry
11-Dec-16	Frozen	Frozen	512.2	Frozen	513.0	Frozen

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- Moist ground indicates that ground has moisture but no standing water.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
23-Jan-17	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
12-Feb-17	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
19-Mar-17	Frozen	Frozen	Frozen	Frozen	513.4	Frozen
09-Apr-17	-	-	-	-	-	-
16-Apr-17	512.2	512.2	512.2	512.2	513.5	-
10-May-17	-	-	512.3	512.3	-	-
14-May-17	512.2	512.2	-	-	513.5	-
21-May-17	-	-	512.3	512.3	-	-
23-May-17	-	-	-	-	-	-
25-May-17	-	-	512.3	512.3	-	-
1-Jun-17	-	-	512.2	512.2	-	-
22-Jun-17	-	-	512.2	512.2	-	-
26-Jun-17	512.2	512.2	512.3	512.3	513.5	Dry
7-Jul-17	-	-	512.2	512.2	-	-
17-Jul-17	512.2	512.2	512.3	512.3	513.4	Dry
3-Aug-17	-	-	-	-	-	-
17-Aug-17	512.2	512.2	512.3	512.3	513.2	Dry
29-Aug-17	-	-	-	-	-	-
18-Sep-17	512.2	512.2	512.2	512.2	513.1	Dry
26-Sep-17	-	-	-	-	-	-
15-Oct-17	512.2	512.2	512.2	512.3	513.3	Dry
14-Nov-17	512.2	512.3	512.3	512.3	513.3	Dry
11-Dec-17	512.2	Frozen	N/A	N/A	513.3	Dry
14-Jan-18	Frozen	Frozen	Frozen	Frozen	513.4	Frozen
11-Feb-18	-	-	-	-	-	-
18-Feb-18	Frozen	Frozen	Frozen	Frozen	513.4	Frozen
18-Mar-18	Frozen	Frozen	Frozen	Frozen	513.4	Frozen
15-Apr-18						
1-May-18			512.3	512.3		
17-May-18	512.2	512.2	512.3	512.3	513.5	513.6
18-Jun-18	512.2	512.2	512.2	512.2	513.2	513.5
17-Jul-18	512.2	512.2	512.2	512.2	512.8	513.6
22-Aug-18	512.2	512.2	512.3	512.3	512.8	513.5
18-Sep-18	512.1	512.1	512.2	512.2	512.7	513.5

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- Moist ground indicates that ground has moisture but no standing water.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP1 (in)	DP1 (out)	DP2 (in)	DP2 (out)	DP3 (in)	DP3 (out)
23-Oct-18	512.2	512.2	512.2	512.2	513.0	513.7
19-Nov-18	Frozen	Frozen	Frozen	Frozen	513.2	Frozen
10-Dec-18	Frozen	Frozen	Frozen	Frozen	513.3	Frozen

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- Moist ground indicates that ground has moisture but no standing water.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
26-Jul-99						
17-Aug-99						
27-Sep-99	511.0					
25-Oct-99	511.2					
21-Nov-99	511.3					
21-Dec-99	511.3					
25-Jan-00	Frozen					
29-Feb-00	511.7					
31-Mar-00	511.6					
02-Jun-00	511.6					
07-Jul-00	511.6					
27-Aug-00	511.5					
28-Sep-00	511.5					
03-Nov-00	511.6					
22-Feb-01	Frozen					
22-Mar-01	Frozen	511.6				
26-Apr-01	511.4	511.7				
31-May-01	511.5					
28-Jun-01	511.3					
01-Aug-01	511.3					
04-Oct-01	511.3					
01-Nov-01	511.5	511.6				
14-Dec-01	511.4	511.6				
10-Jan-02	511.4	511.6				
14-Mar-02	511.5	511.6				
16-May-02	511.5	511.6				
20-Jun-02	511.4					
11-Jul-02	511.4	511.6				
13-Sep-02	511.1	511.6				
01-Nov-02	511.2	511.6				
16-Jan-03	511.2	511.6				
28-Mar-03	511.6	511.6				
15-May-03	511.5	511.6				
23-Jun-03	N/A					
22-Jul-03	510.8	511.5				
20-Aug-03	510.7	511.5				
25-Sep-03	510.2					
22-Oct-03	511.2	511.5	510.4			
25-Nov-03	511.5	511.6	510.5			
22-Dec-03	511.5	511.6	510.5			
09-Feb-04	511.2	511.6	510.5			
16-Mar-04	511.4	511.6	510.5			
20-Apr-04	511.6	511.6	510.5			
18-May-04	511.4	511.6	510.5	510.5		
22-Jun-04	511.2	511.5	510.5	510.5		

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
28-Jul-04	511.3	511.5	510.3			
25-Aug-04	511.2	511.5	509.9			
22-Sep-04	511.1		509.7			
19-Oct-04	511.0	511.5	510.0			
16-Nov-04	510.9	511.3	510.2			
16-Dec-04	511.3	511.5	Frozen			
31-Jan-05	511.3	511.6	510.4			
24-Feb-05	511.2	511.6	Frozen			
22-Mar-05	511.1	511.5	Frozen			
20-Apr-05	511.6	511.6	510.5	510.51		
25-May-05	511.6	511.6	510.5	510.49		
29-Jun-05	511.5	511.5	510.3			
13-Jul-05	511.4	511.4	509.9			
23-Aug-05	511.0	Dry	509.6			
26-Sep-05	510.9	Dry	509.3			
26-Oct-05	511.2		509.9			
16-Nov-05	511.3	511.4	510.3			
14-Dec-05	511.5	511.6	510.3			
20-Jan-06	511.5	511.6	510.4			
14-Feb-06	511.5	511.6	510.4			
19-Mar-06	511.6	511.6	Frozen			
17-Apr-06	511.6	511.6	510.5	510.5		
19-May-06	511.3	511.4	510.5	510.5		
19-Jun-06	511.1	511.4	510.3			
10-Jul-06	511.2	511.4	509.9			
21-Aug-06	511.1	511.4	509.0			
18-Sep-06	511.1	511.4	509.1			
17-Oct-06	511.1	511.4	510.1			
20-Nov-06	511.5	511.6	510.4			
15-Dec-06	511.5	511.6	510.5			
22-Jan-07	511.3	511.6	510.2			
19-Feb-07	511.1	511.6	510.5			
18-Mar-07	512.0	511.6	Frozen			
17-Apr-07	511.6	511.5	510.5	510.5		
17-May-07	511.4	511.6	510.5			
21-Jun-07	511.7	Moist Ground	510.1			
17-Jul-07	511.1	Dry	509.4	Dry	509.2	
21-Aug-07	511.0	511.4	Dry	Dry	N/A	Dry
16-Sep-07	511.2	511.5	Dry		N/A	Dry
14-Oct-07	511.2	511.5	Dry		Dry	Dry
18-Nov-07	511.3	511.6	Dry	Dry	Frozen	Snow
13-Dec-07	511.2	511.6	Frozen		509.4	Snow
20-Jan-08	Frozen	511.6	Frozen		Frozen	Frozen
17-Feb-08	511.6	511.6	510.5	Snow	Frozen	Frozen

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
16-Mar-08	511.5	511.6	510.0		Frozen	Frozen
6-Apr-08	511.6	511.6	510.7		510.1	510.1
20-Apr-08	511.6	511.6	510.5		510.1	510.0
18-May-08	511.6	511.6	510.5		510.1	510.0
15-Jun-08	511.4	511.6	510.4		510.0	510.1
13-Jul-08	511.0	Moist Ground	510.1		509.7	510.0
17-Aug-08	511.4	511.5	510.2		509.8	509.7
14-Sep-08	511.4	511.5	510.2		509.7	509.7
19-Oct-08	511.3	511.5	510.2		509.8	509.8
16-Nov-08	N/A		N/A			
23-Nov-08	511.5	511.6	510.3		Frozen	Ice
14-Dec-08	Frozen	Frozen	Frozen		Frozen	Frozen
18-Jan-09	N/A		Frozen		Frozen	Frozen
08-Feb-09	511.6	511.6	510.5		Frozen	Frozen
15-Mar-09	511.6	511.6	510.5		Frozen	Frozen
12-Apr-09	511.6	511.6	510.5		509.9	510.0
17-May-09	511.5	511.6	510.5		510.0	510.0
14-Jun-09	511.4	511.5	510.4		509.9	510.0
12-Jul-09	N/A		510.7		509.8	509.8
9-Aug-09	511.4	511.5	510.2		509.5	509.6
13-Sep-09	511.2	511.5	509.2		509.9	Moist Ground
11-Oct-09	511.4	511.6	510.3		509.5	Moist Ground
15-Nov-09	511.3	511.5	510.2		509.5	Moist Ground
13-Dec-09	N/A		510.3		Frozen	Snow
17-Jan-10	N/A		510.3		Frozen	Snow
7-Feb-10	511.2	511.6	Frozen		Frozen	Snow
14-Mar-10	511.6	511.6	510.5		510.0	Snow
18-Apr-10	N/A		510.4		510.0	510.1
16-May-10	511.6	511.6	510.4		510.0	510.0
13-Jun-10	N/A		510.4		510.0	510.0
21-Jul-10	511.5	511.5	510.4		510.0	510.0
16-Aug-10	511.4	511.5	510.2		509.9	509.9
12-Sep-10	511.3	511.4	509.8		509.6	509.6
17-Oct-10	511.5	511.6	N/A		509.9	509.9
14-Nov-10	511.6	511.6	510.4		510.0	510.0
19-Dec-10	Frozen	511.6	510.4		Frozen	Snow
16-Jan-11	Frozen	Frozen	510.5		Frozen	Frozen
20-Feb-11	Frozen	Frozen	Frozen		Frozen	Frozen
13-Mar-11	511.6	511.6	Frozen		Frozen	Frozen
17-Apr-11	511.7	511.6	510.5		Frozen	Frozen
15-May-11	511.6	511.6	510.5		510.0	510.0
13-Jun-11	511.6	511.6	510.5		510.0	510.0
17-Jul-11	511.6	511.6	509.9		509.7	509.7
14-Aug-11	511.5	511.5	509.6		509.4	Moist Ground

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
18-Sep-11	511.6	511.6	Dry		508.8	Moist Ground
16-Oct-11	511.6	511.6	510.3		509.5	Moist Ground
20-Nov-11	511.6	511.6	510.3		509.7	509.7
18-Dec-11	511.6	511.6	510.4		Frozen	Frozen
15-Jan-12	511.6	511.6	510.3		Frozen	Snow
19-Feb-12	Frozen	Snow	510.5		Frozen	Snow
26-Feb-12					Frozen	
18-Mar-12	Frozen	511.6	510.5		509.7	510.0
15-Apr-12	511.5	511.6	510.5	Moist Ground	510.0	510.0
13-May-12	511.6	511.6	510.4		510.0	510.0
17-Jun-12	511.6	511.6	510.1		509.9	509.8
15-Jul-12	511.6	511.6	509.3		509.4	Dry
12-Aug-12	511.6	511.6	510.4		509.8	509.8
16-Sep-12	511.5	511.5	509.3		509.5	Moist Ground
14-Oct-12			510.3		509.6	Shallow Ponding
18-Nov-12	511.6	511.6	510.4		510.1	510.0
16-Dec-12	511.6	511.6	510.5		Frozen	Frozen
13-Jan-13	511.6	511.6	Frozen		510.1	Frozen
17-Feb-13	511.6	511.6	Frozen		Frozen	Frozen
17-Mar-13	511.6	511.6	Frozen		Frozen	Frozen
14-Apr-13	511.7	511.7	510.5	510.47	510.1	510.1
12-May-13	511.7	511.6	510.5		510.1	510.0
16-Jun-13	511.6	511.6	510.5		510.0	510.0
14-Jul-13	511.6	511.6	509.8		509.9	509.9
18-Aug-13	511.4	511.3	510.1		509.9	509.9
15-Sep-13		511.5	510.1		509.7	509.7
13-Oct-13	511.6	511.6	510.3		509.9	509.8
17-Nov-13	511.7	511.6	510.5		510.1	510.1
16-Dec-13	511.6	511.6	Frozen		Frozen	Frozen
19-Jan-14	Frozen	511.6	Frozen		Frozen	Frozen
16-Feb-14	Frozen	511.6	Frozen		Frozen	Frozen
17-Mar-14	Frozen		Frozen		Frozen	Frozen
13-Apr-14	511.7	511.7	Frozen		510.1	Frozen
11-May-14	511.6	511.6	510.5	510.47	510.1	510.1
15-Jun-14	511.6	511.6	510.4		509.9	509.9
13-Jul-14	511.6	511.6	510.3		509.9	509.9
17-Aug-14	511.6	511.6	510.3		509.7	509.7
7-Sep-14	511.5	511.5	510.2		509.6	509.6
12-Sep-14			N/A		509.7	509.6
19-Oct-14	511.6		510.4		509.7	509.7
16-Nov-14	Frozen		510.4		Frozen	Frozen

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TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
14-Dec-14	Frozen		510.4		Frozen	Frozen
18-Jan-15	Frozen		Frozen		Frozen	Frozen
15-Feb-15	Frozen		N/A		Frozen	Frozen
15-Mar-15	Frozen		Frozen		Frozen	Frozen
19-Apr-15			510.5		N/A	N/A
17-May-15	511.5	511.5	510.4		510.1	510.0
14-Jun-15	511.6	511.6	510.4		510.0	510.0
19-Jul-15	511.5	511.5	510.2		510.0	510.0
9-Aug-15	511.5	511.5	510.2		509.9	509.9
6-Sep-15	511.5	511.5	510.0		509.6	509.6
11-Oct-15	511.5	511.5	509.0		509.2	Dry
15-Nov-15	511.6	511.6	510.3		509.7	509.7
6-Dec-15	511.5	511.5	510.3		509.7	509.7
17-Jan-16	Frozen		510.4		Frozen	Frozen
14-Feb-16	Frozen		Frozen		Frozen	Frozen
13-Mar-16	511.6	511.6	510.5		510.0	510.0
17-Apr-16	511.6	511.6	510.5		510.1	510.1
1-May-16	511.6	511.6	510.5		510.1	510.0
15-May-16	511.6	511.6	510.5		510.0	510.0
5-Jun-16	511.6	511.5	510.4	Dry	510.0	510.0
19-Jun-16	511.5	511.5	510.1		509.9	509.9
3-Jul-16	511.5	511.4	509.8	Dry	509.7	509.7
17-Jul-16	511.4	511.4	509.2		509.5	Dry
24-Jul-16					509.2	Dry
7-Aug-16	511.2		Dry		508.9	Dry
21-Aug-16	511.4	511.4	509.5		509.3	Dry
18-Sep-16	511.4	511.4	Dry		508.9	Dry
16-Oct-16	511.5	511.5	Dry		508.6	Dry
13-Nov-16	511.5	511.5	509.2		508.8	Dry
11-Dec-16	511.6		509.9		509.2	Dry

NOTE:
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- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
23-Jan-17	511.6	511.6	510.4		Frozen	Frozen
12-Feb-17	Frozen	Frozen	510.6	Frozen	Frozen	Frozen
19-Mar-17	511.7	Frozen	510.4	Frozen	Frozen	Frozen
09-Apr-17	-	-	-	-	510.1	510.1
16-Apr-17	511.6	511.6	510.5	-	510.1	509.9
10-May-17	511.7	511.7	510.4	510.4	510.1	510.1
14-May-17	-	-	-	-	-	-
21-May-17	511.7	511.7	510.5	510.5	510.1	510.1
23-May-17	511.7	511.7	-	-	510.1	510.1
25-May-17	511.7	511.7	510.5	510.5	510.1	510.1
1-Jun-17	511.6	511.6	510.5	510.4	510.0	510.0
22-Jun-17	511.6	511.6	510.4	Dry	510.0	510.0
26-Jun-17	511.6	511.6	510.4	-	510.0	510.0
7-Jul-17	511.6	511.6	510.4	Dry	510.0	510.0
17-Jul-17	-	-	Dry	Dry	510.0	510.0
3-Aug-17	-	-	-	-	509.9	509.9
17-Aug-17	-	-	510.2	Dry	509.9	509.9
29-Aug-17	-	-	-	-	509.7	509.7
18-Sep-17	-	-	510.2	Dry	509.7	509.7
26-Sep-17	-	-	-	-	509.7	509.7
15-Oct-17	-	-	510.4	Dry	509.8	509.7
14-Nov-17	-	-	510.4	-	509.9	Frozen
11-Dec-17	-	-	510.4	Dry	Frozen	Frozen
14-Jan-18	Frozen	Frozen	Frozen	-	501.1	Frozen
11-Feb-18	-	-	-	-	-	Frozen
18-Feb-18	Frozen	Frozen	Frozen	-	Frozen	Frozen
18-Mar-18	Frozen	Frozen	Frozen	-	Frozen	Frozen
15-Apr-18	511.2	511.3				
1-May-18	511.2	511.2	510.5	510.5	510.1	510.1
17-May-18	511.2	511.2	510.5	510.4	510.0	510.0
18-Jun-18	511.1	511.1	510.2	510.4	509.7	509.7
17-Jul-18	511.1	511.1	509.4	510.4	509.4	509.5
22-Aug-18	511.1	511.1	510.1	510.4	509.2	509.5
18-Sep-18	511.0	511.0	509.0	510.4	508.7	509.5

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP4 (in)	DP4 (out)	BRIDSON DP (in)	BRIDSON DP (out)	DP5 (in)	DP5 (out)
23-Oct-18	511.1	511.0	509.6	510.4	509.0	509.6
19-Nov-18	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
10-Dec-18	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen

NOTE:
- Bridson DP elevations estimated based on site plan ground elevation and monitor stick-up.
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
26-Jul-99								
17-Aug-99								
27-Sep-99								
25-Oct-99								
21-Nov-99								
21-Dec-99								
25-Jan-00								
29-Feb-00								
31-Mar-00								
02-Jun-00								
07-Jul-00								
27-Aug-00								
28-Sep-00								
03-Nov-00								
22-Feb-01								
22-Mar-01								
26-Apr-01								
31-May-01								
28-Jun-01								
01-Aug-01								
04-Oct-01								
01-Nov-01								
14-Dec-01								
10-Jan-02								
14-Mar-02								
16-May-02								
20-Jun-02								
11-Jul-02								
13-Sep-02								
01-Nov-02								
16-Jan-03								
28-Mar-03								
15-May-03								
23-Jun-03								
22-Jul-03								
20-Aug-03								
25-Sep-03								
22-Oct-03								
25-Nov-03								
22-Dec-03								
09-Feb-04								
16-Mar-04								
20-Apr-04								
18-May-04								
22-Jun-04								

NOTE:

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
28-Jul-04								
25-Aug-04								
22-Sep-04								
19-Oct-04								
16-Nov-04								
16-Dec-04								
31-Jan-05								
24-Feb-05								
22-Mar-05								
20-Apr-05								
25-May-05								
29-Jun-05								
13-Jul-05								
23-Aug-05								
26-Sep-05								
26-Oct-05								
16-Nov-05								
14-Dec-05								
20-Jan-06								
14-Feb-06								
19-Mar-06								
17-Apr-06								
19-May-06								
19-Jun-06								
10-Jul-06								
21-Aug-06								
18-Sep-06								
17-Oct-06								
20-Nov-06								
15-Dec-06								
22-Jan-07								
19-Feb-07								
18-Mar-07								
17-Apr-07								
17-May-07								
21-Jun-07								
17-Jul-07	N/A							
21-Aug-07	N/A	Dry						
16-Sep-07	Dry	Dry						
14-Oct-07	Dry	Dry						
18-Nov-07	Dry	Snow						
13-Dec-07	Frozen	Buried						
20-Jan-08	Frozen	Buried						
17-Feb-08	Frozen	Buried						

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
16-Mar-08	Frozen	Buried						
6-Apr-08	Frozen	Snow						
20-Apr-08	511.8	511.8						
18-May-08	511.8	511.8						
15-Jun-08	511.9	511.9						
13-Jul-08	511.4	Dry						
17-Aug-08	511.3	Ponded						
14-Sep-08	510.5	Dry						
19-Oct-08	511.4	511.4						
16-Nov-08								
23-Nov-08	511.7	Snow						
14-Dec-08	511.8	Snow						
18-Jan-09	Frozen	Buried						
08-Feb-09	Frozen							
15-Mar-09	Frozen	Frozen						
12-Apr-09	511.9	511.9						
17-May-09	511.7	511.7						
14-Jun-09	511.6	511.7						
12-Jul-09	511.5	511.6						
9-Aug-09	511.5	511.5						
13-Sep-09	511.0	511.4						
11-Oct-09	510.7	Dry						
15-Nov-09	510.8	Dry						
13-Dec-09	511.2	Snow						
17-Jan-10	511.3	512.0						
7-Feb-10	511.5	Snow						
14-Mar-10	511.8	511.9						
18-Apr-10	511.8	511.9						
16-May-10	511.8	511.8						
13-Jun-10	511.8	511.8						
21-Jul-10	511.8	511.8						
16-Aug-10	511.8	512.7						
12-Sep-10	511.8	511.8						
17-Oct-10	511.3	511.4						
14-Nov-10	511.3	Dry						
19-Dec-10	511.7	Snow						
16-Jan-11	Frozen	Snow						
20-Feb-11	Frozen	Frozen						
13-Mar-11	Frozen	Frozen						
17-Apr-11	511.6	511.8	511.8	511.8				
15-May-11	511.8	511.9						
13-Jun-11	511.7	511.8						
17-Jul-11	510.9	Dry	510.8	Dry				
14-Aug-11	510.4	Dry						

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.
- New DP6 TOP elevation estimated at 511.02 m ASL

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
18-Sep-11	Dry	Dry	509.9	Dry				
16-Oct-11	510.4	Dry	510.4	Dry				
20-Nov-11	511.2	Dry	511.2	Dry				
18-Dec-11	511.4	Snow						
15-Jan-12	Frozen	Snow						
19-Feb-12	Frozen	Snow	Frozen	Snow				
26-Feb-12	Frozen							
18-Mar-12	511.8	511.8	511.8	511.8				
15-Apr-12	511.8	511.7	511.6	511.5				
13-May-12	511.7	511.7						
17-Jun-12	511.7	511.7						
15-Jul-12	510.4	Dry	510.4	Dry				
12-Aug-12	511.5	Dry	511.4	511.4				
16-Sep-12	510.6	Moist Ground	510.3	Moist Ground				
14-Oct-12	510.4	Dry						
18-Nov-12	511.0	511.7	510.8	511.5				
16-Dec-12	511.8	511.8						
13-Jan-13	Frozen	Frozen						
17-Feb-13	Frozen	Snow						
17-Mar-13	Frozen	Snow						
14-Apr-13	511.9	511.9	511.8	511.7				
12-May-13	511.9	511.9	512.0					
16-Jun-13	511.9	511.9						
14-Jul-13	511.9	511.9	511.7	511.7				
18-Aug-13	511.6	Dry	511.6	Dry				
15-Sep-13	510.9	Dry	511.1	Dry				
13-Oct-13	511.3	511.9						
17-Nov-13	511.5	512.0	511.7	511.7				
16-Dec-13	Frozen	Snow						
19-Jan-14	Frozen	Frozen						
16-Feb-14	Frozen	Frozen	Frozen	Frozen				
17-Mar-14	Frozen	Frozen	Frozen	Frozen				
13-Apr-14	511.9	511.8	511.6	511.6				
11-May-14	511.6	511.9	511.6	511.7				
15-Jun-14	511.8	Dry	511.6					
13-Jul-14	511.8	Dry	511.6	Dry				
17-Aug-14	511.7	Dry	511.5	Dry				
7-Sep-14	511.6	Dry	511.5	Dry				
12-Sep-14	510.7	Dry						
19-Oct-14	510.8	511.9	511.5	511.6				
16-Nov-14	Frozen	Frozen						

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.
- New DP6 TOP elevation estimated at 511.02 m ASL

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
14-Dec-14	Frozen	Frozen	Frozen	Frozen				
18-Jan-15	Frozen	Frozen						
15-Feb-15	Frozen	Frozen						
15-Mar-15	Frozen	511.8	Frozen	511.5				
19-Apr-15	N/A	N/A						
17-May-15	N/A	N/A						
14-Jun-15	N/A	N/A						
19-Jul-15	N/A	N/A						
9-Aug-15	N/A	N/A						
6-Sep-15	N/A	N/A			N/A		N/A	
11-Oct-15	510.1	Dry			N/A		N/A	
15-Nov-15	511.0	Dry	510.7	Dry	509.0		N/A	
6-Dec-15	511.3	Dry	511.0	Dry	509.0		511.2	
17-Jan-16	Frozen	Frozen	Frozen	Frozen	Frozen		Frozen	
14-Feb-16	Frozen	Frozen	Frozen	Frozen	Frozen		Frozen	
13-Mar-16	512.0	512.0			509.4		511.3	
17-Apr-16	512.0	512.0			509.3		511.3	
1-May-16	511.8				509.3		511.3	
15-May-16	512.0	512.0			509.3		511.3	
5-Jun-16	511.7	511.7			509.3		511.3	
19-Jun-16	511.4	511.6			509.2		511.2	
3-Jul-16	510.8	Dry			509.0		511.2	
17-Jul-16	510.6	Dry			508.8		511.2	
24-Jul-16	510.2	Dry						
7-Aug-16	Dry	Dry	Dry	511.2	508.4		511.2	
21-Aug-16	Dry	Dry	Dry	Dry	508.6		511.2	
18-Sep-16	Dry	Dry			508.2		511.2	
16-Oct-16	Dry	Dry			508.0		511.2	
13-Nov-16	Dry	Dry	Dry	Dry	508.4		511.3	
11-Dec-16	Dry	Dry	Dry	Dry	508.7	Dry	511.3	511.3

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.
- New DP6 TOP elevation estimated at 511.02 m ASL

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
23-Jan-17	511.9	511.9	510.6	510.6	509.2	509.2	Frozen	Frozen
12-Feb-17	Buried	Buried/Frozen	Buried	Buried	Frozen	Frozen	Frozen	Frozen
19-Mar-17	Buried	Buried/Frozen	Buried	Buried	509.3	Frozen	Frozen	Frozen
09-Apr-17	511.9	511.9	-	-	-	-	-	-
16-Apr-17	512.0	512.0	510.7	510.7	509.3	509.3	511.3	511.3
10-May-17	511.8	511.8	-	-	509.4	509.4	511.3	511.4
14-May-17	-	-	-	-	-	-	-	-
21-May-17	511.8	511.8	-	-	-	-	511.3	511.3
23-May-17	511.8	511.8	-	-	-	-	-	-
25-May-17	511.8	511.8	-	-	-	-	511.3	511.3
1-Jun-17	511.8	511.8	-	-	509.3	509.3	511.3	511.3
22-Jun-17	511.8	511.8	-	-	509.3	509.3	511.3	511.3
26-Jun-17	512.0	512.0	510.7	510.7	509.3	509.3	511.3	511.3
7-Jul-17	511.8	511.8	-	-	509.3	509.3	511.3	511.3
17-Jul-17	511.9	511.9	510.6	510.6	509.3	509.3	511.3	511.3
3-Aug-17	511.7	511.6	-	-	-	-	-	-
17-Aug-17	511.5	Dry	510.1	Dry	509.2	509.2	511.3	511.3
29-Aug-17	510.9	Dry	-	-	-	-	-	-
18-Sep-17	511.0	Dry	509.7	Dry	509.0	Dry	511.3	511.3
26-Sep-17	510.7	Dry	-	-	-	-	-	-
15-Oct-17	511.4	Dry	510.1	Dry	509.1	Dry	511.3	511.3
14-Nov-17	511.8	511.8	510.4	510.4	509.2	509.2	511.3	511.3
11-Dec-17	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
14-Jan-18	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
11-Feb-18	Frozen	Frozen	-	-	-	-	-	-
18-Feb-18	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
18-Mar-18	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen
15-Apr-18								
1-May-18	511.9	511.9			509.4	509.4	511.4	511.4
17-May-18	511.8	511.8	-	-	509.4	509.3	511.4	511.4
18-Jun-18	511.6	511.6	-	-	509.2	509.2	511.3	511.3
17-Jul-18	510.5	511.5	-	-	508.8	509.1	511.3	511.3
22-Aug-18	510.5	511.5	-	-	508.8	509.1	511.4	511.4
18-Sep-18	510.2	511.5	-	-	508.2	509.1	511.3	511.3

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.
- New DP6 TOP elevation estimated at 511.02 m ASL

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP6 (in)	DP6 (out)	New DP6 (in)*	New DP6 (out)	DP7 (in)	DP7 (out)	DP8 (in)	DP8 (out)
23-Oct-18	510.1	511.4			508.7	509.1	511.4	511.3
19-Nov-18	511.1	-			509.0	-	Frozen	Frozen
10-Dec-18	Frozen	Frozen			Frozen	Frozen	Frozen	Frozen

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.
- New DP6 TOP elevation estimated at 511.02 m ASL

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
26-Jul-99						
17-Aug-99						
27-Sep-99						
25-Oct-99						
21-Nov-99						
21-Dec-99						
25-Jan-00						
29-Feb-00						
31-Mar-00						
02-Jun-00						
07-Jul-00						
27-Aug-00						
28-Sep-00						
03-Nov-00						
22-Feb-01						
22-Mar-01						
26-Apr-01						
31-May-01						
28-Jun-01						
01-Aug-01						
04-Oct-01						
01-Nov-01						
14-Dec-01						
10-Jan-02						
14-Mar-02						
16-May-02						
20-Jun-02						
11-Jul-02						
13-Sep-02						
01-Nov-02						
16-Jan-03						
28-Mar-03						
15-May-03						
23-Jun-03						
22-Jul-03						
20-Aug-03						
25-Sep-03						
22-Oct-03						
25-Nov-03						
22-Dec-03						
09-Feb-04						
16-Mar-04						
20-Apr-04						
18-May-04						
22-Jun-04						

NO DATA

NOTE:

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
28-Jul-04						
25-Aug-04						
22-Sep-04						
19-Oct-04						
16-Nov-04						
16-Dec-04						
31-Jan-05						
24-Feb-05						
22-Mar-05						
20-Apr-05						
25-May-05						
29-Jun-05						
13-Jul-05						
23-Aug-05						
26-Sep-05						
26-Oct-05						
16-Nov-05						
14-Dec-05						
20-Jan-06						
14-Feb-06						
19-Mar-06						
17-Apr-06						
19-May-06						
19-Jun-06						
10-Jul-06						
21-Aug-06						
18-Sep-06						
17-Oct-06						
20-Nov-06						
15-Dec-06						
22-Jan-07						
19-Feb-07						
18-Mar-07						
17-Apr-07						
17-May-07						
21-Jun-07						
17-Jul-07						
21-Aug-07						
16-Sep-07						
14-Oct-07						
18-Nov-07						
13-Dec-07						
20-Jan-08						
17-Feb-08						

NO DATA

NOTE:

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
16-Mar-08						
6-Apr-08						
20-Apr-08						
18-May-08						
15-Jun-08						
13-Jul-08						
17-Aug-08						
14-Sep-08						
19-Oct-08						
16-Nov-08						
23-Nov-08						
14-Dec-08						
18-Jan-09						
08-Feb-09						
15-Mar-09						
12-Apr-09						
17-May-09						
14-Jun-09						
12-Jul-09						
9-Aug-09						
13-Sep-09						
11-Oct-09						
15-Nov-09						
13-Dec-09						
17-Jan-10						
7-Feb-10						
14-Mar-10						
18-Apr-10						
16-May-10						
13-Jun-10						
21-Jul-10						
16-Aug-10						
12-Sep-10						
17-Oct-10						
14-Nov-10						
19-Dec-10						
16-Jan-11						
20-Feb-11						
13-Mar-11						
17-Apr-11						
15-May-11						
13-Jun-11						
17-Jul-11						
14-Aug-11						

NO DATA

NOTE:

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
18-Sep-11						
16-Oct-11						
20-Nov-11						
18-Dec-11						
15-Jan-12						
19-Feb-12						
26-Feb-12						
18-Mar-12						
15-Apr-12						
13-May-12						
17-Jun-12						
15-Jul-12						
12-Aug-12						
16-Sep-12						
14-Oct-12						
18-Nov-12						
16-Dec-12						
13-Jan-13						
17-Feb-13						
17-Mar-13						
14-Apr-13						
12-May-13						
16-Jun-13						
14-Jul-13						
18-Aug-13						
15-Sep-13						
13-Oct-13						
17-Nov-13						
16-Dec-13						
19-Jan-14					Snow	
16-Feb-14					Snow	
17-Mar-14					Snow	
13-Apr-14					Snow	
11-May-14					Dry	
15-Jun-14					509.3	
13-Jul-14					509.3	
17-Aug-14					Dry	
7-Sep-14					N/A	
12-Sep-14					Dry	
19-Oct-14					509.4	
16-Nov-14					Snow	

NOTE:
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- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
14-Dec-14					Snow	
18-Jan-15					Snow	
15-Feb-15					N/A	
15-Mar-15					Snow	
19-Apr-15					509.4	
17-May-15					509.4	
14-Jun-15					509.4	
19-Jul-15					509.4	
9-Aug-15					Dry	
6-Sep-15	N/A		507.2		Dry	
11-Oct-15	N/A		507.1		Dry	
15-Nov-15	507.7		507.3		Dry	Dry
6-Dec-15	507.7		507.4		Snow	Snow
17-Jan-16	Frozen		507.4		Snow	Snow
14-Feb-16	Frozen		507.4		Frozen	Frozen
13-Mar-16	507.8		507.4		509.5	509.5
17-Apr-16	507.8		507.4		509.4	509.5
1-May-16	507.8		507.4			
15-May-16	507.8		507.4		509.4	509.4
5-Jun-16	507.8		507.4			
19-Jun-16	507.6		507.4		Dry	Dry
3-Jul-16	507.4		507.2			
17-Jul-16	507.1		507.1		Dry	Dry
24-Jul-16						
7-Aug-16	506.7		507.1			
21-Aug-16	507.2		507.0		Dry	Dry
18-Sep-16	506.7		507.1		Dry	Dry
16-Oct-16	Dry		507.1		Dry	Dry
13-Nov-16	506.9		507.1		Dry	Dry
11-Dec-16	Dry	Dry	507.1	Dry	Dry	Dry

NOTE:
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- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT
DRIVEPOINTS
111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
23-Jan-17	507.7	507.7	507.3	507.3	509.3	Frozen
12-Feb-17	Frozen	Frozen	507.4	507.4	Buried	Frozen
19-Mar-17	Frozen	Frozen	507.4	507.4	Frozen	509.5
09-Apr-17	-	-	-	-	-	-
16-Apr-17	507.8	507.8	507.4	507.4	509.4	509.4
10-May-17	507.8	507.8	507.4	507.4	-	-
14-May-17	-	-	-	-	509.4	-
21-May-17	507.8	507.8	507.4	507.4	509.5	509.5
23-May-17	-	-	-	-	-	-
25-May-17	507.8	507.8	507.4	507.4	-	-
1-Jun-17	507.8	507.8	507.4	507.4	-	-
22-Jun-17	507.8	507.8	507.4	507.4	-	-
26-Jun-17	507.8	507.8	507.4	507.4	509.4	509.5
7-Jul-17	507.8	507.8	507.4	507.4	-	-
17-Jul-17	507.8	507.7	507.4	507.4	509.4	509.5
3-Aug-17	-	-	-	-	-	-
17-Aug-17	507.7	507.7	507.4	507.4	Dry	509.3
29-Aug-17	-	-	-	-	-	-
18-Sep-17	507.7	507.7	507.3	507.4	Dry	-
26-Sep-17	-	-	-	-	-	-
15-Oct-17	507.7	507.7	507.4	507.4	Dry	509.3
14-Nov-17	507.8	507.8	507.4	507.4	509.3	509.4
11-Dec-17	Frozen	Frozen	507.4	507.4	Buried	Buried
14-Jan-18	Frozen	Frozen	507.4	507.4	Frozen	Frozen
11-Feb-18	-	-	-	-	-	-
18-Feb-18	Frozen	Frozen	N/A	N/A	Frozen	Frozen
18-Mar-18	Frozen	Frozen	507.4	507.4	Frozen	Frozen
15-Apr-18				507.4		
1-May-18	507.8	507.8	508.2	508.2		
17-May-18	507.8	507.8	508.2	508.2	509.4	509.5
18-Jun-18	507.7	507.8	507.3	507.3	Dry	509.4
17-Jul-18	507.7	507.8	507.3	507.3	Dry	Dry
22-Aug-18	507.5	507.8	506.9	507.4	Dry	Dry
18-Sep-18	506.6	507.7	506.9	507.3	Dry	Dry

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

TABLE C-8
GROUNDWATER / SURFACE WATER ELEVATIONS
DUNTROON QUARRY - 2018 AMP SUMMARY REPORT

DRIVEPOINTS

111-53312-01 A61

DATE	DP9 (in)	DP9(out)	DP10 (in)	DP10 (out)	BH03-7 SG1	BH03-7 SG2
23-Oct-18	507.2	507.8	507.0	507.4	Dry	Dry
19-Nov-18	507.7	507.7	507.3	-	Frozen	Frozen
10-Dec-18	Frozen	Frozen	507.3	-	Frozen	Frozen

NOTE:
- Frozen / snow indicates monitor frozen and/or snow covered.
- Dry indicates no water detected in monitor.
- N/A indicates water level not available.

FIGURE C-63

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP1 (in and out)

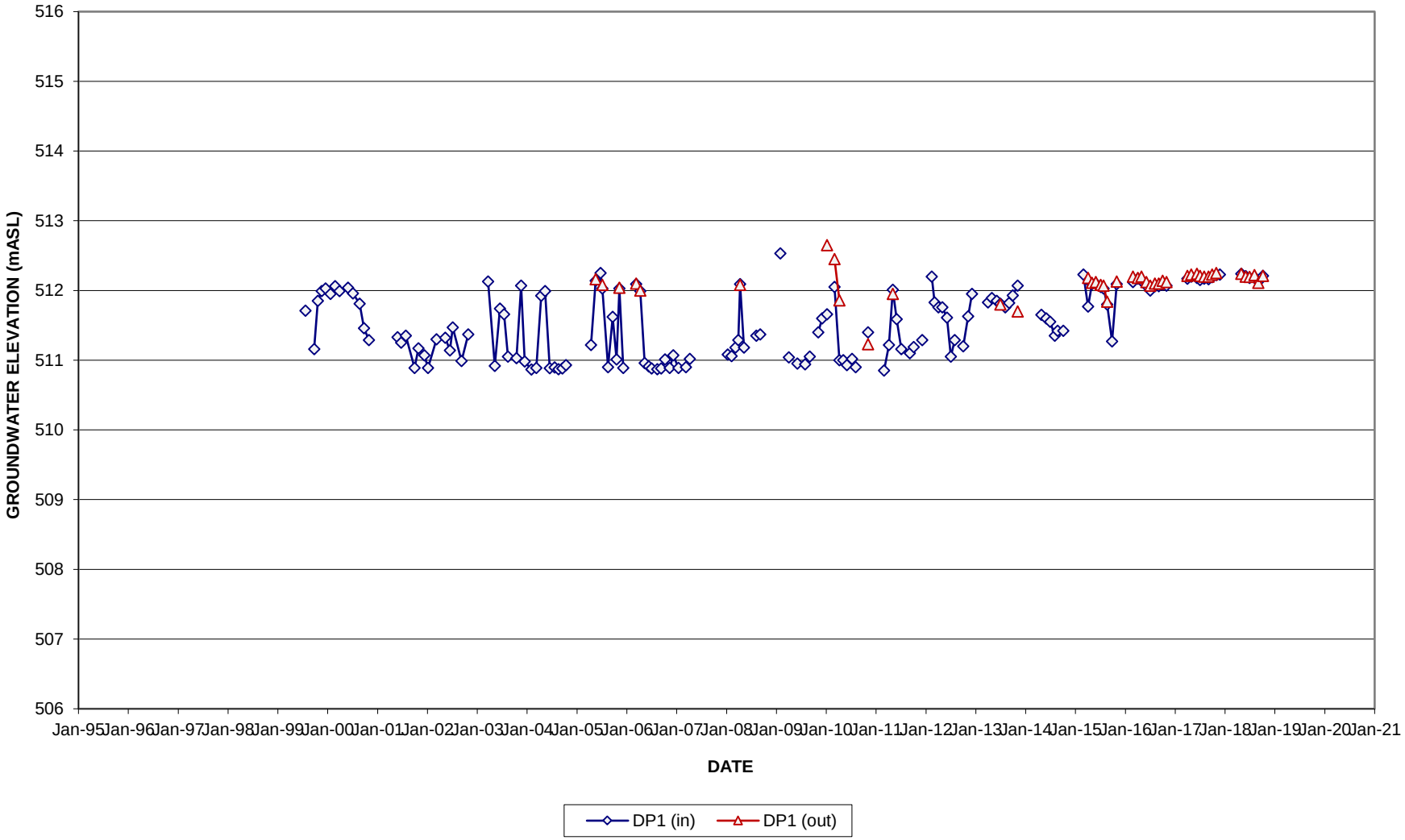

FIGURE C-64

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP2 (in and out)

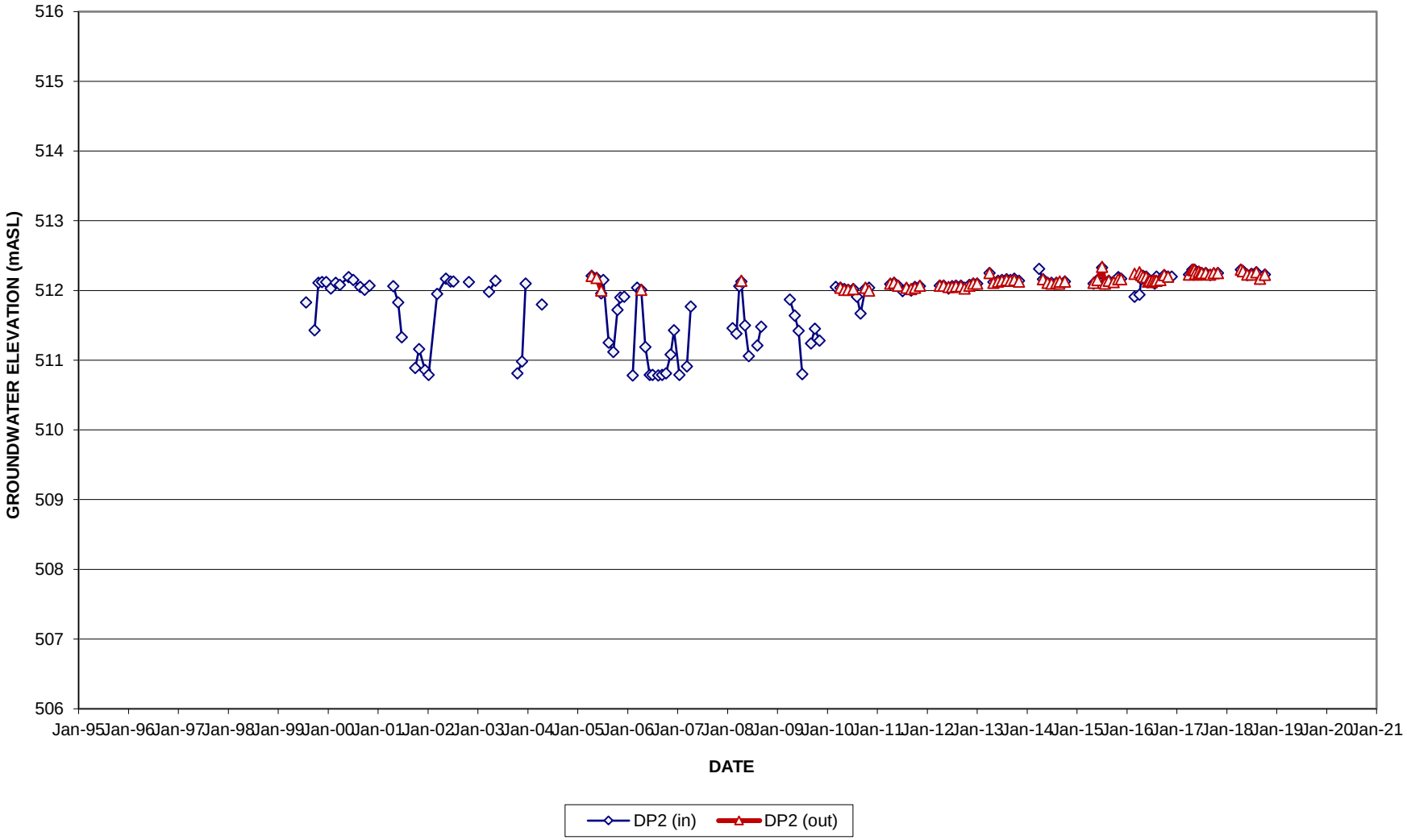

FIGURE C-65

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP3 (in and out)

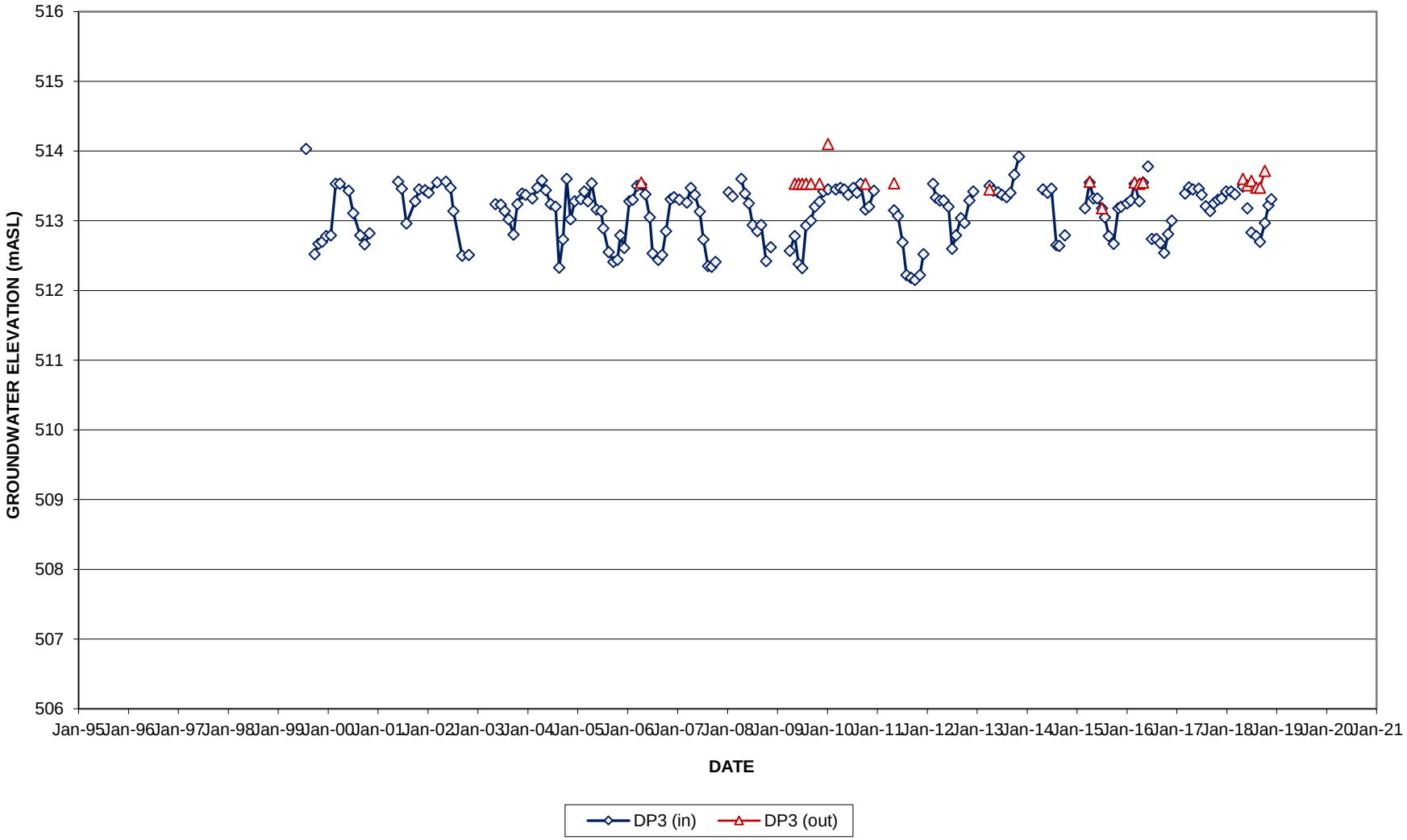

FIGURE C-66

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP4 (in and out)

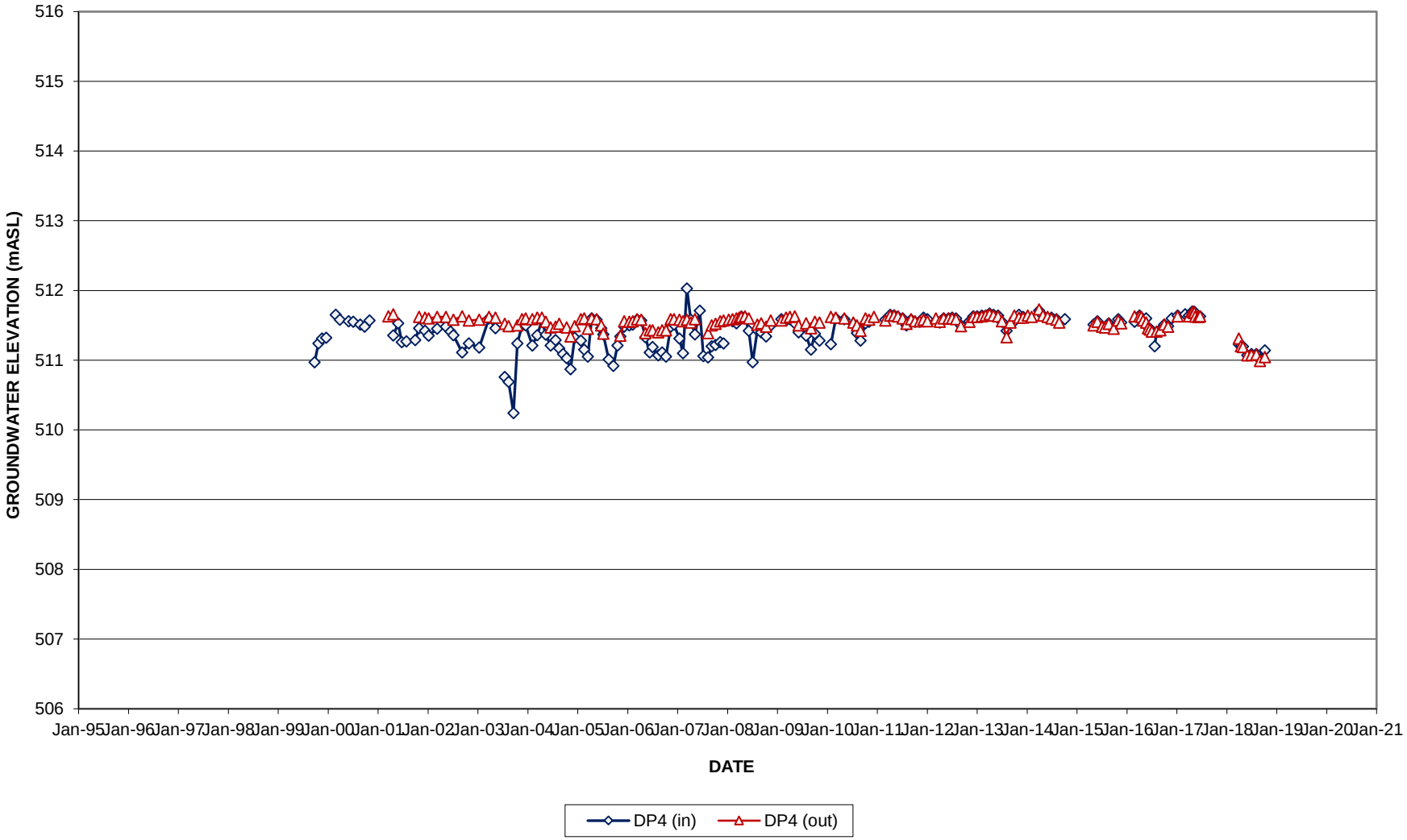

FIGURE C-67

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP5 (in and out)

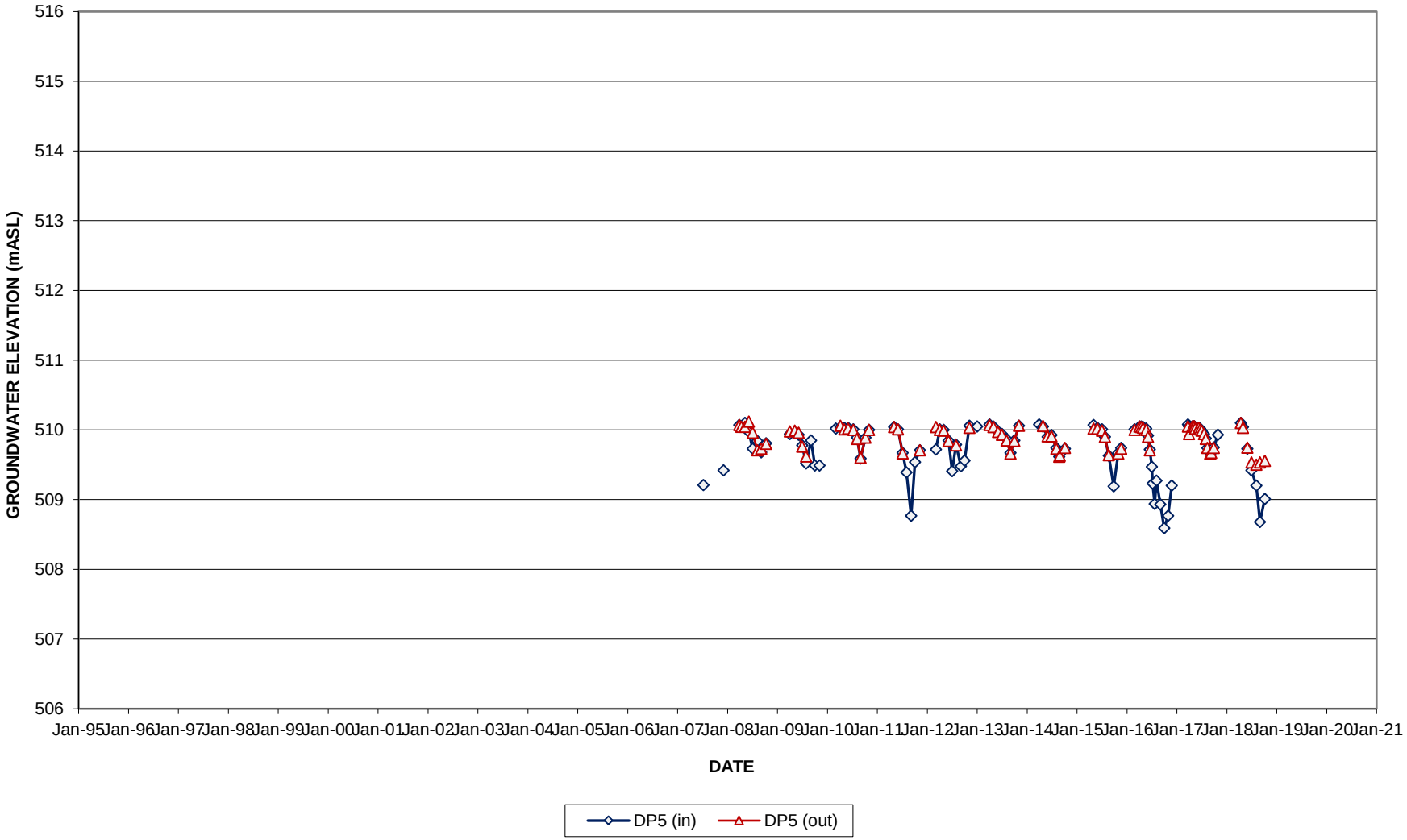

FIGURE C-67 (a)

GROUNDWATER HYDROGRAPH (DATALOGGER)
DP5

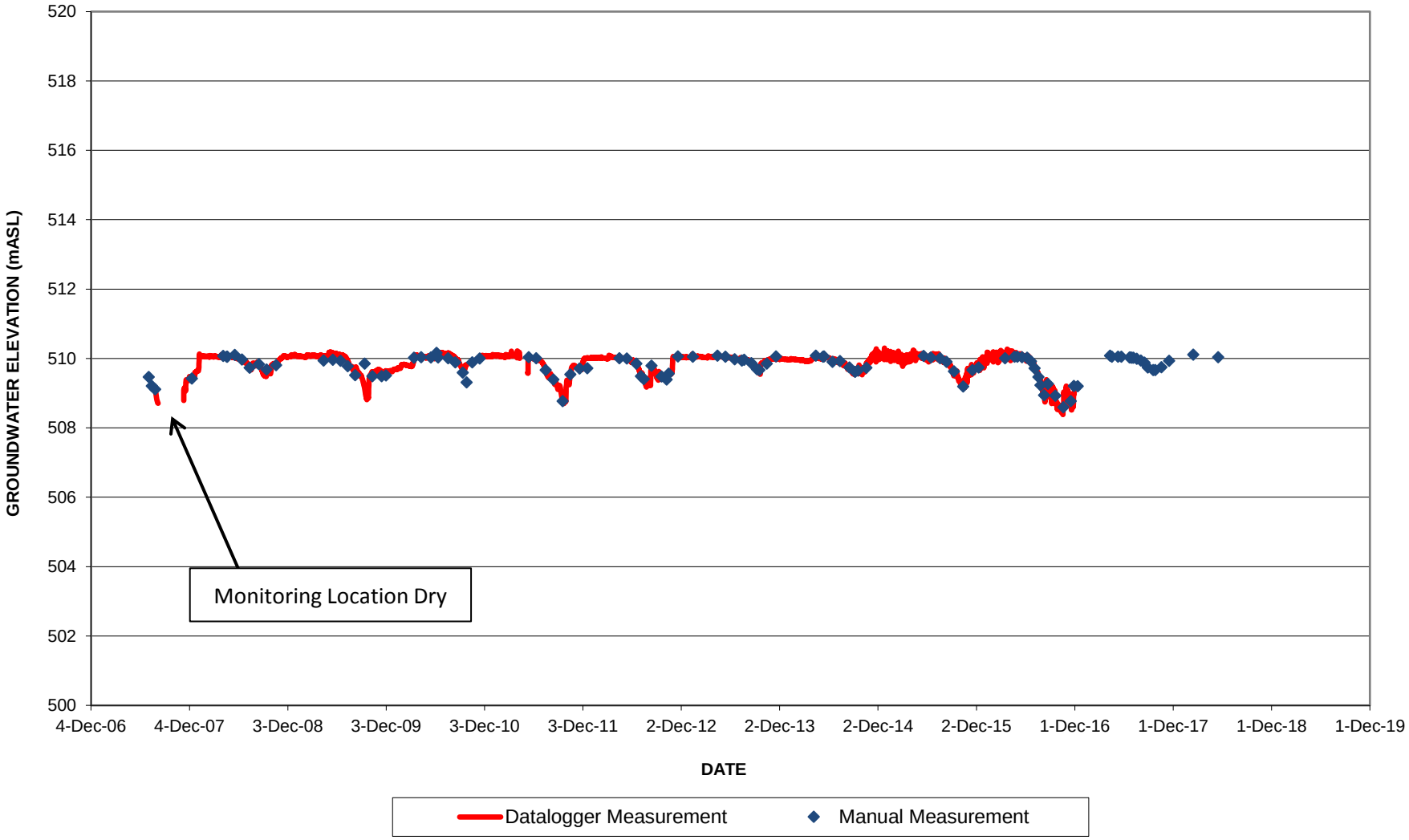

FIGURE C-68

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP6 (in and out)

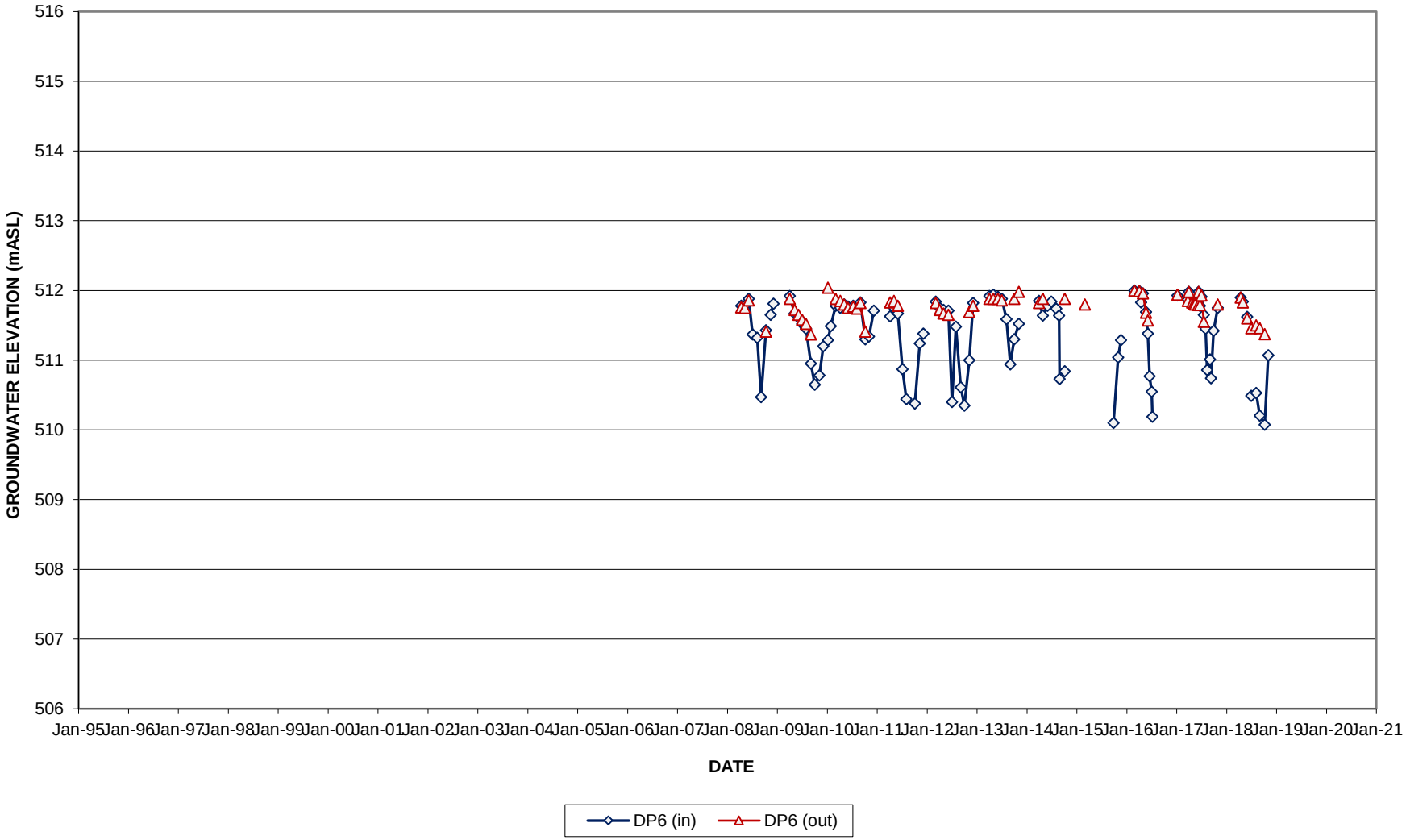

FIGURE C-68 (a)

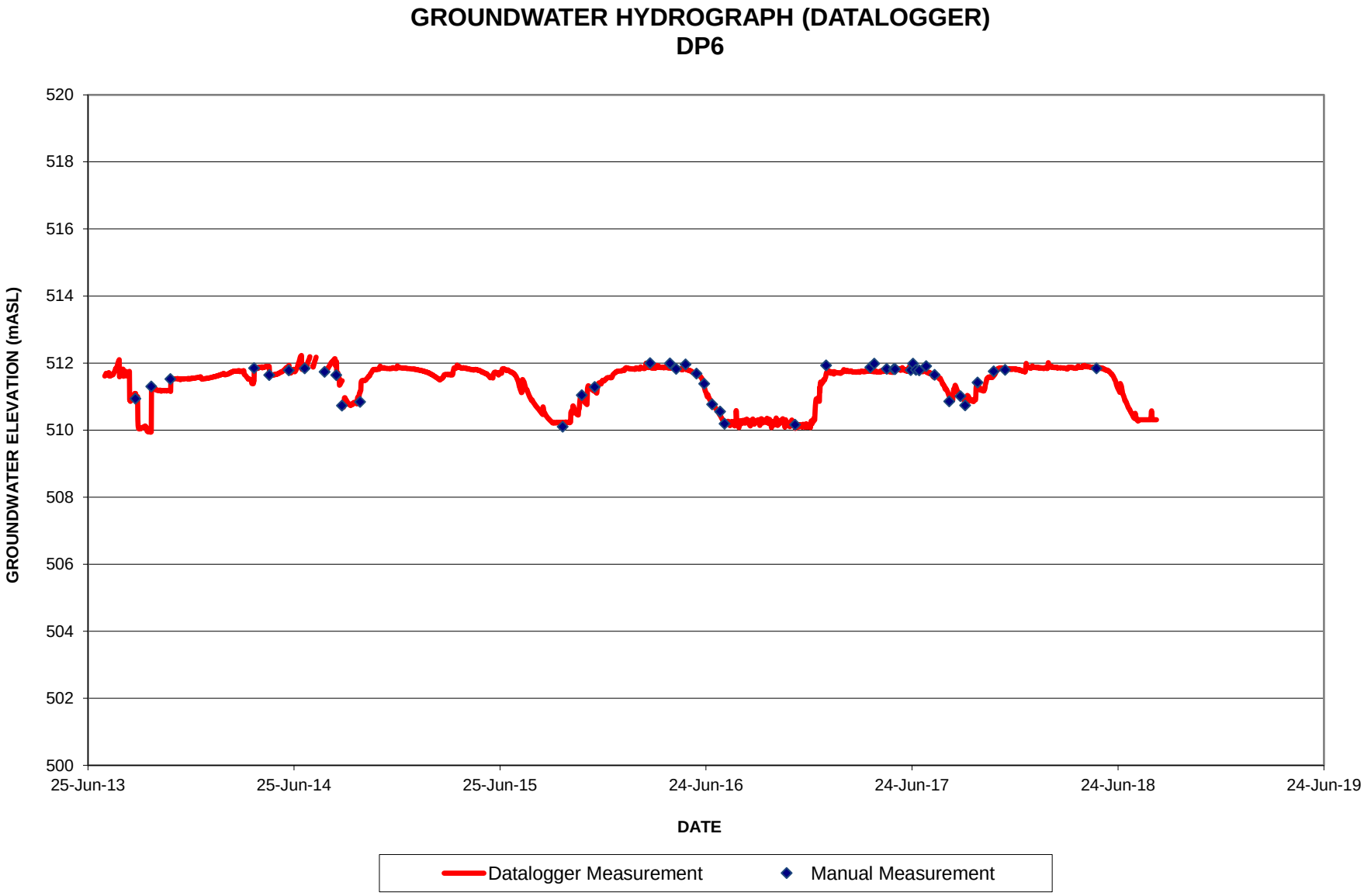
GROUNDWATER HYDROGRAPH (DATALOGGER)
DP6
GROUNDWATER ELEVATION (mASL)
520
518
516
514
512
510
508
506
504
502
500
25-Jun-13
25-Jun-14
25-Jun-15
24-Jun-16
24-Jun-17
24-Jun-18
24-Jun-19
DATE
Datalogger Measurement
Manual Measurement

FIGURE C-69

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP7 (in and out)

FIGURE C-70

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP8 (in and out)

FIGURE C-71

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP9 (in and out)

FIGURE C-72

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP10 (in and out)

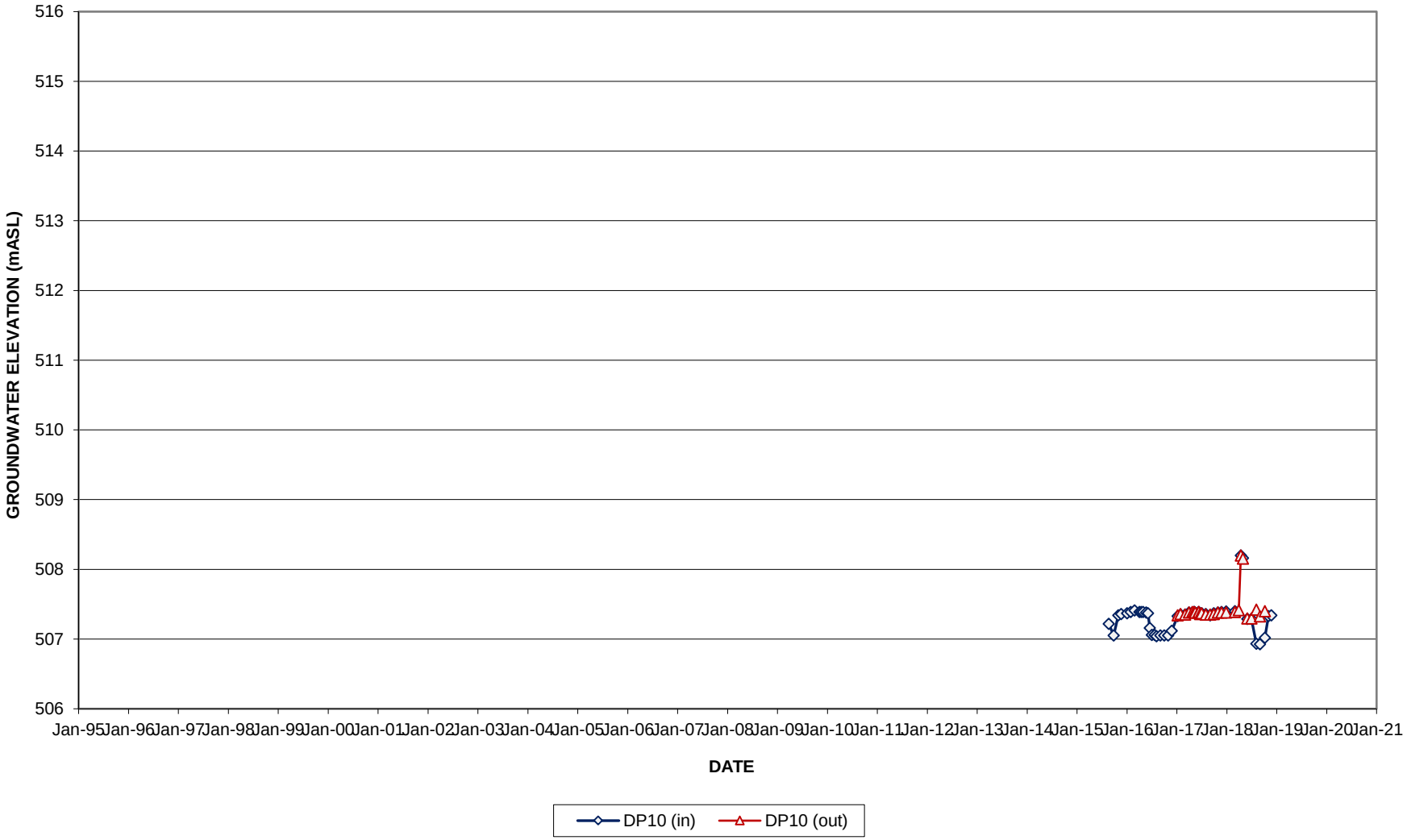

FIGURE C-73

GROUNDWATER/SURFACE WATER HYDROGRAPH
Bridson (in and out)

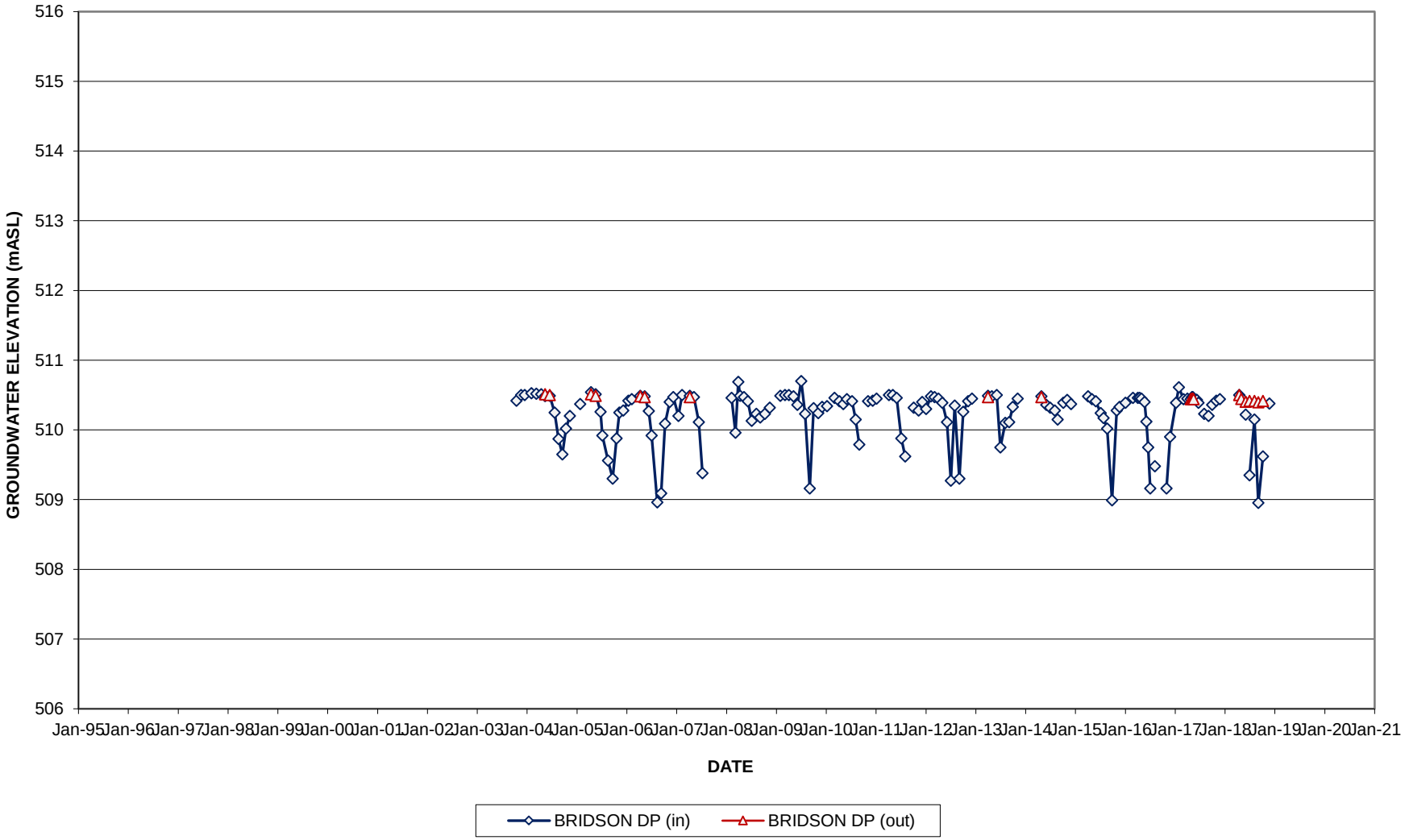

FIGURE C-74

SURFACE WATER DEPTH IN RR#2
STAFF GAUGE #1 and #2 at BH03-7 nest

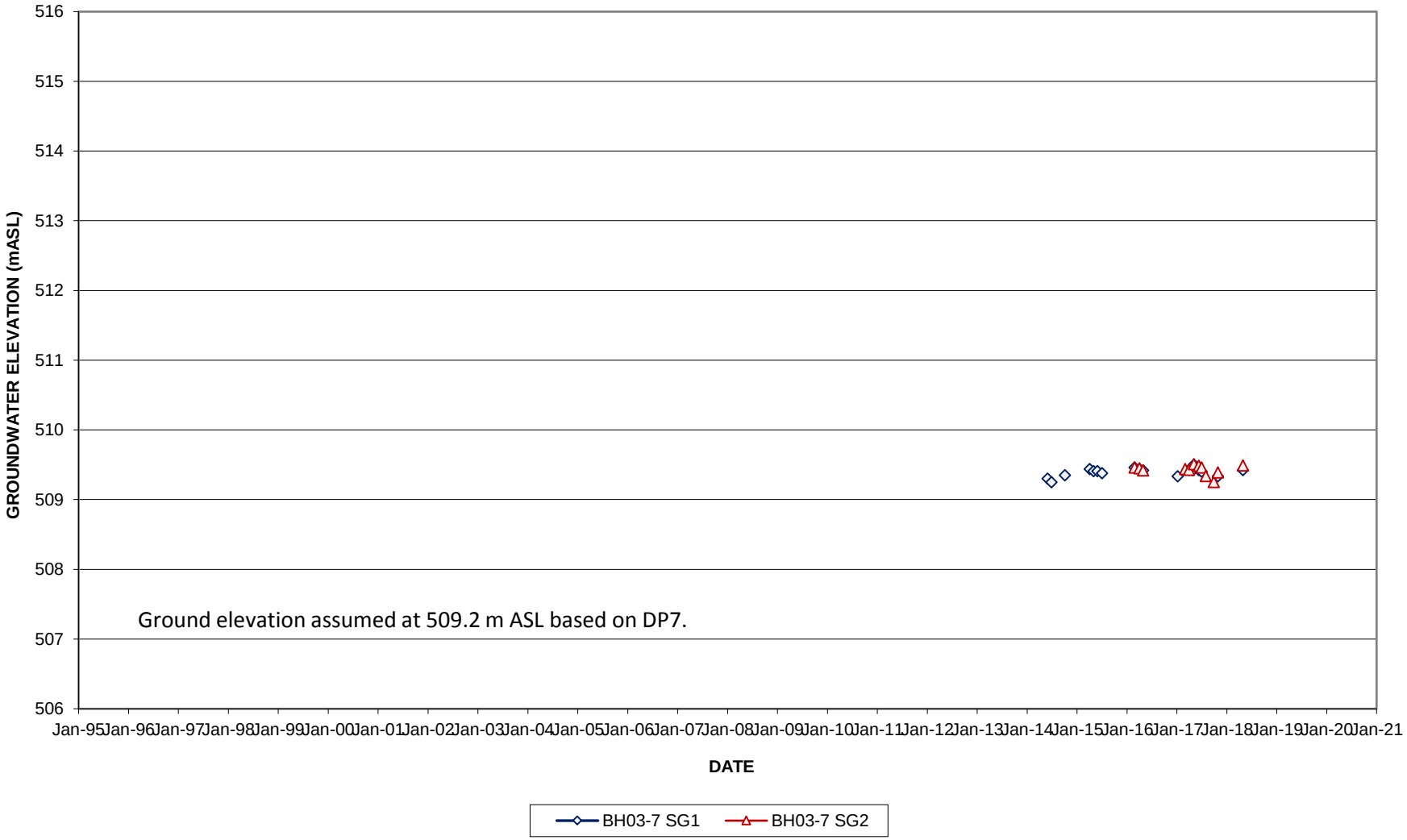

FIGURE A-48 (b)

GROUNDWATER/SURFACE WATER HYDROGRAPH
DP6 new (in and out)

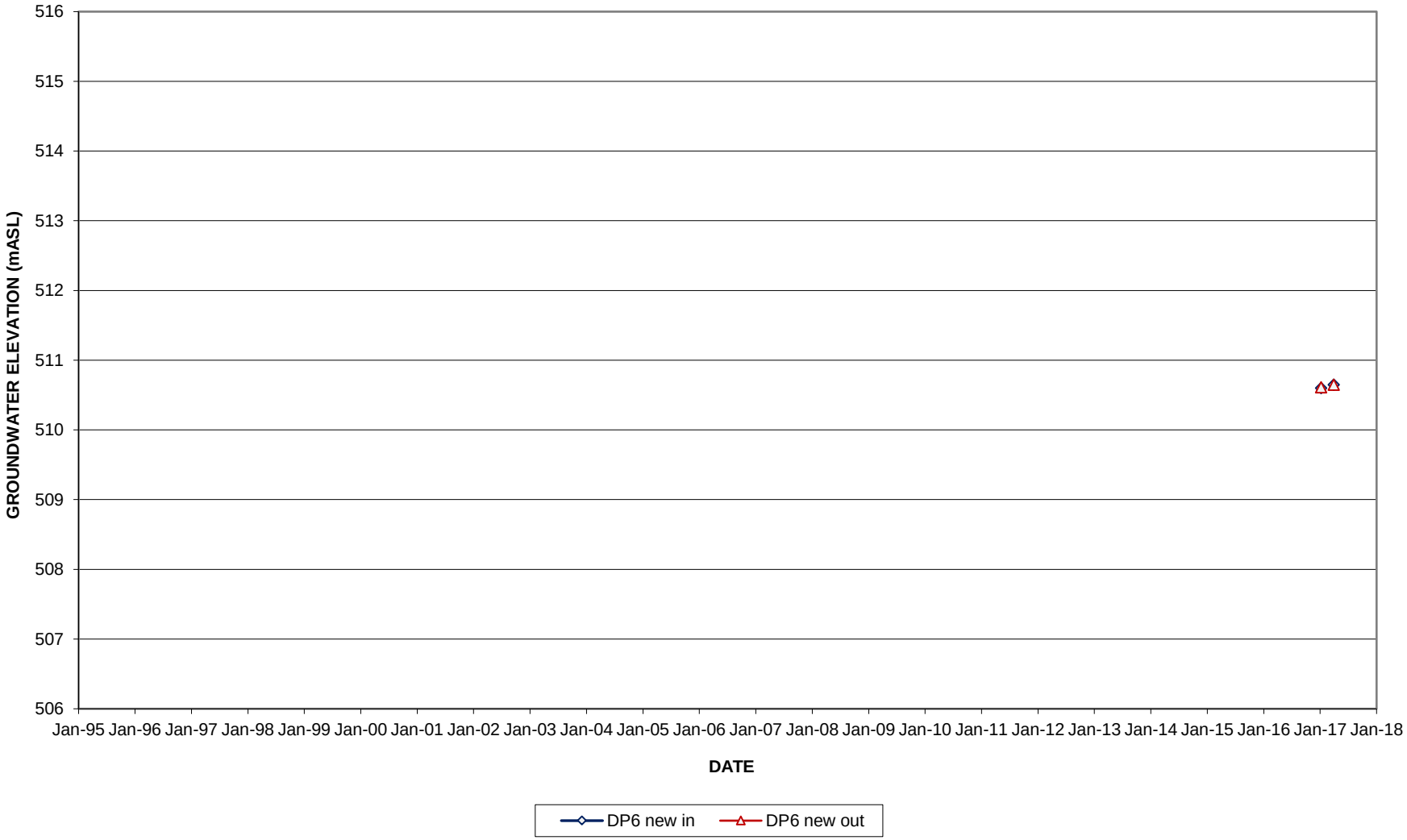

TABLE C-10
GROUNDWATER LABORATORY ANALYSIS (2018)

DUNTROON QUARRY - AMP MONITORING REPORT (2018)
111-53312.01 100

		ODWQS		RESIDENTIAL WELLS							
				RW1			RW2				
PARAMETERS	UNITS	Objective	Type	24-Oct-16	2-May-17	9-May-18	24-Oct-16	2-May-17	16-May-17	9-May-18	GW DUP 9-May-18
Total Coliform	cfu/100mL	0	MAC	<2	0	0	12	40	6	2	4
E.Coli	cfu/100mL	0	MAC	0	0	0	0	0	0	0	0
Heterotrophic Plate Count	cfu/mL			130	200	1	290	30	130	2	2
Temperature (field)	°C			19.1	20.3	9.4	11.6	9.4		9.3	-
pH @25°C (lab)	pH units	6.5-8.5	OG	7.91	8.05	8.04	7.88	7.95	*Re-sample	8.03	7.91
pH (field)	pH units	6.5-8.5	OG	7.7	7.7	7.4	7.4	7.5	for Bacti	7.3	-
Conductivity @25°C (lab)	µS/cm			595	487	460	1260	760	only*	1110	1120
Conductivity (field)	µS/cm			581	449	464	992	708		1165	-
Dissolved Oxygen (field)	mg/L			6.7	-	7.5	11.2	-		9.6	-
Alkalinity (CaCO3)	mg/L	30-500	0G	276	240	239	302	247		284	278
Hardness (CaCO3)	mg/L	80-100	OG	<1	<1	247	348	255		321	329
Chloride	mg/L	250	AO	17	6.4	4.65	204	81.5		204	205
Fluoride	mg/L	1.5	MAC	0.1	<0.1	0.036	0.1	<0.1		0.065	0.06
Nitrate (N)	mg/L	10.0	MAC	1.1	0.6	0.471	1.6	0.8		0.769	0.768
Nitrite (N)	mg/L	1.0		<0.1	<0.1	<0.010	<0.1	<0.1		<0.010	<0.010
Sulphate	mg/L	500	AO	7	6	4.2	12	6		8.26	8.25
Colour	TCU	5	AO	<2	-	7.1	7	-		<2.0	<2.0
Total Suspended Solids	mg/L			3	<3	<2.0	11	<3		<2.0	<2.0
Ammonia (N) - Total	mg/L			0.01	<0.01	0.156	0.04	<0.01		0.026	<0.020
Unionized Ammonia as NH_3	mg/L			0.0002	<0.0002	0.0006	0.0002	<0.0001		0.0001	<0.0001
Total Kjeldahl Nitrogen	mg/L			<0.1	0.2	<0.15	0.3	0.2		<0.15	<0.15
Phosphorus - Total	mg/L			<0.01	<0.01	<0.00030	0.01	0.01		0.0051	0.0069
Turbidity (lab)	NTU			-	-	0.94	-	-		0.46	0.38
Calcium	mg/L			0.07	0.17	68.1	103	73.8		91.7	95.1
Magnesium	mg/L			0.02	0.08	18.6	22.4	17.1		22.4	22.3
Potassium	mg/L			<0.1	0.1	0.957	0.6	0.3		0.671	0.682
Sodium	mg/L	200,20	AO,MAC	159	107	3.71	144	60.6		116	115
Aluminum	mg/L			<0.01	<0.01	0.0142	0.03	0.04		0.0064	0.0062
Antimony	mg/L	0.006	MAC	0.0002	<0.0001	<0.00010	0.0001	<0.0001		<0.00010	<0.00010
Arsenic	mg/L	0.025	MAC	0.0123	0.0007	0.00054	0.0003	0.0005		0.0001	0.00013
Barium	mg/L	1.0	MAC	<0.001	<0.001	0.0138	0.015	0.008		0.0129	0.0128
Beryllium	mg/L			<0.002	<0.002	<0.00010	<0.002	<0.002		<0.00010	<0.00010
Cadmium	mg/L	0.005	MAC	<0.00002	<0.000014	<0.0000050	<0.00002	<0.000014		<0.0000050	<0.0000050
Chromium	mg/L	0.05	MAC	0.002	<0.001	<0.00050	<0.002	0.003		0.00062	0.00061
Cobalt	mg/L			<0.0001	0.0001	<0.00010	0.0001	<0.0001		<0.00010	<0.00010
Copper	mg/L			0.147	0.0263	0.0155	0.011	0.0076		0.0151	0.015
Iron	mg/L	0.3	AO	<0.005	<0.005	<0.010	0.009	0.073		0.013	0.012
Lead	mg/L	0.01	MAC	0.00077	0.00017	0.000317	0.00015	0.00026		0.000233	0.000228
Manganese	mg/L	0.05	AO	<0.001	<0.001	<0.00050	<0.001	<0.001		<0.00050	<0.00050
Molybdenum	mg/L			<0.0001	<0.0001	<0.000050	<0.0001	0.0001		0.000077	0.000072
Nickel	mg/L			<0.01	<0.01	<0.00050	<0.01	<0.01		0.00064	0.00057
Selenium	mg/L	0.05	MAC	<0.001	<0.001	0.00006	<0.001	<0.001		0.000087	0.000094
Silver	mg/L			<0.00002	<0.00002	<0.000050	<0.00002	<0.00002		<0.000050	<0.000050
Strontium	mg/L			<0.001	<0.001	0.0802	0.275	0.159		0.213	0.218
Thallium	mg/L			<0.00005	<0.00005	<0.000010	<0.00005	<0.00005		<0.000010	<0.000010
Titanium	mg/L			<0.005	<0.005	0.00047	<0.005	<0.005		<0.00030	<0.00030
Tungsten	mg/L			<0.01	<0.01	<0.00010	<0.01	<0.01		<0.00010	<0.00010
Uranium	mg/L	0.02	MAC	0.00011	0.00010	0.00013	0.00016	0.00013		0.000124	0.000118
Vanadium	mg/L			<0.005	<0.005	<0.00050	<0.005	<0.005		<0.00050	<0.00050
Zinc	mg/L			<0.005	<0.005	0.0201	<0.005	0.007		0.0156	0.016
Zirconium	mg/L			<0.003	<0.003	<0.00030	<0.003	<0.003		<0.00030	<0.00030
Anion Sum	meq/L			6.23	5.13	-	12.2	7.14		-	-
Cation Sum	meq/L			6.93	4.66	-	13.2	7.73		-	-
Ion Ratio	AS/CS			0.9	1.1	-	0.919	0.958		-	-
TDS (Calc)	mg/L			354	266	256	674	391		630	630
Benzene	µg/L	1	MAC	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Toluene	µg/L	60	MAC	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Ethylbenzene	µg/L	140		<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5
Xylene, m, p-	µg/L			<1.0	<1.0	<0.4	<1.0	<1.0		<0.4	<0.4
Xylene, o-	µg/L			<0.5	<0.5	<0.3	<0.5	<0.5		<0.3	<0.3
Xylene, total	µg/L	90	MAC	<1.1	<1.1	<0.5	<1.1	<1.1		<0.5	<0.5
PHC F1 (C6-C10)	µg/L			<50	<50	<25	<50	<50		<25	<25
PHC F2 (>C10-C16)	µg/L			<50	<50	<100	<50	<50		<100	<100
PHC F3 (>C16-C34)	µg/L			<400	<400	<250	<400	<400		<250	<250
PHC F4 (<C34-C50)	µg/L			<400	<400	<250	<400	<400		<250	<250

APPENDIX D

LONG TERM TREND ECOLOGICAL MONITORING PROGRAM RESULTS

Walker Aggregates Duntroon Expansion Quarry Amphibian Monitoring Program

2018 Annual Monitoring Report

April 3, 2019

Prepared for:

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Ecologist / Landscape Architect

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1.0 INTRODUCTION

The focus of the wetland component of the Long Term Trend Ecological Monitoring (LTTEM) program in the Walker Aggregates Inc. Duntroon Expansion Quarry Adaptive Management Plan (Stantec 2013) is on amphibian vernal breeding pools and ensuring hydroperiods are suitable for continued hydrophytic plant growth in the surrounding wetland zones. Wetland water level monitoring is conducted as part of the PITM and the LTTWM programs and will be interpreted from a natural heritage perspective.

Ecological monitoring to complement the water level monitoring will include two components: vegetation monitoring and wildlife monitoring. Wildlife monitoring in wetlands is focused on amphibians (Anura: frogs and toads and Urodela: salamanders). Amphibians are excellent indicators of the health of the wetland area and water regime trends that could be affecting wetland function. Wildlife monitoring was initiated in 2018 and is described below.

2.0 METHODS

Site visits occurred on Walker Aggregates Inc. Duntroon Expansion Quarry property on three occasions in 2018 (April 26, May 23, June 15). During the visits six predetermined Stations were surveyed (Stations 1 - 6) for amphibian habitat, and amphibian community through incidental observation and breeding evidence with egg mass surveys and breeding call surveys. These Stations were selected based on previous amphibian monitoring at the Subject Property and the proximity of the Stations to the Duntroon Quarry.

2.1 HABITAT ASSESSMENT

Habitat conditions were recorded at each Station. The habitat assessment included a variety of parameters which can affect the presence, abundance, reproduction, survival and diversity of amphibian communities; these were: average depth, maximum depth, average length and width, substrate type, amount of litter/debris, number of egg attachment sites, likelihood of fish, emergent/wetland vegetation, edge vegetation, dominant surrounding vegetation/community, percent canopy closure and percent in-pond shrub cover and species.

A photographic record was completed at all Stations during each Site visit.

2.2 AMPHIBIAN EGG MASS SURVEY

During each Site visit two Stantec biologists surveyed for amphibian egg masses at Stations 2 and 4. Stations were surveyed by wading through the habitat for 30 minutes and visually looking for egg masses. Each egg mass encountered was recorded and identified to species, and mass condition was described (dead/alive/hatched). Polarized sunglasses were worn which decreased glare on the water, improving egg mass detection.

Incidental amphibian observations were recorded during the egg mass surveys.

2.3 AMPHIBIAN BREEDING CALL SURVEY

During the first Site visit, Automated Recording Units (ARU's) were fastened to a tree or pole at each station in proximity to wetland features, in areas with little ground vegetation to minimize background noise. The ARU was programmed to record daily between April 26 – June 25, 2018. For each day within the schedule period, four (4) 5-minute recording windows were programmed, starting:

1. 25 minutes before sunrise (pre-dawn)
2. 120 minutes after sunrise (dawn)
3. 10 minutes after sunset (evening)
4. 11:00pm (night)

Incidental records of amphibians observed were recorded during the deployment of ARU's and in subsequent Site visits. ARU's were visited during all Site visits to check on battery levels.
ARU units were collected during the last Site visit (June 15, 2018) and brought back to the Stantec office for data downloading and analysis.

2.3.1 Data Analysis

The Bird Studies Canada (BSC) Marsh Monitoring Program (MMP) for Surveying Amphibians (BSC 2009) was utilized for analyzing the ARU data. Standardized methodology in the MMP provides repeatable data analysis for future years of monitoring. Following the MMP methodology, dates selected for amphibian call analysis at the Walker Aggregates Duntroon Pit met the following conditions:

1. Each station was surveyed three times during spring and early summer, a minimum of 15 days apart, Per the MMP, if possible, survey dates should fall within these windows: Survey 1 – April 15 – 30, Survey 2 – May 15 – 30, Survey 3 June 15 – 30.
2. Air temperatures were: greater than 5 8C for first survey, 10 8C for second survey, and 17 8C for third survey.
3. Each station was surveyed for 3 minutes, beginning at least one-half hour after sunset
4. Wind strength was Code 0, 1, 2 or 3

The ARU recording periods were analyzed on dates April 30, May 25 and June 14, 2018. Dates were selected through an analysis of weather conditions archived from the Environment Canada Collingwood weather station. Considerations were made for an appropriate spread between analysis dates, ideal weather conditions (light winds, no precipitation, seasonal temperatures) and background noise.

Each survey station included listening for three minutes for all calling toads and frogs. Call levels were described using values of 1, 2, or 3. Level 1 indicates that individuals could be counted, and calls were not simultaneous. Level 2 denotes that calls are distinguishable but with some simultaneous calling. Level 3 indicates a full chorus where calls are continuous and overlapping.

Data collected in 2018 was compared to previous years egg mass survey and breeding call survey data to observe trends in abundance and diversity. Previous studies include the following:

Egg Mass Surveys

- Investigation of Salamander Community, Wildlife Scientific Collector's Permit No. 1031106 (Stantec 2010)
- Investigation of Salamander Community, Wildlife Scientific Collector's Permit No. 10452052 (Stantec - April 2008)
- Investigation of Salamander Community (Stantec - April 2009)

Breeding Call Surveys

- Amphibian Breeding Call Survey (Stantec 2010)

3.0 RESULTS

3.1 HABITAT ASSESSMENT

An amphibian habitat assessment was completed at each of the six Stations. A photographic record showing habitat at each Station is provided in Appendix A. Station UTM coordinates are provided in Table B.1, Appendix B, and incidental amphibian observations in Table B.2, Appendix B. Station habitat descriptions are as follows:

Station 1

A small pond, approximately 10 m x 10 m, at the edge of a young mixed forest community bordered by a hay field/pasture. A creek approximately 15 m to the north flowed east past the feature, providing source water for the pond and surrounding area. Water was present in the pond on June 15th indicating the habitat likely supports the larval development period for most amphibians. Water depth was measured to be an average of 0.30 m and maximum depth of 0.70 m. Substrate was organic with litter/debris with a depth of 0.15 m. The pond was surrounded by willow and dogwood shrubs with a 10 % canopy closure. An abundance of grasses and vegetation provided 20 % in-pond cover. Fish were not observed and are likely not present in the feature. Depending on water depth at freeze up, this feature may provide aquatic overwintering amphibian habitat. Surrounding upland area would provide terrestrial overwintering amphibian habitat.

Station 2

This feature is a large flooded area in a mature deciduous swamp forest community which receives surface water runoff from surrounding lands. Average water depth was 0.30 m and maximum depth was 0.56 m. Water was present in the feature on June 15th indicating the habitat likely supports the larval development period for most amphibians (Harding 1997). Substrate was organic with an abundance of leaf litter and tree branch litter. Litter depth was approximately 0.10 m. Egg attachment sites were abundant, provided by organic debris and in-water shrubs. Percent canopy closure over feature was approximately 80 % by mature maple sp. Fish were not observed and likely not present in the feature. Depending on water depth at freeze up, this feature may provide aquatic overwintering amphibian habitat. Nearby permanent ponds and surrounding upland area would provide aquatic and terrestrial overwintering amphibian habitat.

Station 3

Station 3 is within the mature deciduous swamp forest described for Station 2 but is located further east. Seemingly higher in elevation, Station 3 held less water than that observed at Station 2 with average depths of 0.15 m, maximum depth of 0.30 m and less flooded area. Substrate was organic with leaf litter and tree branch litter providing an abundance of egg attachment sites and in-water cover for stages of amphibian development. This feature was likely amphibian breeding and larval development habitat and not likely aquatic overwintering habitat; however, upland habitat would be available for those species that can overwinter in terrestrial habitat such as the American Toad, Western Chorus Frog, Wood Frog, Gray Treefrog, and Spring Peeper (Harding 1997).

Station 4

A low-lying area with dense dogwood and willow shrubs. This feature received drainage from a mature deciduous forest to the south and mixed forest to the north. Average water depth was 0.20 m and maximum depth of 0.45 m. Substrate was organic with leaf litter and shrub branch litter providing an abundance of egg attachment sites and approximately 70 % in-water cover for developing amphibians. Canopy closure was 50 %, mainly provided by shrubs. Fish were not observed and likely not present in the feature. This feature was likely amphibian breeding and larval development habitat and not likely aquatic overwintering habitat, however, upland habitat would be available for those species that can overwinter in terrestrial habitat.

Station 5

A dug pond that permanently holds water throughout the year. Approximately 21 m x 15 m, this pond had an average depth 1.0 m. Surrounding vegetation community was deciduous forest and meadow. The pond had dense emergent aquatic vegetation (cattail) along the edge and submergent vegetation (chara spp.) throughout. Substrate was a silty clay with detritus including leaf litter. Egg attachment sites were abundant from shrub debris and aquatic vegetation debris. Canopy closure was 5 % and in-water cover was 10 %, however water depth provides refuge for developing amphibians from predators. This feature would provide aquatic overwintering habitat for those species that hibernate in pond substrates such as Green Frog and Northern Leopard Frog (Harding 1997). Fish were observed which were likely Brook Stickleback (non-predatory to amphibians).

Station 6

This Station is a meadow marsh floodplain habitat with a creek that flows west. Grasses were dominant with wetland vegetation including marsh marigold and cattail. Trees and shrubs were sparse with mixed composition of deciduous and coniferous species. The floodplain held water during freshet events however there was minimal water or pooling in the floodplain during the May and June Site visits. Floodplain substrate was organic with detritus and cover was approximately 90 % from tall grasses and emergent vegetation. The amphibian community supported by this habitat would include those species and amphibian life stages adapted to drier conditions, such as the adult Northern Leopard Frog. Aquatic

overwintering habitat in the floodplain would be provided in sections of the creek and surrounding uplands would provide terrestrial overwintering habitat.

3.2 AMPHIBIAN EGG MASS SURVEY

The amphibian egg mass survey was completed at Station 2 and Station 4 during each Site visit (April 26, May 23, and June 15). Suitable habitat was present during each survey, providing conditions for amphibian breeding and larval development. No egg masses were detected at either Station during the April survey. In the May survey, twenty (20) viable Spotted Salamander egg masses were observed at Station 2 and four (4) viable Spotted Salamander egg masses and one dead egg mass were observed at Station 4. The dead egg mass appeared to be caused by low water levels and subsequent desiccation. During the June survey no egg masses were observed at either Station, however five (5) hatched Spotted Salamander egg masses were observed at Station 2 and one (1) hatched Spotted Salamander egg mass was observed at Station 4. Incidental amphibian observations were recorded during the egg mass surveys which included an abundance of tadpoles: adult Chorus Frog and Gray Treefrog at Station 2, and adult Chorus Frog, Spring Peeper, Green Frogs and unidentified tadpoles observed at Station 4.

In comparison to previous (Stantec 2010) egg mass surveys at Stations 2 and 4, Spotted Salamander egg mass records were similar (Table 1). However, Anura egg masses were not observed in 2018, whereas egg masses of multiple Anura species were observed in previous years surveys. Survey timing and weather leading up to the survey are the most likely explanations for the lack of detection of certain species. April is typically the month when “early breeders” including Spring Peeper, Wood Frog, Chorus Frog and Spotted Salamander will begin breeding activity (moving to breeding habitat, vocalization, mating, egg laying). However, in 2018 the arrival of spring weather was late, with average daily temperatures in April only 2.3 8 C. During the April survey in 2018, snow and ice was still on the forest floor and there was minimal open water. Air temperatures rose in May, with average daily temperatures of 14.4 8 C, signaling amphibians to head to breeding habitat. Many Anuran species have short egg incubation times, depending on water temperatures. The Spring Peeper develops from egg to larvae in 4 – 15 days, the Chorus Frog in 3 - 14 days and Wood Frog 4 days to 4 weeks (Harding 1997). In contrast, Spotted Salamander incubation period is 20 – 60 days (Harding 1997), which provides a longer window of survey detection. In the twenty-seven-day period between the April and May egg mass surveys, Anurans could have spawned, and larvae hatched out before Stantec was able to detect egg masses from those species. An abundance of tadpoles observed at both Station 2 and Station 4 during the May egg mass survey would indicate amphibian breeding occurred in early May and that egg masses had already hatched. Egg mass survey results from 2018, 2009, 2008 and 2006 is provided in Table 1.

Table 1: Amphibian Egg Mass Survey Results from 2018 and Previous Survey Years

Station	Survey Date	Species	Number of Egg Masses
Station 2	4/26/2018	-	-
	5/23/2018	Spotted Salamander	20
	6/15/2018	Spotted Salamander	5 (hatched)
	4/27/2009	Spotted Salamander	3
		Wood Frog	"Five large carpets"
	4/30/2008	Spotted Salamander	30
		Pseudacris sp.	1
		Wood Frog	"numerous carpets - mostly hatched"
	4/27/2006	Spotted Salamander	16
		Wood Frog	200
		Northern Leopard Frog	1
Station 4	4/26/2018	-	-
	5/23/2018	Spotted Salamander	4, 1 (dead)
	6/15/2018	Spotted Salamander	1 (hatched)
	4/27/2009	Spotted Salamander	14
	4/30/2008	Spotted Salamander	Number of egg masses not reported

3.3 AMPHIBIAN BREEDING CALL SURVEY

The amphibian breeding call survey was completed within the MMP guidelines except for the date selected for the June survey. The June 15 – 30 survey period is a guideline for the dates to complete the early summer survey, however the ARU data at all Stations past June 14 was poor quality and could not be used for analysis. The MMP states that air temperature and lack of wind are the most important factors to pay attention to when deciding to conduct surveys (BSC 2009). Variables including air temperature and weather were appropriate for the species associated with later breeding periods. Survey date, time and weather is provided in Table B.3, Appendix B.

Three surveys were completed at each of the six Stations for a total of eighteen surveys. The breeding call survey documented six (6) species utilizing habitat at the survey Stations: Wood Frog, Spring Peeper, Western Chorus Frog, American Toad, Green Frog and Gray Treefrog. Spring Peeper was the most commonly detected species with records from eight of eighteen surveys, followed by Western Chorus Frog (four of eighteen) and Gray Treefrog (three of eighteen). Spring Peeper was also the most abundant species with a full chorus at Station 3 and high individual counts (10 - 20) at multiple Stations. Station 5 had the greatest diversity of species (5 species) and Station 6 the least diversity (1 species). Background noise codes during the surveys ranged from 0 (no appreciable effect) to 2 (moderately affecting sampling)

at the Stations. Incidental amphibian observations encountered during Site visits also provide insight into amphibian community at the surveyed Stations. For example, Northern Leopard Frog was not recorded on the breeding call survey however it was observed visually at Stations 1, 5 and 6. Breeding call survey data are provided in Table B.4, Appendix B, and incidental amphibian observations in Table B.2, Appendix B.

In comparison to breeding call surveys from 2007, the 2018 data are similar. Slight differences at some Stations were observed in amphibian community and abundance. As in 2018, the most common species in 2007 were the Spring Peeper and Western Chorus Frog. Amphibian activity, including breeding calls, can be hard to detect due to “explosive breeding” events. Some species, such as the Wood Frog, may only call for a few evenings and with most breeding completed in one evening (BSC 2009). When this is the case, entire species can be missed. Habitat at each Station has not changed since 2007 and therefore amphibian populations are expected to have remained similar. Station 3 and Station 6 did not have previous years data for comparison. Amphibian community documented at surveyed Stations in 2007 and 2018 is provided in Table 2. Individual counts and MMP call codes for each station, survey date and year are provided in Table B.4, Appendix B. Survey date, time and weather for 2007 surveys is provided in Table B.5, Appendix B.

Table 2: Amphibian Community Documented in Breeding Call Survey and Incidentally in 2018 and 2007

Station	Survey Year	Wood Frog	Spring Peeper	Western Chorus Frog	American Toad	Green Frog	Gray Treefrog	Leopard Frog
1	2018	✓	✓			✓[1]	✓	✓[1]
	2007		✓	✓	✓	✓	✓	
2	2018		✓	✓			✓[1]	
	2007	✓	✓	✓	✓		✓	✓[1]
3	2018	✓[1]	✓	✓				
4	2018		✓	✓		✓[1]		
	2007	✓	✓	✓				

Station	Survey Year	Wood Frog	Spring Peeper	Western Chorus Frog	American Toad	Green Frog	Gray Treefrog	Leopard Frog
5	2018		✓	✓	✓	✓	✓	✓[1]
	2007		✓	✓		✓	✓	
6	2018		✓			✓[1]		✓[1]

Note: ✓[1] denotes incidental species observation not recorded in breeding call survey.

4.0 CONCLUSION

The 2018 Amphibian Monitoring Program at the Walker Aggregates Inc. Duntroon Expansion Quarry was completed successfully, fulfilling the requirement of the Adaptive Management Plan which forms part of the Aggregate Resources Act licence. Data of amphibian habitat, egg mass occurrence, incidental observation and breeding calls at each survey Station were collected, providing baseline conditions to compare with for future monitoring years. Habitat at each survey Station was suitable for amphibians and, when comparing 2018 data to previous years' surveys, amphibian communities were similar in diversity and abundance at each Station. Proper timing of egg mass surveys is critical when attempting to detect Anura species.

5.0 REFERENCES

BSC [Bird Studies Canada]. 2009. Marsh Monitoring Program Participants Handbook for Surveying Amphibians. 2009 Edition. 13 pages. Published by Bird Studies Canada in cooperation with Environment Canada and the U.S. Environmental Protection Agency. February 2009.

Harding. 1997. Amphibians and Reptiles of the Great Lakes Region. Great Lakes Environment Series. The University of Michigan.

Stantec. 2010. Duntroon Quarry Expansion Consolidated Natural Environment Report. Lot 25, Concession 12, Township of Clearview.

Stantec. 2013. Adaptive Management Plan (AMP). Duntroon Expansion Quarry. Lot 25 and Pt. Lot 26, Concession 11, Township of Clearview.

APPENDIX A:

Photographic Records

Photo 1: Site 1, April 26, 2018.

Photo 2: Site 1, April 26, 2018.

Photo 3: Site 1, May 23, 2018

Photo 4: Site 1, May 23, 2018

Photo 5: Site 1, June 15, 2018

Photo 6: Site 1, June 15, 2018

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SITE 1: PHOTOGRAPHIC RECORD	1 of 1

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Photo 1: Site 2, April 26, 2018.

Photo 2: Site 2, April 26, 2018.

Photo 3: Site 2, May 23, 2018

Photo 4: Site 2, May 23, 2018

Photo 5: Site 2, May 23, 2018. Spotted Salamander egg mass.

Photo 6: Site 2, June 15, 2018

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Title	Page
SITE 2: PHOTOGRAPHIC RECORD	1 of 2

Stantec

Photo 7: Site 2, June 15, 2018

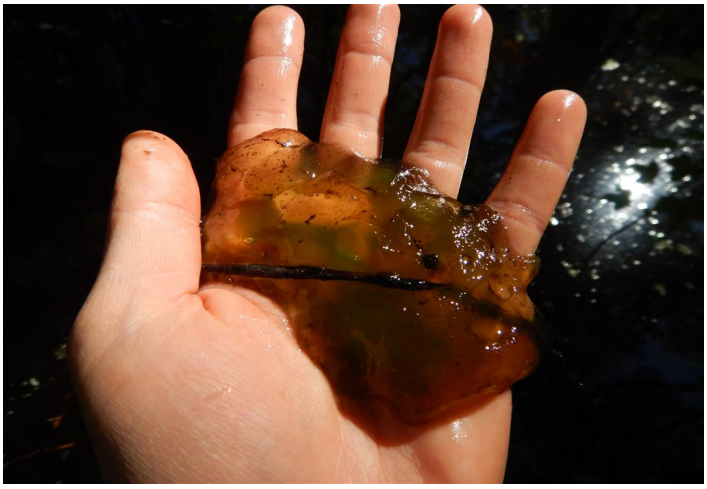

Photo 8: Site 2, June 15, 2018. Spotted Salamander egg mass hatched.

Photo 1: Site 3, April 26, 2018.

Photo 2: Site 3, April 26, 2018.

Photo 3: Site 3, May 23, 2018

Photo 4: Site 3, May 23, 2018

Photo 5: Site 3, June 15, 2018

Photo 6: Site 3, June 15, 2018

Photo 1: Site 4, April 26, 2018.

Photo 2: Site 4, April 26, 2018.

Photo 3: Site 4, May 23, 2018

Photo 4: Site 4, May 23, 2018. Spotted Salamander egg mass.

Photo 5: Site 4, May 23, 2018

Photo 6: Site 4, May 23, 2018

Photo 7: Site 4, June 15, 2018

Photo 8: Site 4, June 15, 2018

Photo 1: Site 5, April 26, 2018.

Photo 2: Site 5, April 26, 2018.

Photo 3: Site 5, May 23, 2018

Photo 4: Site 5, May 23, 2018.

Photo 5: Site 5, June 15, 2018

Photo 6: Site 5, June 15, 2018

Photo 1: Site 6, April 26, 2018.

Photo 2: Site 6, April 26, 2018.

Photo 3: Site 6, May 23, 2018

Photo 4: Site 6, May 23, 2018

Photo 5: Site 6, June 15 , 2018

Photo 6: Site 6, June 15 , 2018

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APPENDIX B:

Tables

Table B.1: ARU Stations UTM Coordinates

Station	UTM Coordinate	
	Easting	Northing
1	558849	4915550
2	559070	4915566
3	559265	4915517
4	559777	4915725
5	560348	4915470
6	559072	4914241

Table B.2: Incidental Amphibian Observations during Site Visits

Station		Incidental Observations
1	4/26/2018	Green Frog (2)
	5/23/2018	Green Frog (2), Leopard Frog (10)
	6/15/2018	-
2	4/26/2018	-
	5/23/2018	Abundance of tadpoles. Chorus Frog (1), Gray Treefrog (1)
	6/15/2018	Tadpoles observed, hatched Spotted Salamander egg masses, Green Frog (1)
	4/27/2006	Leopard Frog (2), Wood Frog (1), Spring Peepers (3) and a chorus of Watern Chorus Frog
3	4/26/2018	-
	5/23/2018	Wood Frog (1)
	6/15/2018	-
4	4/26/2018	Chorus Frog (2), Spring Peeper (3)
	5/23/2018	-
	6/15/2018	Green Frog (3), tadpoles observed, hatched Spotted Salamander egg masses observed
5	4/26/2018	Leopard Frog (1)
	5/23/2018	Green Frog (1), Leopard Frog (1), American Toad (1), abundant tadpoles, 20 Spotted Salamander egg masses
	6/15/2018	Green Frog (1), hatched Spotted Salamander Egg masses
6	4/26/2018	Leopard Frog (1)
	5/23/2018	Green Frog (1), Leopard Frog (1)
	6/15/2018	Green Frog (2)

Table B.3: Weather Conditions during 2018 Breeding Call Surveys

Survey Round	Survey Date	Time	WEATHER		
			Minimum Daily Temperature °C	Maximum Daily Temperature °C	Total Daily Precipitation
Survey 1	4/30/2018	20:29	5.3	13.9	0.4
Survey 2	5/25/2018	20:57	9.7	19.8	1
Survey 3	6/14/2018	21:11	12.5	20.6	0

Table B.4: Comparison of Breeding Call Survey Results from 2018 and 2007

Station	Survey Round	Survey Year	Wood Frog (WOFR)	Spring Peeper (SPPE)	Western Chorus Frog (CHFR)	American Toad (AMTO)	Green Frog (GRFR)	Gray Treefrog (GRTF)
1	April	2018	1-2	2-10				
	May			2-5				1-3
	June							
	April	2007		3	1-4			
	May			3		1-2		
	June						1-3	1-1
2	April	2018		1-4	1-3			
	May			2-20				1-2
	June							
	April	2007	1-2	3	3			
	May			2-30		1-1		
	June							2-8
3	April	2018			1-3			
	May			3				
	June							
4	April	2018			2-10			
	May			1-3				
	June							
	April	2007	1-5		2-20			
	May			2-30				
	June							
5	April	2018			2-4			
	May			2-20		1-2	2-4	2-5
	June						2-4	
	April	2007		2-40	1-5			
	May			3			1-2	1-2
	June						1-3	1-5
6	April	2018						
	May			2-8				
	June							

Table B.5: Weather Conditions during 2007 Breeding Call Surveys

Survey Round	Survey Date	Time	WEATHER				
			Temperature °C	Wind (Beaufort Scale)	Cloud %	Precipitation	PPT in last 24 hours
Survey 1	4/30/2007	20:30 - 22:05	12	0	75	0	0
Survey 2	5/22/2007	21:10 - 22:19	13	1-2	0	0	0
Survey 3	6/14/2007	21:45 - 22:04	19	0	5	0	0

APPENDIX E

ECOLOGICAL ENHANCEMENT AND MITIGATION MONITORING PROGRAM RESULTS

Walker Aggregates Inc.

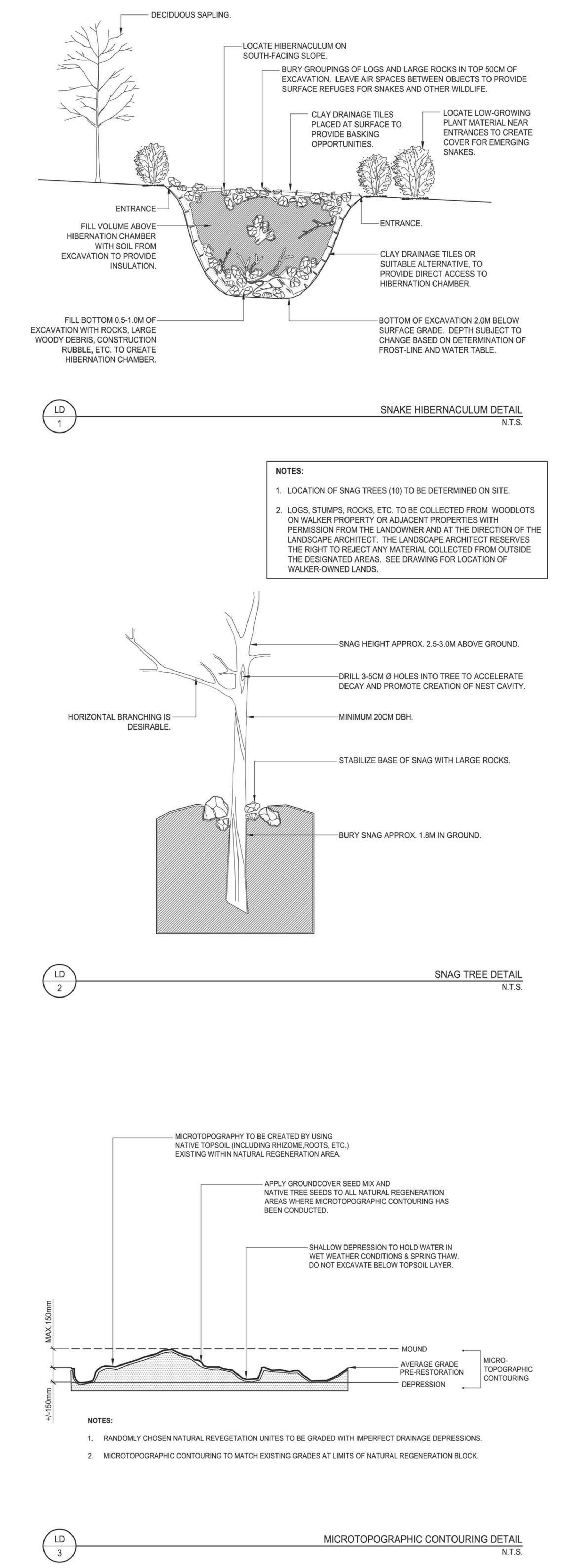
DUNTROON QUARRY REFORESTATION PLANTING

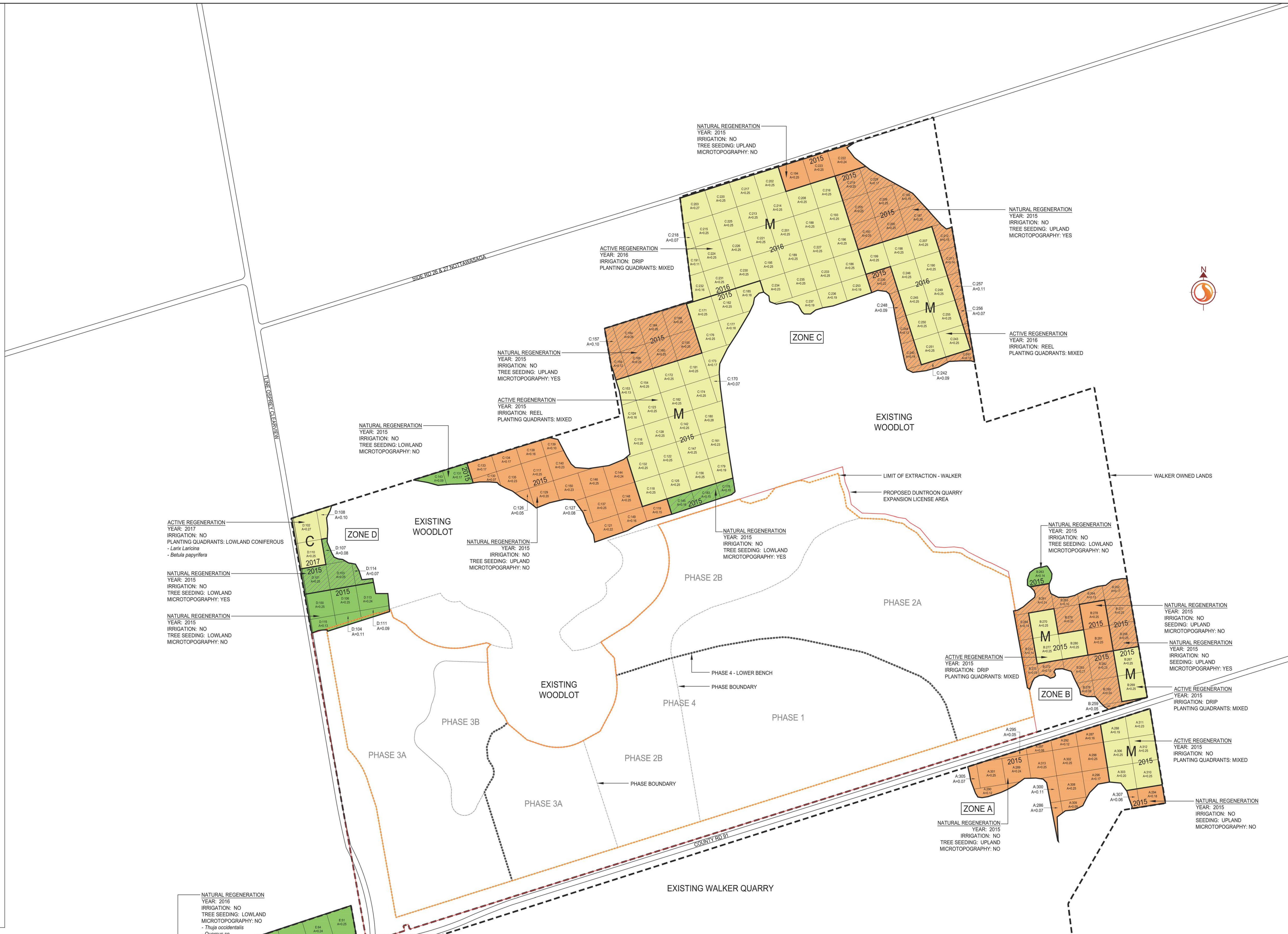
Planting Quantities (Active Regeneration)

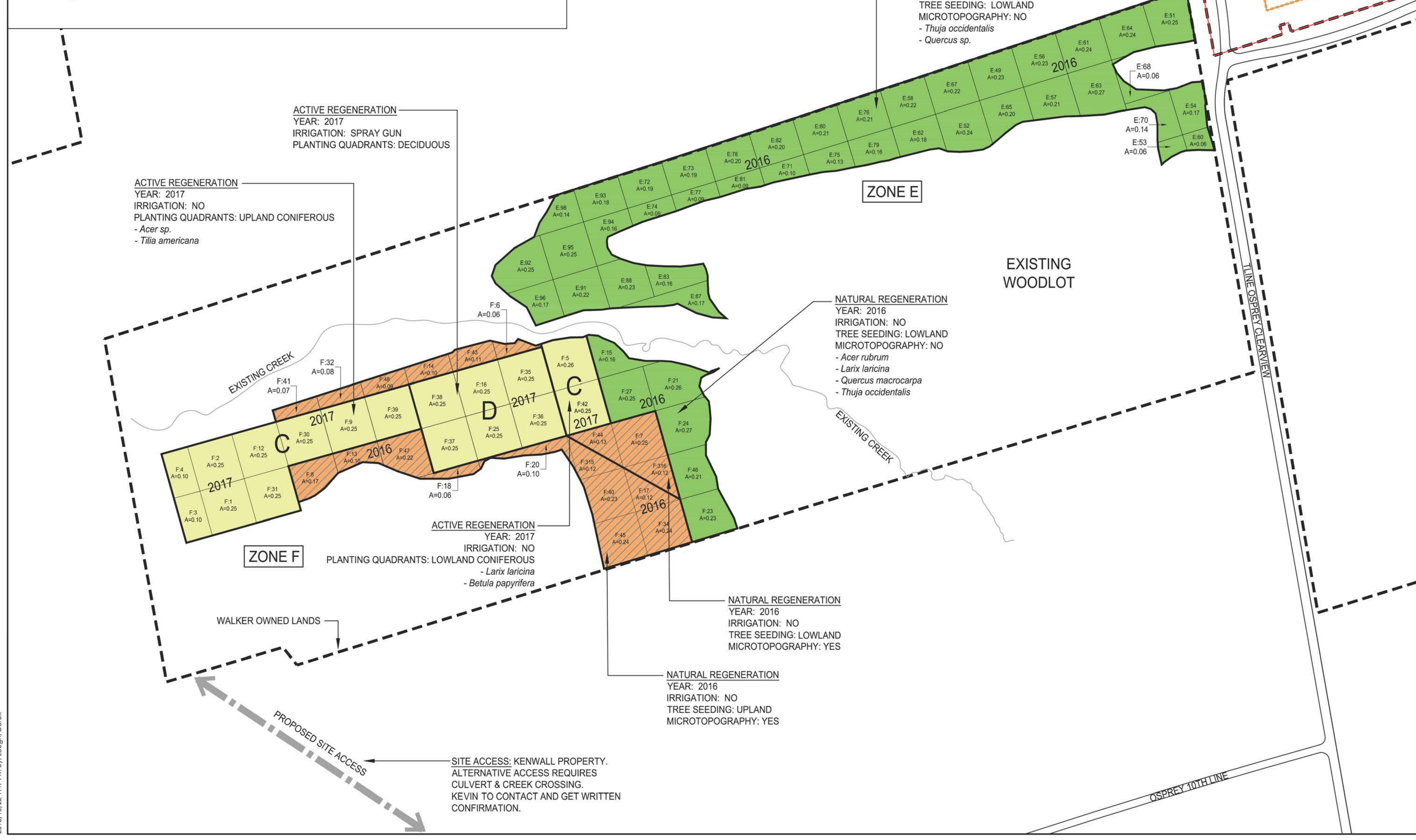
		2015 Planting		2016 Planting		2017 Planting		Project Total	
Deciduous Caliper Whips	**Size**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**
Acer rubrum	25mm	640	395	804	150	252	450	1,696	995
Acer saccharum	25mm	640	1,020	804	2,395	252	810	1,696	4,225
Betula papyrifera	25mm	640	500	804	100	252	190	1,696	790
Populus tremuloides	25mm	640	670	804	450	252	350	1,696	1,470
Prunus serotina	25mm	640	280	804	240	252	200	1,696	720
Quercus rubra	25mm	640	550	804	250	252	300	1,696	1,100
Tilia american	25mm	320	0	402	660	126	50	848	710
Total		**4,160**	**3,415**	**5,226**	**4,245**	**1,638**	**2,350**	**11,024**	**10,010**
		2015 Planting		**2016 Planting**		**2017 Planting**		**Project Total**	
Deciduous Seedlings	**Size**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**
Acer rubrum	60-90cm	320	360	402	470	126	100	848	930
Acer saccharum	60-90cm	320	360	402	500	126	400	848	1,260
Betula allegheniensis	60-90cm	320	220	402	211	126	180	848	611
Betula papyrifera	60-90cm	320	360	402	470	126	375	848	1,205
Carya cordiformis	60-90cm	320	360	402	670	126	150	848	1,180
Fagus grandifolia	60-90cm	320	0	402	41	126	80	848	121
Juglans nigra	60-90cm	320	360	402	550	126	130	848	1,040
Ostrya virginiana	60-90cm								
Populus tremuloides	60-90cm	320	360	402	200	126	175	848	735
Prunus serotina	60-90cm	320	360	402	90	126	160	848	610
Quercus macrocarpa	60-90cm	320	360	402	700	126	150	848	1,210
Quercus rubra	60-90cm	320	360	402	500	126	172	848	1,032
Tilia americana	60-90cm	320	330	402	450	126	150	848	930
Ulmus americana	60-90cm	320	360	402	500	126	150	848	1,010
Total		**4,160**	**4,150**	**5,226**	**5,352**	**1,638**	**2,372**	**11,024**	**11,874**
		2015 Planting		**2016 Planting**		**2017 Planting**		**Project Total**	
Coniferous Seedlings	**Size**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**	**Designed Qty**	**Planted Qty**
Abies balsamea	24-40cm	640	950	804		252	940	1,696	1,890
Larix laricina	24-40cm	640	950	804	500	252	300	1,696	1,750
Picea glauca	24-40cm	640	800	804	1,700	252	425	1,696	2,925
Pinus strobus	24-40cm	801	1,000	1,004	1,700	315	400	2,120	3,100
Pinus resinosa	24-40cm	801	1,000	1,004		315	100	2,120	1,100
Thuja occidentalis	24-40cm	640	780	804	600	252	375	1,696	1,755
Tsuga canadensis	24-40cm	801	1,000	1,004		315	500	2,120	1,500
Total		**4,963**	**6,480**	**6,228**	**4,500**	**1,953**	**3,040**	**13,144**	**14,020**
SUMMARY									
		2015 Planting		**2016 Planting**		**2017 Planting**		**Project Total**	
TOTAL		**13,283**	**14,045**	**16,680**	**14,097**	**5,229**	**7,762**	**35,192**	**35,904**

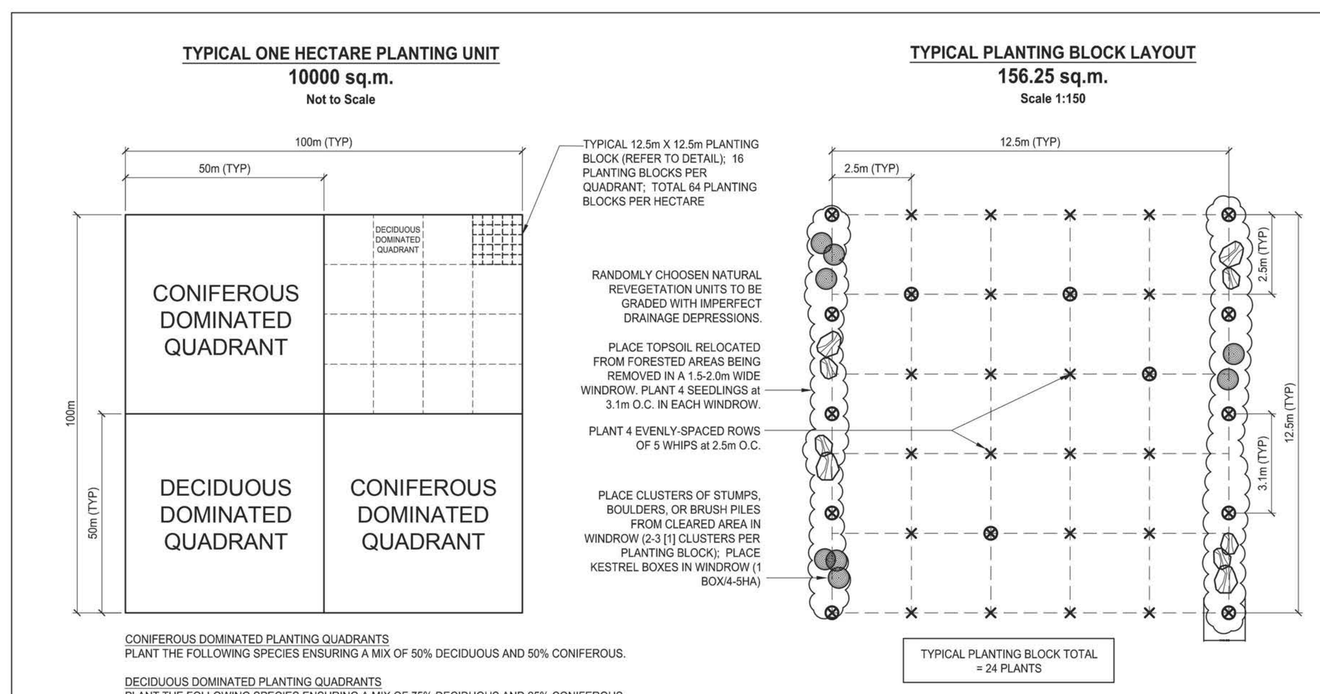
NOTES:

1. LOCATION OF HIBERNACULA (2) TO BE DETERMINED ON SITE.
2. LOGS, STUMPS, ROCKS, ETC. TO BE COLLECTED FROM WOODLOTS ON WALKER PROPERTY OR ADJACENT PROPERTIES WITH PERMISSION FROM THE LANDOWNER AND AT THE DIRECTION OF THE LANDSCAPE ARCHITECT. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY MATERIAL COLLECTED FROM OUTSIDE THE DESIGNATED AREAS. SEE DRAWING FOR LOCATION OF WALKER-OWNED LANDS.









CONIFEROUS DOMINATED PLANTING QUADRANTS
PLANT THE FOLLOWING SPECIES ENSURING A MIX OF 50% DECIDUOUS AND 50% CONIFEROUS.

DECIDUOUS DOMINATED PLANTING QUADRANTS
PLANT THE FOLLOWING SPECIES ENSURING A MIX OF 75% DECIDUOUS AND 25% CONIFEROUS.

GROUNDCOVER SEED MIX

50% - Annual Rye
27% - Oats
23% - Winter Rye

SEED ALL DISTURBED AREAS IN REFORESTATION UNITS AT AN APPLICATION RATE OF 35KG/HA

NATIVE TREE SEEDS

Sugar Maple
Red Maple
Red Oak
White Pine

TREE SEEDS TO BE SEEDED IN SELECTED NATURAL REGENERATION AREAS WHERE MICROTOPOGRAPHIC CONTOURING HAS BEEN CONDUCTED (APPROX. 12 HA).

SEEDS TO BE PURCHASED FROM, AND CERTIFIED BY, THE ONTARIO TREE SEED FACILITY, ANGUS, ON, FOR SEED ZONE 34. SEED AT AN APPLICATION RATE OF 7,400 VIABLE SEEDS/HA.

NOTES

GENERAL REFORESTATION NOTES:

1. ALL PROPOSED NEW PLANTINGS WILL CONSIST OF NATIVE TREES IDENTIFIED IN THE PLANT LIST, WHICH PROVIDE SIMILAR SPECIES COMPOSITION TO ADJACENT AND NEARBY NATURAL AREAS.
2. RANDOMLY CHOSEN NATURAL REVEGETATION UNITS TO BE GRADED WITH IMPERFECT DRAINAGE DEPRESSIONS.
3. ALL EXISTING RESIDENTIAL BUILDINGS LOCATED WITHIN THE PROPOSED REFORESTATION AREAS WILL BE REMOVED PRIOR TO PLANTING.
4. ALL LANDS IDENTIFIED FOR REFORESTATION ARE OWNED BY WALKER AGGREGATES INC.

SEEDING

1. SEEDING WILL BE REQUIRED OVER THE ENTIRE 53.2 HECTARES OF REFORESTED LANDS REGARDLESS IF THE LAND IS PLANTED WITH TREES OR LEFT FOR NATURAL REGENERATION. SEED MIXES HAVE BEEN CHOSEN FOR THEIR ABILITY TO STABILIZE THE SOILS, PROVIDE NUTRIENTS TO THE NEW PLANTINGS, PROVIDE HABITAT FOR WILDLIFE AND CONTROL THE GROWTH OF INVASIVE PLANT SPECIES.
2. WHERE A FORMER AGRICULTURAL FIELD (PASTURE OR CROP) IS PROPOSED FOR REFORESTATION, PLOUGH A SINGLE FURROW AND SEED EXPOSED SOIL AT TIME OF PLANTING ONLY. MOW EXISTING VEGETATION PRIOR TO PLOUGHING IF REQUIRED AT TIME OF PLANTING.
3. WHERE A PARTIALLY-NATURALIZED AREA IS PROPOSED FOR REFORESTATION, MOW AS REQUIRED TO FACILITATE HAND-PLANTING. SEED DISTURBED OR EXPOSED SOIL.
4. SOW DURING CALM WEATHER (WINDS LESS THAN 10KM/H) ON BARE SOIL (THE SEED AREA HAS BEEN PLOWED).
5. SEED MIX APPLICATION TO BE DONE IN A CONSISTENT AND THOROUGH FASHION COVERING ENTIRE SITE.
6. RESEEDING MAY BE REQUIRED IN AREAS WHERE GERMINATION HAS FAILED OR AREAS HAVE BEEN ERODED.

PLANTING

1. MOW ALL REFORESTATION BLOCKS PRIOR TO PLANTING.
2. MACHINE OR HAND PLANT TREES IN A SINGLE FURROW OF SOIL TURNED OVER BY PLOUGH ON CENTER OF PLANTING ROW AND SIMULTANEOUSLY APPLY SIMAZINE IN A 1.0M BAND STRADDLING THE CENTER OF ALL PLANTING ROWS.
3. COLLECT TOPSOIL FROM CLEARED FOREST AREA. MIX WOOD CHIPS FROM CLEARED TREES AND BRUSH INTO SOIL. IN EVERY FIFTH [TENTH] PLANTING ROW, DEPOSIT A 1.5-2.0M BAND OF TOPSOIL ON THE SURFACE PRIOR TO PLANTING AT A DEPTH OF 6-10" (150-200MM). HAND PLANT TREE SEEDLINGS AT +/-3.1M ON CENTER IN RAISED TOPSOIL WINDROWS.
4. COLLECT TREE STUMPS, BOULDERS, AND BRUSH DURING FOREST CLEARING. PLACE IN CLUSTERS THROUGHOUT THE WINDROWS. PROVIDE 2-3 [1] CLUSTERS PER PLANTING BLOCK.
5. INSTALL TREE GUARDS ON ALL SEEDLINGS AND SAPLINGS.
6. FOR THE FOLLOWING THREE YEARS, CHECK ALL TREE GUARDS AND REPLACE AS REQUIRED. PROVIDE 1 APPLICATION OF SIMAZINE EACH SPRING OR FALL. MOW AREA BETWEEN ROWS ONCE IN SEPTEMBER.
7. ALL PLANT MATERIALS ARE TO BE THOROUGHLY WATERED IMMEDIATELY AFTER INSTALLATION. WATER ONCE PER WEEK FOR THE FIRST FOUR WEEKS AND THEN SUFFICIENTLY THEREAFTER TO MAINTAIN OPTIMUM GROWING CONDITIONS.
8. PLANTS ARE NOT TO BE INSTALLED OR TRANSPLANTED DURING EXTREME HEAT, DROUGHT OR OTHER UNDESIRABLE CONDITIONS.
9. FIELD-FITTING SHALL BE USED TO MAXIMIZE THE BENEFIT OF PLANTINGS AROUND THE OUTER LIMITS.

TREE SEEDING

UPLAND MIXTURE
- *Acer saccharum*, Sugar Maple
- *Acer rubrum*, Red Maple
- *Fagus* grandifolia, American Beech
- *Pinus strobus*, White Pine
- *Quercus rubra*, Red Oak

LOWLAND MIXTURE
- *Acer rubrum, Red Maple*
- *Larix laricina, Eastern Larch*
- *Quercus macrocarpa, Bur Oak*
- *Thuja occidentalis - Eastern White Cedar*

NOTE: APPLY SEEDING AT AN APPLICATION RATE OF 7,400 VIABLE SEEDS PER HECTARE.

PLANTING LIST

Botanical Name	Common Name	Size	Quantity Desired
Deciduous Trees			
Acer rubrum	Red Maple	25mm cal. BB 60-90cm CG	2000 1000
Acer saccharum	Sugar Maple	25mm cal. BB 60-90cm CG	2000 1000
Betula alleghenensis	Yellow Birch	60-90cm CG	1000
Betula papyrifera	Paper Birch	25mm cal. BB 60-90cm CG	2000 1000
Carya cordiformis	Bitternut Hickory	60-90cm CG	1000
Fagus grandifolia	American Beech	60-90cm CG	1000
Juglans nigra	Black Walnut	60-90cm CG	1000
Populus tremuloides	Trembling Aspen	25mm cal. BB 60-90cm CG	2000 1000
Prunus serotina	Black Cherry	25mm cal. BB 60-90cm CG	2000 1000
Quercus macrocarpa	Bur Oak	60-90cm CG	1000
Quercus rubra	Red Oak	25mm cal. BB 60-90cm CG	2000 1000
Tilia americana	Basswood	25mm cal. BB 60-90cm CG	1000 1000
Ulmus americana	White Elm	60-90cm CG	1000
Coniferous Trees			
Abies balsamea	Balsam Fir	25-40cm BR	2000
Larix laricina	Eastern Larch	25-40cm BR	2000
Picea glauca	White Spruce	25-40cm BR	2000
Pinus resinosa	Red Pine	25-40cm BR	2500
Pinus strobus	White Pine	25-40cm BR	2500
Thuja occidentalis	Eastern White Cedar	25-40cm BR	2000
Tsuga canadensis	Eastern Hemlock	25-40cm BR	2500

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Notes

Legend

- PROPOSED DUNTROON QUARRY EXPANSION LICENSE AREA
- LIMIT OF EXTRACTION - WALKER
- PHASE BOUNDARY
- PHASE 4 - LOWER BENCH
- ROAD
- WALKER OWNED LANDS
- TYPICAL PLANTING BLOCK / ZONE / REFORESTATION UNIT / AREA (HECTARES)
- 2015 YEAR OF PLANTING TREATMENT

PLANTING TREATMENT
- ACTIVE REGENERATION
- NATURAL REGENERATION - TREE SEEDING LOWLAND MIX
- NATURAL REGENERATION - TREE SEEDING UPLAND MIX

TYPICAL ONE HECTARE PLANTING UNIT
- D DECIDUOUS DOMINATED PLANTING
- C CONIFEROUS DOMINATED PLANTING
- M MIXED DECIDUOUS AND CONIFEROUS DOMINANTED PLANTING

SEEDING
- MICROTOPOGRAPHIC CONTOURING

Revision	By	Appd.	YY.MM.DD
1. ISSUED FOR CONSTRUCTION	BM	DL	15.09.23

File Name: 62602732_L-1.dwg	Dwn.	Chkd.	Dsgn.	YY.MM.DD
	BM	DL	DL	15.09.18

Permit-Seal

Client/Project
WALKER AGGREGATES INC.
DUNTROON QUARRY EXPANSION

ADAPTIVE MANAGEMENT PLAN

Duntroon ON Canada

Title

REFORESTATION PLANTING PLAN

Project No. 62602732
Scale 1:3000 (0 30 90 150m)
Drawing No. L-1
Sheet 1 of 1
Revision 1