



**Harvest Scientific Services**  
Environmental and Earth Science Consultants

## **2019 ANNUAL ENVIRONMENTAL MANAGEMENT REPORT**

### **SPRING FARM SAND AND SOIL EXTRACTION AND PROCESSING OPERATION (DA 75/256)**

**MACARTHUR ROAD, SPRING FARM**

**Prepared for:**

**M. Collins & Sons Holdings Pty Ltd**



**JOB REFERENCE 75/25628**

**25<sup>th</sup> March 2020**

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<b>ANNUAL REVIEW TITLE BLOCK</b>	
Name of Operation	M. Collins and Sons Holdings Pty Ltd
Name of Operator	
Development consent/project approval #	
Name of holder of development consent/project approval	
Mining Lease #	NA
Name of holder of mining lease	NA
Water licence #	
Name of holder of water licence	
MOP/RMP start date	NA
MOP/RMP end date	NA
Annual Review start date	1/1/2019
Annual Review end date	31/12/2019
<p>I, Mart Rampe, certify that this audit report is a true and accurate record of the compliance status of the Spring Farm Quarry for the period 2019 calendar year and that I am authorised to make this statement on behalf of M Collins and Sons Holdings Pty Ltd.</p> <p><i>Note.</i></p> <p><i>(a) The Annual Review is an “environmental audit” for the purposes of Section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in ) an audit report produced to the Minister in connection with an environmental audit (if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of a corporation, \$1 million and for an individual, \$250,000.</i></p> <p><i>(b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A,307B and 307C (False or misleading statement applications/information/documents – maximum penalty 2 years imprisonment or \$22,000, or both).</i></p>	
Name of authorised reporting officer	Mart Rampe
Title of authorised reporting officer	Director – Harvest Scientific Services
Signature of authorised reporting officer	
Date 25/3/2020	

## Revisions register

Date	Details
26-03-2018	Progress Draft Report 1 for client review.
28-03-2018	Final
28-03-2019	Draft Report for client review including Modification 4 Consent Updates
23/2/2020	Draft report for client
25/3/2020	Final Report for client

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## 1.0 INTRODUCTION

Harvest Scientific Services Pty Ltd has been commissioned by M. Collins & Sons Holdings Pty Ltd (Collins) to prepare this *Annual Environmental Management Report* (AEMR) for 2019. The Report has been prepared in accordance with the NSW Department of Planning and Environment requirements for the Collins Sand and Soil Quarry on Lot 22 (DP833317), and Lot 32 (DP 635271), Macarthur Road, Spring Farm.

### 1.1. OBJECTIVES

The objective of this Annual Environmental Management Report is to address Item 4 of Schedule 5 of the NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod 4) dated 2 August 2018

*By the end of March each year, the Applicant shall review the environmental performance of the project to the satisfaction of the Secretary. This review must:*

- a. *Describe the development (including rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;*
- b. *Include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against:*
  - *The relevant statutory requirements, limits or performance measure/criteria;*
  - *The monitoring results of previous years; and*
  - *The relevant predictions in the Mod 4.*
- c. *Identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;*
- d. *Identify any trends in the monitoring data over the life of the project;*
- e. *Identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and*
- f. *Describe what measures will be implemented over the current calendar year to improve the environmental performance of the project.*

### 1.2. REPORTING PERIOD

This report covers the period between 1 January 2019 and 31 December 2019.

### 1.3. ACTIVE ENVIRONMENTAL MANAGEMENT PLAN

The active Environmental Management Plan is entitled '*Environmental Management Plan for Spring Farm Sand and Soil Extraction and Processing Operation*' dated 31 December 2018 prepared by Harvest Scientific Services.

### 1.4. CONSENT AUTHORITIES

The following consent authorities will be provided with a copy of this AEMR:

- The NSW Department of Planning and Environment;
- Camden Council; and
- The NSW Environmental Protection Authority.

### 1.5. CONSENTS AND PERMITS

The site is operated by Collins Construction Materials Pty Ltd (a subsidiary of M. Collins & Sons Holdings Pty Ltd). This site is subject to the following consents and permits:

- NSW Department of Planning and Environment Notice of Modification (DA 75/256 Mod 4) dated 2 August 2018
- NSW Environmental Protection Authority Environmental Protection Licence (EPL) 4093;

- Controlled Activity Approval issued by the NSW Access Resource Regulator dated 7 December 2018; and
- Other activities which are critical to the operation but do not relate directly to DA 75/256 Mod 4 are undertaken on Lot 1 (DP 587631) and subject to Council approval (DA252/93) (Figure 1). These activities include access to the premises via the main entrance, weighbridge, wheel wash, site offices, workshops, resource processing and blending area and water supply pump from the Nepean River. These activities were not considered when preparing this AEMR.

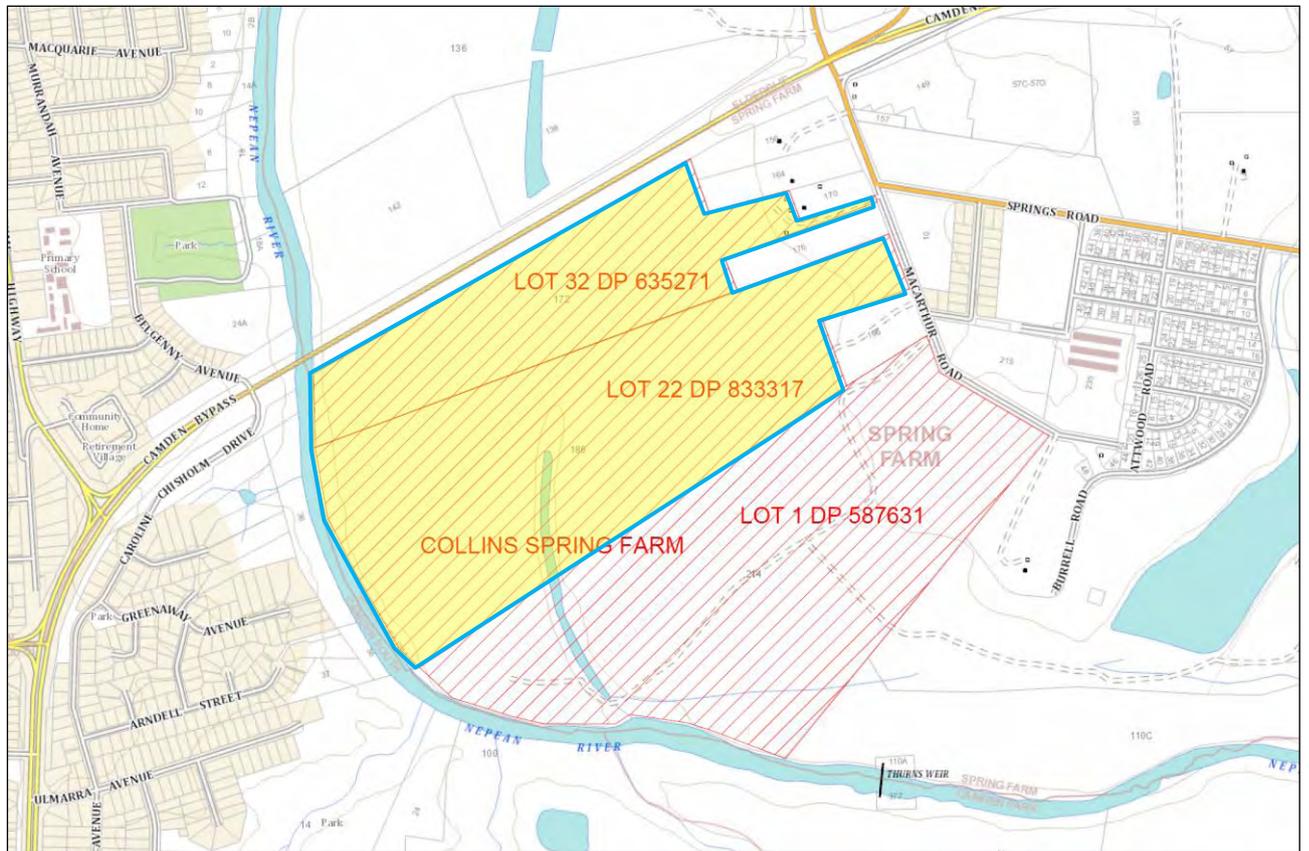
#### 1.6. KEY PERSONNEL RESPONSIBLE FOR ENVIRONMENTAL MANAGEMENT

The key personnel tabled below are responsible for the Environmental Management of the Quarry.

<b>Table 1: Key Environmental Management Personnel</b>		
<b>Contact person</b>	<b>Designation</b>	<b>Contact details</b>
Michael Holz	Manager, Quarry and Transport	0418 423 032

## 2.0 SITE IDENTIFICATION AND LOCATION

Collins Construction Materials Pty Ltd - Spring Farm Quarry operations occupy Lot 1 (DP 587631), Lot 22 (DP833317) and Lot 32 (DP 635271), situated between Macarthur Road and the Nepean River, Spring Farm (Figure 1).



**Figure 1:** Site Locality (the area shaded yellow is the land subject to this 2019 AEMR)

### 3.0 PROJECT DESCRIPTION

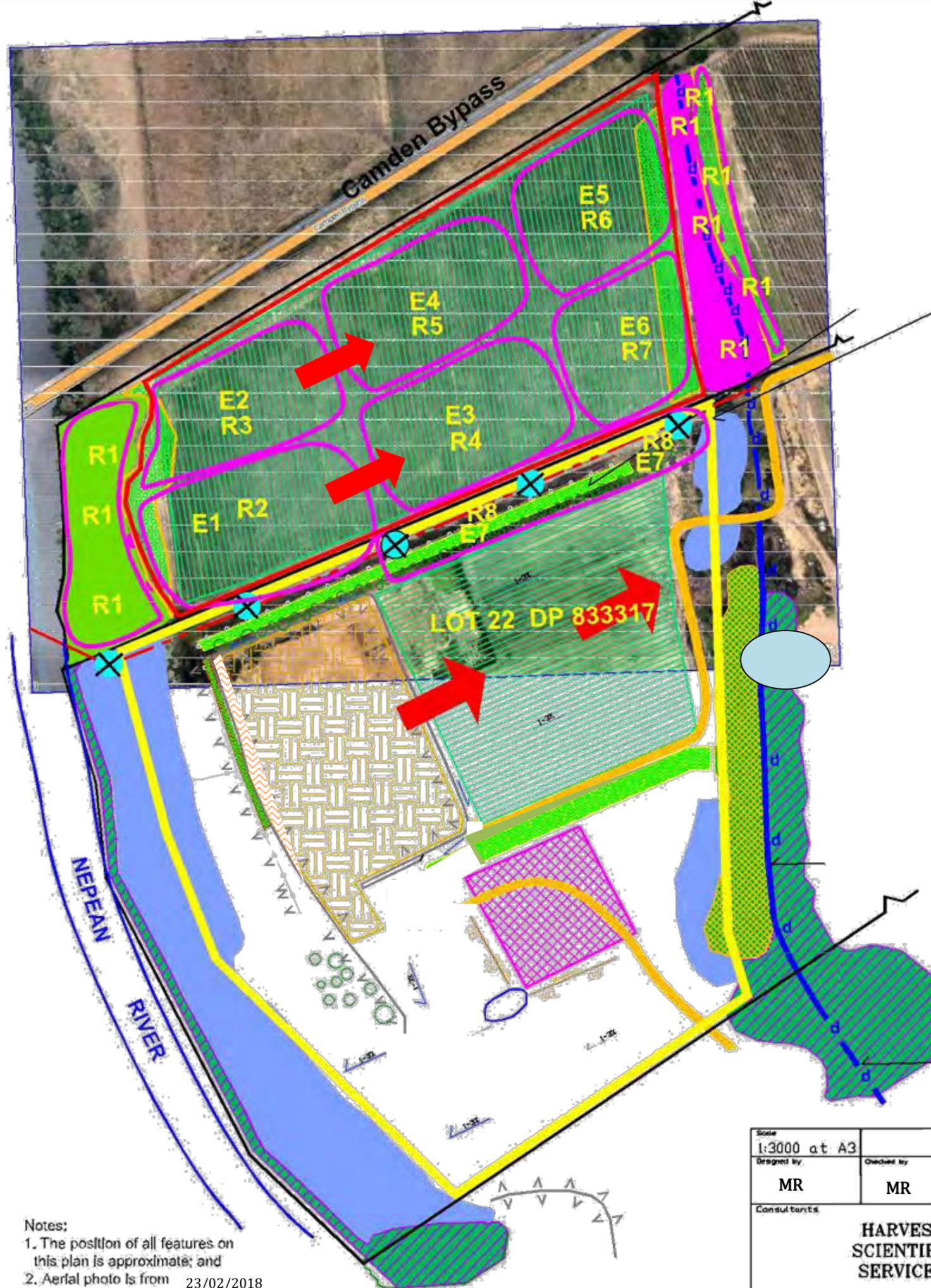
The Collins Spring Farm Quarry is a major supplier of bulk sand and soil materials to the greater Sydney region. Sand and soil is extracted from an approved sixteen hectare (16 Ha) extraction area within the western part of Lot 22 (DP 833317) and more recently from an approved 6.8 hectare (6.8 Ha) extraction area within the western part of Lot 32 (DP 635271) - see Figure 1. The sand and soil resource is extracted to a nominated working depth of approximately 8 metres - the purpose of which is to safeguard the underlying groundwater.

The active working area is confined to five hectares (5 Ha) at any one time in accordance with the approved working plan with one hectare (1 Ha) concurrent rehabilitation. Sand and soil is extracted by excavator and placed into dump trucks. The dump trucks convey the material to the processing area where it is screened using a diesel driven screening plant. Sand and soil are screened to -2 mm and -8 mm respectively. Screened sand and soil is then hauled by dump truck from the processing area to a central stockpile and blending area. Oversize material (overburden) is used to backfill voids and for site rehabilitation purposes. Extraction and rehabilitation cells are illustrated in Figure 2.

Up to 5,000 tonnes of sand and soil are held at any one time in up to five stockpiles. These are segregated by material type, allowing the company to satisfy market demands for specific blended products. Current operations produce around 250,000 to 300,000 tonnes of sand and soil products annually. Twelve people are directly employed at the quarry including plant operators, supervisors and clerical staff. In addition, drivers are employed to deliver and distribute material to customers.

**FIGURE 2**  
**EXTRACTION & REHABILITATION CELLS**

E = Extraction Cell  
R = Rehabilitation Cell



General direction of extraction and rehabilitation

**LEGEND**

- Staging boundary
- Trees to be removed
- Powerpole
- Catch drain
- Intermittent drainage line
- Sediment basin
- Existing vegetation associated with the dry river anabranch located on Lot 32
- Riparian vegetation on Lot 32 associated with the Nepean River
- Past re-vegetation areas/s
- High resilience natural vegetation GCB (2008) (with weed infestation)
- Medium resilience natural vegetation GCB (2008) (with weed infestation)
- Open Paddock Rehabilitation - Complete
- Rehabilitation Areas - 2018
- Scarcely vegetated areas
- Screen plantings
- Future Extraction Area - Lot 32
- Proposed Extraction Area - Lot 22 & Lot 32 - 2018
- Existing internal fence-line
- Property boundary
- Proposed extraction boundary (Lot 32)
- Approved extraction boundary - NDH 22/05/2009
- Aboveground powerlines
- Sediment Pond

YEAR	REHABILITATION CELLS	EXTRACTION CELLS
2012	R1	E1
2013	R2	E2
2014	R3	E3
2015	R4	E4
2016	R5	E5
2017	R6	E6
2018	R7	E7 (extraction complete)
2019	R8 (rehabilitation complete)	
2020	Maintenance R6 and R7	
2021	Maintenance R7	

Notes:  
1. The position of all features on this plan is approximate; and  
2. Aerial photos from 23/02/2018

Scale 1:3000 at A3		Extraction and Rehabilitation Cells			FIGURE 2	
Designed by MR	Checked by MR	Date Issued 21/03/2018	Job No 201414	Filename	Lot No	
Consultants <b>HARVEST SCIENTIFIC SERVICES</b>			Project M Collins Sand and Soil EIA		Client M Collins & Sons Holdings Pty Ltd	
				Council Camden		

#### 4.0 ANNUAL PRODUCTION

Production of sand and soil over the 2019 AEMR is summarized in Table 2. Copies of supporting documentation provided by Collins are appended as follows:

- Industry and Investment Return for Extractive Materials are provided in Appendix 1.
- Number of Laden Loads Outwards (truck movements) are provided in Appendices 2a and 2b
- Weigh Bridge Transactions are provided in Appendix 3.

<b>Table 2: Collins Spring Farm Annual Production Statistics for the 2019 AEMR period</b>	
Total number of laden loads outwards (appendices 2a and 2b)	8233
Average laden truck movements per day	28
Total material extracted	125,908 tonnes
Total Site Production (Appendix 3)*	259,852 tonnes

*\*This figure incorporates production activities related to Lot 1 (DP 587631) and has been included for completeness but such activities are not relevant and are outside the scope of this AEMR as indicated in Section 1.5.*

## **5.0 ANNUAL CONTRIBUTIONS**

As per Item 7 of Schedule 2 of NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod 3) dated 25 October 2012, the Applicant is required pay an annual contribution to Camden Council for the maintenance of Macarthur Road between the main site entrance and intersection with Springs Road.

A total of \$8,860.61 was paid to Camden Council for the contribution in 2019 (Appendix 4).

## 6.0 EXTRACTION AND WORKING AREA

### 6.1 PRODUCTION - 2019 AEMR PERIOD

Current and recent extraction and rehabilitation areas are illustrated in Figure 2 and depict the general direction of the extraction and rehabilitation process.

Sand and soil was actively extracted from the lands between January and December 2019. By the end of the reporting period:

- The open area cell E3 (Figure 2) on Lot 32 (DP 635271) measured approximately 0.2Ha with 1.8 Ha within E1 and E2 cells undergoing concurrent rehabilitation
- Lot 22 (DP 833317) had an active extraction area measuring approximately 1.4Ha (Figure 2); and
- Approximately 64,672 tonnes of raw material had been extracted from the lands (see Figure 3)
- The 2019 total site combined extraction and open area was 3.20Ha (1.80Ha of open area on Lot 22 and 1.4Ha extraction area on Lot 32) complying with the 5.0Ha limit approved by Camden Council.



**Figure 3:** Extraction undertaken in 2019 within LOT 22 (NearMap™ November, 2019)

FIGURE 4

**EXTRACTION & REHABILITATION PLAN FOR 2020**



LOT 32 – Completed Rehabilitation Areas

LOT 22 – Completed Rehabilitation Areas

LOT 32 – Extraction Area for 2020

LOT 32 – Rehabilitation Area for 2020

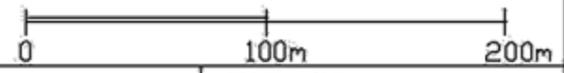
LOT 22 – Extraction Area for 2020

LOT 22 – Rehabilitation Area for 2020

- LEGEND**
- Staging boundary
  - Trees to be removed
  - Powerpole
  - Catch drain
  - Intermittent drainage line
  - Sediment basin
  - Existing vegetation associated with the dry river anabranch located on Lot 32
  - Riparian vegetation on Lot 32 associated with the Nepean River
  - Past re-vegetation areas/s
  - High resilience natural vegetation GCB (2008) (with weed infestation)
  - Medium resilience natural vegetation GCB (2008) (with weed infestation)
  - Open Paddock Rehabilitation - Complete
  - Rehabilitation Areas - 2018
  - Scarcely vegetated area
  - Screen plantings
  - Future Extraction Area - Lot 32
  - Proposed Extraction Area - Lot 22 & Lot 32 - 2018
  - Existing internal fence-line
  - Property boundary
  - Proposed extraction boundary (Lot 32)
  - Approved extraction boundary - NDM 22/05/2009
  - Aboveground powerlines
  - Sediment Pond

Notes:  
 1. The position of all features on this plan is approximate; and  
 2. Aerial photos from 23/02/2018

Scale 1:3000 at A3		Extraction and Rehabilitation Plan for 2020		FIGURE 4	
Designed by: MR	Checked by: MR	Date Issued: 21/03/2020	Job No: 201414	Filename:	Lot No:
Consultants: <b>HARVEST SCIENTIFIC SERVICES</b>			Project: M Collins Sand and Soil EIA		
			Client: M Collins & Sons Holdings Pty Ltd	Council: Camden	



## 6.2 FORECAST PRODUCTION - 2020 AEMR PERIOD

It is proposed to:

- Continue extraction from the current extraction of Lot 22 (DP 833317) illustrated in Figure 4; and
- Re-commence extraction on Lot 32 (DP 635271) proceeding north as illustrated in Figure 4 into E4 after exhaustion of E3.

It is estimated that total extraction and production figures for the 2020 reporting year will be similar to that of 2019. The proposed areas of production during the 2020 AEMR are illustrated in Figure 5.



**Figure 5:** Proposed extraction areas for 2020 (NearMap™ November, 2019)

## 7.0 REHABILITATION - 2019 AEMR PERIOD

### 7.1 INTRODUCTION

Rehabilitation of the Collins quarry site is focused on three basic restoration and rehabilitation zones. These include the following:

- Zone 1 – Nepean River and adjacent banks
- Zone 2 – Dry River Anabranh; and
- Zone 3 – Areas intended for future agricultural areas.

These zones together with commentary on their future treatment is illustrated in Figure 6.

### 7.2 REHABILITATION AND MAINTENANCE

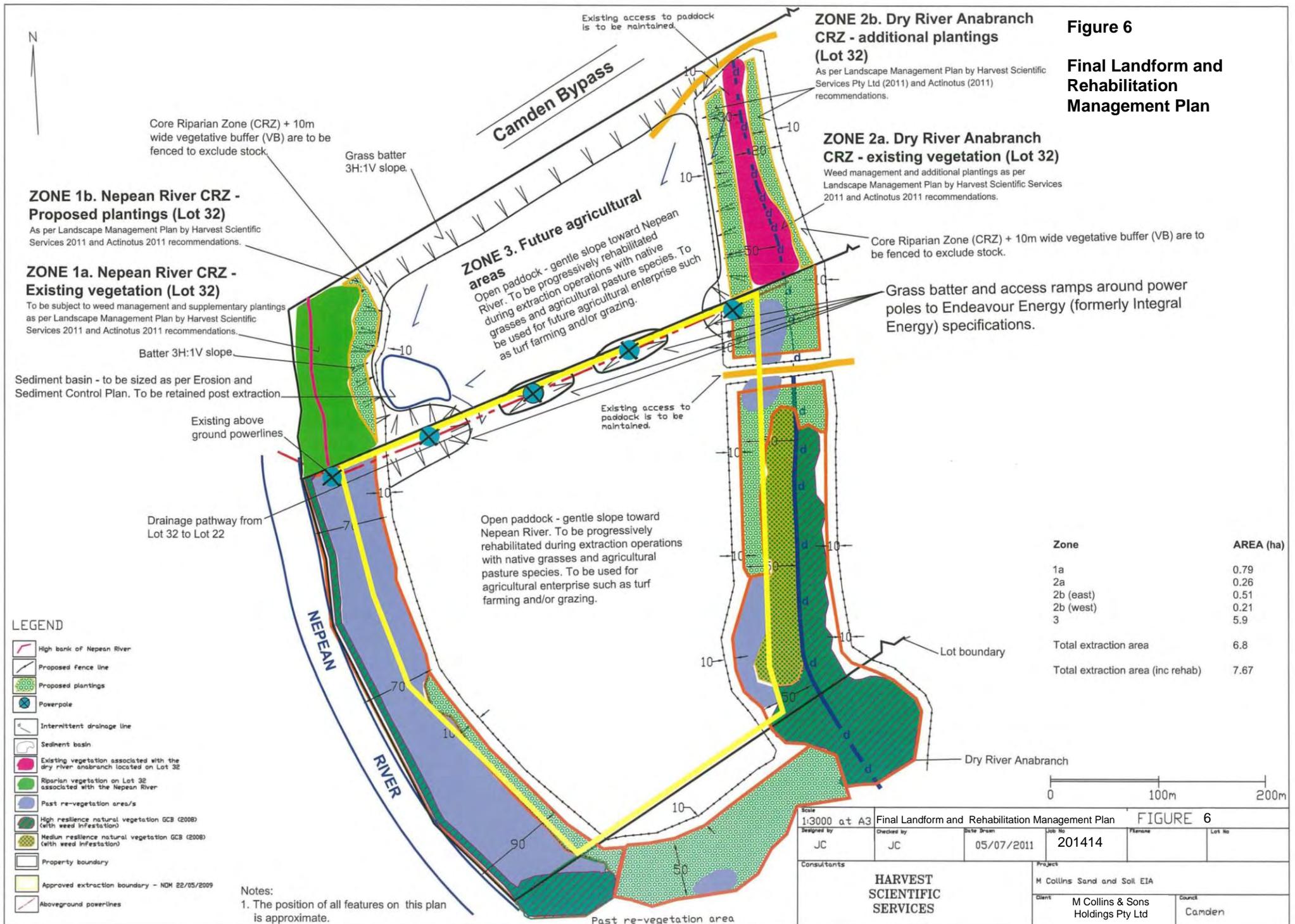
During the 2019 reporting year, rehabilitation and restoration works have continued at the following designated landscape areas (see Figure 6):

- Zone 1a) Nepean River Corridor : During the 2018/19 environmental program this area was provided with secondary and maintenance weeding of re-emergent invasive weeds and herbaceous annual weeds was carried out with the objective of assisting Native planting establishment.
- Zone 1b) Core Riparian Zone – Nepean River : During the 2018/19 environmental program regular routine weeding has been carried out. In addition, hydro mulch seeding and planting of native forestry tube stock has been implemented in this zone.
- Zone 2a) Dry River Anabranh: Limited attention due to noticeably reasonably stable landscape condition. Ongoing monitoring and maintenance is planned for this zone.
- Zone 2b) Dry River Anabranh: Similar to Zone 2a, Limited attention due to noticeably reasonably stable landscape condition. Ongoing monitoring and maintenance is planned for this zone.
- Zone 3 Future Agricultural Area: Weed control to maintain weed spread and contain the spread of invasive species.
- Zone 4 Riparian Linkage : Primary woody weed treatment occurred in this zone to assist in the restoration of natural bushland. Tree plantings and direct seeding is planned for this zone.
- Zone 5 Nepean River Past Revegetation Zone : Infill plantings have occurred to assist with losses and promote diversity within the established zone. Primary and secondary weed management programs have both been implemented.
- Zone 6 Anabranh Central: 018/19 period zone 6 received secondary weed control and maintenance. The zone was used for recruitment of native seedlings.
- Zone 7 Anabranh South : Rehabilitation to protect threatened plant communities and threatened plant species has been the focus in this Zone. Extensive weed control including broad scale woody weed control, invasive ascending vine control and eradication of African Love Grass has improved the vegetation condition.

This work has been carried out by Bowantz Bushfire and Environmental Pty Ltd. The Annual report by Bowantz is attached as Appendix 5, detailing works undertaken and planned.

Figure 6

**Final Landform and Rehabilitation Management Plan**



## 8.0 PROPOSED REHABILITATION - 2020 AEMR PERIOD

### 8.1 FINAL LEVELS

It is proposed to:

- Achieve final levels(RL66) and trimming within Rehabilitation Cells R4 (Lot 32) denoted on Figure 4 and ensure their complete revegetation; and
- Achieve final levels and revegetate areas R3, R5 and R5 on Lot 22 as illustrated in Figure 4 by the end of 2021.

### 8.2 REHABILITATION AND MAINTENANCE

The contractors from Bowantz Bushfire and Environmental Pty Ltd will continue to routinely inspect the site each week to perform rehabilitation tasks as necessary. These tasks will be undertaken in general accordance with the active Landscape Management Plan (Harvest Scientific Services) and will include:

- Fencing maintenance;
- Rubbish removal;
- Continue with the current extensive weeding regime incorporating the spraying and manual removal of woody, herbaceous and scrambling weeds;
- Monitoring and repair as necessary of eroded sites;
- Extensive planting with endemic species sourced from propagules collected on site;
- Monitoring of species composition;
- Monitoring of groundcover; and
- General on-going maintenance.

In addition, continuation of works underway will continue;

- Carry out 40,000 m2 of maintenance along the length of the Nepean River (Lot 22 and Lot 32);
- Carry out 50,000 m2 of maintenance along the Anabranh (Lot 22 and Lot 32);
- Planting 1/3 of the required plants and species within R1 (over approximately 24,500 m2);
- Commence planting within Lot 22 areas R3 to R7;
- Undertake reporting of completed planting, weed re-growth, plant survival and required replacement after primary rehabilitation;
- Review Environmental Key Performance Indicators annually and rehabilitation progress;
- Enhance visual screening by the establishment of the Dry River Anabranh Vegetation;
- State retention of existing screening south of the extraction site;
- Carry out staged retention of vegetation cover on areas not being extracted and progressive rehabilitation of extracted areas; and
- Apply the use of recessive colours to visually intrusive plant, equipment and fencing.

A copy of the completed 2019 Rehabilitation, Monthly Monitoring Reports and 2019 Schedule from Bowantz Bushfire and Environmental Pty Ltd is attached as Appendix 5.

## 9.0 ENVIRONMENTAL MONITORING

### 9.1 PERFORMANCE MEASURES

As per Item 8 of Schedule 3 of NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod 4) dated 2 August 2018 and the Spring Farm Air Quality Monitoring Program dated 7 December 2018 an overview of Environmental Compliance Targets for this quarry is provided in Table 3 below.

<b>Table 3: Environmental Targets (as per Table 1 in Schedule 3: Mod 4 consent)</b>				
<b>Element</b>	<b>Component</b>	<b>Target</b>	<b>Averaging period</b>	<b>Source</b>
Air quality	Deposited Dust (maximum total)	< 4 g / m <sup>2</sup> /month	Annual	DoP Conditions of Consent.
	Deposited Dust (maximum increase)	2 g / m <sup>2</sup> /month	Annual	
	Total Suspended Particles (TSP) Matter	< 90 µg/m <sup>3</sup>	After any legitimate dust related complaint thereafter	
	Particulate Matter (PM <sub>10</sub> )	< 30 µg/m <sup>3</sup>	After any legitimate dust related complaint thereafter	
	Particulate Matter (PM <sub>10</sub> )	< 50 µg/m <sup>3</sup>	After any legitimate dust related complaint thereafter	
Noise	LA10 (15 minute) at each sensitive receptor	< 55 dB(A)	15 minutes	Environmental Protection License 4093.
Groundwater	Electrical conductivity	< 800 uS/cm	N/A	Water Management and Erosion and Sediment Control Plan (11 <sup>TH</sup> December 2018)
	Depth to water table <sup>1</sup> (m)	Depth < 5.83 Depth > 15.93	Monthly	Water Management and Erosion and Sediment Control Plan (11 <sup>TH</sup> December 2018)
	Ph	4.0 – 6.5	N/A	March 2009 – December 2019 Monitoring data. Highest and lowest values rounded up and down to nearest 0.5 respectively.

### 9.2 MONITORING SITES

As per Item 17 of Schedule 5 of the NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod 4) dated 2 August 2018, there are three monitoring sites across the Collins Spring Farm Quarry; MS1 (*Penman*), MS2 (*Turf Farm*), and MS3 (*Wash Plant*). They can be identified on the western boundary of the site, central to the site and nearest the front gate respectively (Figure 7). Monitoring Stations 1 and 3 consist of a dust deposition sampler. Monitoring Station 2 consists of a dust deposition sampler and groundwater monitoring bore.

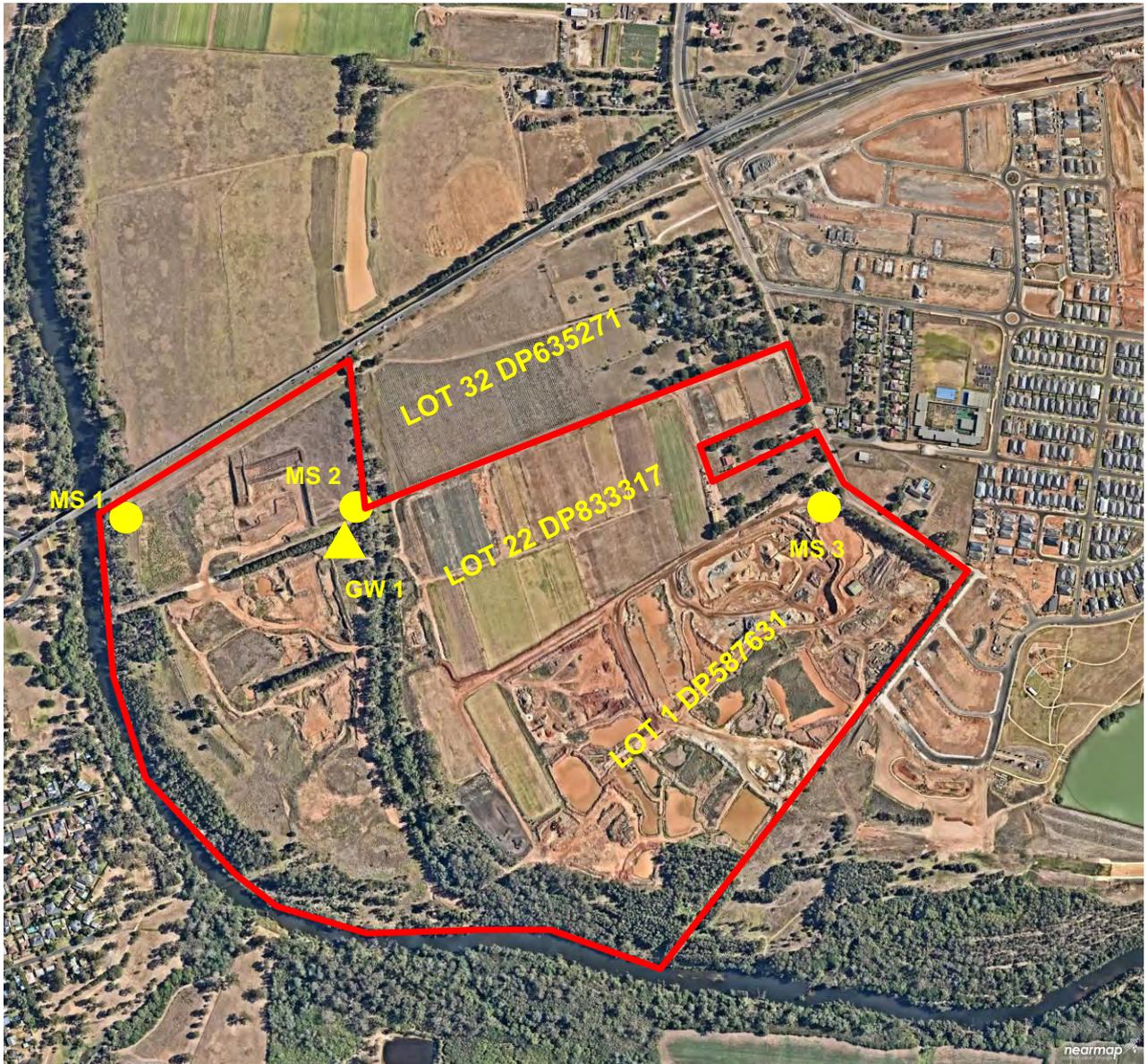


Figure 7: Collins Spring Farm Monitoring Sites

## 10.0 AIR QUALITY

### 10.1 MONITORING

To address Schedule 3 of the NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod4) dated 2 August 2018, Harvest Scientific Services Pty Ltd has been monitoring dust deposition over the Spring Farm Quarry routinely since 2008. Samples are collected monthly from three monitoring stations (MS 1, MS 2 and MS 3 – see Figure 7) and forwarded to a NATA registered laboratory and analysed for Total Insoluble Matter (g/m<sup>2</sup>/month). This monitoring data is available on the Collins and Sons website – <http://www.mcollins.com.au/environmental/environmental-monitoring/>

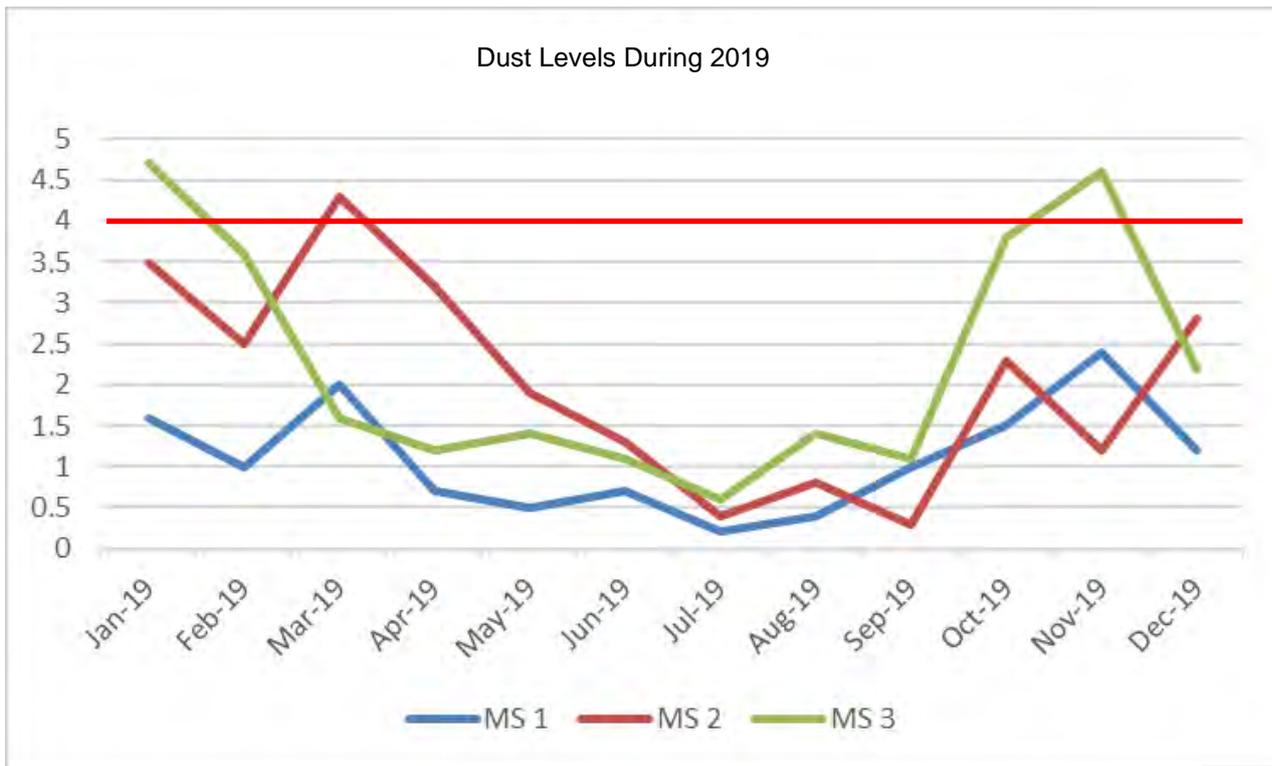
Table 4 and Figure 8 below summarise the results for the 2019 monitoring period. All samples were below the EMP target (4 g/m<sup>2</sup>/month) with the exception of three recorded exceedances during January, March and November: These exceedances were marginal only.

Review of dust deposition data over the last 6 years (the period in which all three monitors have been in place – see Figure 9) suggests the following:

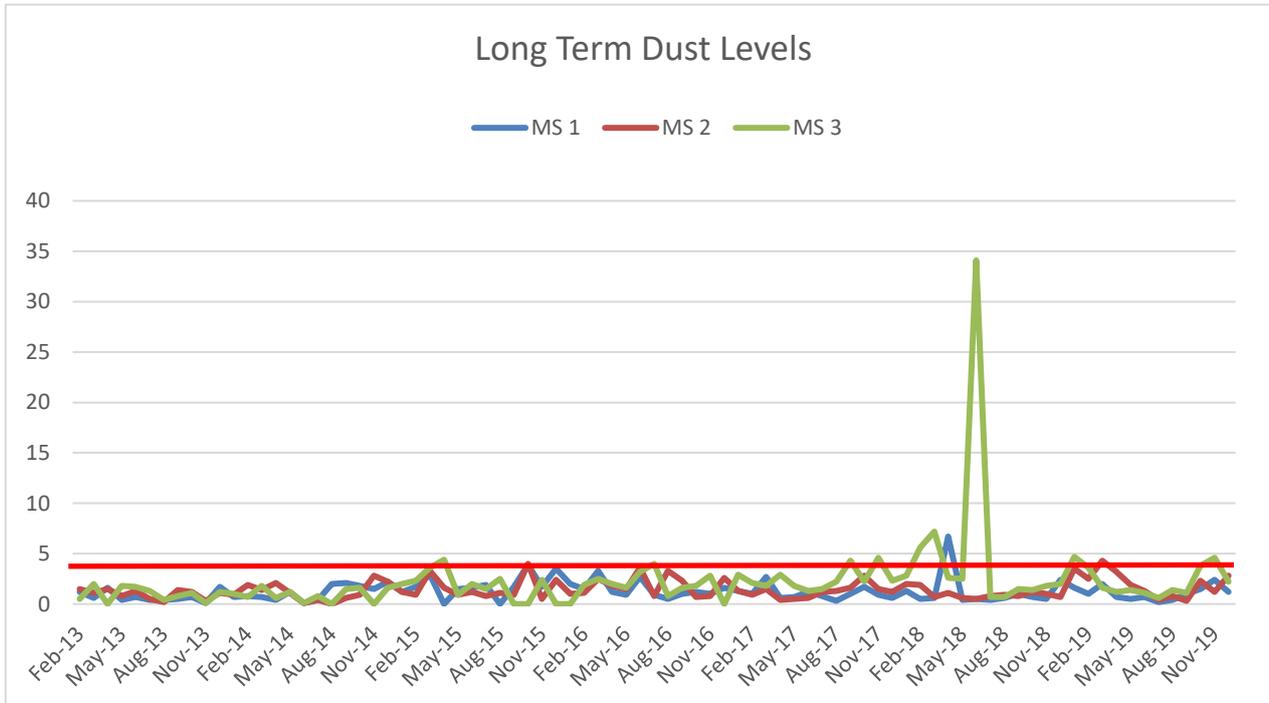
- A modest increase in overall dust deposition over the years reflecting an increase in quarry activities as well as significant expansion of the nearby Spring Farm urban development site which impacts specifically on Monitoring Station MS 3;
- The overall trend during the above period appears to be edging towards lower dust deposition – particularly at Monitoring Stations MS 1 and MS 2; and

The data suggests that exceedances occur mostly during summer months in particular during the during excessive heat and dry windy conditions as depicted in Figure 8.

Period	TIM (g/m <sup>2</sup> /month)			Notes
	MS 1	MS 2	MS 3	
Jan 19	1.6	3.5	<b>4.7</b>	Hot, dry conditions
Feb-19	1	2.5	3.6	
Mar-19	2	<b>4.3</b>	1.6	Project driven demand, use of haul road past this station
Apr-19	0.7	3.2	1.2	
May-19	0.5	1.9	1.4	
Jun-19	0.7	1.3	1.1	
Jul-19	0.2	0.4	0.6	
Aug-19	0.4	0.8	1.4	
Sep-19	1	0.3	1	
Oct-19	1.5	2.3	3.8	
Nov-19	2.4	1.2	<b>4.6</b>	Hot dry conditions
Dec-19	1.2	2.8	2.2	



**Figure 8:** Results of 2019 routine dust deposition monitoring at stations MS1, MS2 and MS3. LHS scale represents Total Insoluble Material (TIM). EPM target illustrated by red line.



**Figure 9:** Results of routine dust deposition monitoring at stations MS1, MS2 and MS3 over 7 years. LHS scale represents Total Insoluble Material (TIM).

In addition, the Company undertook a series of Hi Volume, air quality assessments at Station 2 monitoring 24 hour Total Suspended Particles (TSP) and Fine Particulates (PM 10). Under the Licence conditions for the site, the following air quality targets apply:

- Daily PM 10: 50 µg /m<sup>3</sup>/ 24 Hrs
- Daily TSP: 90 µg /m<sup>3</sup>/ 24 Hrs

Three campaigns were undertaken during 2019, the results of which are summarised below:

**July, 2019**

DATE COLLECTED	PENMAN STATION 1		TURF FARM STATION 2		WASH PLANT STATION 3		SAMPLE ID	NOTES
	TSP	PM 10	TSP	PM 10	TSP	PM 10		
19-06-19				9.20			9660572	No Exceedance
20-06-19			21.30				9660573	No Exceedance
21-06-19				3.80			9660574	No Exceedance
22-06-19			20.70				9660575	No Exceedance
23-06-19				2.70			9660576	No Exceedance
24-06-19			10.30				9660577	No Exceedance
25-06-19				6.20			9660578	No Exceedance
26-06-19			11.50				9660579	No Exceedance
27-06-19				11.30			9660580	No Exceedance
28-06-19			23.10				9660581	No Exceedance

No exceedances were recorded at Station 2 during the monitoring period.

Given the proximity of Station 2 to the approximate centre of the extractive and processing operations, the recorded results indicated that the dust management regime on site at the time was largely working.

**November, 2019**

DATE COLLECTED	PENMAN STATION 1		TURF FARM STATION 2		WASH PLANT STATION 3		SAMPLE ID	NOTES
	TSP	PM 10	TSP	PM 10	TSP	PM 10		
27-09-19			91.80				9660583	Exceedance
28-09-19				28.60			9660584	No Exceedance
29-09-19			81.40				9660585	No Exceedance
30-09-19				64.80			9660586	Exceedance
01-10-19			36.80				9660587	No Exceedance
02-10-19				28.80			9660588	No Exceedance
03-10-19			104.00				9660589	Exceedance
04-10-19				41.80			9660590	No Exceedance
05-10-19			16.50				9660591	No Exceedance
06-10-19				18.90			9660592	No Exceedance

During the testing period it was noted that there were a number of very windy dusty days, with dust being generated from the drought affected areas outside the region and blowing across the test area by westerly winds on most days. In addition, the site directly opposite the Quarry and turf farm was subject to major land levelling activities entailing the removal of topsoil and constant truck movements, all generating significant dust events. As a result of the site and weather conditions during the monitoring period, three exceedances were recorded at Station 2. These exceedances are considered to be of a minor nature.

December, 2019

DATE COLLECTED	PENMAN STATION 1		TURF FARM STATION 2		WASH PLANT STATION 3		SAMPLE ID	NOTES
	TSP	PM 10	TSP	PM 10	TSP	PM 10		
9/12/2019			130.00				9577718	Exceedance
10/12/2019				188.00			9577719	Exceedance
11/12/2019			171.00				9577720	Exceedance
12/12/2019				83.50			9577721	Exceedance
13/12/2019			112.00				9577722	Exceedance
14/12/2019				89.10			9577723	Exceedance
15/12/2019			188.00				9577724	Exceedance
16/12/2019				55.50			9577725	Exceedance
17/12/2019			100.00				9577726	Exceedance
18/12/2019				150.00			9577727	Exceedance

The testing period was noted for its extreme weather (mainly high winds) exacerbated by many days of intensive smoke haze and debris from extensive bushfires located on the perimeter of the Sydney Basin. In addition, the site directly opposite the Quarry and turf farm was subject to major land levelling activities entailing the removal of topsoil and constant truck movements, all generating significant dust events. As a result of the site and weather conditions during the monitoring period, both PM10 and TSP measurements recorded exceedances on all days. Given the weather conditions and nearby activities, these exceedances were not unexpected.

## 10.2 IMPROVEMENTS

In an effort to reduce the number of recorded dust exceedances and to counter the extreme dry, hot conditions prevalent Collins instigated the following dust suppression methods during the 2019 year;

- Maintained the increased frequency of access road dust suppression wet-downs
- Access to the road carriageways between the weighbridge and Macarthur Road were restricted so as to prevent quarry plant and machinery from using that area.
- Collins is still considering the upgrade the sealed area to improve the prevention of dust collecting in this area. In addition, the road pavement approaching the weighbridge from the quarry will also be under consideration to further reduce potential dust emissions.
- The mobile water cart continues to operate solely for the purpose of monitoring weather conditions, truck movements and speeds and thus that wet-downs of the quarry and road areas are applied at a higher than normal frequency. Collins has a staff member dedicated to the role of Water Cart driver and in addition has back-up staff trained in the role to cover leave period or periods where an additional water cart driver may be required.
- Collins has instigated a log book record keeping system for the water cart so that frequency and timing of the water cart usage can be monitored.
- Bund heights are monitored and increased as ongoing site maintenance to capture quarry and extraction pit dust in conjunction with existing controls and the mobile water cart. During excessive dry heat and wind conditions, the plant is shut down, plant and vehicle speed is reduced, product stockpiles are reduced and wet down to form a crust to reduce windblown dust.

Other Critical Protocols for Dust Suppression implemented onsite routinely include:

- Watering: All haul roads, stockpiles and acoustic bunding is subject to a daily wetting from an installed sprinkler system. Water cannons are utilized to wet down all stockpiles being held for sale to suppress fugitive dust emissions;
- Plantings: Upon the completion of final land forming, all surfaces are planted with appropriate grasses and shrubs. This includes quarry floors and batters;
- Shut down: All extractive and processing operations are shut down when wind conditions exceed acceptable velocities and threaten dust generation. This is a subjective assessment by the quarry manager and is based on past experience; and
- Security: Monitoring stations are cordoned off to prevent vandalism and nuisance readings where appropriate.

During the 2019 reporting period, it was the intention of Collins to enlarge the footprint of the sealed area between the weighbridge and the Macarthur Road frontage in order to further reduce the potential for dust emissions from this area. However, Sydney Water undertook a sewer installation project in Macarthur Road throughout the period which forced consideration for sealing the area to be deferred. Whilst the project was underway, the following impacts resulted:

- Truck movements were restricted to the north along Macarthur Road to the Camden By-Pass and diversions would not be possible for quarry trucks; and
- The location of the manhole opposite the quarry entry impeded access and egress of trucks and create safety issues.

## 11.0 SITE WATER MANAGEMENT

### 11.1 GROUND WATER MONITORING

To address Schedule 3 of the NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod 4) dated 2 August 2018, Harvest Scientific Services Pty Ltd has been monitoring groundwater at the Spring Farm Quarry routinely since 2009. Grab samples are collected monthly from a groundwater bore located at MS2 (Figure 7) and forwarded to Sydney Analytical Laboratories Pty Ltd for pH and Conductivity analysis. Groundwater depth is also monitored on a monthly basis. Monitoring data is available on the Collins and Sons website – <http://www.mcollins.com.au/environmental/environmental-monitoring/>

Table 5 and Figure 10 summarise the results for the 2019 monitoring period, whereas Figure 11 provides a summary of data over the last 7 years.

A review of data over the last reporting year demonstrates the following;

- All samples tested were below the nominated salinity target (EC < 800  $\mu$ S/cm) during 2019. Results reflect the continuing low levels of groundwater conductivity (EC) values over the last three years in contrast to higher values noted between 2013 and 2016;
- pH levels were found to occur within a relatively tight range (5.28 – 7.48) and has not altered significantly over the last 7 years; and
- Groundwater depths below ground level fluctuated between 11.50m and 11.80m depth, with a modest rise towards the end of the year perhaps reflecting prolonged drought conditions.

Table 5: Results of Routine Groundwater Analysis					
Date	Time	Temp (°C)	EC (uS/cm)/100	Ph	Water Table Depth (m)
11/1/2019	8.30am	23	291	6.07	11.5
4/2/2019	8.00am	22	264	5.72	11.6
5/3/2019	10.00am	25	262	5.60	11.6
1/4/2019	10.00am	18	273	5.62	11.6
1/5/2019	10.00am	17	221	5.81	11.6
31/5/2019	10.00am	9	293	5.28	11.7
27/6/2019	9.00am	10	288	5.85	11.7
2/8/2019	9.00am	5	318	7.48	11.8
2/9/2019	10.00am	13	318	5.38	11.8
3/10/2019	10.00am	23	318	5.78	11.8
5/11/2019	10.00am	23	318	5.78	11.8
4/12/2019	10.00am	21	307	6.15	11.8

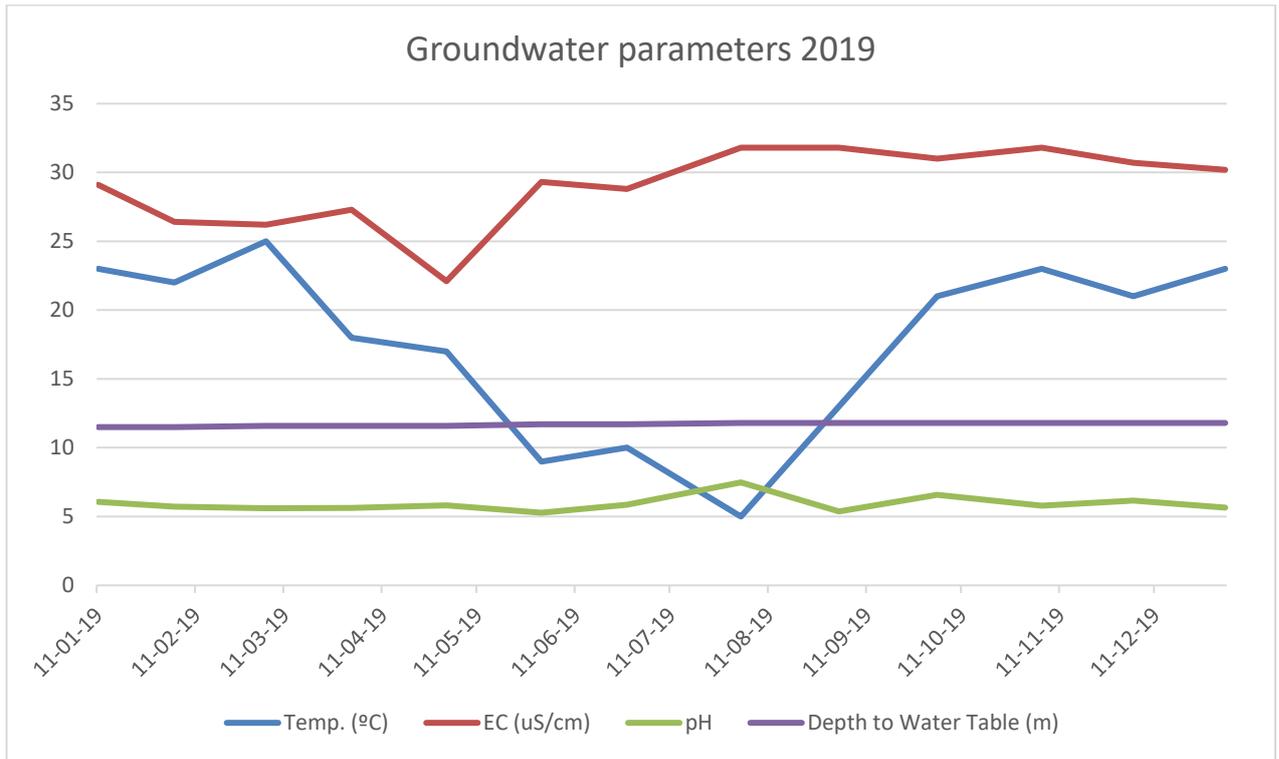


Figure 10: Results of 2019 Groundwater Monitoring (Actual EC values divided by 10)

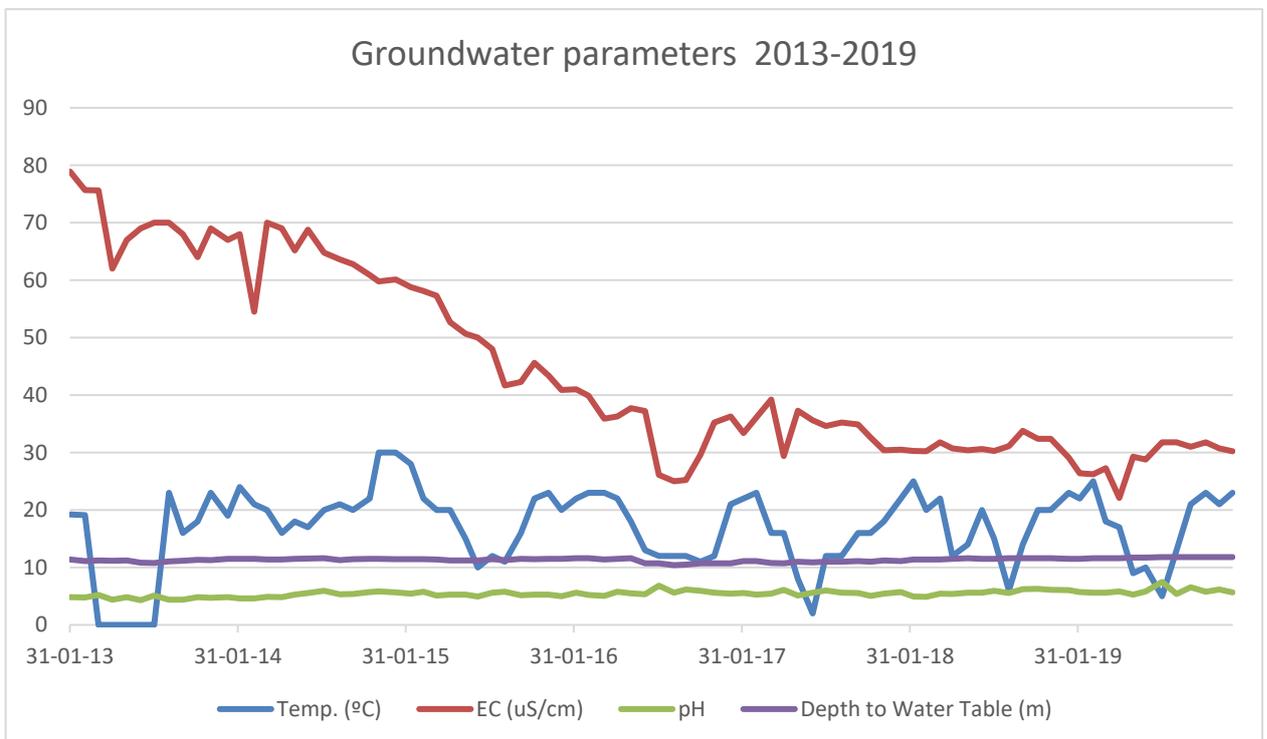


Figure 11: Results of Groundwater Monitoring over 7 years (Actual EC values divided by 10)

## 11.2 PROJECTIONS

Projections for the groundwater parameters for the next reporting period are based on the last seven years of monitoring data. However, these projections are now subject to a significant rainfall/flooding event that occurred during February 2020.

- It is likely that the nominated salinity target (<800 µS/cm) will be maintained and readings for 2020 will be maintained more or less at 2019 levels;
- pH levels are likely to remain within a relatively tight range (6.00 – 7.50); and
- Groundwater depths below ground level have changed since the above mentioned flooding event and at the time of this report, was approximately one metre higher (around 11.00 metres) than the average 2019 readings. It is likely that slight additional rises will be recorded over the first half of 2020.

Based on the above groundwater monitoring data, the groundwater level is likely to remain approximately 10 to 11 metres below the natural ground surface. Assuming a final landform level of up to 8 metres below the existing natural ground level, the permanent groundwater level is anticipated to be approximately 2-3 metres below the finished final landform. This distance is considered to be sufficient buffer distance for the protection of the local groundwater regime from future agricultural impacts.

The following groundwater management protocols which have been adopted for some time, are as follows:

- Maintenance of 1m vertical buffer distance. During active extraction, a buffer distance of 1 meter is to be maintained between the base of the quarry floor and the permanent groundwater horizon. The purpose of the buffer is to ensure adequate protection of groundwater. This buffer is based upon accepted practice on adjacent operations;
- If, during active extraction, the permanent groundwater is inadvertently intercepted, the quarry floor is to be back-filled to provide a 1 meter buffer between the operational surface and groundwater; and
- Groundwater depth, pH and salinity levels are to be continued to be monitored at the existing groundwater monitoring location on a monthly basis.

## 11.3 IMPROVEMENTS

Recorded values are well within realistic ranges and no groundwater management improvements are considered necessary at this point. The Site Manager and machine operator working within the extraction cell checks for floor and wall seepage prior to commencing work, throughout the day and at the end of the day and records findings on the inspection schedule. Any sighting of seepage is reported immediately, although no occurrences have been recorded to date.

## 11.4 SITE WATER BALANCE

### 11.4.1 Introduction

To address Condition 13 of Schedule 3 of the NSW Department of Planning and Environment *Notice of Modification* (DA 75/256 Mod 4) dated 2 August 2018 an overview of available water and water usage is presented in the following sections. In summary, the extraction and processing activities on Spring Farm indicates a positive water balance outcome.

### 11.4.2 Maximum Harvestable Right Dam Capacity (MHRDC) and proposed sedimentation terminal pond

Based on the Maximum Harvestable Right Dam Capacity (MHRDC) calculator located on the Department of Primary Industries Water website (NSW DPIW, 2011), the project site has a MHRDC of 0.075 ML/ha, which equates to 1.32 ML for the approximate 17.7 hectare lot size.

The proposed terminal pond (Figure 6) is to be limited to the MHRDC size of 1.32 ML. As the terminal sedimentation pond is less than the MHRDC a Water Access Licence (WAL) is not required for this structure. This feature is proposed to be retained post extraction as a sediment trap for the post-extraction agricultural production areas.

Water is to be pumped from the terminal sedimentation pond and used for dust suppression purposes during the life of the extraction proposal and irrigation purposes post-extraction.

### 11.4.3 Sources and security of water supply

An annual total of 370.3 ML will be available for site operations from sources including river water from the Nepean River, bore water and surface water from the proposed terminal sedimentation pond. A breakdown of the various water sources is outlined in Table 6.

Table 6. Summary of available water sources and volumes				
Source	WAL WMA 2000	WMA 2000 Approval	Available Volume (ML)	Notes
Nepean River	10AL117216	10WA117217	41	River pump
	10AL117214	10CA117215	230	River pump
Groundwater	10AL117186	10CA117187	0	Offset for 20ML Aquifer Interference Policy
	10AL109570	10CA109571	98	Bore pump (Lot 1 DP 587631)
Onsite terminal sediment basin	Exempt.	Exempt.	1.3	Based on MHRDC
<b>Total</b>			370.3	

The total available volume of water from the Nepean River is 271 ML per annum which is to be sourced from two existing licences under the Water Act 2000 (NSW) (WA, 2000). The Water Access Licences (WAL's) are administered by the NSW Department of Primary Industries Water (DPIW) under the WMA (2000).

The total available volume of water from groundwater sources is 98 ML per annum which is to be sourced from one existing licences under the Water Act 2000 (NSW) (WA, 2000). The Water Access Licences (WAL's) are administered by the NSW Department of Primary Industries Water (DPIW) under the WMA (2000). Approximately 1.3ML of surface water from the proposed onsite terminal sedimentation pond will also be available to supplement site water needs. As this volume is less than the Maximum Harvestable Right (MHR) for the site, a Water Access Licence is not required to utilise this water.

### 11.4.4 Site water use

MCS Pty Ltd currently utilise an annual total of 271 ML and a breakdown of the various water uses is outlined in Table 7. Industrial extraction uses include the water required by the sand wash-plant and for dust suppression purposes. Environmental uses include water utilised for establishment of re-vegetated areas. Agricultural use water is currently utilised by quarrying operations.

Table 7. Summary of annual water uses and volumes	
Aspect	Available Volume (ML/annum)
Industrial (extraction) usage	230
Environmental and rehabilitation usage	41
Agriculture	50*
<b>Total</b>	<b>321</b>

\* Included for completeness for all approved activities to their permissible extent. It is noted that whilst still approved, agricultural activities are not currently undertaken within the Quarry area. As a result, 116ML of potential water source is therefore not currently employed, effectively providing further conservative redundancy to the site water balance.

The annual average usage is not anticipated to change as part of the extraction as the scale of the overall operation is not proposed to change. Water currently utilised on the existing MCS Pty Ltd site for a specific purpose (such as rehabilitation establishment) will be diverted to the adjacent site when it is no longer needed (such as when rehabilitation works are complete). Given that a total of 370.3 ML per annum of water is available (Table 6) and the annual requirement is 321ML (Table 7), ample water sources are therefore available for the proposed operations.

### 11.4.5 Water management, storage and access

Water is pumped directly from the Nepean River with two centrifugal pumps directly to the relevant area for use. Water from the groundwater bore will be pumped directly to the relevant area for use via a standard bore pump that is installed. Water may also be pumped from sediment basins with a fire-fighter pump and recycled onsite site on an as needed basis, such as for dust suppression purposes. Typically water is transported in a water cart but may be pumped locally via sprinklers.

#### 11.4.6 Evaporation Loses Environmental and Rehabilitation

As indicated in Table 7.41 ML is allocated for environmental and Rehabilitation purposes on Lots 32 and 22. Dust suppression is conducted on haul roads, processing areas and establishment of new plantings in rehabilitation areas. The site water cart has a 15,000 litre tank capacity and enables a maximum of four loads per day to be delivered to each of Lots 32 and 22 or 15.84ML. This is within the allocated offsite water use and accordingly annual evaporation losses from environmental (dust suppression) and rehabilitation are applied equivalently at 16ML.

#### 11.4.7 Exported Water in Saleable Product

Materials extracted from Lots 22 and 32 have no application of water other than environmental factors (rain). The amount of water leaving the site via sold material products is variable and is based on climatic conditions and operational throughput. Estimates on this water loss is based on recorded average material moisture content and tonnages leaving the site. Key products exported from the site with contained water include sand and soil.

Materials which remain onsite (eg overburden) or which are imported and on-sold (eg VENM/ENM) are not applicable (no site water transferred offsite) and subsequently is excluded. Estimated water exported from the site in material products during 2019 operations and for maximum approved throughput scenarios is presented in Table 8. Conservatively *maximum* acceptable commercial product moisture limits have been applied to *all* throughput tonnages throughout the year (no change from month to month with climate). The maximum production rates of 300,000 tonnes per annum has been assumed for sand/soil as per actual recorded portions in 2019 throughputs (i.e. approximately 1/1 sand to soil ratio). From Table 8 it can be seen that, conservatively, up to ~20.2ML/year of water may be exported within product materials from the site.

Table 8: Estimated Water Volumes Exported in Sold Product							
Saleable Product	Typical Maximum Moisture Content	Approved Operations			2019 Operations		
		Maximum Throughput	Estimated Exported Water Content		Extracted Tonnage (2019)	Estimated Exported Water Content	
Type	(%)	Tonnes/Yr	Tonnes/yr	ML/yr	Tonnes/yr	Tonnes/yr	ML/yr
Sand	5*	150,000**	7,500	7.50	105,063	5,253.15	5.25
Soil	8*	150,000*	12,000	12.00	20,845	1,667.6	1.67
<b>Totals</b>		<b>300,000</b>	<b>19,500</b>	<b>19.50</b>	<b>125,908</b>	<b>6,920.75</b>	<b>6.92</b>

#### 11.4.8 Reporting Procedures

Water use records for water pumped from the Nepean River and groundwater are maintained onsite and are made available to the NSW Department of Industries, as requested, as per water licence conditions.

#### 11.4.9 Measures to minimise water use

Water use is to be minimised by the following measures:

- Avoid over-application of water;
- Monitoring of the application of water to minimise run-off;
- Minimise the area of exposed surfaces; and
- Apply water on an as-needed basis.

#### 11.4.10 Conclusion

With regard to site water balance it is concluded that:

- Ample water is available the proposed operations
- Provision of the water for this facility is consistent with the objectives of the Water Management Act (2000).

## **12.0 COMPLAINTS**

### **12.1 OVERVIEW**

To address Schedule 5 of the NSW Department of Planning and Environment Notice of Modification (DA 75/256 Mod 4) dated 2 August 2018 the complaint status for a number of environmental factors were assessed during the 2019 AEMR period. Details are provided in the following sections.

### **12.2 NOISE**

Noise from the premises must not exceed an LA10 (15 minute) noise emission criterion of 55 dB(A). Noise from the premises is to be measured or computed at any point within one metre of the boundary of any residential premises or other noise sensitive areas (such as schools, hospitals) in the vicinity of the premises to determine compliance. 5dB(A) must be added if the noise is tonal or impulsive in character.

To comply with the above requirements, Koikas Acoustics Pty Ltd was commissioned to undertake a noise testing program during August 2017 in order to demonstrate that noise arising from the quarry operations does satisfy the above criteria and furthermore, that this compliance can be maintained for a further two years.

The results of this testing program (Statement of Compliance) confirmed that noise levels generated by typical quarry operations at the nearest residential receiver were inaudible and therefore satisfied the nominated noise criterion. Furthermore, it was noted that advancement of these quarrying operations over the next two years will also satisfy the nominated criterion.

No noise related complaints were received during the 2019 AEMR period.

### **12.3 DUST**

One dust complaint was received during the 2019 AEMR period. This was resolved internally. See Appendix 7.

### **12.4 ODOUR**

Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

No odour related complaints were received during the 2019 AEMR period.

### **12.5 RUN-OFF**

No run-off related complaints were received during the 2019 AEMR period.

### 13.0 COMPLIANCE WITH CONDITIONS OF CONSENT

In direct response to the submission of the 2018 AEMR, the NSW Department of Planning and Environment advised that “the report generally satisfies the requirements of the Consent” – see attached Appendix 6.

It was requested that in future AEMR Reports, Collins include a separate summary table that highlights the compliance statistics for all conditions of the approval for the relevant reporting period in accordance with ‘Appendix A – Compliance Table Example of the Compliance Reporting Post Approval Requirements 2018 (‘CRPAR’) available from the Departments website at the following link: [www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)

This summary table is produced as Table 9 below.

<b>Table 9: Compliance Reporting Post Approval</b>				
<b>Item Reference</b>	<b>Compliance Requirement</b>	<b>Phase of the Development</b>	<b>Monitoring Methodology</b>	<b>Evidence &amp; Comments</b>
Notice of Modification 4	Compliance with EIS SEE (MOD 1) EA (MOD 3) EA (MOD 4) Statement of commitments	Operation		
Notice of Modification 4	Implement Air Quality Monitoring Program	Operation	Air Quality Management Plan	External Monthly Air Monitoring by Harvest Scientific Voluntary PM10, TSP Testing twice annually
Notice of Modification 4	Implement Water Management Plan	Operation	<ul style="list-style-type: none"> <li>• Water Management Plan</li> <li>• Site Water Balance;</li> <li>• Erosion and Sediment Control Plan;</li> <li>• Groundwater Monitoring Program; and,</li> <li>• Flood Emergency Procedures Plan</li> </ul>	Daily Visual Inspection by EMR Monthly operational report Form 30 Collins IBMS
Notice of Modification 4	Implement Landscape Management Plan	Operation	Landscape Management Plan (including rehabilitation plan)	Bowanz Annual Bush Regeneration and Ecological Restoration Report Monthly operational report Form 30 Collins EMS
Notice of Modification 4	Implement Rehabilitation Management Plan	Operation	Landscape Management Plan (including rehabilitation plan)	Bowanz Annual Bush Regeneration and Ecological Restoration Report Monthly Visual inspection

				Daily & Monthly by EMR Monthly Operations Report Form 30 Collins EMS
Notice of Modification 4	Implement Waste Management Plan	Operation		Visual daily and monthly inspection by EMR Monthly Operations Report Form 30 Collins EMS
Notice of Modification 4	Implement Environmental Management Strategy	Operation	Environmental Management Plan	Collins EMS operational controls including ECPS and FOPS Collins IBMS and EMS EMP 2018 Approved plan including controls noted above.
Modification 3 16a	Stockpiles - Hydramulch stockpiles where retained for a period greater than 3 months	Operation	Environmental Management Plan including Water Management Plan ( Erosion and sedimentation control) and Landscape Management Plan	Visual Inspection Daily and monthly EMR Monthly Operations Report Form 30 Collins EMS
Modification 2	Extraction Area - Not open, extract or excavate greater than 2ha at once	Operation	Environmental Management Plan	Monthly Operations Report Form 30 Collins EMS
	Eastern Bund Wall - 7 meter height earthen bund wall to west of working extraction area	Operation	Environmental Management Plan	Monthly Operations Report Form 30 Collins EMS
	Noise - Not exceed noise assessment criteria	Operation	Environmental Management Plan	Koikis Acoustic Study 2017 Daily Visual Inspection by EMR Incident Report or Complaint form or register
	Air Quality - TSP Annual not exceed 90ug/m3 and PM10 Matter not exceed 30ug/m3 annually	Operation	Air Quality Management Plan AM15 and AS2724.3-1984	External Monthly Air Monitoring by Harvest Scientific

			AM18 and AS3580.9.6-1990 Investigate following legitimate Dust Compliant	
	Air Quality - PM10 not exceed 50ug/m3 24 hour period	Operation	Air Quality Management Plan AM18 and AS3580.9.6-1990 Investigate following legitimate Dust Compliant Investigate following legitimate Dust Compliant	Voluntary PM10, TSP Testing twice annually
	Air Quality – Deposited Dust not exceed a maximum deposited increase 2 g/m2 per month or maximum total deposited dust level 4 g/m2 month	Operation	Air Quality Management Plan AM18 and AS3580.9.6-1990 Investigate following legitimate Dust Compliant	External Monthly Air Monitoring by Harvest Scientific
	Discharge - No discharge from Site	Operation	Environmental Management Plan including Water Management Plan Emergency preparedness plans	Visual inspection Daily by EMR Monthly Operational Report Form 30 Collins EMS Emergency preparedness plans – accident, incident form and register
	Visual - Establish & maintain perimeter visual plantings to minimise visual impact		Landscape Management Plan	Bowanz Annual Bush Regeneration and Ecological Restoration Report
	Incident Reporting- Reporting within 7 days to the department any exceedance	Operation	Environmental Management Plan	Collins EMS Management Procedure MP37 Accident Incident Reporting, Form and Register

	Annual Reporting - Submit AEMR annually BY 31 <sup>ST</sup> March	Operation	Environmental Management Plan	Collins Environmental Planner
	Independent Environmental Audit – every 3 years	Operation	Environmental Management Plan	Collins Environmental Planner
	Access to Information – Ensure approved management plans, AEMR and monitoring results are on the website	Operation	Collins EMS	Collins Environmental Planner
Original Consent 1	Open extraction area must not exceeding 2Ha at any one time	Operation	Environmental Management Plan	Monthly Operations Report Form 30 Collins EMS
	Dust - Regular watering, Automatic sprinklers on stockpiles, grass stockpiles where such are to be retained for a long period of time	Operation	Environmental Management Plan	Daily and Monthly Visual Inspection by EMR Monthly Operations Report Form 30 Collins EMS Monthly Air Monitoring Reports Harvest Scientific
	Noise - Not exceed LA (10) 15 minute interval noise emission criteria of 55dB (A) at the nearest dwelling	Operation	Environmental Management Plan	Daily and Monthly Visual Inspection by EMR Monthly Operations Report Form 30 Collins EMS Incident Report or Complaint form or register
	Buffer Zone - No excavation 30 meters from any public road or public reserve boundary. 12 meters from any other boundary, Buffer Zone - No building work, parking, plant or stockpile 15 meters from any public boundary. 6 metres from any other boundary.	Operation	Environmental Management Plan	Monthly Operations Report Form 30 Collins EMS
	Imported Fill - Imported fill must be pre approved by Camden council	Operation	Environmental Management Plan	Facility Operating Procedure – Importation of Material
	Tailings - dispersed according to council requirements	Operation	Environmental Management Plan	Collins EMS ECPs and FOPS

	Access Roads - All access roads kept watered to minimise dust	Operation	Environmental Management Plan Traffic Management Plan	Daily and Monthly Visual Inspection by EMR Monthly Operations Report Form 30 Collins EMS Monthly Air Monitoring Reports Harvest Scientific Driver and Contractor Site Induction
	Operation Hours M-F 7am-5pm, Saturday 8-1pm	Operation	Environmental Management Plan	Management by EMR and Quarry Manager
	Annual contribution to Camden Council for the maintenance of Macarthur road	Operation	Collins Statement of Commitments	Annual Environmental Planner
Statement of Commitments	Traffic - Laden Truck Movements not exceed 36 per day average or maximum of 80 any day	Operation	Collins Statement of Commitments	Collins EMS Weekly Truck Movement Report
	Traffic - Limit impact of trucks on public roads	Operation	Collins Statement of Commitments	Collins Daily Allocations Manager Navman Satellite Tracking
	Dust – Voluntary Air Monitoring PM10 & TSP Twice annually	Operation	Air Quality Management Plan	Voluntary PM10, TSP Testing twice annually
EPL 4093	Dust - 3 dust monitoring locations for monthly testing . MS1, MS2, MS3. Monitoring and recording of Dust at MS1, MS2,MS3 Grams per sqm per month	Operation	Air Quality Management Plan	External Monthly Air Monitoring by Harvest Scientific Voluntary PM10, TSP Testing twice annually
	Waste - waste that meets 'recovery exemption' clause 51A of Protection of the Environmental (Waste) Act 2005 onlky allowable imported material for processing	Operation	Waste Management Plan	Visual daily and monthly inspection by EMR Monthly Operations Report Form 30 Collins EMS
	Noise - LA (10) 15 minute interval noise emission criteria of 55dB (A) Measured within one meter from boundary	Operation	Environmental Management Plan	Daily and Monthly Visual Inspection by EMR Monthly Operations Report Form 30 Collins EMS Incident Report or Complaint form or register

	Hours of Operation - Lot 1 7am-5PM m-f and 7am-1pm Saturday Lot 22, 32 7am and 5pm m- f and 8am-1pm Saturday	Operation	Environmental Management Plan	Management by EMR and Quarry Manager
	Annual Return Submission due October annually	Operation	Environmental Management Plan	Annual Environmental Planner
	Dust – Voluntary Monitoring of PM10 and TSP TWICE Annually - April - May period and Sept-Oct period	Operation	Air Quality Management Plan	Voluntary PM10, TSP Testing twice annually
WAL Licences	Aquifer 20UNITS Complete and maintain logbook	Operation	Environmental Management Plan Water Management Plan	Monthly Operations Report Form 30 Collins EMS
	98 units Complete and maintain logbook	Operation	Water Management Plan	Monthly Operations Report Form 30 Collins EMS
	Surface Water 230 UNITS complete and maintain logbook	Operation	Water Management Plan	Monthly Operations Report Form 30 Collins EMS
	Surface Water 41 UNITS complete and maintain logbook	Operation	Water Management Plan	Monthly Operations Report Form 30 Collins EMS
	Groundwater Complete & maintain groundwater extraction log book.	Operation	Water Management Plan	Monthly Groundwater Monitoring by Harvest Scientific pH, EC, depth to groundwater (m). Field pH and EC meters, water sampling device, tape measure

## 14.0 LIMITATIONS OF THIS REPORT

This report has been prepared subject to a number of limitations. These include:

- The application of conditions of approval or impacts of unanticipated future events could modify the outcomes described in this document. In particular, the occurrence of earthquakes of any magnitude, extreme rainfall events or the effects of climate change have not been considered but should they occur, may have a significant impact on the site. The client agrees that such events are possible but nevertheless accepts the risk that they pose;
- The findings contained in this report are the result of discrete/specific methodologies used in accordance with normal practices and standards. To the best of our knowledge, they represent a reasonable interpretation of the general condition of the site in question. Under no circumstances, however, can it be considered that these findings represent the actual state of the site/sites at all points;
- In preparing this report, Harvest Scientific Services has relied upon information and documentation provided by the client and/or third parties. Harvest Scientific Services did not attempt to independently verify the accuracy or completeness of that information. To the extent that the conclusions and recommendations in this report are based in whole or in part on such information, they are contingent on its validity. Harvest Scientific Services assume no responsibility for any consequences arising from any information or condition that was concealed, withheld, misrepresented, or otherwise not fully disclosed or available to Harvest Scientific Services Pty Ltd; and
- This report is not to be relied upon for any purpose other than that defined in this report.

Prepared by:

Mart Rampe BSc (Applied Geology)

Director and Principal Environmental Scientist

28/3/2020

**APPENDICES**

**APPENDIX 1: INDUSTRY AND INVESTMENT RETURN (2019) FINANCIAL YEAR)**



RETURN FOR EXTRACTIVE MATERIALS: YEAR ENDED 30 JUNE 2019

Quote RIMS ID in all correspondence

Quarry Id: 6339	Rims ID: 400233	<b>Inquiries</b> please telephone: (02) 4063 6713  <b>Completed or Nil Returns</b> Email – <a href="mailto:mineral.royalty@planning.nsw.gov.au">mineral.royalty@planning.nsw.gov.au</a> Postal Address (see below)
Operators Name: LTD	COLLINS CONSTRUCTION MATERIALS PTY LTD	
Address:	PO BOX 378 NARELLAN NSW 2567	<b>Please amend name, postal address and location of mine or quarry if incorrect or incomplete.</b>
Email:	matt@mcollins.com.au	
Quarry Name: Quarry Address:	SPRING FARM/NESBITT QUARRY MACARTHUR RD	

2018-2019

The return should be completed and forwarded to Senior Advisory Officer, RESOURCE ECONOMICS, RESOURCE PLANNING & PROJECTS, NSW DEPARTMENT OF PLANNING, INDUSTRY & ENVIRONMENT, PO BOX 344 HUNTER REGION MAIL CENTRE NSW 2310 on or before 31 October 2019.

The return should relate to the above quarrying establishment and should cover the operations of quarrying and treatment (such as crushing, screening, washing etc.) carried out at or near the quarry.

Director, Resource Planning & Projects

Please complete all of the following information to assist in identifying the location of the Quarry

Typical Geology ALLUVIA FLOOD PLAIN

Nearest Town to Quarry CAMDEN

Local Council Name CAMDEN

Deposited Plan and Lot Number/s of Quarry DP833317 Lot 1 DP587631 Lot 22

Email Address of Operator matt@mcollins.com.au

Name of Owner or Licensee COLLINS CONSTRUCTION MATERIALS PTY LIMITED

Postal Address of Licensee P.O. Box 378 NARELLAN NSW 2567

Licence/Lease Number/s (if any)  
 From Mineral Resources NSW (Industry & Investment NSW) \_\_\_\_\_  
 From Department of Lands or other Department \_\_\_\_\_

If any output was obtained from land NOT held under licence from the above Departments, state the Name/s and Address/es of the Owners of the land \_\_\_\_\_

To the best of my knowledge, information entered in this return is correct and no blank spaces left where figures should have been inserted.

- SIGNATURE of PROPRIETOR or MANAGER [Signature] DATE 31-10-19
- CONTACT PERSON for this return MATT COLLINS
- NAME (Block letters) MATTHEW J COLLINS Telephone (02) 9774-1544

**SALES During 2018-2019**

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential.

Product	Description	Quantity Tonnes
<b>Virgin Materials</b>		
• <b>Crushed Coarse Aggregates</b>		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
<b>Recycled Materials</b>		
• <b>Crushed Coarse Aggregates</b>		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand	IMPORTED SAND	19,400
Manufactured Sand		
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
• <b>River Gravel</b>		
Over 30mm		
5mm to 30mm		
Under 5mm		
• <b>Construction Sand</b>	Excluding Industrial	257,300
• <b>Industrial Sand</b>		
Foundry, Moulding		
Glass		
Other (Specify)		
• <b>Dimension Stone</b>	Building, Ornamental, Monumental	
Quarried in Blocks		
Quarried in Slabs		
• <b>Decorative Aggregate</b>	Including Terrazzo	
• <b>Loam</b>	Soil for Topdressing, Garden soil, Horticultural purposes)	6,300
• <b>TOTAL SITE PRODUCTION</b>		283,000
• <b>Gross Value (\$) of all Sales</b>		
• <b>Type of Material</b>		
• <b>Number of Full-Time Equivalent (FTE) Employees</b>	Employees:	Contractors

Please Note: A return for clay based products can be obtained by contacting the inquiry number.

**APPENDIX 2: LADEN LOADS OUTWARDS (2019 CALENDAR YEAR)**

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
-----------	-------

Row Labels	Load Count	Sum of Weight
01-100	66	1,116.34
01-102	6,525	215,652.74
01-104	57	1,356.29
01-117	2	73.78
01-126	68	2,184.26
02-008	24	271.54
04-001FSC	9	284.14
05-001	222	5,819.40
05-003	67	1,512.38
05-012	2	21.82
05-042	3	35.96
05-062	109	3,355.88
05-075	1	4.66
05-076	30	985.96
05-800	137	4,313.58
06-150	18	562.16
06-151	2	42.78
06-160	52	1,616.86
07-007	48	1,535.12
07-008	207	3,763.70
07-015	67	2,503.50
07-016	368	9,931.14
07-100	39	1,231.24
07-101	16	502.60
07-105	6	188.94
07-115	4	126.24
10-010SF	69	562.50
16-002	15	296.12
<b>Grand Total</b>	<b>8,233</b>	<b>259,851.63</b>

**APPENDIX 3: DELIVERED TONNAGES (2019 CALENDAR YEAR)**

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Mon-7-Jan-19	16
Tue-8-Jan-19	12
Wed-9-Jan-19	6
Thu-10-Jan-19	21
Fri-11-Jan-19	21
Sat-12-Jan-19	8
Mon-14-Jan-19	29
Tue-15-Jan-19	25
Wed-16-Jan-19	43
Thu-17-Jan-19	24
Fri-18-Jan-19	41
Sat-19-Jan-19	13
Mon-21-Jan-19	42
Tue-22-Jan-19	26
Wed-23-Jan-19	44
Thu-24-Jan-19	25
Fri-25-Jan-19	34
Tue-29-Jan-19	30
Wed-30-Jan-19	24
Thu-31-Jan-19	32
Fri-1-Feb-19	29
Sat-2-Feb-19	11
Mon-4-Feb-19	41
Tue-5-Feb-19	33
Wed-6-Feb-19	30
Thu-7-Feb-19	36
Fri-8-Feb-19	41
Sat-9-Feb-19	19
Mon-11-Feb-19	42
Tue-12-Feb-19	44
Wed-13-Feb-19	39
Thu-14-Feb-19	40
Fri-15-Feb-19	39
Sat-16-Feb-19	20
Mon-18-Feb-19	33
Tue-19-Feb-19	42
Wed-20-Feb-19	26
Thu-21-Feb-19	35
Fri-22-Feb-19	31
Sat-23-Feb-19	23
Mon-25-Feb-19	28

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Tue-26-Feb-19	43
Wed-27-Feb-19	53
Thu-28-Feb-19	38
Fri-1-Mar-19	29
Sat-2-Mar-19	13
Mon-4-Mar-19	30
Tue-5-Mar-19	32
Wed-6-Mar-19	34
Thu-7-Mar-19	29
Fri-8-Mar-19	39
Sat-9-Mar-19	16
Mon-11-Mar-19	26
Tue-12-Mar-19	35
Wed-13-Mar-19	32
Thu-14-Mar-19	28
Fri-15-Mar-19	25
Sat-16-Mar-19	7
Mon-18-Mar-19	13
Tue-19-Mar-19	14
Wed-20-Mar-19	26
Thu-21-Mar-19	31
Fri-22-Mar-19	34
Sat-23-Mar-19	16
Mon-25-Mar-19	21
Tue-26-Mar-19	36
Wed-27-Mar-19	53
Thu-28-Mar-19	50
Fri-29-Mar-19	49
Sat-30-Mar-19	22
Mon-1-Apr-19	44
Tue-2-Apr-19	34
Wed-3-Apr-19	53
Thu-4-Apr-19	48
Fri-5-Apr-19	47
Sat-6-Apr-19	23
Mon-8-Apr-19	41
Tue-9-Apr-19	46
Wed-10-Apr-19	43
Thu-11-Apr-19	40
Fri-12-Apr-19	46
Sat-13-Apr-19	22

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Mon-15-Apr-19	46
Tue-16-Apr-19	55
Wed-17-Apr-19	63
Thu-18-Apr-19	58
Fri-19-Apr-19	1
Sat-20-Apr-19	3
Tue-23-Apr-19	18
Wed-24-Apr-19	18
Fri-26-Apr-19	12
Sat-27-Apr-19	12
Mon-29-Apr-19	32
Tue-30-Apr-19	39
Wed-1-May-19	41
Thu-2-May-19	32
Fri-3-May-19	35
Sat-4-May-19	22
Mon-6-May-19	37
Tue-7-May-19	30
Wed-8-May-19	47
Thu-9-May-19	50
Fri-10-May-19	41
Sat-11-May-19	26
Mon-13-May-19	38
Tue-14-May-19	41
Wed-15-May-19	37
Thu-16-May-19	45
Fri-17-May-19	49
Sat-18-May-19	23
Mon-20-May-19	34
Tue-21-May-19	44
Wed-22-May-19	28
Thu-23-May-19	44
Fri-24-May-19	33
Sat-25-May-19	20
Mon-27-May-19	41
Tue-28-May-19	33
Wed-29-May-19	33
Thu-30-May-19	37
Fri-31-May-19	28
Sat-1-Jun-19	21
Mon-3-Jun-19	31

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Tue-4-Jun-19	10
Wed-5-Jun-19	7
Thu-6-Jun-19	25
Fri-7-Jun-19	43
Sat-8-Jun-19	11
Tue-11-Jun-19	24
Wed-12-Jun-19	27
Thu-13-Jun-19	33
Fri-14-Jun-19	33
Sat-15-Jun-19	22
Mon-17-Jun-19	23
Tue-18-Jun-19	39
Wed-19-Jun-19	33
Thu-20-Jun-19	41
Fri-21-Jun-19	26
Sat-22-Jun-19	15
Mon-24-Jun-19	18
Tue-25-Jun-19	23
Wed-26-Jun-19	21
Thu-27-Jun-19	28
Fri-28-Jun-19	24
Sat-29-Jun-19	13
Mon-1-Jul-19	14
Tue-2-Jul-19	31
Wed-3-Jul-19	25
Thu-4-Jul-19	10
Fri-5-Jul-19	6
Sat-6-Jul-19	4
Mon-8-Jul-19	25
Tue-9-Jul-19	12
Wed-10-Jul-19	27
Thu-11-Jul-19	19
Fri-12-Jul-19	25
Sat-13-Jul-19	18
Mon-15-Jul-19	26
Tue-16-Jul-19	20
Wed-17-Jul-19	20
Thu-18-Jul-19	16
Fri-19-Jul-19	30
Sat-20-Jul-19	18
Mon-22-Jul-19	19

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Tue-23-Jul-19	22
Wed-24-Jul-19	21
Thu-25-Jul-19	33
Fri-26-Jul-19	24
Sat-27-Jul-19	13
Mon-29-Jul-19	24
Tue-30-Jul-19	18
Wed-31-Jul-19	18
Thu-1-Aug-19	9
Fri-2-Aug-19	13
Sat-3-Aug-19	3
Mon-5-Aug-19	7
Tue-6-Aug-19	11
Wed-7-Aug-19	14
Thu-8-Aug-19	6
Fri-9-Aug-19	8
Sat-10-Aug-19	6
Mon-12-Aug-19	13
Tue-13-Aug-19	13
Wed-14-Aug-19	14
Thu-15-Aug-19	12
Fri-16-Aug-19	12
Sat-17-Aug-19	3
Mon-19-Aug-19	14
Tue-20-Aug-19	15
Wed-21-Aug-19	18
Thu-22-Aug-19	14
Fri-23-Aug-19	21
Sat-24-Aug-19	9
Sun-25-Aug-19	1
Mon-26-Aug-19	9
Tue-27-Aug-19	22
Wed-28-Aug-19	27
Thu-29-Aug-19	16
Fri-30-Aug-19	6
Sat-31-Aug-19	1
Mon-2-Sep-19	29
Tue-3-Sep-19	32
Wed-4-Sep-19	22
Thu-5-Sep-19	30
Fri-6-Sep-19	31

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Sat-7-Sep-19	12
Mon-9-Sep-19	27
Tue-10-Sep-19	38
Wed-11-Sep-19	35
Thu-12-Sep-19	24
Fri-13-Sep-19	24
Sat-14-Sep-19	11
Mon-16-Sep-19	30
Tue-17-Sep-19	5
Wed-18-Sep-19	2
Thu-19-Sep-19	4
Fri-20-Sep-19	16
Sat-21-Sep-19	4
Mon-23-Sep-19	31
Tue-24-Sep-19	35
Wed-25-Sep-19	25
Thu-26-Sep-19	23
Fri-27-Sep-19	23
Sat-28-Sep-19	11
Mon-30-Sep-19	39
Tue-1-Oct-19	30
Wed-2-Oct-19	35
Thu-3-Oct-19	28
Fri-4-Oct-19	36
Sat-5-Oct-19	8
Tue-8-Oct-19	15
Wed-9-Oct-19	46
Thu-10-Oct-19	38
Fri-11-Oct-19	23
Sat-12-Oct-19	2
Mon-14-Oct-19	44
Tue-15-Oct-19	34
Wed-16-Oct-19	41
Thu-17-Oct-19	45
Fri-18-Oct-19	56
Sat-19-Oct-19	20
Mon-21-Oct-19	36
Tue-22-Oct-19	30
Wed-23-Oct-19	58
Thu-24-Oct-19	51
Fri-25-Oct-19	30

**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Sat-26-Oct-19	13
Mon-28-Oct-19	31
Tue-29-Oct-19	37
Wed-30-Oct-19	39
Thu-31-Oct-19	27
Fri-1-Nov-19	36
Sat-2-Nov-19	20
Mon-4-Nov-19	12
Tue-5-Nov-19	49
Wed-6-Nov-19	55
Thu-7-Nov-19	31
Fri-8-Nov-19	45
Sat-9-Nov-19	9
Mon-11-Nov-19	45
Tue-12-Nov-19	22
Wed-13-Nov-19	26
Thu-14-Nov-19	36
Fri-15-Nov-19	32
Sat-16-Nov-19	10
Mon-18-Nov-19	31
Tue-19-Nov-19	41
Wed-20-Nov-19	49
Thu-21-Nov-19	29
Fri-22-Nov-19	23
Sat-23-Nov-19	9
Mon-25-Nov-19	28
Tue-26-Nov-19	24
Wed-27-Nov-19	35
Thu-28-Nov-19	30
Fri-29-Nov-19	66
Sat-30-Nov-19	11
Mon-2-Dec-19	37
Tue-3-Dec-19	41
Wed-4-Dec-19	35
Thu-5-Dec-19	39
Fri-6-Dec-19	49
Sat-7-Dec-19	14
Mon-9-Dec-19	45
Tue-10-Dec-19	35
Wed-11-Dec-19	50
Thu-12-Dec-19	44

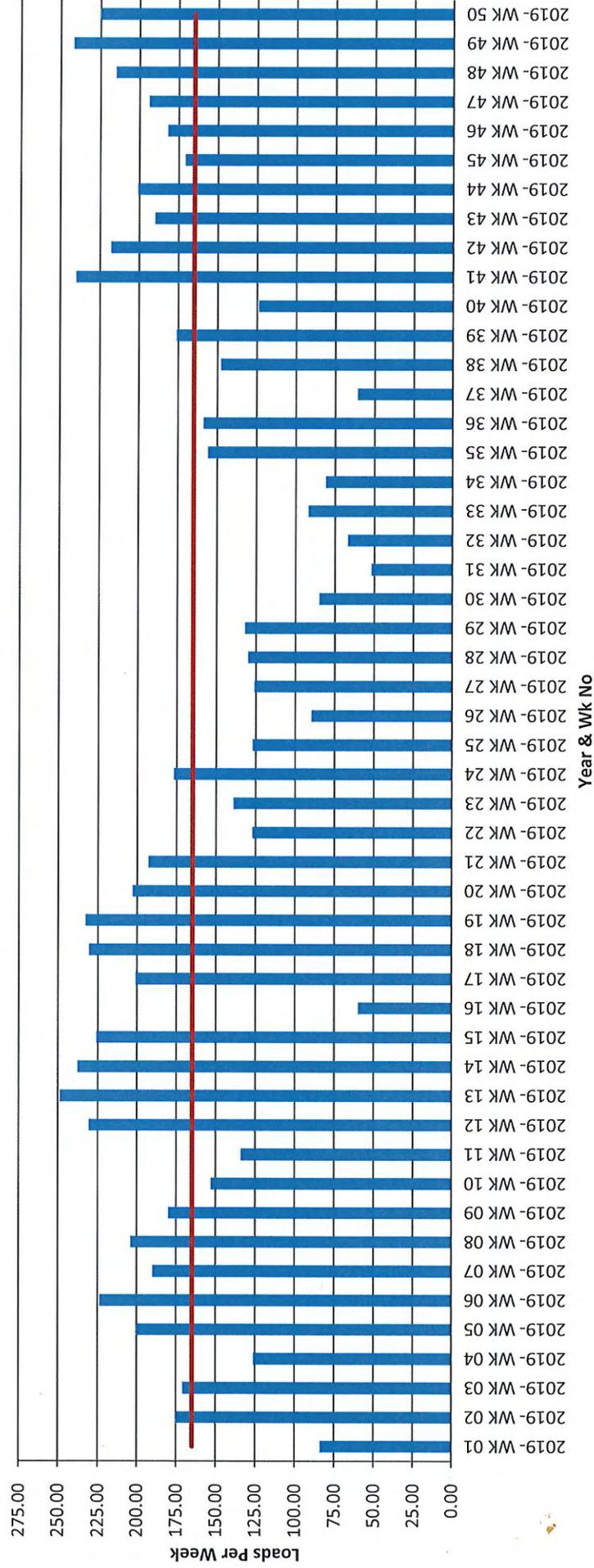
**Collins Construction Materials Pty Limited**  
**Weighbridge Transactions**  
**Between 1/1/2019 and 31/12/2019**

Load Type	DELIV
Date	Count
Fri-13-Dec-19	48
Sat-14-Dec-19	20
Mon-16-Dec-19	47
Tue-17-Dec-19	29
Wed-18-Dec-19	40
Thu-19-Dec-19	43
Fri-20-Dec-19	66
<b>Grand Total</b>	<b>8233</b>

No of Weeks	50
No of days per week	6
Ave Loads per week	165
Ave loads per day	28

# Collins Construction Materials Pty Limited - Weighbridge Transactions

## Number of Loads per week Jan 1 - Dec 31, 2019



Legend:   
■ Loads per week   
— Ave per week 165

**APPENDIX 4: CONTRIBUTIONS TO CAMDEN COUNCIL**



**Camden Council**  
 70 Central Ave, Oran Park  
 PO Box 183, Camden 2570  
 Telephone: 02 4654 7777 Fax: 02 4654 7829  
 Email: mail@camden.nsw.gov.au  
 www.camden.nsw.gov.au ABN: 31 117 341 764

RECEIVED  
 26 FEB 2019

BY: .....

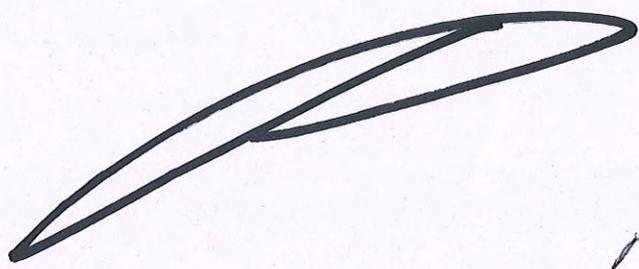
**Tax Invoice**  
 ABN 31 117 341 764

030940

M Collins & Sons Holdings Pty Ltd  
 PO Box 378  
 NARELLAN NSW 2567

**Account No:** 1392.10  
**Page No:** 01  
**Date:** 21/02/2019  
 TAX INVOICE

Date	Invoice	Description	Amount
21/02/2019	53720	Macarthur Road Maintenance GST \$805.51 Annual Contribution Levy as per condition of development consent modified by Department of Planning & Environment on 2 August 2018 - Spring Farm Quarry Extension Extraction commencement date: 18/12/2008 Extraction and Processing Operations extended to 30 June 2021 Invoice period 18/12/18 to 18/12/19 Invoice Total (including GST if applicable)	8860.61         8860.61
Total Value non-taxable supply(s) Total Value taxable supply(s) excluding GST Total GST Payable			0.00 8055.10 805.51
<b>Due Date:</b>		23/03/2019	<b>Amount Due:</b> 8860.61



*my* 06664099

Please detach and send with cheque payment.

**Due Date:**

**Amount Due:**

23/03/2019

8860.61

M Collins & Sons Holdings Pt  
 PO Box 378  
 NARELLAN NSW 2567

**Account No:** INVOICE  
 1392.10 53720



Bill Code: 717405  
 Ref: 1392109

**In Person**

Payments can be made between 8.30am and 5.00pm  
 Monday to Friday at the Oran Park Office, 70 Central Ave,  
 Oran Park, or Camden and Narellan Libraries.  
 or Phone Customer Service: 02 4654 7777

**By Mail**

Send this tear off with your cheque or money order to:  
 Camden Council, PO Box 183,  
 Camden NSW 2570.

**Telephone and Internet Banking - BPAY®**

Contact your bank or financial institution to make this payment  
 from your cheque, savings, debit, credit card or transaction  
 account. For more information visit www.bpay.com.au.

**APPENDIX 5: BOWANTZ ENVIRONMENTAL REPORT 2019**



# ANNUAL REPORT 2018/2019

## BUSH REGENERATION AND ECOLOGICAL RESTORATION

EXISTING SAND AND SOIL EXTRACTION OPERATIONS

Lot 32 DP 635271 & Lot 22 DP 833317

M Collins and Sons (Holdings Pty Ltd)



*Pomaderris sp. Springfarm – Bowantz P/L*

PREPARED BY

Bowantz Bushfire & Environmental Pty Ltd

Bowantz Bushfire & Environmental Pty Ltd

Office: 9 Horsley Road Oak Flats NSW 2529

ABN: 99331245746

Phone: 0415 617 771

E-mail: [Daniel@bowantz.com.au](mailto:Daniel@bowantz.com.au)

Report Compilation and Review	Name and Position	Document Revision	Date
Author:	Daniel Anderson  Grad Cert Bushfire Planning, Grad Dip CLM, Master EnvSc (Planning, Ecology)	Final Draft	8/11/2019
Author:	Romy Brien  BSc (Land and Heritage Management)	Review	19/09/2019
Client Review	Landholders Review Presented to M Collins Representatives for comment	Final Version	8/11/2019

## 1. INTRODUCTION

### 1.1 Background

Spring Farm Quarry is a sand and soil extraction and processing plant owned and operated by M Collins and Sons (Holdings) Pty Ltd (MCS). The Quarry and processing plant currently operate from two lots 22 DP 833317 and 32 DP 635271 located adjacent to the Nepean River in the Camden Local Government Area (LGA) see figure 1 below.

The site has been operational since 1988 and is a major source of products for the Sydney region, comprising a significant resource identified in the Sydney Regional Environmental Plan (No-9 Extractive Industry) (Harvest Scientific Landscape Management Plan 2018).

In May 2009 (MCS) was granted consent for the continuation of operations on the site by the Department of Planning for the continued extraction and processing of materials at the site. This approval was to allow operations to continue for a further 10-year period until 2019 (Harvest Scientific Landscape Management Plan 2018). Director General Requirements for the modification of continued operations were then issued on 23rd December 2010 and included requirements relating to future quarry closure and rehabilitation of the site (Harvest Scientific Landscape Management Plan 2018).

A Landscape Management Plan (LMP) was subsequently developed for the site by Harvest Scientific Services Pty Ltd in 2018 to address the Director General Requirements and to provide a clear practical framework for the restoration of the native vegetation impacted by the activity with accordance to relevant environmental and planning legislation and the operational consents for the site. As such the LMP has been used to provide MCS with clear performance targets, restoration principles, monitoring and maintenance procedures required for the sustainable management of the site and surrounding environments (Harvest Scientific Landscape Management Plan 2018).

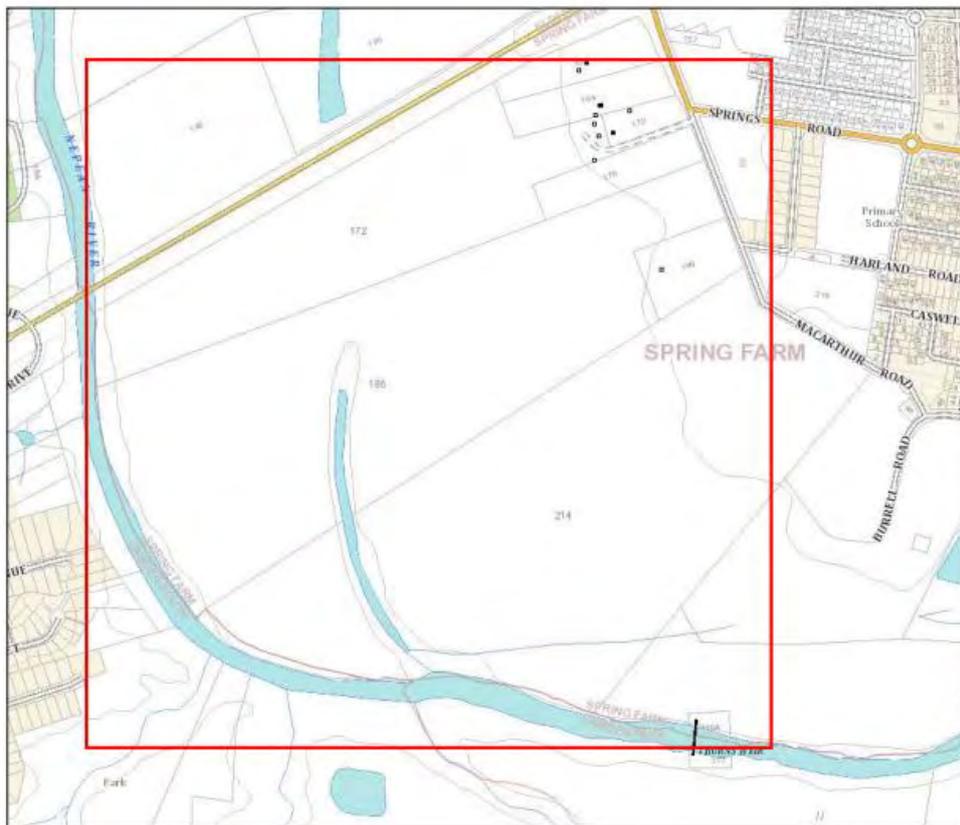
Bowantz Bushfire & Environmental Pty Ltd (BBE) have been engaged by MCS since 2008 to manage and implement the environmental actions and recommendations described for the site within the LMP and other supporting planning documents for the site. Bowantz Bushfire & Environmental is an environmental restoration and environmental planning business, we have professional acumen and skills in ecological restoration works and an ability to integrate on ground practical project delivery with scientific monitoring and condition assessment practice.

This report constitutes a review of the applied restoration program predominantly targeting ecological restoration objectives and outcomes delivered over the most recent 2018-2019 work program.

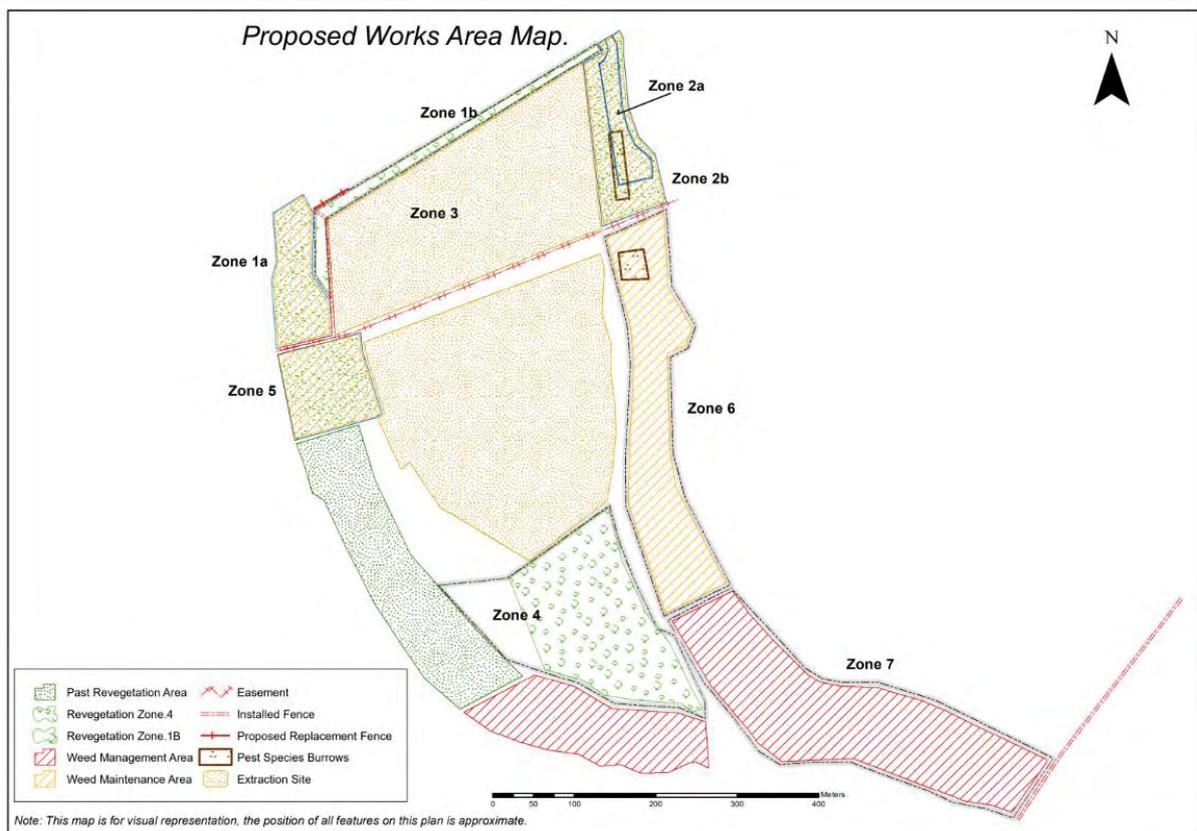
The environmental works program is determined by Bowantz & MCS at the end of an annual audit, assessment and review of key delivery outcomes presented annually within the Bush Regeneration and Ecological Restoration Annual Report. The report also incorporates specific condition assessment reviews of the key restoration zones in line with the original LMP objectives prescribed by Harvest Scientific within the LMP 2016 and adaptive management observation and recommendations presented to the clients in an active and real time paradigm.

The report focusses on specific auditing of outcomes delivered which relate to key restoration objectives and measurable milestones stated for important ecological zones in the LMP and also responds to condition requirements 22 & 24 of the controlled activity approval number 10 ERM2013/0830 issued by the NSW Office of Water under the NSW Water Management Act 2000.

## 2. LOCATION

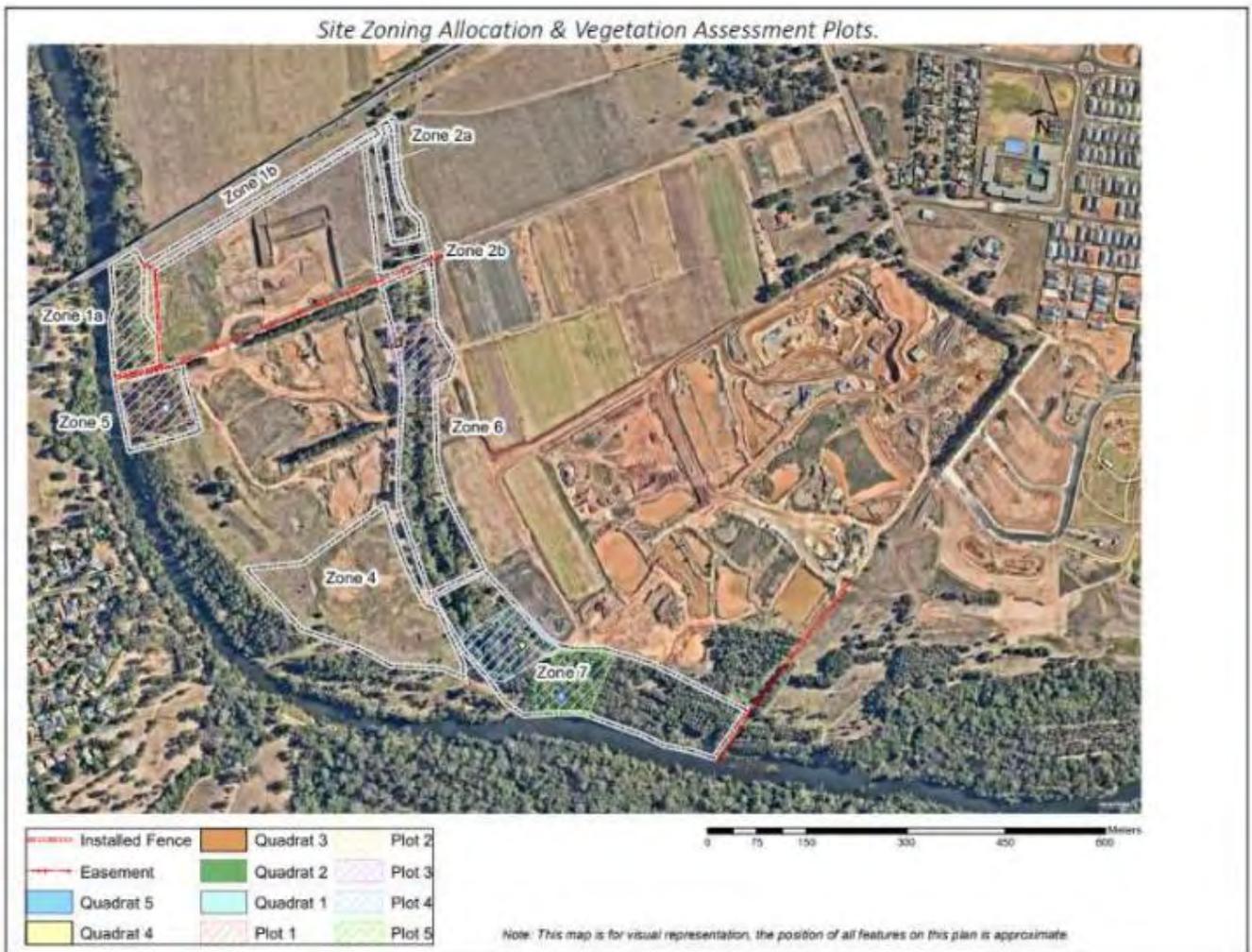


Map 1. Site enclosed within red frame. Six Maps image of site.



Map 2. Project zones (Environmental Management) within the Springfarm Project Site.

### 3. SITE DESCRIPTION AND PROJECT ZONES



Map 3. Map showing site zoning and vegetation assessment plots.

The project site is displayed within the general site area shown above in figure 1 (site location). The project site is bound to the east by Macarthur Road, to the west by the Nepean River, the north by the Camden By-Pass Roadway and to the south again by the Nepean River. Significant areas of environmental and ecological importance within the subject site have been the focus of the restoration works program. The LMP divided the restoration focus areas into four distinct environmental focus zones accordingly:

- Zone 1 – The Nepean River Riparian Corridor
- Zone 2 – The Dry Past River Anabranch
- Zone 3 – Open Paddock Agricultural Production Areas
- Zone 4 – Riparian Linkage Zone

From this segregation our restoration program works have divided the work zones further into zone units which both reflect the vegetation and ecological landscapes intrinsic to each zone and portion the zones into management units incorporating the work activities prescribed.

The restoration work zones devised through the delivery of our program are provided as follows:

### **Zone 1a) Nepean River Corridor**

This area contains remnant vegetation stands previously mapped by Actinotus (2011) as 'Riparian Forest on Coastal Floodplains'. This vegetation complex is now re-addressed as 'River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions' and is recorded as an endangered ecological community under the NSW Threatened Species Conservation Act.

During the 2018/19 environmental program this area was provided with secondary and maintenance weeding of re-emergent invasive weeds and herbaceous annual weeds was carried out.

The objective in this zone is to maintain native vegetation condition and address weed incursion, to protect previous re-vegetation programs and maintain a high condition vegetation and habitat area.

### **Zone 1b) Core Riparian Zone – Nepean River**

This zone is the land contained within and adjacent to important drainage channels. As a follow on from a revegetation program implemented in the year prior, hydro mulch seeding and planting of native forestry tube stock has been implemented in this zone. Periods of weed control have also been completed especially prior to undertaking of direct seeding revegetation (to remove weed seeds and weed competition) and again after direct seeding to promote the success of the desirable plants species.

### **Zone 2a) Dry River Anabranh**

This area contains limited remnant vegetation stands previously mapped by Actinotus (2011) as 'Alluvial Woodland on Coastal Plains'. This vegetation complex is now re-addressed as 'Alluvial Cumberland Plain Woodland' and is recorded as an endangered ecological community under the NSW Threatened Species Conservation Act and under the federal Environmental Protection and Biodiversity Conservation Act.

This area received limited attention during this annual works period. Previous investments in weed control, re-vegetation, surrogate habitat boxes and invasive species pest control have culminated in a reasonable stable landscape condition here. On-going maintenance of the area is advised.

### **Zone 2b) Dry River Anabranh**

This area contains limited remnant vegetation stands previously mapped by Actinotus (2011) as 'Alluvial Woodland on Coastal Plains'. This vegetation complex is now re-addressed as 'Alluvial Cumberland Plain Woodland' and is recorded as an endangered ecological community under the NSW Threatened Species Conservation Act and under the federal Environmental Protection and Biodiversity Conservation Act.

This area received limited attention during this annual works period. Previous investments in weed control, re-vegetation, surrogate habitat boxes and invasive species pest control have culminated in a reasonable stable landscape condition here. On-going maintenance of the area is advised.

### **Zone 3 Future Agricultural Area**

This zone is in the open paddock area between the Dry River Anabranh and the Nepean River Riparian Zone. This area is determined to be used for future agricultural pursuits such as animal grazing.

Weed control to maintain weed spread and contain the spread of invasive species has been undertaken across this zone during the last year.

#### **Zone 4 Riparian Linkage**

This zone links the Nepean River Riparian Corridor and the Dry River Anabranche remnant vegetation corridors. Over the 2018/19 period this zone has undergone primary woody weed treatment. This will assist in the restoration of natural bushland to link key retained remnant stands of vegetation on the subject site.

Strategic re-vegetation using tree plantings and direct seeding will be incorporated into future land management to provide connectivity linkages of habitat and vegetation cover from the river corridor to the internal anabranche corridor.

#### **Zone 5 Nepean River Past Revegetation Zone**

This area contains mostly recreated restored vegetation landscapes which reflect the vegetation assemblage of River-flat eucalypt forest on coastal floodplains. Previous revegetation programs in this zone date the vegetation stands to be approximately 15 years of age, with recent infill plantings delivered by Bowantz to support losses and increase species diversity delivered in 2018.

Primary and secondary weed management programs have been implemented over the 2018/19 period. These aimed to encourage native seedling recruitment and native canopy health. This area functions as an important habitat zone for native fauna populations. Native flora species diversity is important to support high habitat value and create resilience to the site from re-emergent weed pressure. Weed control to remove invasive vines and high-density mid-storey woody weeds have also helped to un-settle bell minor bird populations and thus reduce bell minor die back in adjacent eucalypt forests.

#### **Zone 6 Anabranche Central**

This area contains limited remnant vegetation stands previously mapped by Actinotus (2011) as 'Alluvial Woodland on Coastal Plains'. This vegetation complex is now re-addressed as 'Alluvial Cumberland Plain Woodland' and is recorded as an endangered ecological community under the NSW Threatened Species Conservation Act and under the federal Environmental Protection and Biodiversity Conservation Act.

This zone received an extensive weed control program over the past two years. It has progressed into a restoring bushland zone which contains significant native plant resilience and a great diversity of native plant species. Over the 2018/19 period zone 6 received secondary weed control and maintenance. The recruitment of native seedlings was satisfactory, reducing the need for manual revegetation to be required.

#### **Zone 7 Anabranche South**

This zone offers substantial ecological restoration opportunity due to its connectivity to the Nepean River Riparian Corridor to the south of the zone. Over the 2018-19 program this zone has received extensive and ongoing restoration. Our program identified this zone as a key primary and secondary weed control objective over the 2018-2019 program. The area contains some valuable remnant trees and forms a vegetation transition between the Alluvial Cumberland Plain Woodland 'and the Riparian Forest on Coastal Floodplains.

Broad scale woody weed control, invasive ascending vine control and eradication of African Love Grass by our program has significantly improve the vegetation condition and habitat value of this

zone, in line with conservation and rehabilitation principles promoted to protect threatened plant communities and threatened plant species which occur within this zone.

### 3. SITE CONDITION MONITORING

#### 3.1 Site Ecological Condition Assessments – Field Surveys

A vegetation assessment was conducted on the 12<sup>th</sup> of September 2019, with the objective of assessing the existing ecological condition within the defined zones across the project site and to audit the current and previous ecological management strategies.

The vegetation assessment is undertaken to provide quantitative and qualitative data which can be compared against the same collected data for each location over time / temporal scale. Outcomes and progress can be measured in this scientific and controlled way to provide additional rigour to observed and subjective condition data also collected from the site and presented within the annual report.

The vegetation assessment was carried out in Zones.1a, .5, .6 and .7, observing the existing floral species richness within a delineated plot and recording species abundance and diversity within a randomly designated 10x10m quadrat. An integrated remote sensing and GIS analysis approach was employed to define the assigned vegetation classification of each plot in regard to Tozer et al (2003), occurring within each zone and produce a list of indicative species associated with the existing vegetation assemblage for baseline referencing.

The GIS desktop analysis mapped two (2) separate vegetative assemblage types encountered during the vegetation assessment. 'Riparian Forest' confined to the western end of the project site bordered by the Nepean River represented in Zone 1a and 5, and 'Alluvial Woodland' encompassing the Dry River Anabranch represented by Zone 6 and 7. Both vegetation types fall within 'River Flat Eucalypt Forest on Coastal Floodplains' listed under Schedule 2 of the BC Act (2016).

Spatial data delineating the surveyed plots and quadrat boundaries was obtained through the implementation of GPS systems and records regarding species richness and abundance were recorded by hand on field documents see appendix 6.3 Site vegetation condition assessment sheets.

#### 3.2 Restoration Zones – Condition Audits

##### **Nepean River Zone.1a** (refer plot 2 and respective quadrat)

Prior to the restoration program, this zone was heavily infested by *Ligustrum* spp. and other woody weeds. Dense vegetation in the mid stratum provides nesting sites for the invasive bird species Bell miner (*Manorina melanophrys*) (Stone and Simpson, 2006). Bell miners are insectivorous, territorial birds which have been associated with symptoms of crown decline in the woodlands which they colonise (Loyn et al. 1983). Bell miner associated dieback has the potential to create significant losses in productivity and biodiversity (Clarke & Schedvin 1999). By removing *Ligustrum* spp. and other woody weeds in this zone we have seen an increase in native canopy health (refer plot 2 field survey).

Improved health in this zone can also be correlated with the control of the invasive vine species *Cardiospermum grandiflorum*. *Cardiospermum grandiflorum* smothers native canopy reducing photosynthesis in native understory plants and allowing for the colonisation of more resistant weed species (Osunkoya et al, 2010). *Cardiospermum grandiflorum* is considered a transformer species as it can change the ecology of an area (Biocontrol of priority environmental weeds in NSW, 2019).

By controlling *Cardiospermum grandiflorum* and other woody weeds in this zone we have improved canopy health and assisted in the resilience of the native understory. This is evident by the increased recruitment on the native shrub *Melicytus dentatus* and the native vine *Pandorea pandorana*, along with improved species richness in the ground layer through herbs and grasses.

#### **Nepean River Zone.5** (refer plot 1 and respective quadrat)

Prior to the primary and secondary weed maintenance program implemented over the past two years, this zone had a high density of annual weed species in the ground stratum, woody weeds in the mid stratum and invasive vine spp. in the upper stratum. The overall health of this zone was in decline.

By controlling the invasive vine spp. in this zone we have strengthened the native understory's ability to photosynthesise and compete with invasive spp. (Osunkoya et al, 2010). The control of the woody weeds in the mid stratum of this zone, removes suitable habitat for the destructive bird spp. Bell miner (*Manorina melanophrys*), resulting in the improved health of the native canopy (Stone and Simpson, 2006). This means that large mature eucalypts that were visually in decline and becoming senescent have responded positively and are showing new growth and vitality.

The improvements in the health of the zone are evident by the increased native canopy health and cover and increased recruitment of native ground covers such as *Oplismenus ameuulus* and *siegesbeckia orientalis*.

#### **Dry River Anabranche Zone.6** (refer plot 3 and respective quadrat)

We have noted an improvement in the health of this zone over the past year (ref appendix data). After a flood event in 2017 left the zone vulnerable to the recruitment of the invasive grass *Eragrostis curvula* and other invasive weed species, careful planning and restoration was necessary. The overall health of the zone is remaining stable, with the native bush mostly outcompeting non-native species, in areas where previous weed control has been contributed.

The annual field survey in this zone recognised a significant increase in the native grass *Austrostipa ramosissima*. *Austrostipa ramosissima* has a positive effect on its surrounding environment as it assists in excluding weed species in the area (Jacobs and Everett, 2016). *Austrostipa ramosissima* can also positively influence the broader ecology of the area as it provides refuge for small reptiles and encourages seed eating birds (Everett et al. 2009).

#### **Dry River Anabranche Zone.7** (refer plot 4 & 5 and respective quadrats)

This zone had a high density of the invasive vine species *Cardiospermum grandiflorum*. *Cardiospermum grandiflorum* had climbed into the Eucalypt canopy forming a dense cover. This cover affects the health of the native canopy (Osunkoya et al, 2010) and excludes light from the understory. It is considered a transformer species as its ability to smother natives and exclude light can change the ecosystem and create an opportunity for other invasive species to colonize the forest floor (Biocontrol of priority environmental weeds in NSW, 2019). The removal of *Cardiospermum grandiflorum* will have a positive effect on overall ecosystem processes and the native plant community (Bulletin OEPP, 2017).

*Pomaderris brunnea* is listed as Vulnerable under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 and the NSW Threatened Species Conservation Act 1995. It is endemic to south eastern Australia, with only sixteen populations recorded. This site has the largest population of *Pomaderris brunnea* recorded anywhere in the region (Sutter, 2011).

The invasion of *Olea europaea* subsp. *Africana* is listed as one of the major threats to *Pomaderris brunnea*. After the removal of this invasive species by our program we have seen an improvement in the health of *Pomaderris brunnea* in this zone. Maintaining a healthy population of *Pomaderris brunnea* fulfils the requirements of the landholders under the NSW Threatened Species Conservation Act 1995 (TSC Act). As the objectives of the TSC Act are; to promote the recovery of threatened spp., to eliminate certain processes that threaten the survival of the threatened spp. and to protect the critical habitat of the threatened spp.

This zone has an ongoing program to remove the high prevalence of *Ligustrum* spp. and *Olea europaea* subsp. *Africana*. These mid stratum spp. provide suitable nesting sites for the destructive bird spp. Bell miner (*Manorina melanophrys*) (Stone & Simpson, 2006). Bell miners are associated with dieback of *Eucalypt* spp. as they increase the prevalence of leaf damaging psyllids in eucalypt tree crowns, significantly threatening the health of the tree (Clarke & Schedvin, 1999). The removal of suitable habitat for Bell miners allows for other insectivorous bird spp. to eat the leaf damaging psyllids resulting in the recovery of tree health (Loyn et al., 1983).

#### 4. CONCLUSIONS

This report provides an accurate account and evaluation of the delivery of key restoration work activities prescribed for the 2018-2019 reporting period. Bowantz Bushfire & Environmental were commissioned by (MCS) to undertake the site environmental restoration works program and produce a robust monitoring and evaluation program culminating in the provision of this report accounting for the progress of the program. The report also includes a review of the current status and environmental condition of restoration project zones as of September 2019.

The site restoration works programs have been guided by the objectives and outputs documented within the Landscape Management Plan (LMP) produced for the subject site by Harvest Scientific Services in 2016 and adaptive management observation and recommendations presented to the clients in an active and real time paradigm by Bowantz Bushfire & Environmental since 2009.

The environmental restoration objectives over the past year have focused on improving native vegetation health and creating a self-sustaining ecosystem in areas of high condition. Other key focuses have been the rehabilitation and re-establishment of structural vegetation in areas recently impacted by extraction operations and ongoing control of invasive pest and plant species as required under the NSW Biosecurity Act and associated regulations.

All restoration activities have been carried out in accordance with the LMP 2018.

## 5. REFERENCES

- Actinotus 2012, 'Flora and Fauna Assessment for proposed Sand and Soil Extraction at Lot 32 DP 635271 Macarthur Road Spring Farm'.
- Biocontrol of priority environmental weeds in NSW 2019. *Balloon vine - Biocontrol of priority environmental weeds in NSW*. [online] Available at: <https://research.csiro.au/nswweeds/balloon-vine> [Accessed 18 Sep. 2019].
- Bulletin OEPP 2017, 'Cardiospermum grandiflorum', *Bulletin OEPP EPPO Bulletin*, vol. 47, no. 3, pp 526-530.
- Clarke, F.C. & Schedvin, N 1999, 'Removal of bell miners *Manorina melanophrys* from *Eucalyptus radiata* forest and its effect on avian diversity, psyllids and tree health', *Biological Conservation*, vol. 88, pp. 111–120.
- Everett, J., Jacobs, S.W.L. & Nairn, L. 2009, 'Austrostipa, Flora of Australia', Poaceae 2, vol. 44A Melbourne: ABR/CSIRO Australia.
- Harvest Scientific Services 2016; Landscape Management Plan Lot 32 DP 635271, Lot 22 DP 833317 Macarthur Road Spring Farm.
- Harvest Scientific Services 2018; Landscape Management Plan Lot 32 DP 635271, Lot 22 DP 833317 Macarthur Road Spring Farm.
- Jacobs, S. and Everett, J. 2016, *Austrostipa ramosissima - Growing Native Plants*. [online] Anbg.gov.au. Available at: <https://www.anbg.gov.au/gnp/trainees-2016/austrostipa-ramosissima.html> [Accessed 18 Sep. 2019].
- Loyn, R.H., Runnals, R.G. & Tyers, J 1983, 'Territorial bell miners and other birds affecting populations of insect prey', *Science*, vol. 221, pp. 1411–1412.
- NSW Biosecurity Act 2015, Part 3 Priority Weeds NSW Department of Primary Industries, Greater Sydney Local Land Services.
- NSW Biodiversity Conservation Act 2016; Schedule 1 Threatened Species, Schedule 2 Threatened Ecological Communities & Schedule 4 Key Threatening Processes.
- NSW Office of Water Controlled Activity Approval; Statement of Approval Number 10ERM2013/0830
- NSW Water Management Act 2000; Guidelines for Riparian Corridors on Waterfront Land.
- Osunkoya, O, Bayliss D, Panetta, F & Vivian-Smith, G 2010, 'Variation in ecophysiology and carbon economy of invasive and native woody vines of riparian zones in south-eastern Queensland', *Austral Ecology*, vol. 35, no. 6, pp.636-649.
- Sutter, G 2011. 'National Recovery Plan for Rufous Pomaderris (*Pomaderris brunnea*)'. Department of Sustainability and Environment, East Melbourne.
- Stone, C & Simpson, J 2006, 'Eucalyptus saligna crown decline', *Cunninghamia*, vol. 9, no. 4, pp. 507-520.

## 6. APPENDIX

### 6.1. Table 1. Tasks delivered across the 2018-2019 works program

Output - Task	Units	Ecological Validation	Delivery Period
Vertebrate Pest – Vermin Monitoring Program.	Entire Site.	Monitoring cameras were set up in key locations to observe fauna activity over the year.	August 2018 to June 2019
Air quality monitoring	Batching area and Zone 1a.	Bowantz Bushfire & Environmental was engaged to help with undertaking of the dust monitoring program, to ensure sediment particulates are not excessively mobilised to become airborne.	September 2018
Monitoring of nesting / habitat boxes	Zone 1b Zone 2a	To support objectives of improving habitat value nesting / habitat boxes were installed in strategic bushland locations to provide surrogate habitat for local animal populations. These boxes were monitored for signs of habitation/use.	October 2018 February 2019 May 2019 August 2019
Weed Control -Primary Eradication	Zone 1b – Riparian corridor Zone 2a/2b – Dry River Anabranh Zone 7 - Anabranh South  ....	Weed control for the purpose of regenerating bushland areas and recreation of bushland areas. Improving the health and resilience of native bushland areas into the future.  .	November 2018 December 2018 January 2019 March 2019 April 2019 May 2019 June 2019 July 2019 August 2019
Weed Control – Secondary	Zone 1A – Nepean River Riparian Corridor Zone 5 – Nepean River Past Revegetation zone. Zone 6 – Anabranh Central Zone 7 - Anabranh South	Refer section 5.10 of the LMP (pg.18) Weed control for the purpose of regenerating bushland areas and recreation of bushland areas. Improving the health and resilience of native bushland areas into the future.  .	December 2018 January 2019 April 2019 July 2019 August 2019
Weed Control – Maintenance	Area 1B – Nepean River Riparian Corridor.	Weed control for the purpose of regenerating	January 2019 February 2019 July 2019

	Zone 2a) and 2b – Dry River Anabranch. Zone 6 – Anabranch Central.	bushland areas and recreation of bushland areas. Improving the health and resilience of native bushland areas into the future. .	August 2019
Seed Collection from established native plants.	Entire site.	Propagation of 1,200 forestry tubes of variant species grown and replanted to the site from locally collected seed sources.	
Revegetation.	Zone 2b and Zone 4.	The revegetation program will consist of appropriate mixes of canopy, mid-storey and ground cover plant species from the suggested species list. Tubestock is currently being grown at Wollondilly Community Nursery.	
Hydro-mulching – direct seeding.	Zone 1b – Nepean River Riparian corridor Zone 3 – Future agricultural area Zone 4 – Riparian Linkage	A mixture of native grasses, sedges, herbs and ground covers have been revegetated through direct seeding.	February 2019
Watering	Zone 1b – Nepean River Riparian Corridor Zone 4 – Riparian Linkage	Watering of revegetated areas and hydro-mulched areas was carried out to increase success rates of native plant growth.	April 2019 June 2019
General Maintenance of site.	Weed control undertaken around service roads, service areas and roadside.	To ensure compliance with the LMP (2018), Bowantz works to reduce non-native plant spp. invasion across the site at Camden. A 600L quick spray unit is often used, targeting weed spp. such as <i>Sisymbrium officinale</i> and <i>eregrastis curvula</i> .	January 2019 February 2019 May 2019

Table 1. Projects delivered across the 2018-2019 works program

6.2. Table 2: Restoration Zone Progress Reporting

Report Objective/ Section/ Statement	Progress (completed, not completed, in progress)	Comments (Alternatives, Additional Information required)
<b>Zone 1: Nepean River Riparian Corridor</b>		
<b>Zone 1a (restore existing vegetation) Completed</b>		
<ul style="list-style-type: none"> <li>• Secondary Weed Control</li> <li>• Monitoring of habitat nesting boxes zone 1a) Four (4) boxes</li> <li>• Watering</li> <li>• Restore natural species composition and structures</li> </ul>	<p>Secondary weed control undertaken July 2019</p> <p>Monitoring of habitat nest boxes (4) January 2019, February 2019, July 2019, August 2019.</p> <p>Maintenance and monitoring of vegetation in this site across the 2018/19 period were carried out to ensure continued ecosystem improvement and health.</p> <p>Water tanks and irrigation lines utilised to water revegetation area May 2019</p>	<p>Weed eradication tasks led to the eradication of well-established privet forests which were impacting vegetation diversity and native vegetation proliferation within this zone.</p> <p>A long-established population of cat's claw creeper vine which had caused death to several native canopy trees has been eradicated.</p> <p>Monitoring of Habitat nesting boxes has shown an average of 60% habitation/use.</p> <p>The revegetation program initiated &amp; completed in July 2018 was watered and maintained through the dry conditions of the 2018/19 period.</p> <p>Continued maintenance of this zone is recommended to ensure bushland health is maintained.</p>
<b>Zone 1b Restore natural species composition - ongoing</b>		
<ul style="list-style-type: none"> <li>• Restore natural species composition and structures</li> </ul>	<p>Monitoring and maintenance of revegetation on the corner embankment of Zone 1 b) (hydro-</p>	<p>The first layer of native vegetation has emerged creating a substratum in which following native</p>

<ul style="list-style-type: none"> <li>• Revegetation to stabilise soil banks and batters</li> </ul>	<p>mulched with locally sourced native plant seed material).</p>	<p>bushland species can emerge.</p> <p>Continued maintenance of this site is recommended to ensure successful revegetation of site in accordance with the LMP.</p>
<p><b>Zone 5: Nepean River Past Revegetation Zone Complete</b></p>		
<ul style="list-style-type: none"> <li>• Primary Weed Control</li> <li>• Secondary Weed Control</li> <li>• Monitoring of habitat nesting boxes zone 5) Two (2) boxes</li> <li>• Restore natural species composition and structures</li> <li>• Watering &amp; Maintenance</li> </ul>	<p>Primary weed control of key problem weeds (<i>notably Cardiospermum grandiflorum, Eragrostis curvula and Ligustrum lucidum</i>) has continued July 2019</p> <p>Secondary weed control undertaken January 2018 and May 2018</p> <p>Monitoring of habitat nesting boxes (2) January 2019, February 2019, July 2019, August 2019.</p> <p>Water tanks and irrigation lines were used to support the watering of this revegetation zone.</p>	<p>Weed eradication tasks led to the eradication of well-established privet forests which were impacting vegetation diversity and native vegetation proliferation within this zone.</p> <p>Thickets of Ligustrum spp. and ascending invasive vine spp. were directly impacting the success of previously established native canopy trees, both creating enormous competition for water and nutrients within the sub-soil. This pressure has been removed through weed control.</p> <p>Monitoring of Habitat nesting boxes has shown an average of 60% habitation/use.</p> <p>Plant predation on revegetation area by wallabies, rabbits and wombats has impacted on revegetation success and may need further monitoring / intervention.</p>
<p><b>Zone 2: Dry River Anabranh</b></p>		
<p><b>Zone 2a (regenerate existing vegetation) Complete</b></p>		

<ul style="list-style-type: none"> <li>• Application of bush regeneration techniques</li> <li>• Weed Management</li> <li>• Monitoring of habitat nesting boxes zone 2a) Four (4) boxes</li> <li>• Watering &amp; Maintenance</li> </ul>	<p>Selective weed control, the structural management of vegetation (through under pruning of limbs, cutting / removal of dead material) and watering of native plants (tube stock) are activities which have contributed to bush regeneration within this zone. April August 2018 – August</p> <p>Weed maintenance has been a focus in this zone over the 2018-2019 program. Re-emergent woody weeds, invasive vines and invasive grasses have been controlled through manual weeding and spraying techniques.</p> <p>Monitoring of habitat nest boxes (4) January 2019, February 2019, July 2019, August 2019.</p> <p>Revegetation planting watered and monitored. Water tanks and irrigation lines used in the watering of this revegetation zone. August 2018, July 2019</p>	<p>Low rainfall events across the 2018 – 2019 works program led to an inability to undertake replacement planting.</p> <p>Replacement plantings are programmed for the 2019 – 2020 works program, however this undertaking will be incorporated only when suitable rainfall is forecast or occurs to trigger the process.</p>
<p><b>Zone 2b Complete</b></p>		
<ul style="list-style-type: none"> <li>• Application of bush regeneration techniques</li> <li>• Weed Management</li> </ul>	<p>Selective weed control, the structural management of vegetation (through under pruning of limbs,</p>	<p>The spread on invasive dry land exotic grass species became a prevalent issue for the management of this zone over the reporting</p>

<ul style="list-style-type: none"> <li>• Restore natural species composition and structures</li> <li>• Watering &amp; Maintenance</li> <li>• Post extraction areas will commence upon completion of final land form levels.</li> </ul>	<p>cutting / removal of dead material) and maintenance weed controls have contributed to restoring zone 2b.</p> <p>Secondary weed control targeting the eradication <i>Olea europaeae ssp. Africana, Eragrostis curvula</i> and <i>Acetosa sagittaria</i> was delivered July 2019.</p> <p>Revegetation in this zone has been watered and monitored across the 2018-2019 program.</p>	<p>period. Species such as <i>Eragrostis curvula</i> (Love Grass) and <i>Nassella neesiana</i> (Chilean needle grass) were targeted for our weed control activities with repetitive spraying of infested areas.</p> <p>Prolonged drought periods and heavy predation on the plants by local rabbits and wallabies have reduced the success of the planting in this zone.</p> <p>Replacement plantings are programmed for the 2019 – 2020 works program, however this undertaking will be incorporated only when suitable rainfall is forecast or occurs to trigger the process.</p>
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**Zone 3: Future Agricultural Area Complete/ongoing**

<ul style="list-style-type: none"> <li>• Hydro-mulching</li> <li>• Watering of Hydro-mulched area</li> </ul> <p>Above tasks completed</p>	<p>A mixture of native grasses, sedges, herbs and ground covers have been revegetated through direct seeding (hydro-mulching). February 2019</p> <p>Watering of Hydro-mulched zone April 2019 and ongoing.</p>	<p>Native grasses propagated through hydro-mulching have been successful. These provide the substrate for native sedges, herbs and ground covers to emerge.</p>
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**Zone 4: Riparian Linkage (non-agricultural production area) Complete/ongoing**

<ul style="list-style-type: none"> <li>• Hi- volume – broad area herbicide spraying weed control across fallow surfaces.</li> <li>• Direct seeding of native plants via hydro mulching methods</li> </ul>	<p>Hi-volume herbicide applications of selective herbicides was used to control emerging annual and perennial weeds. January 2019</p>	<p>This project zone contains landscape areas with vastly differing natural vegetation conditions. Southern portions of the zone have established well as recreated natural vegetation habitats. These</p>
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<ul style="list-style-type: none"> <li>• Watering &amp; Maintenance</li> <li>• Maintenance Weeding</li> </ul>	<p>Direct seeding of native endemic plants through hydro mulching. February 2019</p>	<p>areas were prioritised for ongoing bush regeneration style weed control efforts.</p> <p>Central and northern landscape areas within this zone will require ongoing maintenance weed control to manage emerging annual and perennial weeds which proliferate within the open stretches of reconfigured recreated areas.</p>
<b>Zone 6: Anabranch Central Complete</b>		
<ul style="list-style-type: none"> <li>• Maintenance Weed Control</li> </ul>	<p>Successful bush regeneration techniques employed over the 2017-2018 works program resulted in minimal re-emergence of invasive weed spp.</p> <p>Maintenance and monitoring of this zone were carried out to ensure prolonged health of the zone. August 2019</p>	<p>Revegetation was considered unnecessary in this zone as there is a dominance (&gt;90%) of native native species.</p> <p>The recruitment of the native grass <i>Austrostipa ramosissima</i> has assisted in excluding weed species into this zone.</p>
<b>Zone 7: Anabranch South Ongoing</b>		
<ul style="list-style-type: none"> <li>• Application of bush regeneration techniques</li> <li>• Extensive Weed Management (Primary Weed Control)</li> </ul>	<p>An extensive primary weed control program has been implemented in this zone. The key problem weeds in this zone are being targeted; <i>Ligustrum</i> spp., <i>Olea europaea</i> subsp. <i>Africana</i>, <i>Cardiospermum grandiflorum</i> and <i>Eragrostis curvula</i>. March 2019 – August 2019</p>	<p>A holistic approach to weed control involving heavy primary weed eradication work to encourage natural regeneration in this area is ongoing.</p>

Table 2. Restoration Zone Progress Reporting as at September 2019

6.3. Field surveys of each plot and follow up photos.

- Surveys conducted in the field 11/09/19.

## DECCW VEGETATION FIELD SURVEY FORM

### Module 1 (Minimum requirements)

Location

Reveg area, Collins

Date	12.09.19	Plot ID.	022	Plot no.	1	Recorders	Jake Proust, Romy Brien
AMG grid reference	zone 54 55 (56)	datum GDA 56	Easting	Northing	Position in quadrat		
Base plot size	10/10	Orientation of 0.1ha plot	marked	yes (no)	photo # / orientation	SW	

### Structure & composition (within 0.04 ha quadrat)

Keith class		Confidence: high mod low N.A.
Regional veg class (BVT)	River flat Euc Forest coastal Floodplain	Confidence: high (mod) low N.A.
BioMetric type (or NVCA)		Confidence: high mod low N.A.
Other:		Confidence: high mod low N.A.

### NVIS level V (within 0.04 ha quadrat)

Stratum	Growth form	Species name	Cover	Abund.	For the entire	Field
Upper	Tree	Eucalyptus ampifolia	10%		Upper stratum	
Upper	Tree	Angophora costata	50%		Height to crown (m)	
Upper	Tree	Corymbia gummifera	25%		min mode max	
Mid	Shrub	Meliccytus dentatus	30%		Mid stratum	
Mid					Height to crown (m)	
Mid					min mode max	
Ground	Grass	Microlaena stipoides	50%		Ground stratum	
Ground	Herb	Siegesbeckia orientalis	30%		Height to crown (m)	
Ground	Herb	Oplismenus amoenus	20%		min mode max	

Growth form: T=tree, M=mallee tree, S=shrub, Y=mallee shrub, Z=heath shrub, C=chenopod shrub, G=tussock grass, H=hummock grass, D=sod grass, V=sedge, R=rush, E=fern

Cover: 0-1, 1.2, 3, 4, 5, 10, 15, 20, 25, 30, 35, etc. Abundance: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100, 500, 1000, >1000

# DECCW VEGETATION FIELD SURVEY FORM

Site no. 1

## Condition

	(within 0.04 ha)					(within 0.1 ha quadrat)			
	Upper stratum	Mid stratum	Ground stratum Grasses	Ground stratum Shrubs	Ground stratum Other	Cover %			
<b>Native richness</b>	mod	low	mod	mod	-	Litter		<b>No. trees with hollows</b>	Nil
<b>Native cover</b>	100%					<b>Bare ground</b>		<b>Woody debris</b> lineal metres	heavy
<b>Exotic cover</b>	-	-	-	-	-	<b>Cryptogam</b>		<b>Woody regeneration</b> No. upper stratum sp. & abundance.	

(within 0.1 ha quadrat)

<b>Woody stem-sizes (DBH)</b> (tally within category)	≥ 5–	≥ 10–	≥ 20–	≥ 30 cm DBH	
	< 10	< 20	< 30	measure all	
(or, measure all ≥ 5cm DBH)					
<b>Tree health</b>	no evidence	branchlets dead	small branches dead	main branches dead	trees dead

## Landuse and landcover

<b>Age structure</b>	early regeneration	advanced regeneration	uneven age	mature	senescent	
<b>Landuse (dominant)</b>	nature conservation	travelling stock route	forestry	grazing	cropping	other:
<b>Landcover (upper stratum)</b>	none	native	environmental planting	native plantation	exotic other:	
<b>Landcover (ground stratum)</b>	none	native	environmental planting	native plantation	exotic other:	

## Site history

	Freq. code	Age code	Land manager survey: categories, quantities, comments			
Grazing management			not grazed	set stocked	rotational / cell grazing	
Farming			none	direct drill	disc plough tyned implement	mouldboard rotary hoe
Erosion control			none	contour cultivation	mulching banks	other
Pasture improvement rates (fertiliser) kg/ha			none	<125	125–250	>250
Pasture improvement rates (lime/dolomite) t/ha			none	<2	2–4	4–7 >7
Timber extraction (incl. firewood)						

Site history, continued

	Freq. code	Age code	Land manager survey: categories, quantities, comments
Regrowth management			
Weed control	3	3yrs	Primary weed control completion
Pest animal control			
Burning			
Other			

Frequency: 0=no record, 1=rare (>5yrs), 2=occasional (2-5yrs), 3=frequent (<2yrs) Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Plot disturbance

	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood collection			
Grazing	3	R	Impacted by herbivory (rabbits, wallabies)
Fire damage			
Storm damage			
Other	3	R	Previously impacted by extensive weed infestation.

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Focal taxa

(e.g. disturbance sensitive spp., ROTAPS, etc. within 0.04 ha quadrat)

Stratum	Growth form	Field name	Species name	Cover	Abund.	Field no.	RBG no.
M	T	Banksia	Banksia Integrifolia	L	L		
M	shrub	Tree violet	Meliccytus dentatus	L	L		

Physiography

Morphological Type	Riverine Sediments	Landform Element	Riparian	Landform Pattern	Microrelief
Lithology	depositional	Soil surface Texture		Soil Colour	Dark rich loam
Slope	negligent	Aspect	stn west	Site drainage	low
				Distance to nearest water and type	50m River





Image 1. Plot 1, Zone 5. July 2018



Image 2. Plot 1, Zone 5. September 2019

## DECCW VEGETATION FIELD SURVEY FORM

### Module 1 (Minimum requirements)

#### Location

			Survey code	Plot no.	Recorders		
Date	12.9.19	Plot ID.	030	2	Jake Proust, Romy Brien		
AMG grid reference	zone 54 55 (56)	datum GDA	Easting		Northing		Position in quadrat
Base plot size	10x10	Orientation of 0.1ha plot		marked	yes (no)	photo # / orientation	SW

#### Structure & composition (within 0.04 ha quadrat)

Keith class		Confidence: high mod low N.A.
Regional veg class (BVT)	River Flat Euc Forest	Confidence: high mod low N.A.
BioMetric type (or NVCA)		Confidence: high mod low N.A.
Other:		Confidence: high mod low N.A.

#### NVIS level V (within 0.04 ha quadrat)

Stratum	Growth form	Species name	Cover	Abund.	For the entire			Field
Upper	T	Eucalyptus viminalis	35%		Upper stratum			
Upper	T	Eucalyptus elata	25%		Height to crown (m)			
Upper	T	Casuarina cunninghamiana	10%		min	mode	max	
Mid	S	Meliccytus dentatus	15%		Mid stratum			
Mid	V	Pandorea pandorana	15%		Height to crown (m)			
Mid					min	mode	max	
Ground	G	Anurostipa ramosissima	50%		Ground stratum			
Ground	G	Microlaena stipoides	20%		Height to crown (m)			
Ground					min	mode	max	

Growth form: T=tree, M=mallee tree, S=shrub, Y=mallee shrub, Z=heath shrub, C=chenopod shrub, G=tussock grass, H=hummock grass, D=sod grass, V=sedge, R=rush, E=fern  
 Cover: 0-1, 1, 2, 3, 4, 5, 10, 15, 20, 25, 30, 35, etc. Abundance: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100, 500, 1000, >1000

# DECCW VEGETATION FIELD SURVEY FORM

Site no. 2

## Condition

(within 0.04 ha)	Upper stratum	Mid stratum	Ground stratum Grasses	Ground stratum Shrubs	Ground stratum Other	Cover %	(within 0.1 ha quadrat)	
Native richness	Mod	low	low	low	-	Litter	No. trees with hollows	Y
Native cover	80%					Bare ground	Woody debris lineal metres	heavy
Exotic cover	-	-	-	-	-	Cryptogam	Woody regeneration No. upper stratum sp. & abundance.	moderate

(within 0.1 ha quadrat)

Woody stem-sizes (DBH) <small>(all within category) (only within category)</small>	≥ 5- <10	≥10- <20	≥20- <30	≥30 cm DBH measure all	
(or, measure all ≥5cm DBH)					
Tree health	no evidence	branchlets dead	small branches dead	main branches dead	trees dead

## Landuse and landcover

Age structure	early regeneration	advanced regeneration	uneven age	mature	senescent	
Landuse (dominant)	nature conservation	travelling stock route	forestry	grazing	cropping	other: <u>Revegetation</u>
Landcover (upper stratum)	none	native	environmental planting	native plantation	exotic other:	
Landcover (ground stratum)	none	native	environmental planting	native plantation	exotic other:	

## Site history

	Freq. code	Age code	Land manager survey: categories, quantities, comments			
Grazing management			not grazed	set stocked	rotational / cell grazing	
Farming			none	direct drill	disc plough tynd implement	mouldboard rotary hoe
Erosion control			none	contour cultivation	mulching banks	other
Pasture improvement rates (fertiliser) kg/ha			none	<125	125-250	>250
Pasture improvement rates (lime/dolomite) t/ha			none	<2	2-4	4-7 >7
Timber extraction (incl. firewood)						

Site history, continued

	Freq. code	Age code	Land manager survey: categories, quantities, comments
Regrowth management			
Weed control	3	3yrs	woody weed control complete
Pest animal control			
Burning			
Other			

Frequency: 0=no record, 1=rare (>5yrs), 2=occasional (2-5yrs), 3=frequent (<2yrs) Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Plot disturbance

	Severity code	Age code	Observational evidence:
Clearing (inc. logging)	3	R	woody weed control
Cultivation (inc. pasture)			
Soil erosion	3	R	Flooding, high erosion on banks
Firewood collection			
Grazing			
Fire damage			
Storm damage			
Other	1	R	low weed infestation

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Focal taxa

(e.g. disturbance sensitive spp., ROTAPS, etc. within 0.04 ha quadrat)

Stratum	Growth form	Field name	Species name	Cover	Abund.	Field no.	RBG no.

Physiography

Morphological Type Riverine sediments	Landform Element Riparian	Landform Pattern	Microrelief
Lithology Depositional	Soil surface Texture	Soil Colour Dark rich silt	Soil Depth
Slope	Aspect	Site drainage	Distance to nearest water and type 100m





Image 3. Plot 2, Zone 1a. July 2018



Image 4. Plot 2, zone 1a. September 2019

# DECCW VEGETATION FIELD SURVEY FORM

## Module 1 (Minimum requirements)

### Location

		Survey code		Plot no.	Recorders		
Date	12.9.19	Plot ID.		3	Jake Proust, Romy Brien		
AMG grid reference	zone 54 55 (56)	datum ADA	Easting		Northing		Position in quadrat
Base plot size	10x10m	Orientation of 0.1ha plot		marked	yes no	photo # / orientation	SW

### Structure & composition (within 0.04 ha quadrat)

Keith class		Confidence: high mod low N.A.
Regional veg class (BVT)	River Flat Euc Forest, <sup>coastal</sup> floodplain	Confidence: (high) mod low N.A.
BioMetric type (or NVCA)		Confidence: high mod low N.A.
Other:		Confidence: high mod low N.A.

### NVIS level V (within 0.04 ha quadrat)

Stratum	Growth form	Species name	Cover	Abund.	For the entire			Field
Upper		Eucalyptus baueriana		15%	Upper stratum			
Upper		Casuarina cunninghamiana		5%	Height to crown (m)			
Upper		Eucalyptus viminalis		40%	min	mode	max	
Mid		Melicytus dentatus		40%	Mid stratum			
Mid		Bursaria spinosa		10%	Height to crown (m)			
Mid		Melia azedarach		5%	min	mode	max	
Ground		Enardia hastata		10%	Ground stratum			
Ground		Austrostiper ramosissima		40%	Height to crown (m)			
Ground		Microlaena stipoides		30%	min	mode	max	

Growth form: T=tree, M=mallee tree, S=shrub, Y=mallee shrub, Z=heath shrub, C=chenopod shrub, G=tussock grass, H=hummock grass, D=sod grass, V=sedge, R=rush, E=fern  
 Cover: 0-1,1,2,3,4,5,10,15,20,25,30,35, etc. Abundance: 1,2,3,4,5,6,7,8,9,10,20,50,100,500,1000,>1000

# DECCW VEGETATION FIELD SURVEY FORM

Site no. 3

## Condition

(within 0.04 ha)	Upper stratum	Mid stratum	Ground stratum Grasses	Ground stratum Shrubs	Ground stratum Other	Cover %	(within 0.1 ha quadrat)			
Native richness	High	mod	mod	mod			Litter		No. trees with hollows	
Native cover	100%	100%	30%		40%		Bare ground		Woody debris lineal metres	
Exotic cover			10%				Cryptogam		Woody regeneration No. upper stratum sp. & abundance.	

(within 0.1 ha quadrat)

Woody stem-sizes (DBH) (tally within category)	≥ 5- <10	≥10- <20	≥20- <30	≥30 cm DBH measure all	
(or, measure all ≥5cm DBH)					
Tree health	no evidence	branchlets dead	small branches dead	main branches dead	trees dead

## Landuse and landcover

Age structure	early regeneration	advanced regeneration	<u>uneven age</u>	mature	senescent	
Landuse (dominant)	nature conservation	travelling stock route	forestry	grazing	cropping	other:
Landcover (upper stratum)	none	<u>native</u>	environmental planting	native plantation	exotic other:	
Landcover (ground stratum)	none	<u>native</u>	environmental planting	native plantation	exotic other:	

## Site history

	Freq. code	Age code	Land manager survey: categories, quantities, comments			
Grazing management			<u>not grazed</u>	set stocked	rotational / cell grazing	
Farming			<u>none</u>	direct drill	disc plough tynd implement	mouldboard rotary hoe
Erosion control			none	<u>contour cultivation</u>	mulching banks	other
Pasture improvement rates (fertiliser) kg/ha			<u>none</u>	<125	126-250	>250
Pasture improvement rates (lime/dolomite) t/ha			<u>none</u>	<2	2-4	4-7 >7
Timber extraction (incl. firewood)						

Site history, continued

	Freq. code	Age code	Land manager survey: categories, quantities, comments
Regrowth management			
Weed control		6yrs	weed control, suppression of ground cover
Pest animal control			
Burning			
Other			

Frequency: 0=no record, 1=rare (>5yrs), 2=occasional (2-5yrs), 3=frequent (<2yrs) Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Plot disturbance

	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood collection			
Grazing			
Fire damage			
Storm damage			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Focal taxa

(e.g. disturbance sensitive spp., ROTAPS, etc. within 0.04 ha quadrat)

Stratum	Growth form	Field name	Species name	Cover	Abund.	Field no.	RBG no.
			Metalenca spp.				
			*Increased diversity of grounds + shrub strata				

Physiography

Morphological Type	Landform Element	Riparian	Landform Pattern	Microrelief
Lithology	Soil surface Texture		Soil Colour	Soil Depth
Slope	Aspect	str west	Dark rich silt	Distance to nearest water and type
				> 200m





Image 5. Plot 3, Zone 6. July 2018



Image 6. Plot 3, Zone 6. September 2019.

## DECCW VEGETATION FIELD SURVEY FORM

### Module 1 (Minimum requirements)

Location

		Survey code		Plot no.	Recorders	
Date	12.9.19	Plot ID.		4	Jake Proust, Romy Brien	
AMG grid reference	zone 54 55 (56)	datum GDA	Easting		Northing	Position in quadrat
Base plot size	10 x 10m	Orientation of 0.1ha plot		marked	yes no	photo # / orientation

Structure & composition (within 0.04 ha quadrat)

Keith class		Confidence: high mod low N.A
Regional veg class (BVT)	RiverFlat Enc Forest - coastal floodplain	Confidence: high mod low N.A
BioMetric type (or NVCA)		Confidence: high mod low N.A.
Other:		Confidence: high mod low N.A.

NVIS level V (within 0.04 ha quadrat)

Stratum	Growth form	Species name	Cover	Abund.	For the entire			Field
Upper		Eucalyptus elata	70%		Upper stratum			
Upper		Acacia decurrens	10%		Height to crown (m)			
Upper					min	mode	max	
Mid		Acacia floribunda	20%		Mid stratum			
Mid		Trema tomentosa	15%		Height to crown (m)			
Mid		dematis aristata	10%		min	mode	max	
Ground		Dichondra rufens	20%		Ground stratum			
Ground		Pratia purpurascens	10%		Height to crown (m)			
Ground		Microlaena strobiloides	70%		min	mode	max	

Growth form: T=tree, M=mallee tree, S=shrub, Y=mallee shrub, Z=heath shrub, C=chenopod shrub, G=tussock grass, H=hummock grass, D=sod grass, V=sedge, R=rush, E=fern  
 Cover: 0-1, 1.2, 3, 4, 5, 10, 15, 20, 25, 30, 35, etc. Abundance: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50, 100, 500, 1000, >1000

# DECCW VEGETATION FIELD SURVEY FORM

Site no.

## Condition

(within 0.04 ha)	Upper stratum	Mid stratum	Ground stratum Grasses	Ground stratum Shrubs	Ground stratum Other	Cover %	(within 0.1 ha quadrat)		
<b>Native richness</b>	low	mod	mod	mod	mod	Litter		<b>No. trees with hollows</b>	4/low
<b>Native cover</b>	100%	100%	100%	100%	1	Bare ground		<b>Woody debris</b> lineal metres	mod
<b>Exotic cover</b>	-	-	-	-	-	Cryptogam		<b>Woody regeneration</b> No. upper stratum sp. & abundance.	mod.

(within 0.1 ha quadrat)

<b>Woody stem-sizes (DBH)</b> (tally within category)	≥ 5- <10	≥ 10- <20	≥ 20- <30	≥ 30 cm DBH measure all	
(or, measure all ≥ 5cm DBH)					
<b>Tree health</b>	no evidence	branchlets dead	small branches dead	main branches dead	trees dead

## Landuse and landcover

<b>Age structure</b>	early regeneration	advanced regeneration	uneven age	mature	senescent	
<b>Landuse</b> (dominant)	nature conservation	travelling stock route	forestry	grazing	cropping	other:
<b>Landcover</b> (upper stratum)	none	native	environmental planting	native plantation	exotic other:	
<b>Landcover</b> (ground stratum)	none	native	environmental planting	native plantation	exotic other:	

## Site history

	Freq. code	Age code	Land manager survey: categories, quantities, comments			
Grazing management			not grazed	set stocked	rotational / cell grazing	
Farming			none	direct drill	disc plough tyned implement	mouldboard rotary hoe
Erosion control			none	contour cultivation	mulching banks	other
Pasture improvement rates (fertiliser) kg/ha			none	<125	125-250	>250
Pasture improvement rates (lime/dolomite) t/ha			none	<2	2-4	4-7 >7
Timber extraction (incl. firewood)						

Site history, continued

	Freq. code	Age code	Land manager survey: categories, quantities, comments
Regrowth management			
Weed control	3	R	woody weed + ascending vine control
Pest animal control			
Burning			
Other			

Frequency: 0=no record, 1=rare (>5yrs), 2=occasional (2-5yrs), 3=frequent (<2yrs) Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Plot disturbance

	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			-
Cultivation (inc. pasture)			-
Soil erosion			-
Firewood collection			-
Grazing			-
Fire damage			-
Storm damage			-
Other	3		Heavy weed infestation - controlled.

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Focal taxa

(e.g. disturbance sensitive spp., ROTAPS, etc. within 0.04 ha quadrat)

Stratum	Growth form	Field name	Species name	Cover	Abund.	Field no.	RBG no.
M	S	<i>Reifous pomaderris</i>	<i>Pomaderris brunnea</i> *endangered				

Physiography

Morphological Type <i>holocene</i>	Landform Element <i>Riparian</i>	Landform Pattern	Microrelief
Lithology <i>alluvium</i>	Soil surface Texture	Soil Colour <i>dark, rich</i>	Soil Depth
Slope	Aspect	Site drainage	Distance to nearest water and type <i>&lt; 50 m</i>





Image 7. Plot 4, Zone 7. July 2018.



Image 8. Plot 4, Zone 7. September 2019

# DECCW VEGETATION FIELD SURVEY FORM

## Module 1 (Minimum requirements)

### Location

		Survey code	Plot no.	Recorders		
Date	12/09/19	Plot ID.	5	Jake Proust, Amy Brien		
AMG grid reference	zone 54 55 56 56	datum GDA	Easting	Northing	Position in quadrat	
Base plot size	10x10m	Orientation of 0.1ha plot	marked	yes no	photo # / orientation	

### Structure & composition (within 0.04 ha quadrat)

Keith class		Confidence: high mod low N.A
Regional veg class (BVT)	River flat Euc forest	Confidence: high mod low N.A
BioMetric type (or NVCA)		Confidence: high mod low N.A.
Other:	Alluvial woodland.	Confidence: high mod low N.A.

### NVIS level V (within 0.04 ha quadrat)

Stratum	Growth form	Species name	Cover	Abund.	For the entire	Field
Upper		Eucalyptus piperita	60%		Upper stratum	
Upper		Eucalyptus elata	10%		Height to crown (m)	
Upper		Allocasuarina cunninghamiana	10%		min mode max	
Mid		Melicactus dentatus	30%		Mid stratum	
Mid		Baccharis myrtilloides	10%		Height to crown (m)	
Mid		Phyllanthus spp	10%		min mode max	
Ground		Lomandra longifolia	10%		Ground stratum	
Ground		Clematis aristata	10%		Height to crown (m)	
Ground		Oplismenus aemulus	40%		min mode max	

Growth form: T=tree, M=mallee/tree, S=shrub, Y=mallee shrub, Z=heath shrub, C=chenopod shrub, G=tussock grass, H=hummock grass, D=sod grass, V=sedge, R=rush, E=fern

Cover: 0-1,1.2,3,4,5,10,15,20,25,30,35, etc. Abundance: 1,2,3,4,5,6,7,8,9,10,20,50,100,500,1000,>1000

# DECCW VEGETATION FIELD SURVEY FORM

Site no.

## Condition

(within 0.04 ha)	Upper stratum	Mid stratum	Ground stratum Grasses	Ground stratum Shrubs	Ground stratum Other	Cover %	(within 0.1 ha quadrat)
Native richness	low	low	low	low	low	Litter	No. trees with hollows
Native cover	80%	30%	20	10		Bare ground	Woody debris lineal metres
Exotic cover	-	-	15	5		Cryptogam	Woody regeneration No. upper stratum sp. & abundance.

(within 0.1 ha quadrat)

Woody stem-sizes (DBH) (tally within category)	≥ 5- <10	≥10- <20	≥20- <30	≥30 cm DBH measure all
(or, measure all ≥5cm DBH)				
Tree health	no evidence	branchlets dead	small branches dead	main branches dead trees dead

## Landuse and landcover

Age structure	early regeneration	advanced regeneration	uneven age	mature	senescent
Landuse (dominant)	nature conservation	travelling stock route	forestry	grazing	cropping other: mining
Landcover (upper stratum)	none	native	environmental planting	native plantation	exotic other:
Landcover (ground stratum)	none	native	environmental planting	native plantation	exotic other:

## Site history

	Freq. code	Age code	Land manager survey: categories, quantities, comments			
Grazing management			not grazed	set stocked	rotational / cell grazing	
Farming			none	direct drill	disc plough tyned implement	mouldboard rotary hoe
Erosion control			none	contour cultivation	mulching banks	other
Pasture improvement rates (fertiliser) kg/ha			none	<125	126-250	>250
Pasture improvement rates (lime/dolomite) t/ha			none	<2	2-4	4-7 >7
Timber extraction (incl. firewood)						

Site history, continued

	Freq. code	Age code	Land manager survey: categories, quantities, comments
Regrowth management			
Weed control	3	R	Woody weed + ascending vine control
Pest animal control			
Burning			
Other			

Frequency: 0=no record, 1=rare (>5yrs), 2=occasional (2-5yrs), 3=frequent (<2yrs) Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Plot disturbance

	Severity code	Age code	Observational evidence:
Clearing (inc. logging)			
Cultivation (inc. pasture)			
Soil erosion	3		
Firewood collection			
Grazing			
Fire damage			
Storm damage			
Other			

Severity: 0=no evidence, 1=light, 2=moderate, 3=severe Age: R=recent (<3yrs), NR=not recent (3-10yrs), O=old (>10yrs)

Focal taxa

(e.g. disturbance sensitive spp., ROTAPS, etc. within 0.04 ha quadrat)

Stratum	Growth form	Field name	Species name	Cover	Abund.	Field no.	RBG no.

Physiography

Morphological Type	Landform Element	Landform Pattern	Microrelief
Lithology	Soil surface Texture	Soil Colour	Soil Depth
Slope	Aspect	Site drainage	Distance to nearest water and type
	Holocene alluvium	Dark rich silt	< 10m
	Stn west		





Image 9. Plot 5, Zone 7. July 2018.



Image 10. Plot 5, Zone 7. September 2019.

**APPENDIX 6: NSW DEPARTMENT OF PLANNING RESPONSE TO AEMR 2018**



Matthew J Collins  
Director  
M. Collins & Sons Holdings Pty Ltd  
1/49 Smeaton Grange Rd  
Smeaton Grange, NSW 2567

Contact: Alfarid Hussain  
Phone: 02 9274 6456  
Email: [compliance@planning.nsw.gov.au](mailto:compliance@planning.nsw.gov.au)

27 May 2019

Dear Mr Collins,

**Spring Farm Sand and Soil Extraction Processing Operation –  
2018 Annual Report and IEA 2019 Consultation**

I refer to the Annual Review for the period 1 January 2018 to 31 December 2018, prepared by Harvest Scientific Services Pty Ltd on behalf of Collins Spring Farm Quarry Pty Ltd (“Collins”), and to the request for agency consultation from Mr Peter Marsham of J2M Systems Pty Ltd in regard to the 2019 Independent Environmental Audit (“IEA”) for Spring Farm Sand and Soil Extraction and Processing Operation (“Site”).

**2018 Annual Report**

The Department has reviewed the Annual Review and considers it to generally satisfy the requirements of Schedule 5, Condition 4 of DA 75/256, as modified (“Approval”). Please note, this letter is not an endorsement of the compliance status of the project.

It is requested that in future reports Collins include a separate summary table that highlights the compliance status of all conditions of the Approval for the relevant reporting period in accordance with *Appendix A- Compliance Table Example of the Compliance Reporting Post Approval Requirements 2018 (“CRPAR”)*<sup>1</sup> available in the Department’s website at the following link: <https://www.planning.nsw.gov.au/-/media/Files/DPE/Other/compliance-reporting-post-approval-requirements-2018-06.pdf>.

**2019 IEA**

Please consider the Department’s letter dated 27 March 2019 endorsing Mr Marsham to undertake the 2019 IEA while drafting the report. The Department requests that the 2019 IEA include an assessment of the following:

- 1) Whether the Site’s Rehabilitation Management Plan is being implemented.
- 2) Air Quality exceedances and an update on improvement measures detailed in the 2018 Annual Report.
- 3) Review of the site’s water management.

Note that future requests for agency consultation should be made well ahead of the scheduled dates for the audit.

Please do not hesitate to contact Alfarid Hussain on the above contact details should you have any queries.

Yours sincerely,

Chris Mathieson  
Team Leader – Compliance  
*as the Secretary’s nominee*

<sup>1</sup> Collins may elect to voluntarily comply with the CRPARs, however, must comply with the conditions of the Approval.

**APPENDIX 7: DUST COMPLAINT FORM**

# APPENDIX 10

## Complaints Register and Record Sheet

### Environmental Complaints Form

Applicable Site / Address	214 Macarthur Rd. Springfarm
Name of person making the complaint	Downer EDI. Lot 22 196 Macarthur Rd
Any personal details of the person making the complaint	
The date and time of the complaint	21st August 12 noon.
(Complaint method) How was the complaint made, in person, phone, in writing etc.	phone to Wayne Hawley (CCM)
What is the nature of the complaint, noise, dust, smell or other	Dust - windy day -
What response was given to the complainant	Water cart sent up Lot 22 hauled
What immediate action was taken, detail below dates	as above -
If no action was taken detail why no action was taken	
In what area was the incident noticed from	-
When was the incident noticed	21st August 2019 12 noon.
Date and time of an investigation, record initial findings, (map, photo, etc).	-
Was an authority called? And which one?	-

Additional comments and notes: Downer project on Lot 22 - required assistance with CCM water cart due to excessively windy conditions.

#### INTERNAL USE

Person filling out this form, Name: Emma Collins Signature: [Signature]  
 Date: 9/9/19 What manager was it reported to:  
 Company and Division: CCM  
 How was it reported: Wayne Hawley reported to Emma - Emma discussed with Luke & Michael  
 Date and time the division manager received it:

Records to be kept for 4 years

SPRINGFARM QUARRY COMPLAINTS REGISTER

Date	Nature of Complaints	Location of other details EMP Complaints Form
21/08/2019	Dust	