

## Compliance Report: Translocation and Monitoring

### Squibbs Road Drainage Improvements and Clayton Drive Reserve Translocation Site, Spreyton, Devonport City Council, EPBC 2017/7956

October 2022



**Report for:** Devonport City Council (ABN 47611 446 016) in Compliance with approvals given under the Environment Protection and Biodiversity Conservation (EBCC) Act

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**Location:** Clayton Drive Reserve: GDA94 MGA55: 444525E, 5435050N

**Mapsheets:** Tasmap 1:25000 LATROBE 4443

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## Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed

\_\_\_\_\_

Full name:

Position:

Organisation:

Date:

\_\_\_\_/\_\_\_\_/\_\_\_\_

## Document Review & Authorisation

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## Disclaimer

The information provided in this report is prepared by the authors using documentation provided by Devonport City Council and findings during the site visits. Whilst all endeavours have been made to ensure that the information provided is accurate this does not guarantee that the material is free of error. As such the authors will not be liable for any error, omission or otherwise. However, should any error or omission be noted, the authors will use their best endeavours to correct the material and update this report.

## Acknowledgement

*We acknowledge and pay respect to the traditional owners and custodians of the region the Pannilerpanner clan of the Palawa nation, the land on which they are located, and to their elders past, present and emerging.*

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## Introduction

### Purpose of report

The purpose of this report is to document compliance with the conditions for the Environment EPBC Act Approval 2017/7956 for the Squibbs Rd works site and the translocation site at Clayton Drive Reserve. Details of compliance are provided, and where appropriate, the timing of completion of individual actions is identified. This compliance report covers the 12-month reporting period to October 2022.

### Description of activities

#### Project Overview

A proposal for *Squibbs Road Drainage Improvements and Clayton Drive Reserve Translocation Site, Spreyton, Devonport City Council, EPBC 2017/7956* was approved for a section of Squibbs Rd, Spreyton to improve drainage, road safety and reduce flood risk. The Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) approved the works in 2020 at Squibbs Rd and the Off-set site at Clayton Drive, Spreyton under Project EPBC (EPBC 2017/7956).

This follows previous work approved in 2012, when Devonport City Council was given approval by the (DSEWPC) under the Environment Protection and Biodiversity Conservation Act 1999, for the proposal *Piping of Open Drain and Translocation of Burrowing Crayfish at Sheffield Road, Devonport, Tasmania (EPBC 2011/6095)*, for works to be conducted on a section of Sheffield Rd, Spreyton and the translocation of endangered Central North Burrowing Crayfish *Engaeus granulatus* salvaged from the worksite to a site at 39 Clayton Reserve, Spreyton. As the Sheffield Rd works site was a known site for the endangered species the Central North Burrowing Crayfish (*Engaeus granulatus*)(CNBC), this work was a matter of concern as this species is listed as Endangered under the Environmental Protection and Biodiversity Act 1999 (EPBC Act) and endangered under the Tasmanian Threatened Species Protection Act 1995 (TSPA). This project provided the basis for the methods and development of the translocation *Standard Operating Procedures* and translocation followed the “complete habitat creation and improvement works at the offset site as detailed in the *39 Clayton Drive Spreyton Offset Management Plan: February 2012: Final*”(DSEWPC, 2012).

The conditions compliance table is shown below with the listed conditions of the EPBC approval and status regarding compliance to date. As per the Translocation and Monitoring Report dated 2/04/2020 (Barnes), the compliance table section 2Bi. provides the dates when project actions were initiated and completed.

## CONDITIONS OF APPROVAL: Part A - Conditions specific to the action

Table 1. Conditions of approval, compliance, and evidence

Condition No.	Approval Condition	Compliance:	Evidence/Comments						
1.	The approval holder must not carry out <b>construction</b> outside of the <b>project area</b> at Squibbs Road, Spreyton, or the <b>offset site</b> at Clayton Drive, Spreyton.	Compliant	Construction works at Squibba Rd, Spreyton have been completed within the project area						
2.	To minimise impacts to the <b>Central North Burrowing Crayfish</b> , the approval holder must: A). only undertake <b>construction</b> when a <b>qualified ecologist</b> is present; and	Compliant	Salvage and translocation work was completed with qualified ecologists on-site (Drs Colin McCoull and Richard Barnes of Van Diemen Consulting Pty Ltd (VDC)).						
	B). undertake excavation, salvage and translocation of <b>Central North Burrowing Crayfish</b> in accordance with the i. <b>Standard Operating Procedure</b>	i. Compliant	<div>Excavation, salvage and translocation of <b>Central North Burrowing Crayfish</b> was conducted in accordance with the <b>Operating Procedure as per Translocation and Monitoring Report dated 2/4/2020</b></div> <div>i.</div> <table><tr><th>Operating Procedure</th><th>Target Achievement of salvage/translocation</th></tr><tr><td>a. No impact on flora and fauna (except Central North burrowing crayfish, CNBC) at and near the Work Area beyond that anticipated at the design Phase</td><td>There was no impact to any conservation significant flora or fauna, except Central North Burrowing Crayfish, at or near the Work Area.</td></tr><tr><td>b. The maximum number possible of CNBC successfully translocated from the Work Area to the</td><td>All 16 CNBC salvaged from the excavation works were translocated to the Translocation Area at Clayton Reserve.</td></tr></table>	Operating Procedure	Target Achievement of salvage/translocation	a. No impact on flora and fauna (except Central North burrowing crayfish, CNBC) at and near the Work Area beyond that anticipated at the design Phase	There was no impact to any conservation significant flora or fauna, except Central North Burrowing Crayfish, at or near the Work Area.	b. The maximum number possible of CNBC successfully translocated from the Work Area to the	All 16 CNBC salvaged from the excavation works were translocated to the Translocation Area at Clayton Reserve.
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b. The maximum number possible of CNBC successfully translocated from the Work Area to the	All 16 CNBC salvaged from the excavation works were translocated to the Translocation Area at Clayton Reserve.								



			<p>Translocation Area</p> <hr/> <p>c. Minimal mortality of CNBC during the excavation process at the Work Area</p> <hr/> <p>d. The appropriate preservation and curation of excavation-compromised CNBC for future research opportunities</p>	<p>There was no mortality recorded</p> <hr/> <p>No excavation-compromised CNBC were preserved because none occurred.</p>
	ii. Management, Monitoring and Offset Plan.	ii. Compliant for ii. a & b. Non-compliant for ii.c.	<p>ii. Management, Monitoring and Offset Plan</p> <hr/> <p>a. At least 116 additional <i>Engaeus</i> burrows present in the Translocation Area at the Offset Site</p> <hr/> <p>b. Re-colonisation of CNBC in some of the Work Area</p> <hr/> <p>c. No moderately to highly erosive surfaces present in the Translocation Area at the Offset Site</p>	<p>Key criteria for success of salvage /translocation</p> <hr/> <p>CNBC continue to be present in good numbers in the translocation area</p> <hr/> <p>Some CNBC recolonisation is evident in the work area</p> <hr/> <p>Earthworks and land clearance on the adjacent land is causing erosion and resultant sedimentation within the translocation offset area.</p>
3.	The approval holder must implement the <b>Management, Monitoring and Offset Plan.</b>	Compliant	The Management, Monitoring and Offset Plan has been implemented	
4.	To compensate for the expected loss of <b>Central North Burrowing Crayfish</b> in the <b>project area</b> , prior to any construction, a" <b>Central North Burrowing Crayfish</b> from the <b>project area</b> must be salvaged and translocated to	Compliant	16 CNBC were salvaged from the Squibbs Rd work site and successfully translocated to the Offset site in accordance with the SOP. No mortalities or injured crayfish were noted.	

	the prepared translocation area of the <b>offset site</b> in accordance with the <b>Standard Operating Procedure</b> ".																
5.	A <b>suitably qualified person</b> must conduct monitoring during <b>works</b> and, within one month of the end of salvage and translocation, provide a report to the <b>Department</b> on the number of <b>Central North Burrowing Crayfish</b> :	Compliant	Drs Colin McCoull and Richard Barnes of Van Diemen Consulting Pty Ltd (VDC) monitored the works and oversaw the translocation														
	A) salvaged alive;		16 CNBC were salvaged from the Squibbs Rd work site and successfully translocated to the Offset site in accordance with the SOP.														
	B) euthanised or that died as a result of the action; and		No mortalities or injured crayfish were noted.														
	C) c. successfully translocated.		The 16 CNBC were successfully translocated														
6.	A qualified ecologist must monitor the Central North Burrowing Crayfish colonisation of the project area and the offset site after the completion of works. The approval holder must submit reports detailing Central North Burrowing Crayfish colonisation of the project area and the offset site to the Department at one month, six months, twelve months, twenty-four months and five years after commencement of the action. Each report must specify the total number of Central North Burrowing Crayfish alive at the translocation area of the offset site and the number of individuals colonising the project area.	Non-compliant	<p>The full reporting schedule has not been completed, with the 6-month and 1 Year reports missed due to activity constraints resulting from COVID 19 restrictions.</p> <p>As per and including the Translocation and Monitoring Report EPBC 2017/7956, dated 2/04/2020 (VDC), the dates for completed project monitoring actions are given below with the current report included</p> <table><tr><th>Date</th><th>Actions completed</th></tr><tr><td>17 February 2020</td><td>Habitat created at Offset Site</td></tr><tr><td>24 February 2020</td><td>Salvage and translocation conducted</td></tr><tr><td>9 March 2020</td><td>Monitoring – 2 weeks after translocation</td></tr><tr><td>24 March 2020</td><td>Monitoring – 4 weeks after translocation</td></tr><tr><td>2 April 2020</td><td>Monitoring – 6 weeks after translocation</td></tr><tr><td>25 October 2022</td><td>Monitoring – in lieu of 2 years after translocation</td></tr></table>	Date	Actions completed	17 February 2020	Habitat created at Offset Site	24 February 2020	Salvage and translocation conducted	9 March 2020	Monitoring – 2 weeks after translocation	24 March 2020	Monitoring – 4 weeks after translocation	2 April 2020	Monitoring – 6 weeks after translocation	25 October 2022	Monitoring – in lieu of 2 years after translocation
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2 April 2020	Monitoring – 6 weeks after translocation																
25 October 2022	Monitoring – in lieu of 2 years after translocation																
7.	If the <b>outcomes</b> of the action are not fully achieved within 2 years from the date of <b>commencement of the</b>	Compliant	The outcomes mean the establishment of at least 58 CNBC as per Squibbs Rd – Management, Monitoring and Offset Plan, Final Preliminary Version dated														

	<b>action</b> , in accordance with Section 7.6 of the <b>preliminary documentation</b> , the approval holder must implement contingency measures to ensure the translocation of <b>Central North Burrowing Crayfish</b> is successful, including:		12/08/2019, Section D. 2.1. Survey of site indicates a breeding population covering an area of 35m <sup>2</sup> where active holes indicate a breeding population of CNBC
	A) . Additional side drains and creeks on the <b>offset site</b> ;	Not applicable	The CNBC colony is functioning and expanding, no further works other than maintenance for control of weeds and recommended planting to reduce sedimentation from the adjacent land where disturbance to the habitat has occurred.
	B) . Additional earthworks to retain water and increase habitat capacity at the <b>offset site</b> ;	Not applicable	The CNBC colony is functioning and expanding, no further works other than maintenance for control of weeds and recommended planting to reduce sedimentation from the adjacent land where disturbance to the habitat has occurred.
	C) . The implementation of a revised offset management plan, approved by the <b>Minister in writing</b> within 2 years and 6 months from the <b>commencement of the action</b> , to increase the <b>Central North Burrowing Crayfish</b> colony at the <b>offset site</b> .	Not applicable	The CNBC colony is functioning and expanding, but require maintenance for control of weeds and recommended planting to reduce sedimentation from the adjacent land where disturbance to the habitat has occurred.
8.	The approval holder must notify the Department within 5 years of the commencement of the action if the outcomes' of the action have not fully been achieved and submit to the Department a report regarding why the outcomes of the action have not been achieved. If outcomes have not been fully achieved within 5 years of the commencement of the action, the approval holder must, within 6 years of the commencement of the action, establish an additional offset site in accordance with an offset management plan approved by the Minister in writing to increase another Central North Burrowing Crayfish colony.	Not applicable	Five years has not passed since instigation of the project and translocation of the CNBC to the Clayton Rd translocation site and the outcomes have been fully achieved.

## APPENDIX A: Parameters and frequency of monitoring

Parameters and frequency of Monitoring as set out within the Squibbs Rd - Management, Monitoring and Offset Plan for the Translocation Area in the Offset Site are shown in Table 2. and for the Impact site on Squibbs Rd are shown in Table 3. Monitoring results follow the tables in Appendix B.

**Table 2. Monitoring regime for the Translocation Area in the Offset Site based on project phase**

Parameter	Tasks	Zone and frequency	Responsible
<b>Translocation</b>			
Survivorship	<ul style="list-style-type: none"> <li>Burrow Count</li> <li>Photopoints</li> </ul>	2, 4, 6, 8, 10, 12, 24, 36 and 52 weeks from translocation (1- year monitoring total)	Suitably qualified ecologist
<b>Habitat Creation</b>			
Burrow increase	<ul style="list-style-type: none"> <li>Burrow Count</li> <li>Photopoints</li> </ul>	4, 8, 12, 36 and 52 weeks from translocation then every 12 months (timed for March to April which is after the breeding and dispersal period of CNBC) for a further 9 years (10 years total)	Suitably qualified ecologist
Erosion	<ul style="list-style-type: none"> <li>Photopoints</li> </ul>	4, 8, 12, 36 and 52 weeks from translocation then every 12 months for a further 9 years (10 years total)	Suitably qualified ecologist
Wetness	<ul style="list-style-type: none"> <li>Observation of surface flow areas</li> <li>Auger to water table</li> </ul>	Every month for 6 months from project completion then once every 6 months (10 years total)	Suitably qualified ecologist
Plant survival	<ul style="list-style-type: none"> <li>Count losses</li> <li>Photopoints</li> </ul>	Every 6 months from planting for 10 years	Suitably qualified person

**Table 3. Monitoring regime for the Impact Site and surrounds based on project phase**

Parameter	Tasks	Zone and frequency	Responsible
<b>Monitoring Area 1 – Works Area</b>			
Burrow occurrence	<ul style="list-style-type: none"> <li>Burrow Count</li> <li>Photopoints</li> </ul>	2, 4, 6, 8, 10, 12, 24, 36 and 52 weeks (1-year total)	Suitably qualified ecologist
Erosion and sedimentation	<ul style="list-style-type: none"> <li>Photopoints</li> <li>Observation of surface flow areas and sediment loss/accumulation</li> </ul>	4, 8, 12, 36 and 52 weeks from translocation then every 12 months for a further 9 years (10 years total)	Suitably qualified ecologist
<b>• Monitoring Area 2 – Existing Drain<sup>2</sup></b>			
Burrow occurrence	<ul style="list-style-type: none"> <li>Burrow Count</li> <li>Photopoints</li> </ul>	2, 4, 6, 8, 10, 12, 24, 36 and 52 weeks (1-year total)	Suitably qualified ecologist
Erosion	<ul style="list-style-type: none"> <li>Photopoints</li> <li>Observation of surface flow areas and sediment loss/accumulation</li> </ul>	4, 8, 12, 36 and 52 weeks from translocation then every 12 months for a further 9 years (10 years total)	Suitably qualified ecologist
Wetness	<ul style="list-style-type: none"> <li>Observation of surface flow areas</li> <li>Auger to water table</li> </ul>	Every month for 6 months from project completion then once every 6 months (10 years total)	Suitably qualified ecologist

## APPENDIX B – Monitoring results October 2022

### Translocation site:

#### CNBC Survivorship: Burrow count

Within the 35m<sup>2</sup> area of the Squibbs Rd translocation site the number of holes present in areas of suitable habitat was variable from around 2/ m<sup>2</sup> to 10/ m<sup>2</sup> along the created drainage lines. The burrows ranged from very large to very small indicating a healthy breeding population at the site. Due to the density of rushes and grasses, an exact count was not possible without disturbing the habitat but an estimate would be over 80 in this area. Most of the burrows were active with fresh mud deposits at the entrances or around their chimneys (Figure 3).

On the other side of the access track, outside of the created translocation site, the drainage lines are also inhabited by healthy numbers of the burrowing crayfish, although many more small burrows were noted here, perhaps indicating a younger population.

#### Update on reported incident

The 2020 Translocation and Monitoring Report reported as *Incident* consistent with Condition 17 of the EPBC 2017/7956 documentation. The burrowing crayfish appear to be recolonizing on the western side of the access track which was impacted by earthworks and removal of trees on the adjoining property, however following rain events there has been substantial erosion of the slope and resultant sedimentation into the drainage line running from the neighbouring property and through the track culvert into the translocation area. There was no visible crayfish activity in these heavily sedimented areas. Images in Appendix E.

#### Remedial work

To stabilize the area where the neighbouring landholder has removed vegetation and pushed fill downslope, it is recommended that revegetation be conducted. Planting moisture loving trees/shrubs such as the *Melaleuca ericifolia* in this area will not only stabilise the stream edges but create a more natural habitat for the burrowing crayfish that is commonly found in the local swamp paperbark communities. It would also assist in controlling the exotic grasses through shading, while allowing growth of the native sedges and rushes. Nearby there is also the weed Caper Spurge *Euphorbia lathyris* which is toxic and capable of spreading and should be controlled.

On both sides of the track exotic grasses are colonizing amongst the native *Carex*, *Juncus* and *Poa* species. There is also a small amount of regrowth of blackberry. The blackberry is a Weed of National Significance and should be controlled by spraying in spring or if within the translocation area, cut and paint stems to avoid any potential herbicides contaminating the burrow site areas. Exotic grasses growing amongst the native rushes should be manually removed as the burrowing crayfish are deterred by the dense root systems of these plants.

## Photopoints

Locations of previous photopoints could not be discerned so new points were established around this translocation site. Grid references are given in the table below.

At each point 4 photos were taken consecutively facing North, East, South and West.

**Table 4. Newly established photopoint grid reference locations and description of sites (GDA 94)**

Point #	Easting	Northing	Figures	Point description
Photopoint 1	444526	5435079	10-13	Approx. 20 m north of culvert at translocation site and west of track
Photopoint 2	444524	5435054	14-17	Approx 5 m south from culvert and east of track
Photopoint 3	444516	5435051	18-21	Approx. 12 m southwest of culvert and track

## Habitat Creation:

### Burrow increase

The numbers of burrows have increased beyond the target number of active burrows since the last count and in addition, despite the disturbance caused by the neighbouring landholder, the population is colonizing the western side of the track with many burrows noted along the drainage lines here. Most appeared to be relatively small (approximately 1-2 cm diameter) indicating possible dispersal of younger crayfish from the original translocation population. However, it was also noted that in areas of sediment accumulation resulting from erosion of the slopes following vegetation removal, no burrows were seen, indicating this disturbance is impacting on the colonization of this area by the crayfish. Remedial action through revegetation to the boundary with the neighbour would help stabilize the slope and reduce sedimentation. Figure 1 shows the main areas of burrows in the translocation site. The black outline indicates the approximate boundary of the translocation site, the blue lines show the



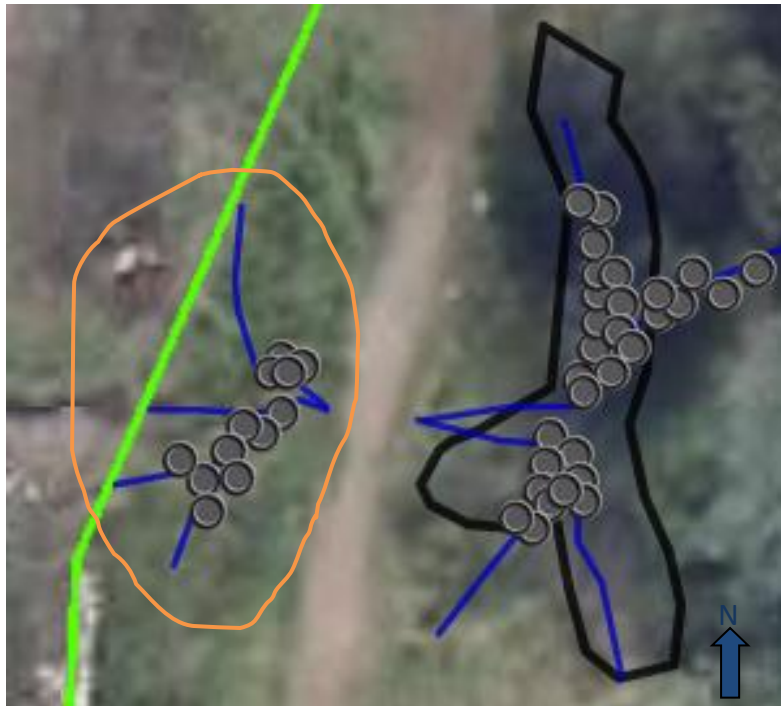
**Figure 1. Translocation site in black showing main active burrow areas along drainage lines.**



drainage lines while the gray dots are the main burrow clusters. Figure 3 shows active burrows.

### Burrow Count

On the western side of the track, amongst the native reeds and rushes (*Carex* and *Juncus* spp), the burrowing crayfish are colonizing (Figure 2). In areas of disturbance and sedimentation the crayfish are absent or in low numbers only. This extension of the CNBC population indicates the translocation population is breeding and dispersal is occurring (Figure 4).



**Figure 3. In the swampy land to the west of the track (shown in orange) and opposite the translocation site, burrowing crayfish are colonising areas free of sediment**



**Figure 4. Central north burrowing crayfish activity under swamp paperbark in translocation area.**



**Figure 2. Crayfish activity in swampy area opposite translocation site**



## **Photopoints**

The images from the three new photopoint positions and details are shown in Appendix C.

## **Erosion:**

The vegetation clearance and earthmoving on the neighbouring land and extending into the Reserve, as reported as an *Incident* in the 2020 Compliance Report, continues to contribute to erosion and sedimentation within the drainage lines running through the translocation site. Despite this, the CNBC are extending their area of colonization. There is a drop in elevation of approximately 25m over a distance of 80 m from Clayton Drive to the base of the slope on the western edge of the track at the translocation site. A comparison of the site surrounds between November 2021 and February 2020 is shown in Figures 5 and 6 respectively.

Revegetation with *Melaleuca ericifolia* within the disturbed area would stabilize the slope and protect the CNBC from further erosion and sedimentation.

## **Wetness:**

Surface flow areas were running well at the time of the survey following a very wet month. The water table was close to the surface making it ideal conditions for the CNBC to disperse and increase the area of colonization.

## **Plant survival:**

Plant survival is good within the translocation site. Losses are very low and are generally the short-lived colonizing species such as the *Cassinia aculeata*. On the northern end of the translocation site where vegetation was disturbed by the neighbouring landholders' actions, the area has regrown with exotic grasses which inhibit regeneration of native woody vegetation from seed fall. It is recommended that the invasive grasses be controlled and this area be revegetated again with native trees and shrubs, including *Melaleuca ericifolia* which forms one of the main vegetation communities that the CNBC is associated with.

The table in Appendix D shows the plant species noted within the 5 m buffer of the Figure of Eight Creek



**Figure 5. Translocation site taken approximately November 2021, showing the property boundaries and extent of vegetation clearance at 79 Clayton Drive, and resultant exposed soils above the translocation site (Map source ListMap).**





Figure 6. Translocation site taken approximately February 2020, showing the extent of the preclearance vegetation above the translocation site (Map source GoogleMap.

## Squibbs Rd works site

Overview can be seen in Figure 7.

### Monitoring Area 1, Works Area

#### Burrow occurrence and Count

It is beyond the 12-month period for monitoring occurrence and count within the works area and there are few signs of CNBC in and around the drainage works. An old disused burrow was noted in the upper section and potentially a small burrow near the bottom, southern end of the works area. With no vegetation and organic matter in this section, it is unlikely the crayfish would recolonise in any numbers within the drain but will likely survive in the bank above in small numbers.

### Erosion and sedimentation

The rock work within the works area drain is well bedded down and appears to be working efficiently to slow water flow and prevent erosion (Figure 7). No recent sedimentation or erosion was noted along this area.



Figure 7. Completed drainage works on Squibbs Rd showing no signs of erosion following recent high rainfall events

### Monitoring Area 2 – Existing Drain

At the southern end of the works area, within the existing drain and on the flat swampy area above, the CNBC are very active. There are many burrows of varying sizes indicating a healthy breeding population (Figure 8). At the top of the bank reeds *Juncus* sp. grow amongst the pasture species improving the habitat for the CNBC. Figure 9 shows the points where burrowing crayfish are active.





**Figure 8. The southern end of the drainage works on Squibbs Rd shows the reeds in the adjacent swampy paddock and extending along drain providing habitat for the CNBC**

### **Erosion**

No sedimentation or erosion was noted in this downstream zone below the works area despite recent heavy rains. The soils are well covered with grasses and reeds, slowing waterflow and protecting the substrate.

### **Wetness**

Due to the recent rains, the water table was high and there was surface water flowing across the swampy area above the existing drain. This can be seen in Figure 8 above.



**Figure 9. Squibbs Rd drainage works area. Showing points extent of drainage works and burrowing crayfish activity**



## Appendix C, Clayton Drive Reserve, Photopoint images

### Photopoint 1



Figure 10. Photopoint 1, North, showing steep cleared bank



Figure 11. Photopoint 1, East, towards the creek buffer and revegetation area



Figure 12. Photopoint 1, South towards the translocation site



Figure 13. Photopoint 1, West towards the cleared bank and disturbed soils adjacent to translocation site

### Photopoint 2



Figure 14. Photopoint 2, North, towards Pp1, showing the cleared slope above



Figure 15. Photopoint 2, East towards creek and southern end of translocation site



Figure 16. Photopoint 2, South, beyond translocation area



Figure 17. Photopoint 2, West towards Pp3 and new natural colonisation area



### Photopoint 3



**Figure 18. Photopoint 3, North towards Pp1, across new natural colonisation area**



**Figure 19. Photopoint 3, East over translocation site and Pp2**



**Figure 20. Photopoint 3, South on edge of disturbed area on property boundary**



**Figure 21. Photopoint 3, West over the disturbed area and log piles left after vegetation clearance.**



## Appendix D, Plant list

### Clayton Drive Reserve

**Table 5. Plant list from 5 m creek buffer. A full plant survey was not undertaken**

Common name, Species	Form		Form
White gum, <i>Eucalyptus viminalis</i>	Tree	Common dogwood, <i>Pomaderris apetala</i>	Tree
Black/swamp gum, <i>E. ovata</i>	Tree	Silver banksia, <i>Banksia marginata</i>	Tree/ lg shrub
Blackwood, <i>Acacia melanoxylon</i>	Tree	Prickly Moses, <i>Acacia verticillata</i>	Shrub
Swamp paperbark, <i>Melaleuca ericifolia</i>	Tree	Teatree/Manuka, <i>Leptospermum scoparium</i>	Tree/ lg shrub
Stinkwood, <i>Zieria arborescens</i>	Tree/ lg shrub	Native cherry, <i>Exocarpos cupressiformis</i>	Tree
Slender honey-myrtle, <i>Melaleuca gibbosa</i>	Shrub	Lemon bottlebrush, <i>Melaleuca pallida</i>	Tree/ lg shrub
Yellow dogwood, <i>Pomaderris elliptica</i>	Shrub	Hopbush, <i>Dodonaea viscosa</i>	Shrub
Spreading wattle, <i>Acacia genistafolia</i>	Shrub	Forest daisy bush, <i>Olearia lirata</i>	Shrub
Dusty daisybush, <i>Ozothamnus</i> sp.	Shrub	Batswing fern, <i>Histiopteris incisa</i>	Groundfern
Soft treefern, <i>Dicksonia antarctica</i>	Treefern	Gahnia grandis	Sedge/Rush
Tall sedge, <i>Carex appressa</i>	Sedge/Rush	Tall sword sedge, <i>Lepidosperma elatius</i>	Sedge/Rush
Reeds <i>Juncus</i> sp.	Sedge/Rush		

## Appendix E, sedimentation resulting from Incident



**Figure 22. Current state of the adjoining land showing some work to reduce erosion on bank.**





**Figure 24. Gravel and sediments at the Reserve culvert, run-off from up-slope erosion**



**Figure 23. Downstream side of culvert with the accumulated sediments and gravel**