



ANNUAL ENVIRONMENTAL MANAGEMENT REVIEW


FOR THE REPORTING YEAR:

AUGUST 2017-2018

ARDMORE PARK QUARRY

5152 OALLEN FORD ROAD, BUNGONIA

Title Block

Name of operation	Ardmore Park Quarry
Name of operator	Multiquip Quarries
Project approval	PA 07_0155
Water license	30111
Name of holder of water license	CEAL Limited
Annual review start date	21 st August 2017
Annual review end date	20 th August 2018
I certify that this audit report is a true and accurate record of the compliance status of Ardmore Park Quarry for the period 2017-2018 and that I am authorised to make this statement on behalf of Multiquip Quarries.	
Name of authorised reporting officer	Alexander Cox
Title of authorised reporting officer	Environmental Officer
Signature of authorised reporting officer	
Date	19/10/2018

Document Control

Written by	Alexander Cox (Environmental Officer)
Authorised by	Jason Mikosic (General Manager)

Revision History:

Version	Date	Comments
Draft 1.0	15/10/2018	First draft
Draft 1.1	16/10/2018	Formatting changes, addition of sections relating to community engagement, flora and fauna and traffic management. Addition of monitoring information about bore depths during reporting period
Draft 1.2	17/10/2018	Spelling and grammatical corrections. Formatting changes. Inclusion of additional pictures and references.
Final Version	19/10/2018	Distribution: DP&E, Pejar Land Council, Multiquip Website.

Company Details

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1 Statement of Compliance

Were all the conditions of the relevant approval complied with?	
PA 07_0155	NO

Non-Compliances

The non-compliances during the period of this review are listed in table 1. A key to the non-compliance table is shown in table 2.

Table 1. Non-Compliances 2017 Reporting Period

Approval	Condition	Condition Description	Status	Comment	AEMR reference
PA 07_0155	3	Requirement to notify DPE of environmental incident.	Administrative	Multiquip failed to notify the DPE about an incident which occurred in 2017 when clean water overflowed from a farm dam onto a neighbouring property.	Section 11 Page 30
PA 07_0155	2	Requirement that project is undertaken with reference to the EA, and statement of commitments, in reference to location of hard rock plant.	Low	Multiquip received a penalty notice from the Department of Planning. Relocation of plant to occur prior to resumption of rock crushing at Ardmore Park.	Section 11 Page 30
PA 07_0155	4 (a) and (b)	Requirement to abide by an implement measures described in the project approval and associated management documents such as approved management plans.	Low	Multiquip partially implemented the Aboriginal Heritage Management Plan, requiring a subsequent investigation.	Section 5.7 Page 23

Non-Compliances Key

Table 2. Key to Non-Compliance Table

Risk level	Colour code	Description
High	Red	Potential for significant environmental consequences regardless of likelihood.
Medium	Orange	Potential for serious environmental consequences but unlikely OR potential for moderate environmental consequences with moderate likelihood.
Low	Yellow	Potential for moderate environmental consequences but is unlikely to occur OR potential for low environmental consequences but is likely.
Administrative	Blue	No potential for environmental harm.

2 Introduction

2.1 Scope

This annual review was prepared to satisfy the requirements of Article 5, Schedule 5 of PA 07_0155 which requires Multiquip Quarries to prepare an environmental review on an annual basis (The Department of Planning and Environment, NSW, 2009). This review was prepared according to the *Annual Review Guideline* published by the Department of Planning (The Department of Planning and Environment, NSW, 2015).

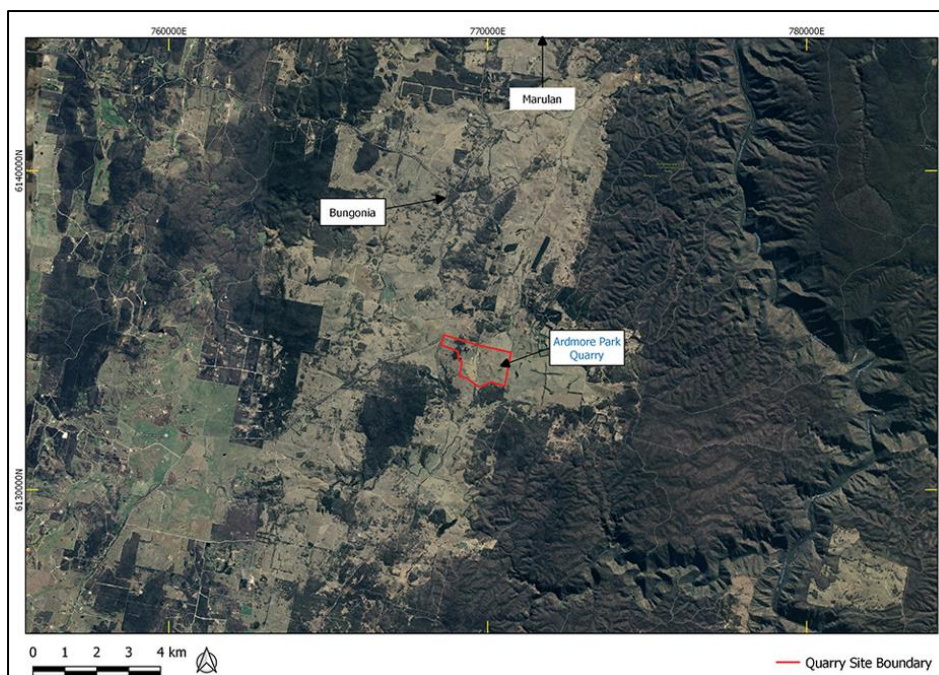
The anniversary date for the Annual Environmental Review is 21st August, and the period covered by this Review is from the 21st August 2017 to the 20st August 2018.

2.2 Background

Ardmore Park Quarry was approved in 2009 by the NSW Minister for Planning. It holds development approval to extract up to 400,000 tonnes of washed sand and hard rock material annually. The quarry is located at 5152 Oallen Ford Road Bungonia, approximately 17km south of Marulan.

Figure 1 shows the location of Ardmore Park in the context of the local geography, and the towns of Marulan and Bungonia. Quarried products are transported via truck, along the primary haulage route following Oallen Ford and Jerrara Roads until the Hume Highway (M31) at Marulan South interchange.

Figure 1 Map of Ardmore Park in Local Context



2.3 Key Contacts

Table 3. Quarry Management Contact Details

Name	Role	Mobile	Email
Stephen Wall	Quarry Manager	0418 255 535	Stephen.w@mqqquarry.com.au
Alexander Cox	Environmental Officer	0429 378 945	Alexander.c@multiquip.com.au

3 Approvals and Licenses

Ardmore Park Quarry operates under a series of licenses and approvals, which are summarised in table 4.

Table 4. Existing Licenses

Development Approval	PA 07_0155
Environmental Protection License	13213
Water Access Licence	30111 – 110 units
	25390 – 9 units, held by Multiquip Transport Pty Ltd
	WAL number yet to be issued – 100 units
Wicket Soil Extraction	MOD/0109/1415

The development approval has been modified twice, in 2010 (modification 1) and 2013 (modification 2). The changes in both modifications are summarised below:

1. Modification 1 change to entrance way of the quarry.
2. Modification 2 approval to sell limited quantities (20,000 T/pa) of quarry products to local customers on roads other than the primary haulage route.

The quarry is managed according to the procedures and policies contained within several management plans which have been prepared in consultation with multiple regulatory agencies and approved by the Department of Planning and Environment. These include:

- Traffic Management Plan.
- Aboriginal Heritage Management Plan.
- Water Management Plan
- Sediment and Erosion Control Management Plan.
- Landscape Management Plan.
- Noise Management Plan.
- Air Quality Management Plan.
- Pollution Incident and Response Management Plan.

These plans are periodically updated throughout the life of the project and are publicly available at the Multiquip website (www.mqqquarry.com/media/).

4 Summary of Operations

4.1 Quarry Development

A number of key development milestones within the quarry were accomplished within the reporting period. These include:

- Installation and commissioning of the sand processing plant.
- Construction of the sand processing pad.
- Construction of haulage road between sand processing pad and the extraction area.
- Installation of the weighbridge.

4.2 Road Upgrade Works

A significant amount of work was undertaken for the required road upgrades on both Jerrara and Oallen Ford Road. Key milestones include:

- Widening of both sides of Jerrara Road for 17km.
- Widening both sides of Oallen Ford Road for 4km.
- Excavation of 42km of roadside drains.
- Widening six major water crossings.
- Installation of \$600,000 of guard rail.
- Installation of safety signage.
- Repainting of centre lines and fog lines along both Oallen Ford and Jerrara Road.

At the time of writing of this review, all stages 1 and 3 of the roadworks have been completed, with stage 2 substantially complete. Outstanding works include defect rectification works on approximately 1,500m² of pavement and 450m of full-road width reconstruction. These works are required prior to Goulburn Mulwaree Council approving the final stage of roadworks. At present Multiquip is entitled to dispatch up to 31 laden loads each day. Once the above works are completed, Multiquip will be able to dispatch the maximum allowable limit of 44 trucks per day. It is anticipated that these works will be completed during the next reporting period.

4.3 Production

Extraction activities for the reporting period are summarised in table 5.

Table 5. Summary of Extraction

Material	Tonnes Processed	Tonnes Sold
Sand	107,500	86,000
Basalt	10,000	0

Approximately 51,200 m³ of overburden material has been removed so far to access the currently extracted sand and basalt resources. This has been used for the construction of an acoustic bund wall along the western boundary of the extraction area and stacked in an area to the south west of the extraction area.

4.4 Modification 3

In 2018, Multiquip applied for a modification to the existing development approval. This is the third modification to the approval, should it be granted in whole or in part by the Department of Planning. The proposed terms of the modification include:

- Expanding the basalt extraction area by a small amount towards the north-east.
- An increase in allowable quarry production and product dispatch from 400,000 tonnes per annum to 580,000 T/pa.
- An extension of the life of the quarry.
- An extension to the allowable operating hours of product dispatch.
- An increase to the daily allowable truck dispatches, while retaining the same monthly cap.

Multiquip published an Environmental Assessment which assessed a broad range of environmental factors including noise, heritage, traffic amenity and safety as well as the social impact on the community of the above changes (RW Corkery and Co, 2018). This document was then open to review by the public and multiple regulatory agencies such as the Department of Planning, Roads and Maritime Service and the Environmental Protection Authority. Over the exhibition period a total of 11 submissions were received from government agencies and other organisations as well as 44 public submissions.

At time of this report, Multiquip has prepared a response to submission document which will be submitted to the Department of Planning. This report will be considered by the Independent Planning Commission, which will make a deliberation on the modification. Multiquip anticipates that this process will be completed during the next reporting period. Any changes to the development approval will be discussed in next year's Annual Environmental Management Review.

5 Environmental Performance

5.1 Monitoring Point Locations

A range of monitoring points both within and surrounding the extraction area are used to assess environmental performance. In total there are four air quality monitoring points, ten monitoring bores and two springs. The locations of each monitoring point are shown in figure 2. A key to figure 2 is included in table 6.

Figure 2 Location of Environmental Monitoring Points

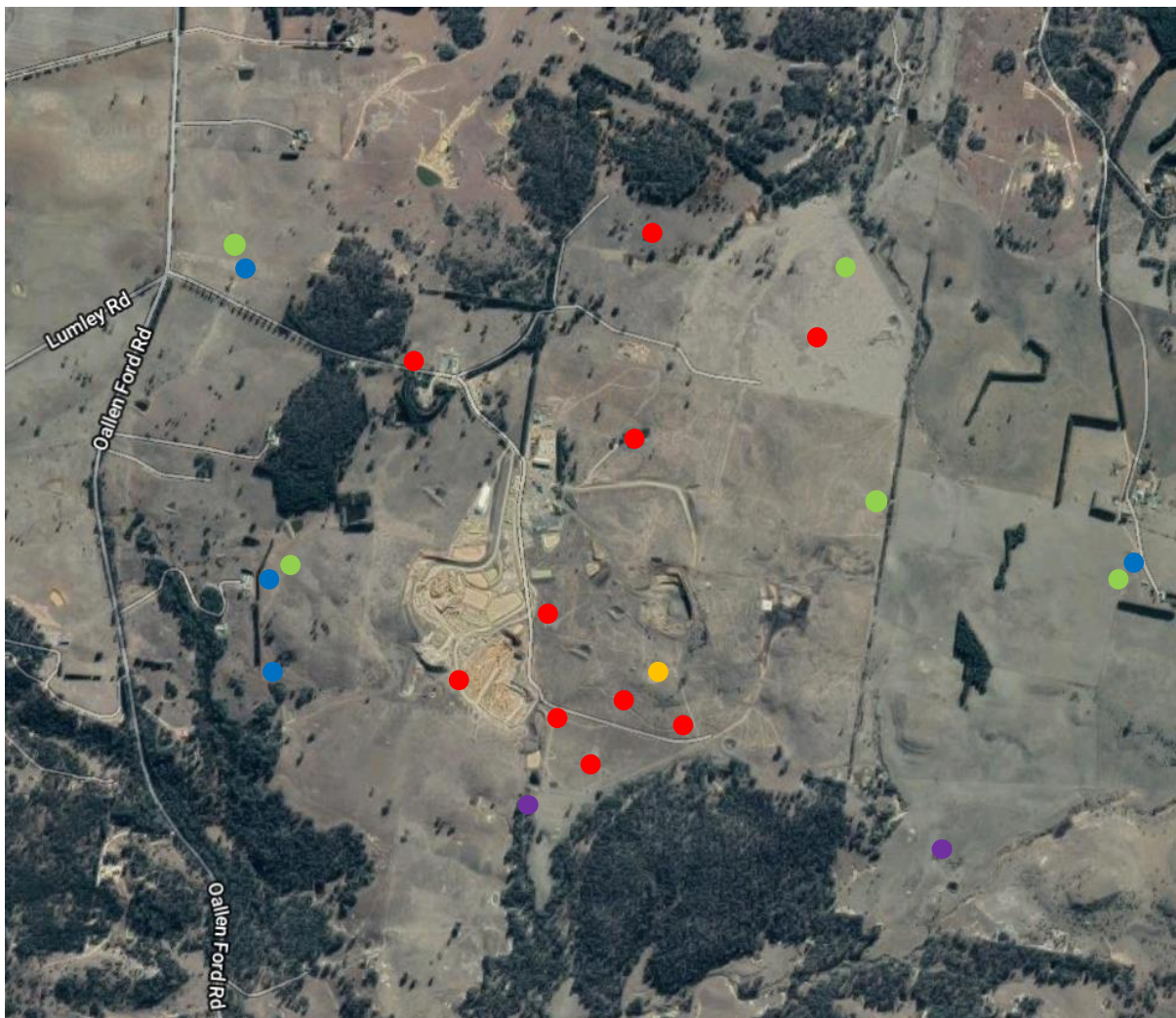


Table 6 Environmental Monitoring Point Key

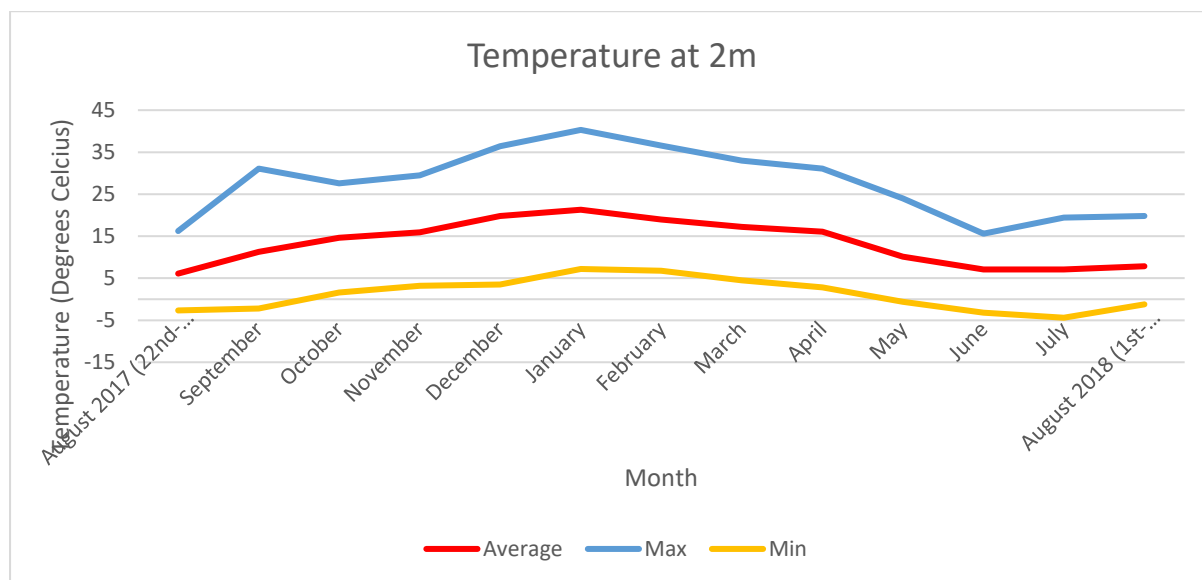
Colour	Type
Red	Monitoring Bore
Purple	Flowing Spring System
Yellow	Meteorological Station
Blue	Dust Deposition
Green	Noise Assessment Location, noise assessments were also undertaken on Oallen Ford and Jerrara Road.

5.2 Meteorological

Temperature

The maximum, minimum and average temperature for each month is presented in figure 3. Average temperatures varied from 20°C in summer to 8°C in winter.

Figure 3 Temperature Ardmore Park



Rainfall

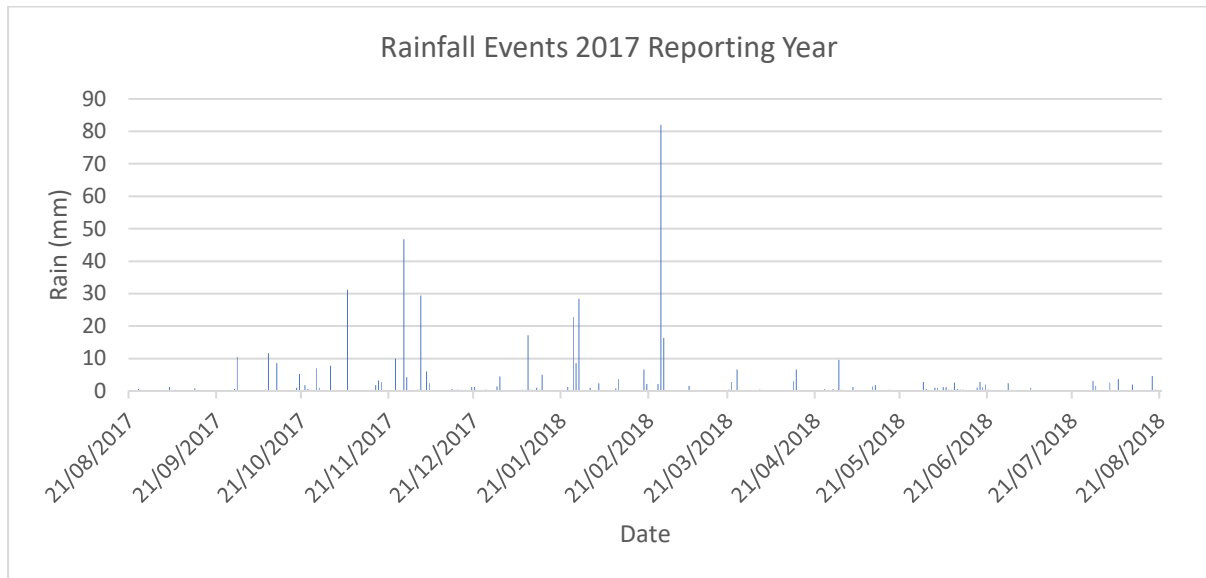
Ardmore Park received 618mm of rain over the reporting year. This compares to an average annual rainfall of 518mm in Goulburn. The monthly rainfall totals are shown in table 7.

Table 7 Monthly Rain Totals

Month	Total Rainfall (mm)
August 2017 (22 nd -31 st)	1.2
September	27.68
October	65.09
November	74.46
December	71.15
January	86.11
February	188.09
March	12.45
April	30.69
May	9.87
June	31.12
July	7.75
August 2018 (1 st -21 st)	12.4

A depiction of the individual rain totals for each day has been shown in figure 4. This effectively summarises the distribution of rain events and their relative magnitude throughout the reporting year. Rainfall was more consistent during spring and summer, with February being the wettest month of the year. The wettest day of the year received 82mm and occurred in February, while a total of 22 days saw more than 5mm.

Figure 4. Weather Station Rain Events



Wind

The Ardmore Park weather station is equipped with an anemometer and is capable of accurately measuring wind speed and direction throughout the year. This information is used by quarry management to improve the environmental performance of the site.

A directional wind rose is shown in figure 5. Winds on site predominantly blow are westerly, with the strongest winds, westerlies and north-westerlies.

Figure 5. Directional Wind Rose

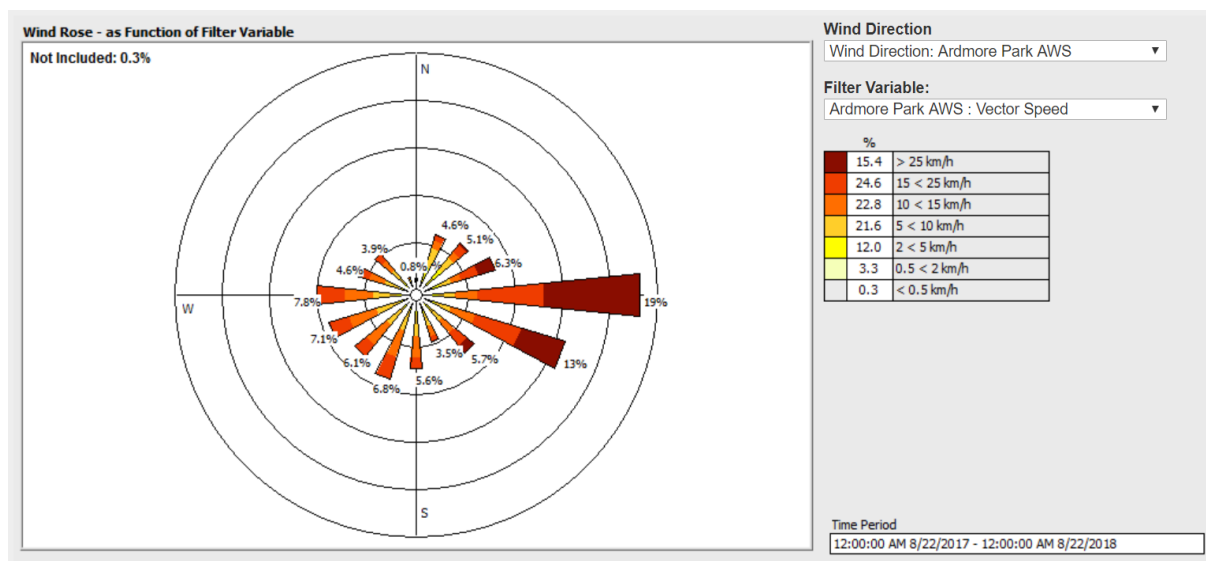


Table 8 summarises the average wind characteristics for each month in the reporting year as well as the maximum wind speed recorded in each month.

Table 8 Wind Direction and Speed by Month

Month	Average Direction	Average Speed (km/hr)	Maximum Speed (km/hr)
August 2017 (22 nd -31 st)	123	10.4	38.8
September	114	22.7	62.6
October	167	13.5	45.2
November	210	12.9	48.6
December	178	14.3	50.1
January (2018)	192	12.4	68.1
February	201	12.9	54
March	204	13.3	56
April	167	13	62.7
May	124	14.2	58.5
June	122	14	73.7
July	110	18.5	83.9
August (1 st -20 th)	108	23.5	77.5

Average wind speeds were reasonably consistent throughout the year, with the highest wind speeds occurring throughout September and August. Maximum wind speeds of up to 84km/hr were recorded in July 2018.

5.3 Air Quality

Minimising dust emissions from quarrying activities is a key environmental priority for the site. Methods for controlling dust generation and emissions include:

- The use of a water cart to wet haul roads and pads during warm and windy conditions.
- Regularly grading internal haul roads to minimise the generation of dust.
- Coating internal roads with road-base to limit dust generation.
- Limiting vehicles to defined access routes and strictly enforcing speed limits.
- Limiting the amount of exposed area and restoring groundcover to worked areas as appropriate.
- Organising potentially dust generating activities such as stripping topsoil to occur during favourable meteorological conditions.

Ardmore Park operates a series of 4 deposited dust gauges to assess off site air quality impacts. These are swapped out and taken to an independent, NATA approved laboratory for testing every month as per the methods outlined in the Air Quality Monitoring Program (RW Corkery and Co , 2010).

The average insoluble solids of each monitor for the duration of the reporting year are summarised in table 9.

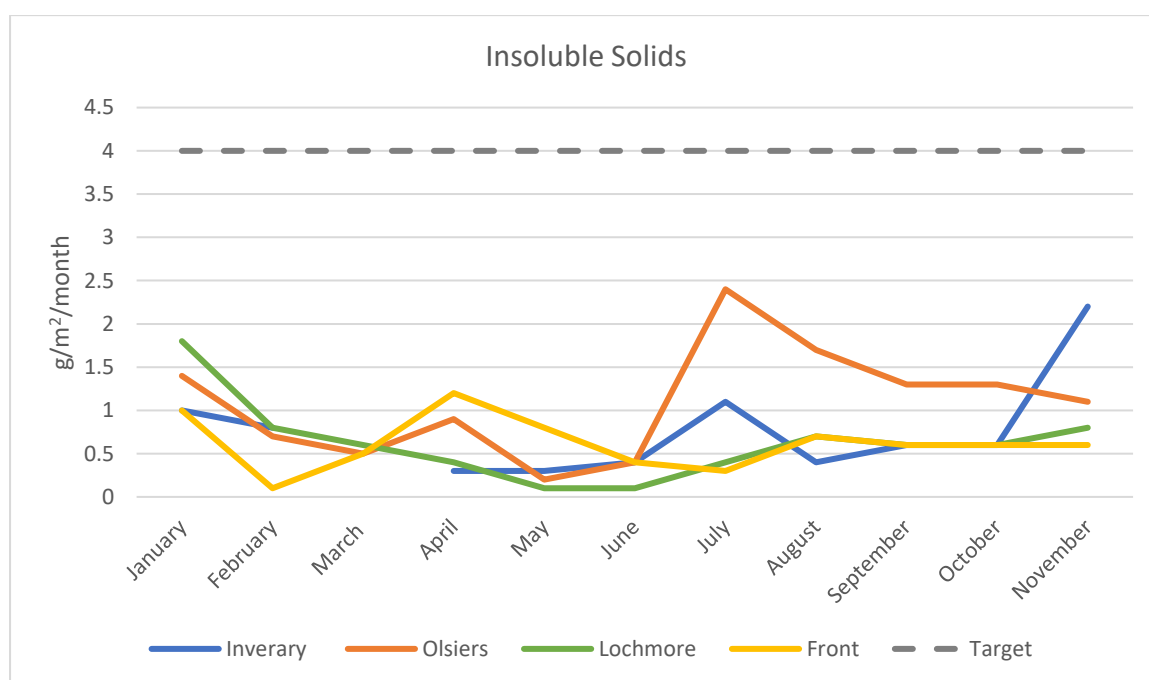
Table 9. Annual Average Insoluble Solids

Monitor	1	2	3	4
Location	Inveraray Park	South-western corner	Western boundary	Front entrance
Insoluble solids	0.77	1.08	0.6	0.6

All deposited dust gauges had an average deposition of less than 1.08g/m² per month. These results clearly demonstrate compliance with the long-term monitoring criteria average of 4g/m² per month.

The results for each individual month are shown in figure 6.

Figure 6. Soluble Solids Dust Deposition



There were no instances of an exceedance of the monitoring criteria in any dust deposition gauge in any month of the reporting year.

The March 2018 sample from “Inveraray Park” could not be evaluated as the bottle was delivered broken to the laboratory. All other samples collected for that month demonstrate clear compliance with the project criteria. As no other sample collected from Inveraray Park demonstrated non-compliance, it is inferred that the quarry remained consistently in compliance with respect to dust emissions for the entire reporting year. This represents a commendable improvement in environmental performance over the previous reporting year and demonstrates that dust emission control methods in use at Ardmore Park have been effective, notwithstanding the challenging, high wind environment.

5.4 Noise

Two independent noise surveys were conducted during the reporting year. These occurred in April and June.

In April, noise assessments were taken at the boundary of Ardmore Park in line with sensitive receivers to the east and west in addition to sites along Jerrara and Oallen Ford Road, as the road upgrade works were being undertaken at the time. The results of the April survey clearly demonstrated compliance with all noise targets required by both the Project Approval and Environmental Protection License (Benbow Environmental Consultants, April 2018).

In June, a survey identified an apparent exceedance of the target at residence 3 in the project approval. The quarry's noise contribution was estimated at 42 dBA, 7 dBA higher than the LaEq15 criteria of 35 dBA. This reading was likely the consequence of a temperature inversion on the morning of the survey. This conclusion is based on:

- Meteorological observations on the day, data available from Goulburn Airport and Ardmore Park's weather station indicate the strong probability of a temperature inversion in the early morning period when surveys began.
- Repeated noise surveys, both at residence 3 and at several other locations (with the same quarry operations taking place) demonstrated compliance consistently throughout that day and other occasions.

On the above basis the above reading was considered anomalous and was rejected. It was concluded overall that the site was compliant (Benbow Environmental Consultants, June 2018).

During the reporting year, in co-operation with the Environmental Protection Authority, Multiquip commenced a pollution reduction program (PRP) to comprehensively assess the extent of Ardmore Park's noise pollution.

Two full days of attended and unattended noise assessments have been organised for September and December of 2018. The results of the pollution reduction program will be discussed in next years AEMR when the program is finalised. At the time of this report, the September survey has been successfully completed. This survey indicated clear compliance with the noise targets outlined in the Project Approval and Environmental Protection License. Given the quarry is now operating at capacity with respect to quantity of plant in operation, it is anticipated that the December survey will also show compliance.

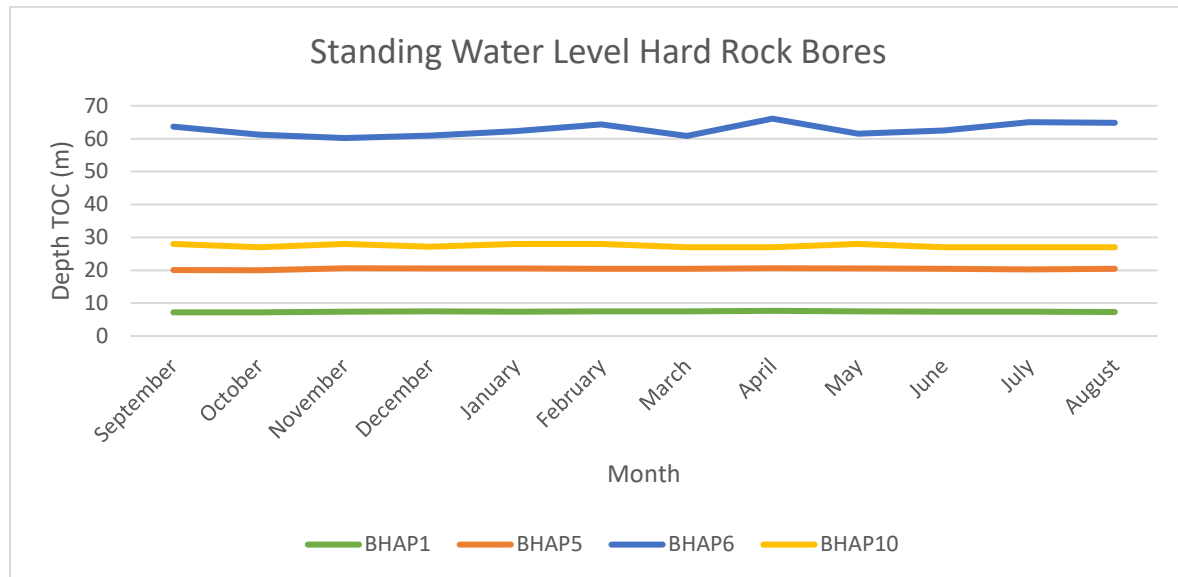
5.5 Groundwater Bores

Ardmore Park has implemented a groundwater monitoring program in 10 separate monitoring bores located strategically throughout and around the quarry site. Each of these bores is "dipped" monthly to assess the standing water level and is sampled either quarterly (in the case of the sand bores) or annually (hard rock). Six bores are located in the southern sand resource, targeting a shallow, perched water table approximately 6m below ground level. The four hardrock bores are distributed to the north of the extraction area and target deeper water bearing layers ranging between 7m and 65m in depth.

Depths Hard Rock Bores

The depth of the standing water level in the hard rock bores is shown in figure 7.

Figure 7 Hard Rock Monitoring Bore Standing Water Levels



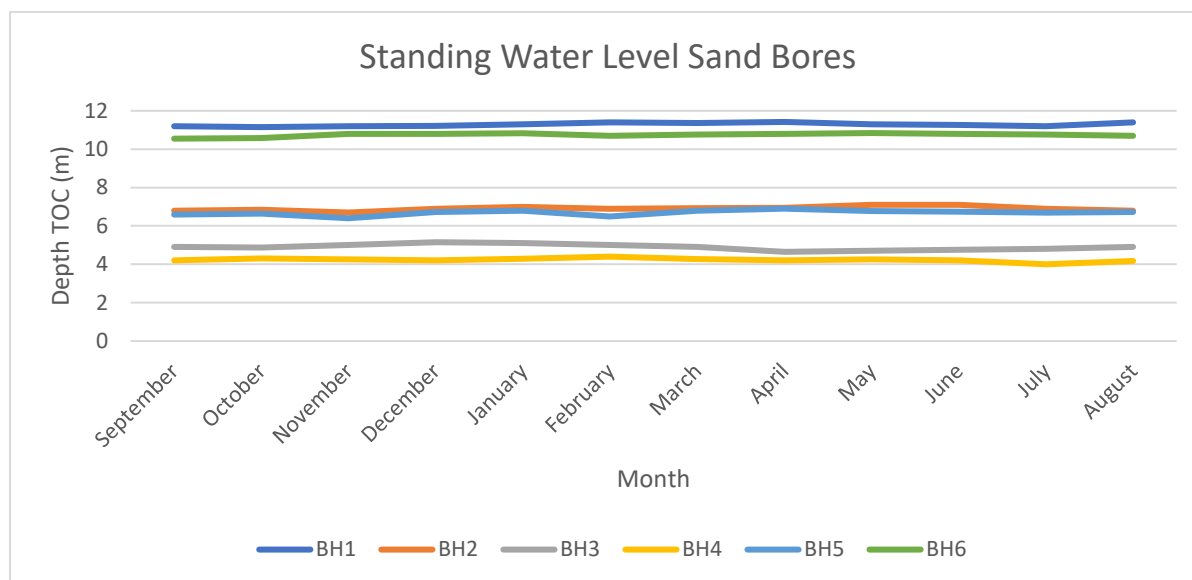
None of the depths recorded in the shallow sand bores have passed the trigger points described in the Water Management Plan (RW Corkery and Co, 2017) of a 15% change in standing water level (SWL) attributable to the project. Water levels can be observed to fluctuate over time but the overall trend in each monitoring bore is considered stable.

Higher fluctuations of the SWL within BHAP6, the production bore, are inferred to be caused by variations in recharge levels following pumping from the fractured rock aquifer. As noted in the original groundwater impact assessment to the quarry, the time taken for the SWL to return to its final level after pumping can take over 24 hours (Larry Cook and Associates, 2008). Depending on the time that the production bore is “dipped” it may therefore still be in the process of recharging. It is anticipated that long term data collection however will yield more reliable trends analysis, although data from this reporting period suggest the SWL remains stable.

Depths Sand Bores

The depth of the standing water level in each sand monitoring bore is shown in figure 8.

Figure 8 Sand Monitoring Bore Standing Water Levels



None of the depths recorded in the shallow sand bores have passed “trigger points” described in the Water Management Plan (RW Corkery and Co, 2017) of a 15% change in standing water level attributable to the project. The data collected in the reporting period indicate no significant change in SWL over time.

Water Quality Sand Bores

Water sampled from the six shallow sand bores is tested quarterly. The average, maximum and minimum test score for each analyte tested are included in the appendix.

No measurements represent exceedances from the performance criteria established in section 8.4.3.4 of the Water Management Plan (RW Corkery and Co, 2017). All sample results indicate that there has been little change in groundwater chemistry over the reporting period.

Water Quality Hard Rock Bores

Water from the four hard rock bores are sampled annually. The results of the independent laboratory tests are summarised in the Appendix.

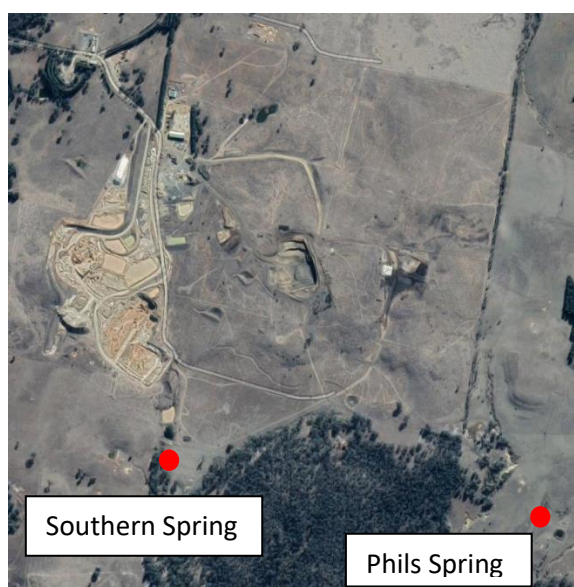
No measurements represent exceedances from the performance criteria established in section 8.4.3.4 of the Water Management Plan (RW Corkery and Co, 2017). All sample results indicate that there has been little change in groundwater chemistry over the reporting period.

5.6 Springs

Three springs form part of the Ardmore Park water monitoring program. These are the Western Spring, the Southern Spring and Phil's Spring (located on a neighbouring property, Inverary Park). The springs are sampled quarterly and the samples assessed for a number of analytes at an independent, NATA approved laboratory. During the reporting year, the western spring was not sampled as it was dry. Multiquip intends to apply for an amendment to EPL 13213 to remove the sampling requirement for the western spring given no samples have been able to be successfully retrieved for the last three consecutive reporting periods. Given this, it has not been a useful diagnostic to assess the site's contribution to local water pollution.

The location of the two springs sampled during the monitoring period are shown in figure 9.

Figure 9 Location of Phils Spring and Southern Spring

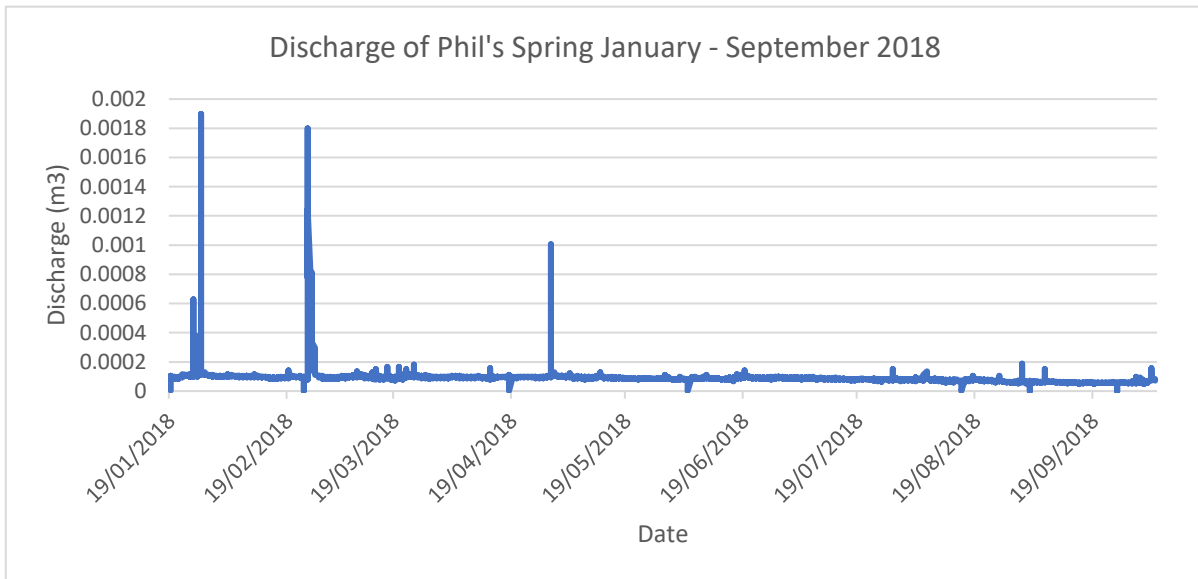


Spring Flow Rate

The flow rate of both Phils Spring and the Southern Spring are measured at least monthly. In January, a v-notch weir was installed in Phils Spring, allowing for detailed, automatic logging of flow over time.

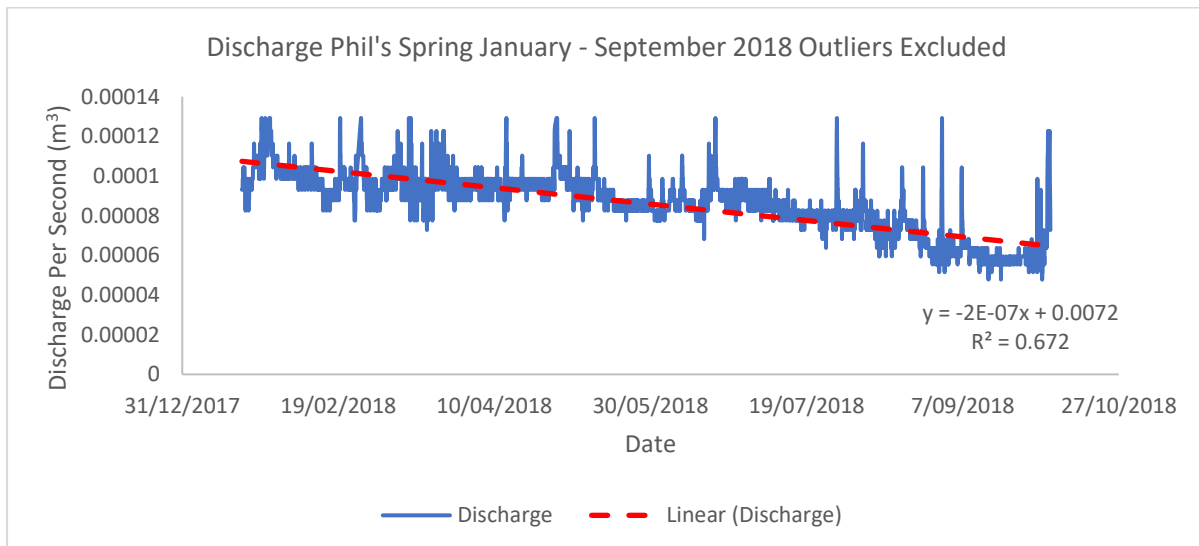
Analysis of the Phil's Springs discharge shows an overall trend of decline, albeit with highly variable discharge during periods of significant rainfall (as much as nine times the standard rate of discharge of 0.1L/sec). The data collected from the v-notch weir over the reporting period is shown in figure 10.

Figure 10 Discharge of Phil's Spring January – September 2018



Statistical analysis of the available flow data, excluding outliers, shows a clearer trend of decline throughout the year. Figure 11 shows this trend, as well as a fitted, linear trend line.

Figure 11 Discharge of Phil's Spring Excluding Outliers



In the reporting year, the flow rate of Phil's Spring past the trigger point of 0.1 L/sec flow rate considered to be a "significant decline" as described in Ardmore Park's Water Management Plan (RW Corkery and Co, 2017). Additional flow data provided to Multiquip by the owners of Inverary Park shows that the observed decline during the reporting period is part of a longer-term consistent decline in flow, from peak flow rates of as high as 28,000 L/day (equivalent to 0.0003m³/sec or 0.3L/sec) in 2004. In response to passing the trigger level as well as claims that use of groundwater at Ardmore Park, had since 2004, contributed in part to the decline in spring flow, Multiquip

commissioned a hydrological assessment as to whether there was any validity to these claims (Larry Cook and Associates, 2018). This report identified four possible reasons for the decline in flow rate of Phil’s Spring:

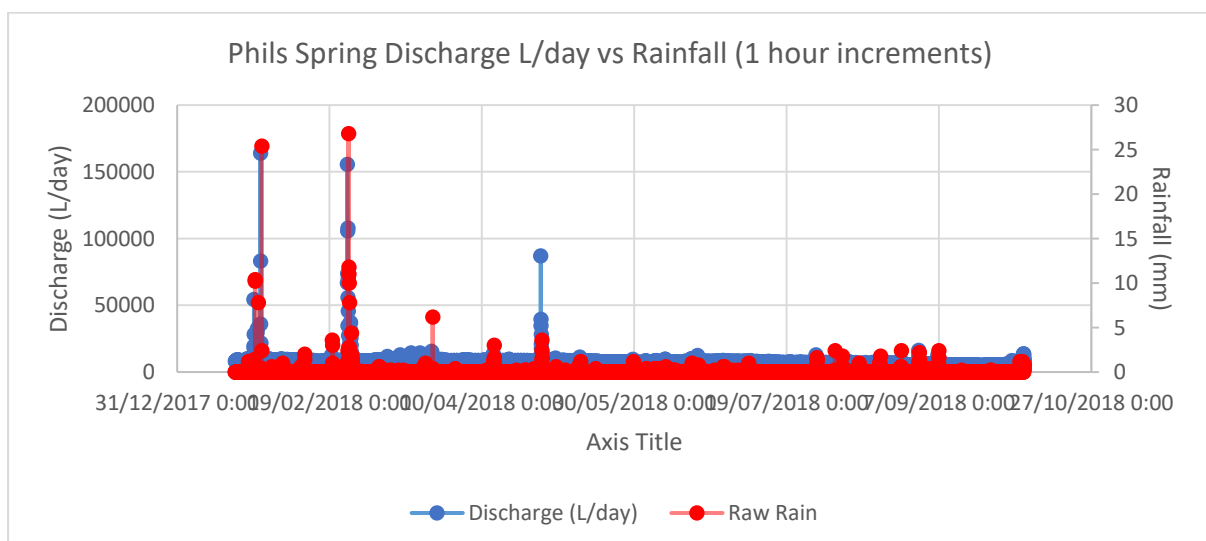
1. Potential interception due to sand extraction.
2. Induced leakage from production bore pumping.
3. Natural decline due to decreased rainfall recharge.
4. Interception due to third party pumping.

Of these potential reasons, only causes one and two can be considered associated with the operation of the Ardmore Park Quarry. The conclusion of this report was that interception due to sand extraction was likely not a cause of the decline in flow rate. This conclusion is not disputed by the owners of Inverary Park (Broadhead, 2018). The report further found that induced leakage from use of the production bore was not likely to be the cause of or contributing to the observed decline of flow in Phil’s spring. To justify this conclusion, the report outlined several reasons as to why groundwater use at Ardmore Park is unlikely causing leakage from Phil’s Spring. These include:

- The existence of a laterally extensive clay layer, identified by test drilling throughout Ardmore Park, which would function as an aquitard, effectively minimising hydrological connectivity between shallow perched water tables and deeper, water bearing layers.
- The fact that monitoring bores on Ardmore Park have not shown any change in piezometer readings, which would support the inference that there is limited hydraulic connection between shallow water bearing layers and the deeper fractured rock aquifer targeted by the production bore.
- The apparent inconsistency between water use at Ardmore Park and the steady rate of decline of flow observed in Phil’s Spring over a period of a decade.

The report further noted that much of NSW is being affected by a period of significant drought and that such conditions can contribute to declines in both spring recharge and flow (Larry Cook and Associates, 2018). Comparison between the Ardmore Park’s hourly rainfall and the flow in Phil’s Spring suggests a high degree of correlation. A plot of these two data sets since the installation of the v-notch weir is shown in figure 12.

Figure 12 Comparison of Hourly Flow Rate of Phil’s Spring to Hourly Rainfall at Ardmore Park



This notwithstanding, Multiquip has received a request by the Department of Planning and Environment to undertake a further study as to the cause of the decline in Phil's Spring. This study will review available monitoring data, the findings of previous investigations and representations from the owners of Inverary Park to assess the likely cause of the decline in flow. The findings of this study will be reported in next years annual review.

The flow rates of the southern spring were estimated monthly via manual measurement. They are summarised in table 10.

Table 10 Flow Rates Southern Spring

Month	Flow Rate (L/sec)
September	0.3
October	0.3
November	0.3
December	0.3
January (2018)	0.3
February	0.3
March	0.3
April	0.3
May	0.3
June	0.3
July	0.3
August	0.3

The broad, braided and highly vegetated path that water discharged from the Southern Spring flows into and through, makes accurate assessments of total flow difficult (refer to figure 13). Field measurements and observations suggest that the Southern Spring has experienced no significant change in flow rate. No change in vegetation has been observed, during any monthly inspection, nor has there been any noticeable changes to channel depth due to erosion nor evidence of pollution discharged from the quarry site.

It is anticipated that during the following reporting year that a second v-notch weir will be installed in the Southern Spring, allowing for further remote data collection and analysis. A site approximately 50m downstream of the spring's origin has been identified as a suitable location to install the weir due to its narrow width, which would minimise the amount of work required to build a weir pool which would effectively channel all flowing water through the weir. The proposed site is shown in figure 13.

Figure 13 Proposed Location of Southern Spring V-notch Weir



Spring Water Quality

Both springs are sampled quarterly, with samples being analysed for a suite of analytes as an independent, NATA approved laboratory. A summary of the results of the spring monitoring laboratory results are included in the Appendix.

None of the samples examined showed exceedances from the performance criteria established in section 8.4.3.4 of the Water Management Plan (RW Corkery and Co, 2017).

5.7 Heritage

Since the commencement of the project, Multiquip has commissioned three surveys of the quarry site, the Bungonia bypass and the roadworks corridor to identify any items of Aboriginal heritage that may be impacted by the quarry extraction or infrastructure construction. These surveys located a total of 10 artefact-bearing sites (Kayandel Archaeological Services, 2010).

An internal review of the Aboriginal Heritage Management Plan in June of 2018 indicated that some artefacts may have been affected by works occurring within Jerrara Road corridor. In response to this, Multiquip commissioned a surveyor to remark out all the sites identified on previous heritage surveys. A qualified archaeologist from OzArk Heritage consultancy then undertook a review of the status of each artefact (OzArk Heritage and Environment Consultants, 2018).

It was discovered:

- 2 artefact sites identified did not occur on land owned by Multiquip or areas disturbed by the road upgrade works.
- 3 artefacts located in the quarry were unable to be relocated due to discrepancies with their recorded location on AHIMS and the coordinates noted in Multiquip's existing heritage documentation, in particular the Ardmore Park Quarry Cultural Heritage Impact Assessment (Cultural Heritage Management Australia, 2008).
- 2 sites on the Bungonia bypass had been partially disturbed, however multiple artefacts were successfully recovered at both sites.
- 2 sites when relocated were found to occur either within the sealed portion of Jerrara Road or the road shoulder. At these sites, no artefacts were able to be identified. It is assumed that these artefacts were therefore disturbed by the road upgrade works. It should be noted that there was an eight-year gap between the identification of these artefacts (2010) and the undertaking of the roadworks (2018). It is likely therefore that these artefacts were subject to significant interference prior to Multiquip's construction activity, given the high level of general disturbance in the road corridor. Consequently, Multiquip's inability to recover these artefacts cannot be considered surprising.

At the time of writing of this report, this matter had been reported to the Office and Environment and Heritage as well as the Department of Planning and Environment. The Department of Planning and Environment subsequently conducted an inspection of the site in late August. The outcomes of any matters raised by the Department will be discussed in next years annual review.

At the conclusion of the reporting year, a program of test pitting was undertaken throughout the southern sand extraction area of the quarry. This program uncovered a series of five small Aboriginal artefacts in the basalt soils downslope of the sand extraction area (OzArk Heritage and Environmental Consultants, 2018). A detailed summary of the pitting methodology and the findings will be provided in next years annual review.

5.8 Bushfire Management

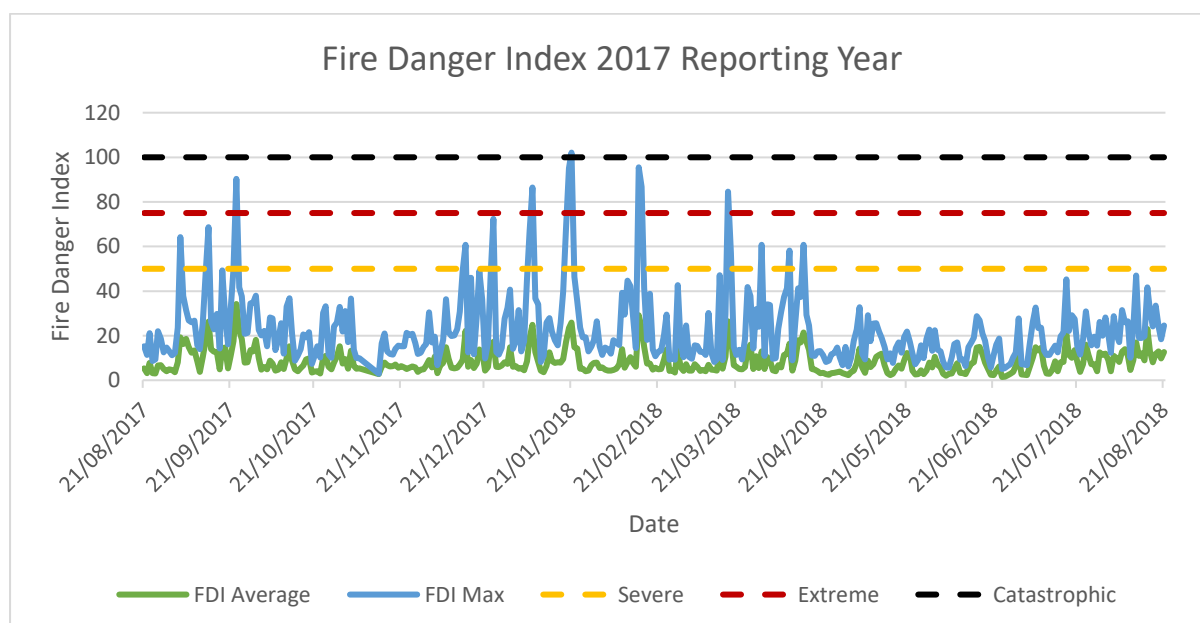
This year, Multiquip developed a Bushfire Management Plan (Multiquip Quarries, 2018). It summarises the planned response Multiquip will adopt should a bushfire occur either on the quarry site itself or in the immediate local area as well as the means by which Multiquip will improve its capacity to minimise the risk of and respond effectively to the threat posed by fires. The Bushfire Management Plan has been posted to the company website and can be accessed at www.mqquarry.com.au/media.

In this reporting year the following fire prevention and control measures have been implemented:

- Staff training with respect to fire extinguisher use and first aid for fire related injuries.
- Inspection and testing of all firefighting equipment on site.
- The purchase of a mulcher attachment to a tractor which has been used to create fire-trails and access paths throughout the property.
- Hazard reduction in the areas of the quarry identified as buffer zones in Goulburn Mulwaree Council bushfire prone land map (Goulburn Mulwaree Council, 2018). This area notably included a 20-40m strip of tall pasture grass adjacent to the eastern boundary, the other side of which consists of Eucalypt woodland.
- Implementing a new, more rigorous “hot works” approval system, which requires additional safeguards to minimise the risk of starting a fire.
- Regular hazard inspections throughout the site.

The Ardmore Park weather station is equipped to calculate the McArthur Forest Fire Danger Index as a function of relative humidity, temperature and windspeed. This information is assessed by site management on days when the fire risk is elevated. The daily maximum and average fire danger index scores for the 2017 reporting year are shown in figure 13.

Figure 14 Daily Fire Danger Index 2017 Reporting Year



A total of seven days reached “severe” conditions, while four days could be categorised as “extreme” and one day, the 21st January, as “catastrophic”. The yearly plot of the danger index clearly delineates between the cooler winter period in which the index rarely averages above twenty, and the Bushfire Danger Period which occurs between October and March (NSW Rural Fire Service, 2018). Notably the fire risk was elevated in throughout late winter and spring period in 2017.

The quarry was not threatened by a fire during the reporting period.

5.9 Native Flora and Fauna

The land upon which the Ardmore Park Quarry is being developed was extensively cleared for stock grazing not long after the European settlement of the Bungonia area in the early 1830s. A few small patches of regrowth native woodland occur in several areas of the quarry, in three knolls located in the east and in the northern corner of the property. Species common in these locations include Silvertop Ash (*Eucalyptus sieberi*), Red Stringybark (*E. macrorhyncha*), Inland Scribbly Gum (*E. rossii*) and Blue-leaved Stringybark (*E. agglomerate*) (Kevin Mills and Associates, 2008). No land clearing will occur in these areas throughout the duration of the project, as these areas are well clear of the extraction area.

Two threatened species of fauna were identified in the original flora and fauna survey conducted as part of the original Environmental Assessment of the Ardmore Park Quarry project (Kevin Mills and Associates, 2008). These species, both birds; the Diamond Firetail (*Stagonopleura guttata*) and the Speckled Warbler (*Pyrrholaemus sagittatus*) were identified in and nearby the forested knolls, especially near the existing residence in the case of the Diamond Firetail. The measures in place to protect these species are described in the Landscape Management Plan and include the regular maintenance fencing and preventing disturbance of forested areas (Kevin Mills and Associates, 2010).

The only endangered ecological community (EEC) scheduled under both The Environmental Protection and Biodiversity Conservation Act (2016) and the NSW Threatened Species Convention Act (1995) is the White Box, Yellow Box and Blakely’s Red Gum Woodland. This ecological community was originally common throughout the western slopes and tablelands of the Great Dividing Range and could be found from Victoria through to Southern Queensland (The Department of Environment and Heritage, 2006). Currently as a result of land clearing and poor management, less than 5% of the original distribution remains intact. The Grassy White Box community is additionally listed in the EPBC Act (2016) and remnant formations are present in the local area. Rehabilitation activities will prioritise the planting of these communities (Kevin Mills and Associates, 2010).

5.10 Invasive Species

An extensive program of weed spraying took place in December of 2017 and January 2018 throughout the Ardmore Park property and throughout the properties which comprise the Bungonia village bypass road. Targeted species included serrated tussock (*Nassella trichotoma*), blackberry (*Rubus fruticosus*) and St Johns Wort (*Hypericum perforatum*).

No invasive fauna management programs were undertaken during the reporting period.

5.11 Transport Management

Product transportation from Ardmore Park is managed by a Traffic Management Plan (TMP) which has been approved by the NSW Department of Planning (Christopher Hallam and Associates, 2010). This TMP describes the commitments made by Multiquip in both the Project Approval for the development (The Department of Planning and Environment, NSW, 2009). Notably the plan includes a driver's code of conduct, which all Multiquip drivers and contractors are required to adhere to. This code of conduct contains several measures intended to maximise the safety of other road users and ensure that local amenity is protected as much as possible. These measures include:

- Limiting the use of engine brakes near residential areas.
- Using the Bungonia bypass road.
- Reiterating the project's hours of operation.
- Communication protocols with local school bus services.

5.12 Waste Management

General waste generated from quarrying or office work related activities is disposed of in a skip bin which is periodically taken to landfill.

Waste oils and chemicals are removed from site by licensed contractors and are disposed of in a safe manner.

A small quantity of waste tyres are stored on site, in stacked formations. These tyres are periodically removed by licensed contractors and disposed of appropriately.

7 Water

Multiquip Quarries controls three water access licenses. Two are directed at the Goulburn Fractured Hardrock Aquifer, and a third allows limited withdrawal from Bungonia Creek.

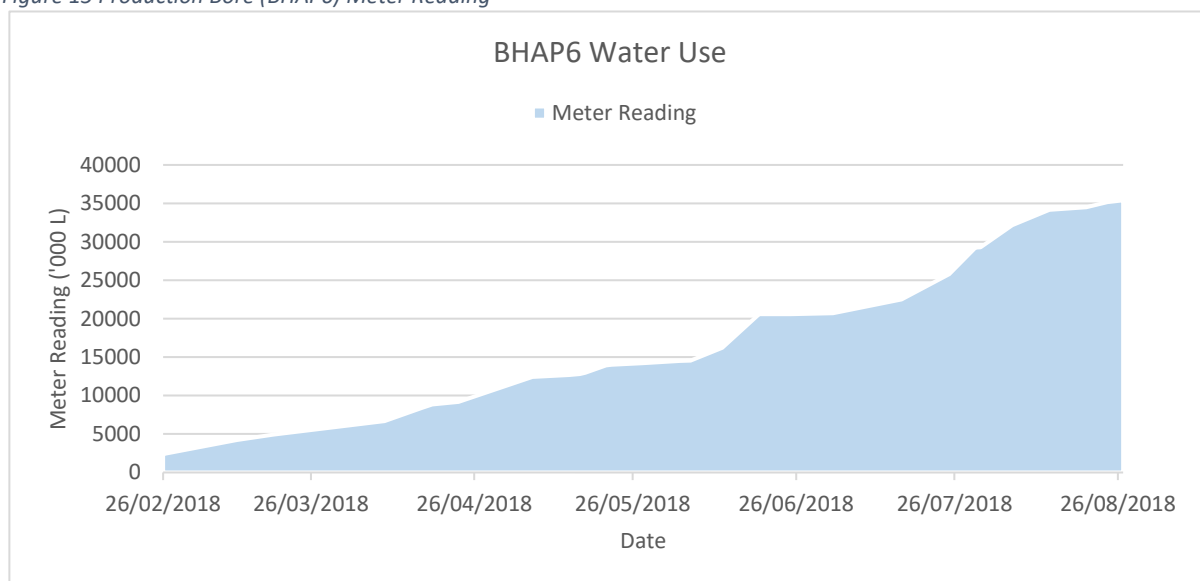
Water use at the quarry totalled 34.5ML for this reporting year. Of this, 20.7ML was withdrawn during the 2017 water year, with the residual 13.9ML coming from the 2018 allocation. Water is withdrawn from a depth of approximately 90m and either directed into a standpipe, to fill the sites

water cart or directed via pipes to “top up” the dams associated with sand washing when they become depleted.

All water used during the reporting year was used under water access license 30111. An additional license (also of the Goulburn fractured rock aquifer) and 25390 (from the Bungonia Creek) were not used.

A plot of the water usage from BHAP6 during this reporting period is displayed in figure 14.

Figure 15 Production Bore (BHAP6) Meter Reading



8 Rehabilitation

No rehabilitation activities were undertaken during the reporting period. The quarry project remains in relative infancy and the area of disturbance remains relatively small. It is anticipated that as the project matures, more rehabilitation activities will be pursued.

9 Community

9.1 Activities

Multiquip has made several financial and in-kind contributions to the local community during the reporting period. These include:

- Painting of the Bungonia Progress Association Hall (at a cost of \$15,000).
- Building and installing signage to the Progress Association Hall.
- Providing equipment for basic landscaping works at the back of the Progress Association Hall (approximate cost of \$5,000).

Multiquip also organised a road safety day on the 28th October 2017. The road safety day was broadly attended by both local residents and Multiquip staff. The day featured new trucks purchased as part of the Multiquip fleet and stalls from food vendors, the local Rural Fire Service, the State Emergency Service and Goulburn Mulwaree Council. Both the Mayor of Goulburn, Bob Kirk and the local member for Hume, The Hon. Angus Taylor MP also attended. During the day, approximately \$500 was raised from food sales and donated to the Bungonia Progress Association, and as much as \$6,000 of food and merchandise was donated to attendees. Some of the photos of the day are shown in figure 16.

The day provided an opportunity for local residents to get inside of and experience different heavy vehicles. The displays also showed the evolution of trucks over the past ten years how they have advanced with regards to both efficiency and safety.

Figure 16 Photos of the Road Safety Day



9.2 Community Consultative Committee

The Community Consultative Committee (CCC) meets several times each year. It is comprised of five members of the local community, Multiquip's Environmental Officer, the Community Liason Officer and General Manager. The committee is chaired by an independent person, Mr Donald Elder, whose appointment has been approved by the Department of Planning.

The purpose of CCC meetings are to establish working relationships between state significant projects and the wider communities in which they operate as well as better improve the access to information for both community stakeholders and state significant projects to best deliver on social, environmental and economic outcomes (The Department of Planning and Environment, 2016).

Meetings are advertised on the community Facebook page and members of the public are welcome to attend. Minutes are recorded and made freely available on the company's website for download (<http://mqquarry.com.au/media/>).

Multiquip held four CCC meetings during this reporting year, in August and December 2017 and March and June of 2018. Topics discussed included:

- Updates on the road upgrade works.
- Questions on the proposed modification of the project approval (modification 3).
- Discussions about Ardmore Park's environmental performance.

9.3 Complaints

Multiquip is required to maintain a register of community complaints. In this reporting year the company received fifty-one complaints, of which thirty-four related to the Ardmore Park Quarry and seventeen related to the roadworks. The breakdown of the complaints received are presented in table 14.

Table 11 Summary of Noise Complaints

Category	Number of complaints received
Noise	28
Dust	1 (in conjunction with a complaint about noise)
Water	3
Road transport	2
Road upgrade works	17

Of the twenty-eight noise complaints, twenty-four were from a single receiver located adjacent to the quarry, of which twenty-one related to adverse noise impacts, particularly in the morning period on days in which inversion conditions were likely. Significant progress has been achieved in reducing the noise generated by sand washing activities with the replacement of diesel power with electric plant and a silenced generator. Multiquip will continue to conduct noise compliance assessments at regular intervals to ensure compliance with site environmental targets is met.

Typical complaints relating to the roadworks included damage to fences adjacent to the road corridor and requests to expand driveway widths and improve access to the upgraded road formation. Complaints relating to roadworks effectively ceased following the completion of the road upgrade works in July of 2018.

Multiquip maintains a complaints hotline which is advertised prominently at the entrance to the quarry and at both entrances of the Bungonia bypass road. Individuals wishing to lodge a complaint or ask a question of quarry management are encouraged to contact Stephen Wall or Alexander Cox on the details listed in Section 2.3.

10 Independent Audit

Multiquip did not undertake an independent environmental audit during this reporting year.

The next independent audit is due and will be completed in October 2018. At the time of this report, an independent environmental auditor had been appointed and approved by the Department of Planning. The findings of this audit will be discussed in the 2018 annual review.

11 Incidents and Non-Compliances

This reporting year, three compliance matters arose, relating to the location of the mobile rock crushing plant, Aboriginal Heritage and a requirement to notify the Department of Planning as to environmental incidences. The requirement to notify the Department of Planning issue related to the overflow of clean water from a farm dam onto an adjoining property to the north-east in the previous reporting year. The Aboriginal Heritage issue is discussed at depth in Section 5.7.

No significant incidents or injuries occurred during the reporting year.

Rock Crushing Plant Positioning

On the 2nd March 2018, Multiquip received both a show cause notice and a draft development order from the Department of Planning and Environment relating to the location of the mobile crushing plant on Ardmore Park. The Department alleged that by locating the crushing plant on the central hardstand on the site, as opposed to a cut section in the basalt processing area, that Multiquip had breached project approval 07_0155. Subsequent to this, the Department revised its draft development order to require a cessation of rock crushing activities on site until the plant had been relocated to the cut section of the processing area. Since receiving the initial draft order in March, rock crushing activities have been suspended at Ardmore Park. At the time of this report however, the Department of Planning has yet to impose a final development order on the site.

It is anticipated that the rock crushing plant would be relocated to within the cut section of the pit during the 2018 reporting period as part of the proposed modification 3, thereby achieving compliance with PA 07_0155. Multiquip notes that the temporary positioning of the crushing plant on the hardstand did not lead to non-compliances with respect to exceeding the environmental monitoring performance targets, in particular noise and dust. The noise and dust monitoring results are discussed in sections 5.3 and 5.4 of this report.

12 Expectations for the 2018-2019 Reporting Year

Overburden removal and sand extraction will continue. During the next reporting period, Multiquip expects to extract and sell the 400,000 T permitted by the existing, unmodified project approval. The sand extraction pit will continue to expand towards the southern-eastern boundary.

Infrastructure development work that remains to be completed includes the construction of the maintenance shed and the completion of a storage shed. Preliminary work on constructing a permanent site office will take place.

The hard rock processing plant will be relocated into a cut section of the basalt extraction area, pending a deliberation on Modification 3. Overburden from this area will be used to progressively construct a bund wall to the north of the central basalt extraction area. It is anticipated that this bund will shield the view of the quarry from parts of Inverary Road and further attenuate any potential noise and dust impacts that may be experienced by residences to the north of the site.

Multiquip will also expand on its existing fleet of road trucks. Four Scania R series prime movers will be acquired in addition to two further Kenworth 610 rigids. Multiquip expects that the use of a modern truck fleet will have further benefits to the local community in the form of quieter operation and improved safety features not present on older models including fatigue management features and enhanced brakes and suspension.

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14 Appendix Water Quality Monitoring Results

Benzene

µg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	0			
BHAP10	0			
BHAP5	0			
BHAP6	0			
S1	4	>1	>1	>1
S2	4	>1	>1	>1
S3	4	>1	>1	>1
S4	4	>1	>1	>1
S5	4	>1	>1	>1
S6	4	>1	>1	>1
Phils Spring	4	>1	>1	>1
Southern Spring	4	>1	>1	>1

Calcium

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	19	19	19
BHAP10	1	19	19	19
BHAP5	1	26	26	26
BHAP6	1	82	82	82
S1	4	43	43.75	45
S2	4	9.8	9.95	10
S3	4	43	46.75	48
S4	4	40	40	40
S5	4	52	53	54
S6	4	55	56.25	59
Phils Spring	4	55	55	55
Southern Spring	4	32	34.25	39

Chloride

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	170	170	170
BHAP10	1	23	23	23
BHAP5	1	54	54	54
BHAP6	1	70	70	70
S1	4	250	267.5	290
S2	4	130	137.5	140
S3	4	75	79.25	84
S4	4	43	43.25	44
S5	4	54	54.5	55
S6	4	82	86.75	93
Phils Spring	4	170	170	170
Southern Spring	4	92	92.5	93

Ethyl Benzene

µg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	0			
BHAP10	0			
BHAP5	0			
BHAP6	0			
S1	4	>1	>1	>1
S2	4	>1	>1	>1
S3	4	>1	>1	>1
S4	4	>1	>1	>1
S5	4	>1	>1	>1
S6	4	>1	>1	>1
Phils Spring	4	>1	>1	>1
Southern Spring	4	>1	>1	>1

Electrical Conductivity $\mu\text{S}/\text{cm}$

Bore	Count	Minimum	Average	Maximum
BHAP1	1	680	680	680
BHAP10	1	810	810	810
BHAP5	1	750	750	750
BHAP6	1	820	820	820
S1	4	1200	1225	1300
S2	4	630	647.5	660
S3	4	690	735	760
S4	4	690	697.5	700
S5	4	750	750	750
S6	4	820	840	860
Phils Spring	4	1200	1225	1300
Southern Spring	4	690	717.5	770

Iron $\mu\text{g}/\text{L}$

Bore	Count	Minimum	Average	Maximum
BHAP1	1	>10	>10	>10
BHAP10	1	>10	>10	>10
BHAP5	1	>10	>10	>10
BHAP6	1	>10	>10	>10
S1	4	>10	>10	>10
S2	4	>10	>10	>10
S3	4	>10	>10	>10
S4	4	>10	>10	>10
S5	4	>10	>10	>10
S6	4	>10	>10	>10
Phils Spring	4	>10	>10	>10
Southern Spring	4	>10	>10	26

Magnesium

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	13	13	13
BHAP10	1	29	29	29
BHAP5	1	78	78	78
BHAP6	1	32	32	32
S1	4	54	55	57
S2	4	33	33.5	35
S3	4	49	54.25	57
S4	4	59	59.75	61
S5	4	57	58	59
S6	4	53	54	56
Phils Spring	4	93	94.5	99
Southern Spring	4	42	44	48

Manganese

µg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	9	9	9
BHAP10	1	6	6	6
BHAP5	1	>5	>5	>5
BHAP6	1	110	110	110
S1	4	10	10	10
S2	4	37	37	37
S3	4	>5	>5	>5
S4	4	>5	>5	>5
S5	4	>5	>5	>5
S6	4	>5	>5	>5
Phils Spring	4	>5	>5	>5
Southern Spring	4	92	1347.333333	3800

pH

pH units

Bore	Count	Minimum	Average	Maximum
BHAP1	1	6.5	6.5	6.5
BHAP10	1	7.5	7.5	7.5
BHAP5	1	8.2	8.2	8.2
BHAP6	1	7.5	7.5	7.5
S1	4	6.8	6.875	6.9
S2	4	6.5	6.575	6.6
S3	4	7.2	7.25	7.3
S4	4	7.5	7.575	7.7
S5	4	7.4	7.475	7.6
S6	4	7.4	7.45	7.5
Phils Spring	4	7.4	7.45	7.5
Southern Spring	4	7.4	7.4	7.4

Potassium

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	1.7	1.7	1.7
BHAP10	1	1.6	1.6	1.6
BHAP5	1	1.2	1.2	1.2
BHAP6	1	2	2	2
S1	4	1.4	1.475	1.7
S2	4	0.6	0.725	0.9
S3	4	1.1	1.275	1.5
S4	4	0.9	1.05	1.3
S5	4	1.2	1.3	1.4
S6	4	0.9	1.1	1.3
Phils Spring	4	1.1	1.125	1.2
Southern Spring	4	1.3	1.525	1.9

Sodium

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	85	85	85
BHAP10	1	140	140	140
BHAP5	1	16	16	16
BHAP6	1	56	56	56
S1	4	120	127.5	140
S2	4	63	63	63
S3	4	25	27.5	29
S4	4	25	25	25
S5	4	25	25.25	26
S6	4	47	48	49
Phils Spring	4	83	83.75	84
Southern Spring	4	50	50.25	51

Sulfate

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	6	6	6
BHAP10	1	7	7	7
BHAP5	1	28	28	28
BHAP6	1	12	12	12
S1	4	5	5	5
S2	4	6	6.5	8
S3	4	5	5	5
S4	4	5	5.25	6
S5	4	4	4	4
S6	4	6	6.5	7
Phils Spring	4	16	16	16
Southern Spring	4	1	1	1

Toluene

µg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	0			
BHAP10	0			
BHAP5	0			
BHAP6	0			
S1	4	>1	>1	>1
S2	4	>1	>1	>1
S3	4	>1	>1	>1
S4	4	>1	>1	>1
S5	4	>1	>1	>1
S6	4	>1	>1	>1
Phils Spring	4	>1	>1	>1
Southern Spring	4	>1	>1	>1

Total Dissolved Solids

mg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	380	380	380
BHAP10	1	510	510	510
BHAP5	1	440	440	440
BHAP6	1	410	410	410
S1	4	700	712.5	730
S2	4	350	382.5	410
S3	4	380	422.5	450
S4	4	340	362.5	370
S5	4	400	422.5	450
S6	4	430	462.5	500
Phils Spring	4	730	757.5	800
Southern Spring	4	310	367.5	430

Total Petroleum Hydrocarbons

µg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	>0.01	>0.01	>0.01
BHAP10	1	>0.01	>0.01	>0.01
BHAP5	1	>0.01	>0.01	>0.01
BHAP6	1	>0.01	>0.01	>0.01
S1	4	>0.01	>0.01	>0.01
S2	4	>0.01	>0.01	>0.01
S3	4	>0.01	>0.01	>0.01
S4	4	>0.01	>0.01	>0.01
S5	4	>0.01	>0.01	>0.01
S6	4	>0.01	>0.01	>0.01
Phils Spring	4	>0.01	>0.01	>0.01
Southern Spring	4	>0.01	>0.01	>0.01

Xylene

µg/L

Bore	Count	Minimum	Average	Maximum
BHAP1	1	>2	>2	>2
BHAP10	1	>2	>2	>2
BHAP5	1	>2	>2	>2
BHAP6	1	>2	>2	>2
S1	4	>2	>2	>2
S2	4	>2	>2	>2
S3	4	>2	>2	>2
S4	4	>2	>2	>2
S5	4	>2	>2	>2
S6	4	>2	>2	>2
Phils Spring	4	>2	>2	>2
Southern Spring	4	>2	>2	>2