MINUTES

ORDINARY COUNCIL MEETING

18 DECEMBER 2018

3.00PM

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TUESDAY 18 DECEMBER 2018

1. OPENING, OBITUARIES, VISITOR

1.1 OPENING

President Hudson opened the meeting at 3.00pm.

1.2 OBITUARIES

Mr George Bartlett

2. RECORD OF ATTENDANCE/APOLOGIES

2.1 RECORD OF ATTENDANCE

Cr D.P.Hudson	President
Cr A.J. Metcalf	Deputy President
Cr R.I. Trepp	
Cr L.G. Hagboom	
Cr L.H. Holberton	
Cr J.C. Chatfield	
Cr B.A. Ward	
R.L. McCall	Chief Executive Officer
S.G. Fitchat	Finance Manager
G.C. Brigg	Assets & Works Manager
E.L. Richards	Council Liaison/Minutes

2.2 LEAVE OF ABSENCE

Cr B.N. Walsh

2.3 APOLOGIES

L.A. Valentine	Corporate & Community Services

2.4 GUESTS

3. RESPONSE TO PREVIOUS PUBLIC QUESTIONS TAKEN ON NOTICE

4. DECLARATION OF ELECTED MEMBERS & OFFICERS FINANCIAL INTERESTS

- Emma Richards – Item 13.1.2 – Disposal of Land – Tender 2018-04
- Robert Trepp – Item 13.1.2 – Disposal of Land – Tender 2018-04
- Lindsay Hagboom – Item 13.1.2 – Disposal of Land – Tender 2018-04 & Item 13.1.3 – Disposal of Land – Lot 13 Maisey Street Dowerin
- Rebecca McCall – Item 10.1.4 – Chief Executive Officer - Directions Board of Management Appointment

5. PUBLIC QUESTION TIME

6. APPLICATIONS FOR LEAVE OF ABSENCE

Nil

7. CONFIRMATION OF MINUTES

COUNCIL DECISION – 7.1

Moved: Cr BA Ward Seconded: Cr RI Trepp Carried: 7/0

THAT THE MINUTES OF THE ORDINARY MEETING OF THE DOWERIN SHIRE COUNCIL HELD ON 27 NOVEMBER 2018 BE CONFIRMED AS A TRUE AND CORRECT RECORD OF PROCEEDINGS.

8. PETITIONS/DEPUTATIONS/PRESENTATIONS

Nil

9. ANNOUNCEMENTS BY PRESIDENT WITHOUT DISCUSSION

9.1 PRESIDENT ANNOUNCEMENTS

Nil

10. REPORTS OF COMMITTEE AND OFFICERS

10.1 OPERATIONS

10.1.1 DRAFT GRAVEL SUPPLIES & REHABILITATION POLICY

Date: 6 December 2018
Applicant: Nil
Location: Nil
File Ref: Organisation/Governance/Council Policies
Disclosure of Interest: Nil
Author: Glen Brigg, Works & Assets Manager
Attachments: 1. Draft Gravel Supplies & Rehabilitation Policy

Summary

Council to consider the adoption of a new Gravel Supplies and Rehabilitation Policy.

Background

Council adopted the Road Network Supplies from Landowners in Exchange for Work Policy 17th April 2017. The policy is brief and doesn't give staff clear direction on procedures needed to extract gravel and sands, nor does the policy address the rehabilitation of pits under the Department of Water and Environmental Regulations guidelines.

Comment

The Gravel Supplies and Rehabilitation Policy provides staff with clear directions, from first contact with landholder through to the rehabilitation of pits from where council extracts road construction materials.

The existing policy includes,

"The value of compensating road / earth works provided by the Shire to a property

owner will be calculated on the basis of $1.00 per each m3 of material extracted from the

private property to facilitate Shire works. This value cannot be converted to a cash payment"

Staff sourcing gravel for capital road works recently found very few landholders were prepared to provide the shire with road building materials for $1.00 per cubic metre. Some landholders staff have approached mentioned they have supplied the shire with road building materials in previous years with work not carried out by the shire in exchange for that material.

Paying for road building materials on completion of the project allows staff to post expenses to the appropriate project at the time of extraction. Paying $2.00 per cubic metre + GST will help staff negotiate a better supply of gravel for road works across the shire.

Financial Implications

Paying $2.00 + GST per cubic metre of gravel will impact on the shires budget in the long term. At present most gravel used on state and federal funded projects. Savings can be found if gravel pits are closer to job with shorter hauls increasing productivity.

Risk Implications

The Shire requires approximately 50,000 cubic metres of gravel each year to keep up with road

pavement wear rates. Over the next 20 years the shire will need to source 1,000,000 cubic metres of gravel. Failure to source the quantities of gravel required, the shire can't meet road pavement renewal targets within the asset management plan.

Consultation

Department of Water and Environmental Regulations
CEO
Council Workshop

Policy Implications

The current Road Network Supplies from Landholders in Exchange for Work Policy will be replaced with the Gravel Supplies & Rehabilitation Policy.

Statutory Implications

S 3.22 Local Government Act Western Australia 1995

Compensation

3.22. (1) If a person who is —

(a) the owner or occupier of land granted in fee simple; or

(b) the occupier of land held under lease or on conditional terms of purchase from the Crown, except for pastoral or timber purposes,

sustains damage through the performance by a local government of its functions under this Act, the local government is to compensate the person if the person requests compensation unless it is otherwise expressly stated in subsection (5) or in Schedule 3.1 or Schedule 3.2.

(2) Despite subsection (1), regulations amending Schedule 3.1 or Schedule 3.2 may exclude or limit the obligation of a local government to pay compensation for a particular matter.

(3) The assessment of damage for which compensation is to be paid is to include the value of any material taken under Subdivision 2.

(4) A dispute about the amount of compensation is to be determined by arbitration in accordance with section 3.23.

Voting Requirements

Simple/ majority required.

OFFICER RECOMMENDATION – 10.1.1

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO LOCAL GOVERNMENT ACT 1995 SECTION 3.22 RESOLVES TO REPLACE THE ROAD NETWORK SUPPLIES FROM LANDHOLDERS IN EXCHANGE FOR WORK POLICY WITH THE GRAVEL SUPPLIES & REHABILITATION POLICY.

COUNCIL DECISION – 10.1.1

Moved: Cr LH Holberton Seconded: Cr RI Trepp Carried: 7/0

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO LOCAL GOVERNMENT ACT 1995 SECTION 3.22 RESOLVES TO REPLACE THE ROAD NETWORK SUPPLIES FROM LANDHOLDERS IN EXCHANGE FOR WORK POLICY WITH THE GRAVEL SUPPLIES & REHABILITATION POLICY.

10.1.2 COUNCIL MEETING DATES FOR 2019

Date: 10 December 2018
File Ref: Organisation/Governance/Council Meetings
Disclosure of Interest: Nil
Author: Rebecca McCall, Chief Executive Officer
Attachments: Nil

Summary

To determine the Ordinary Meetings of Council dates for 2019.

Background

In accordance with Regulation 12(1) of the *Local Government (Administration) Regulations 1996,* at least once each year a local government is to give public notice of the dates, times and place at which the Ordinary Meetings of Council re to be held in the next 12 months.

Comment

In previous years Ordinary Meetings of Council have been held on the fourth Tuesday of every month commencing at 3.00pm with the following exceptions:

August – third Tuesday to avoid clash with Field Days; and

December – third Tuesday due to Christmas holiday period.

Council may wish to revise the day on which the Meetings are held and/or their commencement time, though the Officer's Recommendation assumes that Council does not wish to make any changes.

Financial Implications

Funds are included in the 2018/19 Budget to cover any costs associated with conducting Council meetings, and to advertise and promote the dates of Ordinary Meetings of Council.

Risk Implications

Council would be contravening the *Local Government Act 1995* and the *Local Government (Administration) Regulation 1996* if it did not consider and comply with this item.

Consultation

Emma Richards, Governance Officer

Policy Implications

Nil

Statutory Implications

Section 5.3 of the *Local Government Act 1995*

Regulation 12(1) of the *Local Government (Administration) Regulations 1996* applies.

Voting Requirements

Simple majority required.

OFFICER RECOMMENDATION – 10.1.2

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO SECTION 5.3 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES THAT THE 2019 ORDINARY MEETINGS OF COUNCIL BE HELD IN THE COUNCIL CHAMBERS OF THE SHIRE ADMINISTRATION BUILDING ON THE FOLLOWING DATES COMMENCING AT 3.00PM:

TUESDAY, 22 JANUARY 2019	***TUESDAY, 23 JULY 2019***
TUESDAY, 26 FEBRUARY 2019	***TUESDAY, 20 AUGUST 2019***
TUESDAY, 26 MARCH 2019	***TUESDAY, 24 SEPTEMBER 2019***
TUESDAY, 23 APRIL 2019	***TUESDAY, 22 OCTOBER 2019***
TUESDAY, 28 MAY 2019	***TUESDAY, 26 NOVEMBER 2019***
TUESDAY, 25 JUNE 2019	***TUESDAY, 17 DECEMBER 2019***

AND THE ABOVE DATES BE ADVERTISED.

COUNCIL DECISION – 10.1.2

Moved: Cr JC Chatfield Seconded: Cr BA Ward Carried: 7/0

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO SECTION 5.3 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES THAT THE 2019 ORDINARY MEETINGS OF COUNCIL BE HELD IN THE COUNCIL CHAMBERS OF THE SHIRE ADMINISTRATION BUILDING ON THE FOLLOWING DATES COMMENCING AT 3.00PM:

TUESDAY, 22 JANUARY 2019	***TUESDAY, 23 JULY 2019***
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TUESDAY, 28 MAY 2019	***TUESDAY, 26 NOVEMBER 2019***
TUESDAY, 25 JUNE 2019	***TUESDAY, 17 DECEMBER 2019***

AND THE ABOVE DATES BE ADVERTISED.

10.1.3 PERMISSION TO COLLECT NATIVE FLORA IN THE SHIRE OF DOWERIN

Date: 10 December 2018
Applicant: Mrs Lyn Phillips
Location: Shire of Dowerin
File Ref: Organisation/Community/Environment Management/Permits
Disclosure of Interest: Nil
Author: Rebecca McCall, Chief Executive Officer
Attachments: Nil

Summary

This item seeks Council's retrospective endorsement to grant permission for Mrs Lyn Phillips to collect flora from roads verges and reserves in the Shire of Dowerin.

Background

Mrs Phillips is seeking Council's permission to collect flora from reserves (including road reserves) vested in the Shire. Mrs Phillips holds a current license issued by the Department Biodiversity, Conservation and Attractions (DBCA) to take flora for scientific or other prescribed purposes. The license conditions include the requirement to obtain written authority from the land manager prior to the collection of flora.

Comment

The application compiles with the requirements of the DBCA. In granting an approval Council may wish to consider the following conditions in addition;

- the approval is for only 12 months period terminating 1st November 2019
- all care to be taken to avoid any disturbance to fauna habitat
- all care taken to avoid the disturbance that may lead to soil degradation
- ensure appropriate hygiene measures are followed at, all times to prevent the spread of plant disease and weeds
- does it require Council to be specific about the percentage of seed collected, that can be utilised for research.

Financial Implications

Nil

Risk Implications

There are associated risks involved, however the applicant is experienced and will be advised to wear appropriate high visibility clothing. Environmental risks will be managed via the CALM license.

Consultation

Nil

Policy Implications

Nil

Statutory Implications

Licences are issued under the *Wildlife Conservation Act 1950* and the *Biosecurity and Agriculture*

Management Act 2007. The Acts require permission from the landholder, in this case the Shire of Dowerin. Council can provide permission under Section 3.1 of the *Local Government Act 1995 (General Function).*

Strategic Implications

Strategic Community Plan - Theme 3 – Natural Environment – Outcome 1 - Reference N1

Voting Requirements

Simple majority required.

OFFICER RECOMMENDATION – 10.1.3

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO SECTION 3.1 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO GRANT APPROVAL TO MRS LYN PHILLIPS TO COLLECT NATIVE FLORA FROM COUNCIL MANAGED RESERVES AND ROAD RESERVES WITHIN THE SHIRE OF DOWERIN SUBJECT TO THE FOLLOWING CONDITIONS:

- ***THE COLLECTION OF SEED IS TO BE CARRIED OUT SO AS NOT TO ENDANGER THE LONGTIME SURVIVAL OF THE NATIVE FLORA ON THE THOROUGHFARE;***
- ***ALL PERSONS COLLECTING THE NATIVE SEED ARE TO HOLD A CURRENT LICENSE UNDER THE CONSERVATION ACT 1950 AND ABIDE BY THE CONDITIONS OF THAT LICENSE;***
- ***ALL CARE TO BE TAKEN TO AVOID THE DISTURBANCE OF FAUNA HABITAT;***
- ***ALL CARE TO BE TAKEN TO AVOID ANY DISTURBANCE THAT MAY LEAD TO SOIL DEGRADATION;***
- ***ENSURE APPROPRIATE HYGIENE MEASURES ARE FOLLOWED AT ALL TIMES TO PREVENT THE SPREAD OF PLANT DISEASE AND WEEDS;***
- ***THE APPROVAL BE GRANTED FOR 12 MONTHS PERIOD TERMINATING ON THE 1 NOVEMBER 2019.***

COUNCIL DECISION – 10.1.3

Moved: Cr RI Trepp Seconded: Cr BA Ward Carried: 7/0

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO SECTION 3.1 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO GRANT APPROVAL TO MRS LYN PHILLIPS TO COLLECT NATIVE FLORA FROM COUNCIL MANAGED RESERVES AND ROAD RESERVES WITHIN THE SHIRE OF DOWERIN SUBJECT TO THE FOLLOWING CONDITIONS:

- **THE COLLECTION OF SEED IS TO BE CARRIED OUT SO AS NOT TO ENDANGER THE LONGTIME SURVIVAL OF THE NATIVE FLORA ON THE THOROUGHFARE;**
- **ALL PERSONS COLLECTING THE NATIVE SEED ARE TO HOLD A CURRENT LICENSE UNDER THE CONSERVATION ACT 1950 AND ABIDE BY THE CONDITIONS OF THAT LICENSE;**
- **ALL CARE TO BE TAKEN TO AVOID THE DISTURBANCE OF FAUNA HABITAT;**
- **ALL CARE TO BE TAKEN TO AVOID ANY DISTURBANCE THAT MAY LEAD TO SOIL DEGRADATION;**
- **ENSURE APPROPRIATE HYGIENE MEASURES ARE FOLLOWED AT ALL TIMES TO PREVENT THE SPREAD OF PLANT DISEASE AND WEEDS;**
- **THE APPROVAL BE GRANTED FOR 12 MONTHS PERIOD TERMINATING ON THE 1 NOVEMBER 2019.**

10.1.4 CHIEF EXECUTIVE OFFICER - DIRECTIONS BOARD OF MANAGEMENT APPOINTMENT

Date: 10 December 2018
File Ref: Organisation/Governance/Primary & Annual Returns
Disclosure of Interest: Nil
Author: Rebecca McCall, Chief Executive Officer
Attachments: Nil

Summary

To endorse the Chief Executive Officers appointment to the Board of Management of Directions Workforce Solutions Incorporated.

Background

Directions is a community based registered charity organisation with over 30 years' experience providing workforce development solutions to business through apprenticeships and traineeships, alongside career development and advice to assist jobseekers to make the best choices. Directions assist businesses build a skilled, safe, successful workforce and aims to ensure there are plenty of skilled workers in the future.

A Board of Management governs the associated body and it has authority to control and manage the affairs of the Association subject to the Rules of the Association.

The Chief Executive Officer was nominated and duly appointed onto the Board of Management at the Annual General Meeting of Directions November 2018.

Comment

The Board of Directions meet in Northam on a quarterly basis. The commitment requires the attendance of meetings plus travel which is estimated to be 16 hours per annum. The Chief Executive Officer proposes that this time is taken in lieu to ensure that the business of Directions will not impact on the administration of the Shire of Dowerin.

The Directions Workforce Solutions Incorporated Rules of Association outlines in Clause 15 renumeration of board members. The prescribed sitting fees for board members in 2019 are $400 per meeting.

The Chief Executive Officer will be declining the Board of Management Sitting Fees of $400 per meeting and will be advising the Chair of the Board of Management that membership is voluntary.

It is hoped that the Chief Executive Officer's voluntary involvement will benefit the region through linking relevant networks across the Wheatbelt with Directions in the aim to build a sustainable skilled workforce benefiting industry sectors within the outlining region.

Chief Executive Officers seeks Council's endorsement of the two-year appointment.

Financial Implications

The financial implications will include travel to Northam quarterly. The Chief Executive Officer will endeavor to schedule any meetings concerning Council on the same day of Directions Board of Management meetings.

Risk Implications

Nil

Consultation

Nil

Policy Implications

Shire of Dowerin Code of Conduct

Statutory Implications

Section 5.84 *Local Government Act 1995* applies.

The Chief Executive Officer will be required to disclose interest in a primary and annual return.

Strategic Implications

Strategic Community Plan - Theme 1 – Our Lifestyle – Outcome 4 - Reference C6

Strategic Community Plan - Theme 3 – Our Economy – Outcome 3 - Reference E6

Voting Requirements

Simple majority required

OFFICER RECOMMENDATION – 10.1.4

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO SECTION 5.84 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO APPROVE THE CHIEF EXECUTIVE OFFICERS APPOINTMENT TO THE BOARD OF DIRECTIONS WORKFORCE SOLUTIONS INCORPORATED.

COUNCIL DECISION – 10.1.4

Moved: Cr BA Ward Seconded: Cr LH Holberton Carried: 7/0

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO SECTION 5.84 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO APPROVE THE CHIEF EXECUTIVE OFFICERS APPOINTMENT TO THE BOARD OF DIRECTIONS WORKFORCE SOLUTIONS INCORPORATED.

10.1.5 RESTRICTED ACCESS VEHICLE (RAV) 4

Date: 11 December 2018
File Ref: Organisation/Governance/Council Policies
Disclosure of Interest: Nil
Author: Glen Brigg, Works & Assets Manager
Attachments: Nil

Summary

For Council to consider a request to amend the Restricted Access Vehicle (RAV) rating for Dowerin Meckering Road.

Background

An application was submitted to Main Roads Western Australia (MRWA) requesting to inspect Dowerin Meckering Road for a route determination category RAV 6-7. The overall length of the road being inspected extends beyond the Shire of Dowerin's boundary to the intersection of Quelagetting Road in the Shire of Cunderdin.

Heavy Vehicle Services recently asked for Jones Street to be included in the route determination which Council rejected. This application is for Dowerin Meckering Road only. Dowerin Meckering Road was inspected by HVS in September 2018 for a route determination. Dowerin Meckering Road is currently included in the RAV Route Network as category RAV 5 without conditions.

Comment

Most significate changes from category RAV 5 to RAV 6-7 is the overall length of truck and trailer combinations. The RAV 5 route allows heavy vehicle combinations up to 27.5m. RAV 6-7 route allows combinations from 27.5m to 36.5m.

Contact was made with the Manager of Works at the Shire of Cunderdin to ensure RAV route connectivity when entering the Shire of Cunderdin. The Shire of Cunderdin has formally agreed to allow Heavy Vehicles Services to inspect the section of the Dowerin Meckering Road for RAV 6-7 in the Shire of Cunderdin.

Heavy Vehicle Services recently communicated they are seeking RAV 7 connectivity from Dowerin to Great Eastern Highway. Currently the Meckering Road is RAV 7 from Quelagetting intersection to Great Eastern Highway. North of the Quelagetting intersection to the Shire boundary is RAV 5. Dowerin Meckering Road from the Shire boundary to Dowerin townsite is RAV 5 without conditions.

Financial Implications

There are no immediate financial implications, however a change in RAV Network Rating for all or part of the road has the potential to reduce the life of the road and increase the maintenance requirements of the road.

Risk Implications

Any amendment to RAV Network Ratings can potentially reduce the life of the road and increase the maintenance requirements of the road, therefore impacting on the Shire of Dowerin's Asset Management Plan and Long-Term Financial Plan.

Consultation

Heavy Vehicle Services

Manager of Works, Shire of Cunderdin

Chief Executive Officer (CEO)

Policy Implications

Request to Access Roads;

a) RAV Classified Roads – If required, heavy vehicle transport operators may request use of a classified road on the RAV Network by applying to the CEO for approval.

b) Unclassified Roads - If the road is not classified on the RAV Network then the applicant will first need to apply to MRWA (HVS). Upon receipt from MRWA (HVS), the Shire of Dowerin will assess the request in accordance with MRWA approved guidelines and if supported, a submission will be made to MRWA (HVS) for their consideration including any conditions that may apply to the use of the road.

c) AMMS Network - Heavy Vehicle Transport Operators may apply for a road already classified on the RAV Network to be approved for an AMMS Network level by applying to MRWA (HVS). Upon receipt from MRWA (HVS) the Shire of Dowerin will assess the request in accordance with MRWA approved guidelines. If supported, a submission will be made to MRWA (HVS) for their consideration

d) Should the road access request be declined, the Shire of Dowerin will inform MRWA (HVS) who will advise the applicant.

e) Depending on the need for access, a RAV access request may be supported if the applicant is willing to meet the costs associated for the Shire to carry out any road upgrades or vegetation pruning necessary to qualify the road for the RAV network level requested.

RAV Road Reclassification;

The Shire may withdraw support for an approved route at any time if:

(i) the route is deemed unsafe for RAV use;
(ii) the route is deemed unsuitable for RAV use; or
(iii) the heavy vehicle transport operator has breached approval conditions.

The CEO may grant agreement to Main Roads for all RAVs up to RAV 4 without referring the matter to Council providing the road/roads comply with the Main Roads Route Assessment Guidelines at standard VSR axle mass limits.

Statutory Implications

The *Road Traffic Act 1974* and the Road Traffic (Vehicle) Regulations 2014 govern the use of heavy vehicles on roads within Western Australia and define items such as compliance notices, exemptions, permits and notices for heavy restricted access vehicles. These regulations also contain provisions for mass and loading, load restraints, vehicle modifications and vehicle maintenance.

Voting Requirements

Simple/ required.

OFFICER RECOMMENDATION – 10.1.5

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO THE ROAD TRAFFIC ACT 1994, THE LOCAL GOVERNMENT ACT 1995 AND THE LAND ADMINISTRATION ACT 1997 RESOLVES TO ADVISE MAIN ROADS WESTERN AUSTRALIA, THAT COUNCIL AGREES THAT HEAVY VEHICLE SERVICES INSPECTS THE DOWERIN MECKERING ROAD FOR ROUTE DETERMINATION RAV 6-7 PROVIDED THE FULL LENGTH OF DOWERIN MECKERING ROAD IS APPROVED FOR RAV 6-7 TO THE GREAT EASTERN HIGHWAY TO ENSURE CONNECTIVITY.

COUNCIL DECISION – 10.1.5

Moved: Cr AJ Metcalf Seconded: Cr RI Trepp Carried: 7/0

THAT COUNCIL, BY SIMPLE MAJORITY, PURSUANT TO THE ROAD TRAFFIC ACT 1994, THE LOCAL GOVERNMENT ACT 1995 AND THE LAND ADMINISTRATION ACT 1997 RESOLVES TO ADVISE MAIN ROADS WESTERN AUSTRALIA, THAT COUNCIL AGREES THAT HEAVY VEHICLE SERVICES INSPECTS THE DOWERIN MECKERING ROAD FOR ROUTE DETERMINATION RAV 6-7 PROVIDED THE FULL LENGTH OF DOWERIN MECKERING ROAD IS APPROVED FOR RAV 6-7 TO THE GREAT EASTERN HIGHWAY TO ENSURE CONNECTIVITY.

10.1.6 PROPOSED SUBDIVISION OF LOT 84 (#423) COOK ROAD, DOWERIN

Date:	10 December 2018
Applicant:	AJ Marsh Pty Ltd on behalf of Gimson Pty Ltd
Location:	423 Cook Road, Dowerin
File Ref:	Compliance/Development & Building/Subdivision Applications
Disclosure of Interest:	Nil
Author:	Rebecca McCall, Chief Executive Officer
Attachments:	2. Location Plan 3. Plan of Subdivision 4. DC Policy 3.4 Homestead Lot Policy Area

Summary

Council is asked to consider its advice to the Western Australian Planning Commission (WAPC) regarding a proposal to create a homestead lot at Lot 84 (#423) Cook Road, Dowerin (the subject site).

It is recommended that Council advise the WAPC that Council has no objection to the proposed subdivision, subject to recommended conditions.

Background

The Western Australian Planning Commission has referred for Council comment a proposal to subdivide the subject site into 2 lots by creating an 8.1ha homestead lot (proposed Lot 2) in an existing uncleared area, and a 121.3994ha balance lot (proposed Lot 1) as shown in **Attachment 3** – Plan of Subdivision.

Existing Lot 84 is 129.4994ha in extent.

The subject site is located approximately 8.0km southeast of Dowerin townsite as is more clearly shown on the attached Location Plan (**Attachment 2**).

Under the Shire's Local Planning Scheme No. 2 (the Scheme), the subject site is zoned 'Rural'.

Under clause 3.2 (Objectives of the Zones) of the Scheme, the objectives of the Rural zone are;

- *To provide for a range of rural pursuits that are compatible with the capability of the land and retain the rural character and amenity of the locality.*
- *To protect land from urban uses that may jeopardise the future use of that land for other planned purposes that are compatible with the zoning.*
- *To protect the land from closer development that would detract from the rural character and amenity of the area.*
- *To prevent any development that may affect the viability of a holding.*
- *To encourage small scale, low impact tourist accommodation in rural locations.*
- *To encourage a diversification of rural activities that will reduce the dependency of the rural sector on traditional crops.*

Comment

The WAPC's Development Control Policy No. 3.4 – Subdivision of Rural Land (DC Policy 3.4) guides the subdivision of rural land to achieve the key objectives of State Planning Policy 2.5: Rural Planning, which are to:

(a) support existing, expanded and future primary production through the protection of rural land, particularly priority agricultural land and land required for animal premises and/or the production of food;

(b) provide investment security for existing, expanded and future primary production, and promote economic growth and regional development on rural land for rural land uses;

(c) outside of the Perth and Peel planning regions, secure significant basic raw material resources and provide for their extraction;

(d) provide a planning framework that comprehensively considers rural land and land uses, and facilitates consistent and timely decision-making;

(e) avoid and minimise land use conflicts;

(f) promote sustainable settlement in, and adjacent to, existing urban areas; and

(g) protect and sustainably manage environmental, landscape and water resource assets.

In accordance with Part 6.6 of DC Policy 3.4, the creation of homestead lots is intended to allow farmers to continue to occupy their dwelling when they cease to farm and provide settlement opportunities in areas where land fragmentation is limited and unlikely to increase. According to the Policy, homestead lots are to be created in a manner that is consistent with the rural character and landscape of a locality and may be facilitated through boundary rationalisation or the creation of a new lot.

An assessment of the proposal was undertaken against the establishment criteria for homestead lots listed under Part 6.6 of DC Policy 3.4 as follows:

	Criterion	**Compliance**
(a)	The land is in the DC 3.4 Homestead lot policy area	Yes. Refer Attachment 3 – DC Policy 3.4 Homestead Policy Area.
(b)	The homestead lot has an area between one and four hectares, or up to 20 hectares to respond to the landform and include features such as existing outbuildings, services or water sources	Yes. The proposed homestead lot is 8.1ha in extent to include existing outbuildings, electricity connections and an existing water source.
(c)	There is an adequate water supply for domestic, land management and fire management purposes	Yes. Complies.
(d)	The dwelling is connected to a reticulated electricity supply or an acceptable alternative is demonstrated	Yes. Complies.
(e)	The homestead lot has access to a constructed public road	Yes. The lot has direct frontage to Cook Road (constructed to gravel standard).
(f)	The homestead lot contains an existing residence that can achieve an appropriate buffer from adjoining rural land uses	Yes. Complies.
(g)	A homestead lot has not been excised from the farm in the past	N/A
(h)	The balance lot is suitable for the continuation of the rural land use, and generally consistent with prevailing lot sizes, where it can be shown that this is consistent with the current farming practices at the	Yes. Complies.

	Criterion	Compliance
	property	
(i)	The dwelling on a homestead lot must be of a habitable standard and may be required to be certified as habitable by the local government	Yes. Complies.

As the subject site is identified as land falling within a bush fire prone area of Western Australia as designated by the Fire and Emergency Services (FES) Commissioner, State Planning Policy No. 3.7 – Planning in Bushfire Prone Areas applies to the proposed subdivision.

Given the above, staff recommend Council advises the WAPC that the proposal is supported, subject to recommended conditions as outlined in the 'Officer Recommendation' section of this report.

Financial Implications

There are no direct financial implications for the Shire of the recommendations of this report.

Risk Implications

There are no known risk implications for the Shire in relation to the recommendations of this report.

Consultation

In preparing this report, Council's CEO consulted and liaised with Hinterland Urban & Regional Planning Consultants.

Policy Implications

Nil

Statutory Implications

The following statutory implications applies:

Planning and Development Act (as amended) 2005; Shire of Dowerin Local Planning Scheme No.2; State Planning Policy No. 2.5 – Rural Planning; Development Control Policy No. 3.4 – Subdivision of Rural Land; and State Planning Policy No. 3.7 – Planning in Bushfire Prone Areas.

Strategic Implications

Strategic Community Plan – Theme 5 – Our Leaders – Outcome 2 – Reference L4

Voting Requirements

Simple Majority required.

OFFICER RECOMMENDATION – 10.1.6

THAT COUNCIL ADVISE THE WESTERN AUSTRALIAN PLANNING COMMISSION THAT COUNCIL SUPPORTS THE PROPOSED HOMESTEAD LOT SUBDIVISION OF LOT 84 (#423) COOK ROAD, DOWERIN AS DEPICTED ON THE PLAN OF SUBDIVISION DATED 28 NOVEMBER 2018 (WAPC REF. NO. 157480), SUBJECT TO THE FOLLOWING RECOMMENDED CONDITIONS:

1. ***ALL BUILDINGS AND EFFLUENT DISPOSAL SYSTEMS HAVING THE NECESSARY CLEARANCE FROM THE NEW BOUNDARIES AS REQUIRED UNDER THE RELEVANT LEGISLATION INCLUDING THE LOCAL PLANNING SCHEME, BUILDING ACT 2011, AND NATIONAL CONSTRUCTION CODE SERIES/BUILDING CODE OF AUSTRALIA (AS AMENDED).***

2. ***A NOTIFICATION, PURSUANT TO SECTION 165 OF THE PLANNING AND DEVELOPMENT ACT 2005, IS TO BE PLACED ON THE CERTIFICATE(S) OF TITLE OF THE PROPOSED LOT(S) WITH A BUSHFIRE ATTACK LEVEL (BAL) RATING OF 12.5 OR ABOVE, ADVISING OF THE EXISTENCE OF A HAZARD OR OTHER FACTOR.***

   NOTICE OF THIS NOTIFICATION IS TO BE INCLUDED ON THE DIAGRAM OR PLAN OF SURVEY (DEPOSITED PLAN). THE NOTIFICATION IS TO STATE AS FOLLOWS:

   'THIS LAND IS WITHIN A BUSHFIRE PRONE AREA AS DESIGNATED BY AN ORDER MADE BY THE FIRE AND EMERGENCY SERVICES COMMISSIONER AND IS/MAY BE SUBJECT TO A BUSHFIRE MANAGEMENT PLAN. ADDITIONAL PLANNING AND BUILDING REQUIREMENTS MAY APPLY TO DEVELOPMENT ON THIS LAND'

3. ***A NOTIFICATION, PURSUANT TO SECTION 70A OF THE TRANSFER OF LAND ACT 1893 IS TO BE PLACED ON THE CERTIFICATE(S) OF TITLE OF THE PROPOSED LOT(S). NOTICE OF THIS NOTIFICATION IS TO BE INCLUDED ON THE DIAGRAM OR PLAN OF SURVEY (DEPOSITED PLAN). THE NOTIFICATION IS TO STATE AS FOLLOWS:***

   'A RETICULATED SEWERAGE SERVICE IS NOT AVAILABLE TO THE LOT(S).'

4. ***A NOTIFICATION, PURSUANT TO SECTION 70A OF THE TRANSFER OF LAND ACT 1893 IS TO BE PLACED ON THE CERTIFICATE(S) OF TITLE OF THE PROPOSED LOT(S). NOTICE OF THIS NOTIFICATION IS TO BE INCLUDED ON THE DIAGRAM OR PLAN OF SURVEY (DEPOSITED PLAN). THE NOTIFICATION IS TO STATE AS FOLLOWS:***

   'A MAINS POTABLE WATER SUPPLY IS NOT AVAILABLE TO THE LOT(S).'

COUNCIL DECISION – 10.1.6

Moved: Cr LG Hagboom Seconded: Cr BA Ward Carried: 7/0

THAT COUNCIL ADVISE THE WESTERN AUSTRALIAN PLANNING COMMISSION THAT COUNCIL SUPPORTS THE PROPOSED HOMESTEAD LOT SUBDIVISION OF LOT 84 (#423) COOK ROAD, DOWERIN AS DEPICTED ON THE PLAN OF SUBDIVISION DATED 28 NOVEMBER 2018 (WAPC REF. NO. 157480), SUBJECT TO THE FOLLOWING RECOMMENDED CONDITIONS:

1. **ALL BUILDINGS AND EFFLUENT DISPOSAL SYSTEMS HAVING THE NECESSARY CLEARANCE FROM THE NEW BOUNDARIES AS REQUIRED UNDER THE RELEVANT LEGISLATION INCLUDING THE LOCAL PLANNING SCHEME, BUILDING ACT 2011, AND NATIONAL CONSTRUCTION CODE SERIES/BUILDING CODE OF AUSTRALIA (AS AMENDED).**

2. **A NOTIFICATION, PURSUANT TO SECTION 165 OF THE PLANNING AND DEVELOPMENT ACT 2005, IS TO BE PLACED ON THE CERTIFICATE(S) OF TITLE OF THE PROPOSED LOT(S) WITH A BUSHFIRE ATTACK LEVEL (BAL) RATING OF 12.5 OR ABOVE, ADVISING OF THE EXISTENCE OF A HAZARD OR OTHER FACTOR.**

   NOTICE OF THIS NOTIFICATION IS TO BE INCLUDED ON THE DIAGRAM OR PLAN OF SURVEY (DEPOSITED PLAN). THE NOTIFICATION IS TO STATE AS FOLLOWS:

   'THIS LAND IS WITHIN A BUSHFIRE PRONE AREA AS DESIGNATED BY AN ORDER MADE BY THE FIRE AND EMERGENCY SERVICES COMMISSIONER AND IS/MAY BE SUBJECT TO A BUSHFIRE MANAGEMENT PLAN. ADDITIONAL PLANNING AND BUILDING REQUIREMENTS

MAY APPLY TO DEVELOPMENT ON THIS LAND.'

3. **A NOTIFICATION, PURSUANT TO SECTION 70A OF THE TRANSFER OF LAND ACT 1893 IS TO BE PLACED ON THE CERTIFICATE(S) OF TITLE OF THE PROPOSED LOT(S). NOTICE OF THIS NOTIFICATION IS TO BE INCLUDED ON THE DIAGRAM OR PLAN OF SURVEY (DEPOSITED PLAN). THE NOTIFICATION IS TO STATE AS FOLLOWS:**

   'A RETICULATED SEWERAGE SERVICE IS NOT AVAILABLE TO THE LOT(S).'

4. **A NOTIFICATION, PURSUANT TO SECTION 70A OF THE TRANSFER OF LAND ACT 1893 IS TO BE PLACED ON THE CERTIFICATE(S) OF TITLE OF THE PROPOSED LOT(S). NOTICE OF THIS NOTIFICATION IS TO BE INCLUDED ON THE DIAGRAM OR PLAN OF SURVEY (DEPOSITED PLAN). THE NOTIFICATION IS TO STATE AS FOLLOWS:**

   'A MAINS POTABLE WATER SUPPLY IS NOT AVAILABLE TO THE LOT(S).'

10.1.7 DEVELOPMENT APPROVAL – GRAIN RECEIVAL AND STORAGE FACILITIES

Date:	11 December 2018
Applicant:	Co-operative Bulk Handling Limited (CBH)
Location:	Lot 801 on DP 73758 Irvine Road, Dowerin
File Ref:	Compliance/Development & Building/Development Applications Disclosure
Disclosure of Interest:	Nil
Author:	Rebecca McCall, Chief Executive Officer
Attachments:	5. Location Plan 6. Proposed Site Development Plan and associated drawings (belt conveyor & portable bulkheads) 7. Comprehensive Design Report & Transport Impact Assessment Report 8. Dust Management Plan 9. Noise Management Plan

Summary

Council is asked to determine an application for development approval for additional grain receival and storage facilities at CBH's Dowerin West grain receival site located on Irvine Road (parallel to Goomalling - Wyalkatchem Road) approximately 2km southwest of Dowerin townsite.

It is the author's recommendation that Council approves the proposed development, subject to conditions.

Background

The Shire has received a development application from CBH that proposes to construct additional grain receival facilities at its Dowerin West grain receival site located at Lot 801 on Deposited Plan 73758 Irvine Road, Dowerin (the subject site). The subject site has a legal area of 44.4497ha and is located approximately 2km southwest of Dowerin townsite. Access to the subject site is facilitated via Irvine Road as is more clearly shown on the Location Plan (refer **Attachment 5** – Location Plan).

The Proposal:

The proposed development (to be developed east of the existing grain receival facility) comprises the following components: -

- 3 x 340m long x 35m wide open bulkheads (OBH's) using 1.8m high wall frames on sealed pads covered with tarpaulins once filled with grain;
- 1 x hopper pit and ground conveyor in between two of the OBH's;
- Connecting existing to new stormwater drainage alongside the internal roads and around the OBH pads to a new drainage basin; and
- Sealed internal road connecting the existing internal roads.

Refer **Attachment 6** – Proposed Site Development Plan and associated drawings (belt conveyor & portable bulkheads).

The Applicant also submitted to the Shire the following technical reports and management plans in support of the proposal:

- Comprehensive Design Report (includes engineering design, stormwater drainage calculations, internal road layout, pavement design) – refer **Attachment 7**;
- Transport Impact Statement Report – refer **Attachment 7**;
- Dust Management Plan – refer **Attachment 8**; and

- Noise Management Plan – refer **Attachment 9**. Note: The Noise Management Plan will apply to noise generated at the site during the construction phase only.

Shire of Dowerin Local Planning Scheme No. 2 (the Scheme)

The subject site is zoned 'Rural' by the Scheme. A grain receival facility can be described/characterised as a "Primary Production Industry". The Model Scheme Text in the *Planning and Development (local planning schemes) Regulations 2015* define Primary Production Industry as follows:

> *"industry — primary production means premises used —*
>
> *(a) to carry out a primary production business as that term is defined in the Income Tax Assessment Act 1997 (Commonwealth) section 995-1; or*
>
> *(b) for a workshop servicing plant or equipment used in primary production businesses;"*

The land use class "industry – primary production" is depicted with the symbol "P" in Table 1 – Zoning Table of the Scheme.

'P' means that the use is permitted by the Scheme providing the use complies with the relevant development standards and the requirements of the Scheme.

Under clause 3.2 (Objectives of the Zones) of the Scheme, the objectives of the Rural zone are:

- *To provide for a range of rural pursuits that are compatible with the capability of the land and retain the rural character and amenity of the locality.*
- *To protect land from urban uses that may jeopardise the future use of that land for other planned purposes that are compatible with the zoning.*
- *To protect the land from closer development that would detract from the rural character and amenity of the area.*
- *To prevent any development that may affect the viability of a holding.*
- *To encourage small scale, low impact tourist accommodation in rural locations.*
- *To encourage a diversification of rural activities that will reduce the dependency of the rural sector on traditional crops.*

Deemed provisions for local planning schemes (contained in Schedule 2 of the Planning and Development (local planning schemes) Regulations 2015)

Clause 66 (1) of the *deemed provisions for local planning schemes* state as follows: -

> *"(1) When, in the opinion of the local government, an application for development approval may affect any other statutory, public or planning authority, the local government is to provide a copy of the application to the authority for objections and recommendations."*

Given that ingress to and egress from the facility is serviced by Irvine Road and Rifle Range Road providing connection to Goomalling – Wyalkatchem Road (last-mentioned under care and control of Main Roads WA (MRWA)), staff considered that the application may affect the interests of MRWA.

An electronic copy of the development proposal was subsequently emailed to MRWA staff in Northam, who provided the following advice to the Shire on the 10th of December 2018:

> *"Further to your correspondence and attachments regarding the expansion of the CBH receival site at Dowerin, Main Roads provides the following comments.*
>
> *As mentioned in the Traffic Impact Statement the intersection of Rifle Range Road with Goomalling Wyalkatchem Road (M016) was upgraded approx. 5 years ago. The current layout includes a right turn pocket and left turn lane on M016*

and has been designed to accommodate multi combination vehicles up to 36.5m in length. No further improvements are expected to be required.

The current RAV ratings as detailed on the HVS RAV Mapping tool, have M016 rated as RAV 5 and Rifle Range Road rated as a RAV 4 with conditions. Irvine Road has no RAV endorsement. The formation of Irvine Road appears to be contained in land owned by CBH rather than in land dedicated as road reserve. This may be the reason it is not shown on the RAV mapping tool. It is suggested that the applicant contacts HVS Main Roads to clarify this when requesting the upgrade from RAV 4 to RAV 7 for both Rifle Range Road and Irvine Road. Once the assessment has been completed this will identify if any improvements are required at either intersection, M016/Rifle Range Road and Rifle Range Road/Irvine Road to accommodate the swept paths of the larger vehicles.

The original development approval for this site included a condition that no access from the CBH site was permitted via the unconstructed section of Irvine Road direct to M016 at the eastern end of the receival site. The reason for this was due to the proximity of the railway crossing. This Xing has active flashing light protection and non-approved vehicular angular access by CBH operations is not appropriate. There is evidence that this unapproved access is still being used from time to time.

Main Roads is prepared to support the proposed development application on the condition that the eastern access is closed to prevent unauthorised use, and to ensure that all traffic accesses the receival site via Rifle Range Road and the western leg of Irvine Road."

Under clause 67 of the *deemed provisions for local planning schemes*, the Shire is to have due regard to the following matters to the extent that, in the opinion of the Shire, those matters are relevant to the development the subject of the application:

(a) *the aims and provisions of this Scheme and any other local planning scheme operating within the Scheme area;*

(c) *any approved State planning policy;*

(m) *the compatibility of the development with its setting including the relationship of the development to development on adjoining land or on other land in the locality including, but not limited to, the likely effect of the height, bulk, scale, orientation and appearance of the development;*

(n) *the amenity of the locality including the following —*

(i) *environmental impacts of the development;*

(ii) *the character of the locality;*

(iii) *social impacts of the development;*

(q) *the suitability of the land for the development taking into account the possible risk of flooding, tidal inundation, subsidence, landslip, bush fire, soil erosion, land degradation or any other risk;*

(r) *the suitability of the land for the development taking into account the possible risk to human health or safety;*

(s) the adequacy of —

(i) the proposed means of access to and egress from the site; and

(ii) arrangements for the loading, unloading, manoeuvring and parking of vehicles;

(t) the amount of traffic likely to be generated by the development, particularly in relation to the capacity of the road system in the locality and the probable effect on traffic flow and safety;

(u) the comments or submissions received from any authority consulted under clause 66;

Comment

An assessment of the proposal against the relevant provisions of the Scheme and the relevant provisions listed under clause 67 of the *deemed provisions for local planning schemes* shows the proposed extension to the existing Dowerin West grain receival site is substantially compliant with the planning framework.

The only key issue bearing on consideration of the proposal is the anticipated increase in heavy vehicle movements that the proposed extensions will generate. To this end, the Transport Impact Statement (TIS) (refer Attachment 3) has assessed the potential traffic impacts associated with the proposed expansion of the facility, which found that the overall all measurable impacts will remain constrained within the annual harvest period which typically spans a 4-6-week long window within the months of October to December. The TIS suggests the site will generate approximately 50 percent more daily deliveries (from 100 up to 150) and peak hourly deliveries (from 20 up to 30) during harvest windows.

The short-term nature of the traffic generated by the facility and under-saturation of the surrounding remote road network will provide sufficient capacity to accommodate the increases hourly and daily traffic.

Lastly, the author of the TIS concludes that the desired changes to the MRWA HVS defined RAV route categories of key site service roads and intersections requires undertaking a formal application and assessment process (RAV category change from current RAV4 to RAV7). Changing from the RAV category from RAV4 to RAV7 will facilitate access to the site by vehicles of increased length and mass without need for special individual operational permits.

It is recommended Council approves the application subject to conditions as outlined under 'Officer Recommendation' section of this report.

Financial Implications

There are no direct financial implications for the Shire of the recommendations of this report.

The Applicant has paid the Shire the relevant statutory planning fees as per Schedule 2 (maximum fees for certain planning services) of the *Planning and Development Regulations 2009*.

Risk Implications

There are no known risk implications for the Shire in relation to the recommendations of this report.

A decision made by the Council of the Shire of Dowerin has a statutory weight where made on valid planning grounds. The application has been assessed against the relevant planning framework to which a recommendation has been prepared.

Consultation

In preparing this report, Council's CEO consulted and liaised with Hinterland Urban & Regional Planning Consultants.

Policy Implications

Nil

Statutory Implications

Planning and Development Act (as amended) 2005

Shire of Dowerin Local Planning Scheme No.2

Planning and Development (Local Planning Schemes) Regulations 2015

Planning and Development Regulations 2009

State Planning Policy No. 2.5 – Rural Planning

Strategic Implications

Strategic Community Plan – Theme 5 – Our Leaders – Outcome 2 – Reference L4

Voting Requirements

Simple Majority required

OFFICER RECOMMENDATION – 10.1.7

THAT COUNCIL GRANTS DEVELOPMENT APPROVAL TO CO-OPERATIVE BULK HANDLING LIMITED FOR CONSTRUCTION OF ADDITIONAL GRAIN RECEIVAL AND STORAGE FACILITIES AT LOT 801 ON DP 73758 IRVINE ROAD, DOWERIN IN ACCORDANCE WITH THE PLANS AND MANAGEMENT PLANS RECEIVED 5 DECEMBER 2018, SUBJECT TO THE FOLLOWING CONDITIONS:

1. ***THE DEVELOPMENT HEREBY PERMITTED MUST SUBSTANTIALLY COMMENCE WITHIN TWO YEARS FROM THE DATE OF THIS DECISION LETTER.***
2. ***THE DEVELOPMENT HEREBY PERMITTED TAKING PLACE IN ACCORDANCE WITH THE APPROVED PLANS.***
3. ***VEHICULAR ACCESS TO THE DEVELOPMENT HEREBY PERMITTED SHALL BE VIA RIFLE RANGE ROAD AND THE WESTERN LEG OF IRVINE ROAD ONLY. THERE IS TO BE NO DIRECT VEHICULAR ACCESS VIA THE UNCONSTRUCTED SECTION OF IRVINE ROAD DIRECT TO M016 AT THE EASTERN END OF THE RECEIVAL SITE TO THE DEVELOPMENT HEREBY PERMITTED.***
4. ***THE STORMWATER SHALL BE DISCHARGED IN A MANNER SO THAT THERE IS NO DISCHARGE ONTO THE ADJOINING PROPERTIES TO THE SATISFACTION OF THE LOCAL GOVERNMENT.***
5. ***PRIOR TO OCCUPATION, STORMWATER DRAINAGE WORKS MUST BE COMPLETED IN ACCORDANCE WITH THE APPROVED PLANS TO THE SATISFACTION OF THE LOCAL GOVERNMENT.***
6. ***THE ON-SITE DRAINAGE SYSTEM SHALL BE MAINTAINED ON AN ONGOING BASIS TO THE SATISFACTION OF THE LOCAL GOVERNMENT.***
7. ***ALL ACTIVITIES ASSOCIATED WITH THE CONSTRUCTION OF THE DEVELOPMENT HEREBY APPROVED MUST BE CARRIED OUT TO THE SATISFACTION OF THE LOCAL AUTHORITY AND ALL CARE MUST BE TAKEN TO MINIMISE THE EFFECT OF SUCH ACTIVITIES ON THE AMENITY OF THE LOCALITY.***
8. ***THE DUST MANAGEMENT PLAN HEREBY APPROVED SHALL BE IMPLEMENTED AND ADHERED TO AT ALL TIMES.***
9. ***THE NOISE MANAGEMENT PLAN HEREBY APPROVED SHALL BE IMPLEMENTED AT THE START OF THE CONSTRUCTION PHASE, AND BE ADHERED TO FOR THE FULL DURATION OF THE CONSTRUCTION PHASE.***

COUNCIL DECISION – 10.1.7

Moved: Cr RI Trepp Seconded: Cr LH Holberton Carried: 7/0

THAT COUNCIL DEFER THIS ITEM TO THE ORDINARY MEETING OF COUNCIL IN JANUARY 2019.

Reason for variation is to allow time for the Chief Executive Officer and Councillors to meet with CBH.

10.2 FINANCE REPORT

10.2.1 FINANCE REPORT– NOVEMBER 2018

Date:	12 December 2018
File Ref:	Organisation/Financial Management/Reporting/Financial Statements/2018-2019 Monthly Financial Statements
Disclosure of Interest:	Nil
Author:	Susan Fitchat
Senior Officer:	Rebecca McCall, Chief Executive Officer
Attachments:	10. Monthly Financial Activity Statements – November 2018

Summary

The Statement of Financial Activity, which includes Detailed Schedules, Statement of Financial Position, Current Ratios and Investment Register for the period ending 30 November 2018 are presented for the Finance Committee to review.

Please note, that the figures are actual at the time of reporting, and the depreciation year to date figures are in the reports as the financial year 2017-2018 has been finalised.

Background

Section 6.4 of the *Local Government Act 1995* requires a Local Government to prepare financial reports.

Regulation 34 & 35 of the *Local Government (Financial Management) Regulations 1996* set out the form and content of the financial reports which have been prepared for the periods as above and are presented to Council for approval.

Comment

In order to fulfil statutory reporting requirements, and to provide the Council with a synopsis of the Shire of Dowerin's overall financial performance on a year to date basis, the following financial reports are attached.

- Statements of Financial Activity – Statutory Reports by Program and Nature or Type
  The Statements of Financial Activity provide details of the Shire's operating revenues and expenditures on a year to date basis. The reports further include details of non-cash adjustments and capital revenues and expenditures, to identify the Shire's net current position; which reconciles with that reflected in the associated Net Current Position note (Note 3).
- Capital Acquisitions

  This report provides year to date budget performance in respect of the following capital expenditure activities and their funding sources. Individual project information can be found at Note 12.
- Note 1 – Significant Accounting Policies

  This note provides details of the accounting policies relating to the Shire's accounts.
- Note 2 - Explanation of Material Variances

  Council adopted (in conjunction with the Annual Budget) a material reporting variance

threshold of 5% or $5,000, whichever is the greater. This note explains the reasons for any material variances identified in the Statements of Financial Activity at the end of the reporting period.

- Note 3 - Net Current Funding Position - Statutory Requirement
  This note provides details of the composition of the net current asset position on a year to date basis and reconciles with the closing funding position as per the Statement of Financial Activity.
- Note 4 – Cash and Investments
  This note provides Council with the details of the actual amounts in the Shire's bank accounts and/or Investment accounts as at reporting date.
- Note 5 – Budget Amendments
  This note provides Council with a list of all budget amendments to date.
- Note 6 – Receivables
  This note provides Council with the sundry debtors outstanding as at reporting date.
- Note 7 - Cash Backed Reserves
  This note provides summary details of transfers to and from reserve funds, and associated interest earnings on reserve funds, on a year to date basis.
- Note 8 – Rating Information
  This note provides details of rates levied during the year.
- Note 9 – Information on Borrowings
  This note shows the Shire's current debt position and lists all borrowings.
- Note 10 – Grants and Contributions Received
  This note is being redeveloped and will be provided as soon as possible.
- Note 11 – Trust Funds
  This note shows the balance of funds held by the Shire in its Trust Fund on behalf of another person/entity.
- Note 12 – Capital Acquisitions
  This note details the capital expenditure program for the year.

Financial Implications

The budgeted opening funding surplus as per the Budget adopted on 21 August 2018 presents a $1,492,612 (Rate Setting Statement).

Risk Implications

Timely preparation of the monthly financial statements within statutory guidelines is vital to good financial management. Failure to submit compliant reports within statutory time limits will lead to non-compliance with the *Local Government Act 1995* and the *Local Government (Financial Management) Regulations 1996*.

Consultation

At the Finance Committee meeting on 12th December 2018, the following was considered in relation to the financial statements.

1. Note 2: Explanation of Material variances
   Variances in the program Other Property and Services will require more detail before presentation to Council. The current variance is mainly attributed to the under-recovery of

the plant and labour costs. This will be addressed during the Budget Review.

2. Note 3: Net Current Funding Position:
   Includes the tracking of the cash flow projection for the rest of the financial year in the liquidity graph. Additional graphs have been created for projection information purposes.
3. Note 11: Trust Funds
   The review and closure of obsolete trust funds accounts shall be assessed within the requirements of the Local Government (Financial Management) Regulations 1996 and the Local Government Act 1995. It is anticipated that this shall be completed by February 2019
4. Note 12: Capital Assets
   1 vehicle has been traded in and a new utility vehicle purchased in December 2018.
5. Note 10: Grants and Contributions
   A column to be inserted to present the YTD Budget compared to the YTD Actual.
   Currently it is the whole annual budget compared to YTD Actual.
   The capital road expenditure shall be revised during the budget review.

Policy Implications

The Shire of Dowerin has a comprehensive suite of financial management policies. Finances have been managed in accordance with these policies.

Statutory Implications

Council is required to adopt monthly statements of financial activity to comply with Regulation 34(1) of the *Local Government (Financial Management) Regulations 1996*. The FMR r. 34(4) allows for the Statements to be presented to Council at an Ordinary Meeting of Council within 2 months after the end of the month to which the statements relate, therefore by presenting the financial statements in December, the Shire of Dowerin compiles with statutory obligations.

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Simple Majority will be required at the Ordinary Meeting of Council.

OFFICER AND COMMITTEE RECOMMEDATION – 10.2.1

THAT THE COUNCIL BY SIMPLE MAJORITY PURSUANT TO REGULATION 34(1) OF THE LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATION 1996 RECEIVES THE STATUTORY FINANCIAL ACTIVITY STATEMENT REPORTS FOR THE PERIOD ENDING 30 NOVEMBER 2018.

COUNCIL DECISION – 10.2.1

Moved: Cr RI Trepp Seconded: Cr BA Ward Carried: 7/0

THAT THE COUNCIL BY SIMPLE MAJORITY PURSUANT TO REGULATION 34(1) OF THE LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATION 1996 RECEIVES THE STATUTORY FINANCIAL ACTIVITY STATEMENT REPORTS FOR THE PERIOD ENDING 30 NOVEMBER 2018.

10.2.2 ACCOUNTS FOR PAYMENT – 1 NOVEMBER TO 30 NOVEMBER 2018

File Ref:	Organisation/Financial Management/Reporting/Financial Statements/2018-2019 Monthly Payment List
Disclosure of Interest:	Nil
Author:	Kathleen Brigg – Finance Officer
Senior Officer:	Susan Fitchat – Finance Manager
Attachments:	11. List of Accounts for November 2018 12. Credit Card Statement for November2018

Background

The attached schedules of cheques drawn and electronic payments that have been raised under delegated authority during the month since the last Council meeting are presented to the Finance Committee before being presented to Council to be received.

Comment

The list as presented has been reviewed by the Finance Manager and Chief Executive Officer.

The ending sequence number for October were as follows:

Cheque:	10581
EFT:	6290

The beginning sequence number for November were as follows:

Cheque:	10582
EFT:	6291

The credit card statement with supporting invoices will be reviewed by the Finance Committee.

Consultation

At the Finance Committee meeting on 12th December 2018, the Finance Committee checked the sequencing of the payments and enquired about the following payments and contras:

- The Telstra accounts should be reviewed to see whether there is a cheaper service provider that can provide the same service.
- Fire brigade expenditure are contras as they are subsidized by an operational grant funding from the Department of Fire and Emergency Services. The payment list has been updated accordingly.
- EFT6383. JS Roadside Products Pty Ltd. $16,967.50.
  Response: This is for the purchase of 500 roadside guideposts and the labour hire cost of the driver to install the posts.

Financial Implications

Funds expended are in accordance with Council's adopted budget for the 2018-19 financial year.

Risk Implications

Council would not be contravening to the *Local Government Act 1995* and *Local Government (Financial Management) Regulations 1996* if this item was not presented to Council.

Consultation

Nil

Policy Implications

The Shire of Dowerin has a comprehensive suite of financial management policies. Finances have

been managed in accordance with these policies. Payments have been made under delegation.

Statutory Implications

Regulation 12 & 13 of the *Local Government (Financial Management) Regulations 1996* requires that a separate list be prepared each month for adoption by Council showing:

- Creditors paid under delegated authority from Council

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Simple Majority will be required at the Ordinary Meeting of Council.

OFFICER AND COMMITTEE RECOMMENDATION – 10.2.2

THAT COUNCIL RECEIVE THE REPORT FROM THE CHIEF EXECUTIVE OFFICER ON THE EXERCISE OF DELEGATED AUTHORITY IN RELATION TO CREDITOR PAYMENTS CHEQUE NUMBERS 10582 TO 10597 AND EFT6291 TO EFT6398 FROM THE MUNICIPAL FUND FOR THE PERIOD 01 TO 30 NOVEMBER 2018.

COUNCIL DECISION – 10.2.2

Moved: Cr RI Trepp Seconded: Cr BA Ward Carried: 7/0

THAT COUNCIL RECEIVE THE REPORT FROM THE CHIEF EXECUTIVE OFFICER ON THE EXERCISE OF DELEGATED AUTHORITY IN RELATION TO CREDITOR PAYMENTS CHEQUE NUMBERS 10582 TO 10597 AND EFT6291 TO EFT6398 FROM THE MUNICIPAL FUND FOR THE PERIOD 01 TO 30 NOVEMBER 2018.

10.2.3 TERM INVESTMENT

Date: 7 December 2018
File Ref: Organisation/Financial Management/Investments
Disclosure of Interest: Nil
Author: Susan Fitchat, Finance Manager
Senior Officer: Rebecca McCall, Chief Executive Officer
Attachments: 13. Interest Quotes

Background

The Shire investment for plant replacement was released in November, however the purchase of the grader is anticipated to be postponed to February/March 2019.

- $266,625 term deposit invested with Bendigo on 15th November
- $268,334 is the amount to be invested with interest earned.

Comment

In accordance with Council policy, officers have invited two local banks, NAB and Bendigo to provide the Shire with their term deposit rates. See attachment for responses.

As the funds are required for the replacement of the grader which is anticipated to be purchased by March 2019, a term deposit for 3 months is recommended.

The interest rates quoted are disclosed below.

Term/Period	National Australia Bank Ltd	Bendigo and Adelaide Bank Ltd
3 months	2.65%	2.60%

It is recommended to re-invest the term deposit with National Australia Bank.

Financial Implications

An investment of $268,334 provides a return of approximately $1,777 for 3 months (based on a rate of 2.65%).

Risk Implications

Term deposits with banks are considered low risk. However, there are risks inherent in any investment. Changes to the rates can have a positive or negative impact on returns. Another risk to consider is that the Shire is one of the larger customers and a decision by the Shire to invest in either bank will impact on the other.

Consultation

Susan Fitchat, Finance Manager

Policy Implications

Council adopted the Shire of Dowerin Investment Policy at the Ordinary Meeting of Council on 27 June 2017. This matter has been considered in the context of that Council policy.

Statutory Implications

As outlined in the *Local Government Act 1995* and *Local Government (Financial Management) Regulations 1996.*

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Simple Majority is required is required for this recommendation.

OFFICER AND COMMITTEE RECOMMENDATION – 10.2.3

THAT COUNCIL INVEST THE FUNDS OF $268,334.00 INCLUDING INTEREST WITH NATIONAL AUSTRALIA BANK FOR A TERM OF 3 MONTHS.

COUNCIL DECISION – 10.2.3

Moved: Cr BA Ward Seconded: Cr AJ Metcalf Carried: 7/0

THAT COUNCIL INVEST THE FUNDS OF $268,334.00 INCLUDING INTEREST WITH NATIONAL AUSTRALIA BANK FOR A TERM OF 3 MONTHS.

10.2.4 FINANCIAL RESERVES POLICY FOR REVIEW

Date:	7 December 2018
File Ref:	Organisation/Governance/Council Policies
Disclosure of Interest:	Nil
Author:	Susan Fitchat, Finance Manager and
Senior Officer:	Rebecca McCall, Chief Executive Officer
Attachments:	14. Financial Reserves Policy
	15. Leave Liability Table

Background

As part of the preparation for the review of the budget, the attached policy has been updated to incorporate recommendations by a local government consultant. The policy should ensure that the Shire has adequate reserves and to aim to have adequate cash balances for employee leave provisions and to sustain plant purchases as per the adopted Budget and Long-Term Financial Plan.

- Financial Reserves Policy

  The following amendment have been made;

  1.2.1 Long Service Leave Reserve has been amended to Leave Reserve and incorporates all current leave that cannot be absorbed within the annual budget. 80% cash value has been increased to 100%.
  1.2.2 Plant Replacement Reserve has been amended to Plant Reserve, and incorporates the cost of new additional plant, replacement and refurbishment.

A leave management policy will be drafted in the new calendar year to assist with the monitoring of due leave entitlement balances.

Comment

The policy has been reviewed by the management team.

Financial Implications

Funds expended are in accordance with Council's policy.

Risk Implications

Nil

Consultant

Darren Friend, Financial Consultant

Policy Implications

Updated and to replace current policy once reviewed.

Statutory Implications

Section 6.11 (2) of the *Local Government Act 1995* requires that before a Local Government*:*

a. Change the purpose of a reserve account; or
b. Use the money in a reserve account for another purpose

It must give one month's notice of the proposed change of purpose of use.

Strategic Implications

Nil

Voting Requirements

Simple Majority will be required at the Ordinary Meeting of Council.

OFFICER AND COMMITTEE RECOMMENDATION – 10.2.4

THAT COUNCIL ADOPT AND ADVERTISE THE REVISED FINANCIAL RESERVES POLICY.

COUNCIL DECISION – 10.2.4

Moved: Cr RI Trepp Seconded: Cr JC Chatfield Carried: 7/0

THAT COUNCIL ADOPT AND ADVERTISE THE REVISED FINANCIAL RESERVES POLICY.

10.3 MINUTES TO BE RECEIVED

10.3.1 MINUTES FROM COMMITTEE MEETINGS TO BE RECEIVED

Date: 10 December 2018
File Ref: Organisation/Governance/Committees
Disclosure of Interest: Nil
Author: Rebecca McCall, Chief Executive Officer
Attachments: 16. Australia Day Committee Minutes, 27 November 2018
17. Finance Committee Meeting Minutes, 12th December 2018
18. Audit Committee Meeting Minutes, 18th December 2018 - To be tabled at the Council Meeting

Summary

The report formally presents the minutes of Committees of Council from the previous month.

Background

The Shire has established the following Committees of Council:

Audit Committee;

Australia Day Honours Committee;

Finance Committee;

Local Emergency Management Committee;

Bush Fire Advisory Committee; and

Road Verge Management Advisory Committee.

The above Committees do not have any delegated authority; therefore any recommendations requiring a Council decision that result from a Committee meeting must be brought before Council. This will be done via agenda items to Council.

(NB: The list above excludes those Committees that are external to the Shire, i.e. established and managed by an external group, on which the Shire has nominated representatives. Council representatives from the external committees will report back to Council verbally at the next available Council meeting. Should a decision of Council be required, an agenda item will be prepared for Council.)

Comment

The attached minutes are the unconfirmed minutes of the meetings of Committees of Council held in the previous month.

Consultation

Nil

Financial Implications

The Officer's recommendation for Council to receive the minutes of Committee meetings carries no financial commitment for Council. Should any recommendation require a financial commitment or have any implication outside the CEO's delegated authority, the matter will be referred to Council as

a specific agenda item.

Risk Implications

Nil

Policy Implications

Nil

Statutory Implications

Administration regulation 11 sets out the content that the minutes of council or committee meetings must contain, including:

- the names of members present at the meeting;
- details of each motion moved, the mover and the outcome of the motion;
- details of each decision made at the meeting; and
- written reasons for each decision made at a meeting that is significantly different from the committee's or council employee's recommendation.

Section 5.22(2) and (3) of the Act requires that the minutes of a council or committee meeting are to go to the next meeting of the council or committee for confirmation and signing by the person presiding to certify the confirmation.

Strategic Implications

The Strategic Community Plan

Objective 4.2 - Strong leadership and governance

Voting Requirements

Simple majority

OFFICER RECOMMENDATION – 10.3.1

THAT COUNCIL BY SIMPLE MAJORITY PURSUANT TO SECTION 3.18 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO:

1. ***RECEIVE THE MINUTES OF THE:***
    a. ***AUSTRALIA DAY HONOURS COMMITTEE MEETING (UNCONFIRMED), 27TH NOVEMBER 2018;***
    b. ***FINANCE COMMITTEE MEETING (UNCONFIRMED), 12TH DECEMBER 2018; AND***
    c. ***AUDIT COMMITTEE MEETING (UNCONFIRMED), 18TH DECEMBER 2018.***

COUNCIL DECISION – 10.3.1

Moved: Cr BA Ward Seconded: Cr RI Trepp Carried: 7/0

THAT COUNCIL BY SIMPLE MAJORITY PURSUANT TO SECTION 3.18 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO:

1. **RECEIVE THE MINUTES OF THE:**
    a. **AUSTRALIA DAY HONOURS COMMITTEE MEETING (UNCONFIRMED), 27TH NOVEMBER 2018;**
    b. **FINANCE COMMITTEE MEETING (UNCONFIRMED), 12TH DECEMBER 2018; AND**
    c. **AUDIT COMMITTEE MEETING (UNCONFIRMED), 18TH DECEMBER 2018.**

10.3.2 RECOMMENDATIONS FROM AUDIT COMMITTEE FOR COUNCIL CONSIDERATION

Note:

The below Officer's Recommendation is to be considered by the Audit Committee at its meeting scheduled for 1.00pm on 18 December 2018. If the Committee resolves differently to the Officer's Recommendation it will be tabled at the Council Meeting. The final determination will be reflected as a Council Resolution in the Minutes.

Voting Requirements

Simple majority

OFFICER RECOMMENDATION – 10.3.2

THAT THE AUDIT COMMITTEE;

1. ***ADOPT THE 2017/18 ANNUAL REPORT, AND RECEIVE THE AUDITOR'S REPORT AND MANAGEMENT REPORT FROM AMD CHARTERED ACCOUNTANTS FOR THE 2016/17 FINANCIAL YEAR;***
2. ***RECOMMEND THE ADOPTION OF THE 2017/18 ANNUAL REPORT, AND RECEIPT OF THE AUDITOR'S REPORT AND MANAGEMENT REPORT FROM AMD CHARTERED ACCOUNTANTS FOR THE 2017/18 FINANCIAL YEAR TO COUNCIL; AND***
3. ***RECOMMEND TO COUNCIL THAT IT HOLD ITS ANNUAL GENERAL MEETING OF ELECTORS ON TUESDAY 5 FEBRUARY 2019 AT 6.00PM AT THE DOWERIN COMMUNITY CLUB.***

COUNCIL DECISION – 10.3.2

Moved: Cr AJ Metcalf Seconded: Cr BA Ward Carried: 7/0

THAT COUNCIL;

1. **ADOPT THE 2017-2018 ANNUAL REPORT, AND RECEIPT OF THE AUDITOR'S REPORT AND MANAGEMENT REPORT FROM AMD CHARTERED ACCOUNTANTS FOR THE 2017-2018 FINANCIAL YEAR;**
2. **HOLD ITS ANNUAL GENERAL MEETING OF ELECTORS ON TUESDAY 5 FEBRUARY 2019 AT 6.00PM, AT THE DOWERIN COMMUNITY CLUB; AND**
3. **AUTHORISES TO PAY THE AUSTRALIAN TAX OFFICE THE GST LIABILITY BALANCE OF $108,704.00.**

Reason for variation as the Audit Committee Meeting has now been held.

11. NEW BUSINESS OF AN URGENT NATURE

Nil

12. ELECTED MEMBERS MOTIONS

Nil

13. CONFIDENTIAL ITEMS

13.1.1 MOVE BEHIND CLOSED DOORS

RECOMMENDATION – 13.1.1

THAT THE MEETING MOVE BEHIND CLOSED DOORS TO DISCUSS CONFIDENTIAL MATTERS, ITEM 13.1.2 – DISPOSAL OF LAND – TENDER 2018-04 & ITEM 13.1.3 – DISPOSAL OF LAND – LOT 13 MAISEY STREET DOWERIN.

COUNCIL DECISION – 13.1.1

Moved: Cr RI Trepp Seconded: Cr LH Holberton Carried: 7/0

THAT THE MEETING MOVE BEHIND CLOSED DOORS TO DISCUSS CONFIDENTIAL MATTERS, ITEM 13.1.2 – DISPOSAL OF LAND – TENDER 2018-04 & ITEM 13.1.3 – DISPOSAL OF LAND – LOT 13 MAISEY STREET DOWERIN.

Susan Fitchat, Glen Brigg, Cr RI Trepp, Cr LG Hagboom & Emma Richards left the Chambers at 3.50pm.

13.1.2 CONFIDENTIAL ITEM - DISPOSAL OF LAND – TENDER 2018-04

COUNCIL DECISION – 13.1.2

Moved: Cr Metcalf Seconded: Cr Holberton Carried: 5-0

THAT COUNCIL, BY ABSOLUTE MAJORITY, PURSUANT TO SECTION 3.58 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO;

1. **DECLINE THE OFFER OF $66,000 TO PURCHASE LOT 46 PLAN P129090 AT 12 COTTRELL STREET, DOWERIN;**
2. **DECLINE THE OFFER OF $57,000 TO PURCHASE LOT 52 PLAN D093105 AT 4 O'LOGHLEN STREET, DOWERIN;**
3. **ACCEPT THE OFFER OF $85,000 FROM MERVIN BARR TO PURCHASE LOT 46 PLAN P129090 AT 12 COTTRELL STREET, DOWERIN IN ACCORDANCE WITH THE VALUATON REPORT;**
4. **PROVIDE LOCAL PUBLIC NOTICE OF THE PROPOSAL TO DISPOSE OF PURCHASE LOT 46 PLAN P129090 AT 12 COTTRELL STREET, DOWERIN; AND**
5. **AUTHORISE THE PRESIDENT AND CHIEF EXECUTIVE OFFICER TO SIGN THE CONTRACT OF SALE AND TRANSFER OF LAND FOR PURCHASE LOT 46 PLAN P129090 AT 12 COTTRELL STREET, DOWERIN.**

Cr RI Trepp returned to the Chambers at 3.56pm.

13.1.3 CONFIDENTIAL ITEM - DISPOSAL OF LAND – LOT 13 MAISEY STREET DOWERIN

COUNCIL DECISION – 13.1.3

Moved: Cr Holberton Seconded: Cr Chatfield Carried: 6/0

THAT COUNCIL, BY ABSOLUTE MAJORITY, PURSUANT TO SECTION 3.58 OF THE LOCAL GOVERNMENT ACT 1995 RESOLVES TO DECLINE THE OFFER OF $50,000 TO PURCHASE LOT 13 PLAN D03566 MAISEY STREET, DOWERIN.

13.1.4 MOVE OUT FROM BEHIND CLOSED DOORS

RECOMMENDATION – 13.1.4

THAT THE MEETING MOVE OUT FROM BEHIND CLOSED DOORS.

COUNCIL DECISION – 13.1.4

Moved: Cr Ward Seconded: Cr Holberton Carried: 6/0

THAT THE MEETING MOVE OUT FROM BEHIND CLOSED DOORS.

Susan Fitchat, Glen Brigg, Cr LG Hagboom & Emma Richards returned to the Chambers at 3.54pm.

14. CLOSURE OF MEETING

There being no further business Cr Darrel Hudson (President) declared the meeting closed at 3.55pm.

These minutes were confirmed true and accurate at the Ordinary Council Meeting held on Tuesday 22 January 2019.

…….. ……

D.P. Hudson ***Date***

PRESIDENT

ORDINARY COUNCIL MEETING
ATTACHMENTS
Tuesday
18 December 2018
3.00pm

SHIRE OF DOWERIN

ATTACHMENTS

10.1.1

1. Draft Gravel Supplies & Rehabilitation Policy

10.1.6

2. Location Plan
3. Plan of Subdivision
4. DC Policy 3.4 Homestead Lot Policy Area

10.1.7

5. Location Plan
6. Proposed Site Development Plan and associated drawings (belt conveyor & portable bulkheads)
7. Comprehensive Design Report & Transport Impact
8. Dust Management Plan
9. Noise Management Plan

10.2.1

10. Monthly Financial Activity Statements – November 2018

10.2.2

11. List of Accounts for November 2018
12. Credit Card Statement for November 2018

10.2.3

13. Interest Quotes

10.2.4

14. Financial Reserves Policy
15. Leave Liability Table

10.3.1

16. Australia Day Committee Minutes, 27th November 2018
17. Finance Committee Meeting Minutes, 12th December 2018
18. Audit Committee Meeting Minutes, 18th December 2018 – To be tabled at the Council Meeting

13.1.3

19. Confidential Attachment – Valuation Addendum

GRAVEL SUPPLIES AND REHABILITATION POLICY

Policy Owner Chief Executive Officer

Distribution All Employees

Responsible Officer Works and Assets Manager

Date Adopted DRAFT

File Reference Organisation/Governance/Council Policies

Objective

To ensure there is adequate supply of road building materials available for Council road works and there is an effective rehabilitation program in place and to ensure arrangements are transparent and comply with the Shire's obligations under sections 3.21 and 3.22 of the Local Government Act 1995.

Policy

Access to Gravel

Council recognises that in order to access gravel it needs to pay a fair price and abide by its own policies and local laws. To this end, Council will undertake the following:

- approach the landowner at least four weeks prior to the time that the works are due to commence, to advise the landowner of the Shire's intention, negotiate compensation and enable the landowner to make any domestic arrangements in relation to stock, etc.
- All gravel pits opened on private property will be reclaimed before the plant shifts to the next programmed job, unless firm arrangements are made with the landowner for not reclaiming.
- If the area is required for dam catchments, all top soil shall be stock piled, or removed if suitable for road building.
- If required by land holder, gravel areas shall be fenced, and suitable gates fitted to fenced area, at Shires expense.
- All care is to be taken to cause the least amount of inconvenience to the landowner as is possible.
- All Gravel Pits are to be rehabilitated in accordance with this Policy.
- Council's preference for payment of gravel is to pay $2.20 including GST per cubic metre for compacted gravel that is removed from private property. The cost will be charged against the particular job or jobs concerned.
- All transactions to be in accordance with relevant legislation and include a written agreement setting out all relevant details, including rehabilitation of the quarry/pit.

Gravel Pit Rehabilitation

The Shire recognises and accepts that gravel pit rehabilitation is necessary to avoid soil compaction, decrease surface drainage, avoid erosion and minimise visual pollution.

1. In general, prior to opening a gravel pit, a plan for the management of the site will be prepared which will include rehabilitation and monitoring.
2. Private operators are required to submit and abide to a gravel pit management plan, which includes rehabilitation and monitoring, before establishing a gravel pit.
3. Wherever possible, new gravel pits will be established on cleared land, not existing bushland and will not be located on a road verge.
4. Where necessary, the visual impacts of an operating gravel pit will be minimised through the establishment of buffers between the pit and visual vantage point/s.
5. Where necessary, the dust and noise impacts of an operating gravel pit will be minimised through the establishment of buffers between the pit and neighbours.
6. Throughout the life of the pit, topsoil, overburden and vegetation will be stockpiled separately ready for respreading in the rehabilitation process.
7. If weeds have developed on the topsoil mounds these should be removed prior to respreading the topsoil.
8. If necessary, drainage structures will be established within the pit, to reduce any ponding and surface erosion.
9. Rehabilitation will be done progressively throughout the life of the gravel pit.
10. The site will be monitored every year and for three years after closure of the pit. If rehabilitation is inadequate, appropriate measures will be taken to ensure success.

Bush Sites

Where a proposed gravel pit is located within bushland, the following will apply:

1. Refer to the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* and obtain the necessary clearing permits.
2. Prior to opening a gravel pit, seed from local endemic species will be collected from the site and stored for use in the revegetation phase of rehabilitation.
3. The general process of rehabilitation will be to first rip the floor of the pit at 1 metre intervals across the contour. Following ripping the pit needs to be shaped so that the surfaces are as smooth as possible, and the edges are battered down to blend in with the landscape. The batter slopes should be no steeper than 4H:1V. Next, the overburden, and then the topsoil should be returned to the pit. The site should then be cross-ripped at 1m intervals on the contour to encourage plant growth. Finally, the vegetation and debris should be returned to the pit.
4. Seeds collected prior to pit establishment should be scattered on the site at the time of year suited for germination (varies with location) if establishment from respreading vegetation has been inadequate. If a store of seeds is not available, seed from local endemic species should be collected from surrounding areas.
5. If the gravel pit is located on farm land, it will be fenced to exclude stock to help ensure adequate regeneration.

Pastured Sites

1. Prior to establishment of the site, the landowner will be asked how they want the site rehabilitated.
2. For sites to be rehabilitated back to pasture the general process of rehabilitation will be as follows. Firstly, the floor of the pit will be ripped to a depth of at least 50cm

along the contour. Following ripping the pit needs to be shaped so that the surfaces are as smooth as possible, and the edges are battered down to blend in with the landscape.

Next, the overburden and then topsoil should be returned to the pit. Pasture seed will be spread.

Abandoned Gravel Pits

1. An amount to be determined by Council as part of the annual budget process will be budgeted each financial year for rehabilitating abandoned gravel pits until all pits are rehabilitated to a satisfactory level.
2. The method for rehabilitation will not change from that mentioned in the section on current gravel pits.
3. If fill is no longer available, spoil from roadworks etc. will be used. Topsoil, if no longer on site, will be carted to the area to ensure regeneration will be satisfactory.
4. The site will be monitored every year for three years after rehabilitation works. If rehabilitation is inadequate, appropriate measures will be taken to ensure success.

Roles and Responsibilities

Chief Executive Officer
The Chief Executive Officer has responsibility to ensure this policy is implemented.

Related Documentation

NIL

Related Legislation/Local Law/Policy/Procedure

Sections 3.21 and 3.22 Local Government Act 1995

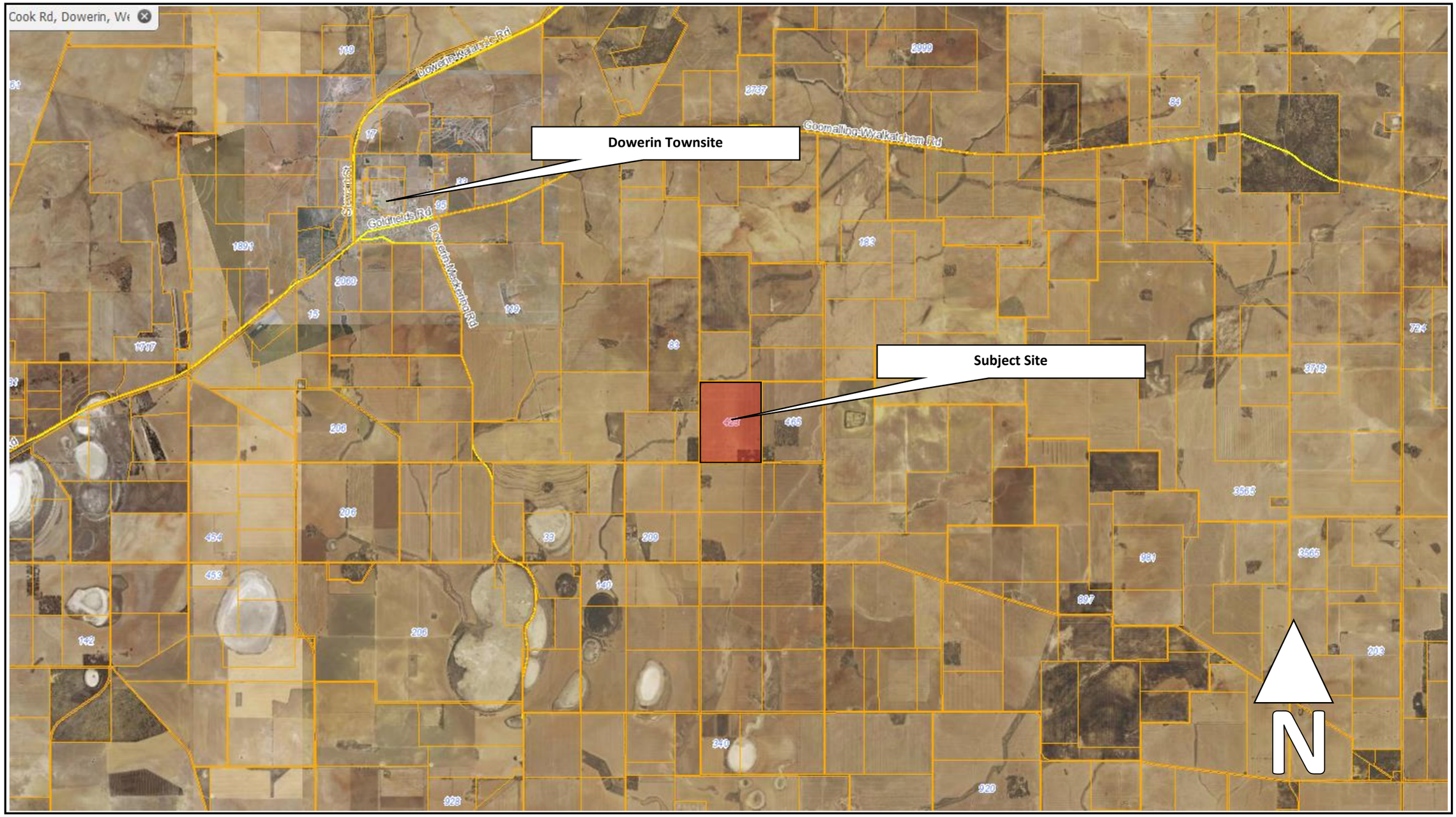
Related Delegation

NIL

Review History

ATTACHMENT 1 – LOCATION PLAN

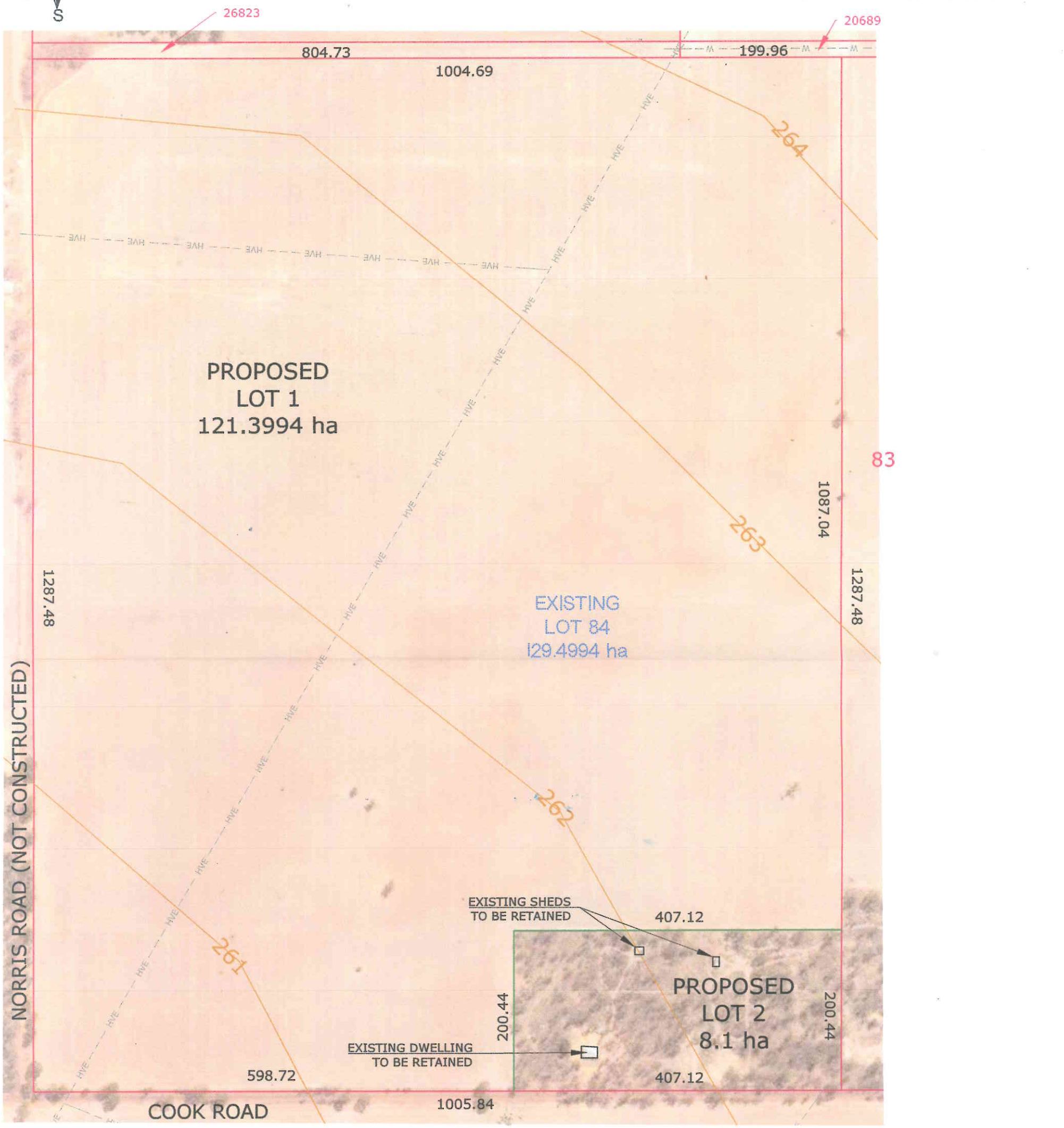
LOT 84 (#423) COOK ROAD, DOWERIN



DEPARTMENT OF PLANNING, LANDS AND HERITAGE	
DATE	FILE
28-Nov-2018	157480

LEGEND

- EXISTING LOT BOUNDARY
- 250 CONTOURS
- PROPOSED LOT BOUNDARY
- HVE HIGH VOLTAGE OVERHEAD POWER LINES
- W WATER PIPE (WATER CORPORATION)



EXISTING LOT DETAILS:

LOT 84 ON DP224578
C/T 1021/879
AREA 129.4994 ha

NOTES:

1. *ALL DIMENSIONS AND AREAS ARE SUBJECT TO SURVEY.*
2. *ALL EXISTING STRUCTURES TO BE RETAINED.*
3. *BUSHFIRE PRONE AREA AFFECTS PARTS OF LOTS.*
4. *INTENSITY OF DEVELOPMENT NOT INCREASED, THEREFORE, BAL NOT REQUIRED.*

A.J. Marsh Pty Ltd
ACN 0564 353 687
ABN 11 054 353 687
Alan Marsh (Director)
L.S., A.I.T., M.I.S.

PROJECT:
PROPOSED (HOMESTEAD LOT) SUBDIVISION OF LOT 84 ON DEPOSITED PLAN 224578, 423 COOK ROAD, DOWERIN, SHIRE OF DOWERING, TO CREATE TWO LOTS

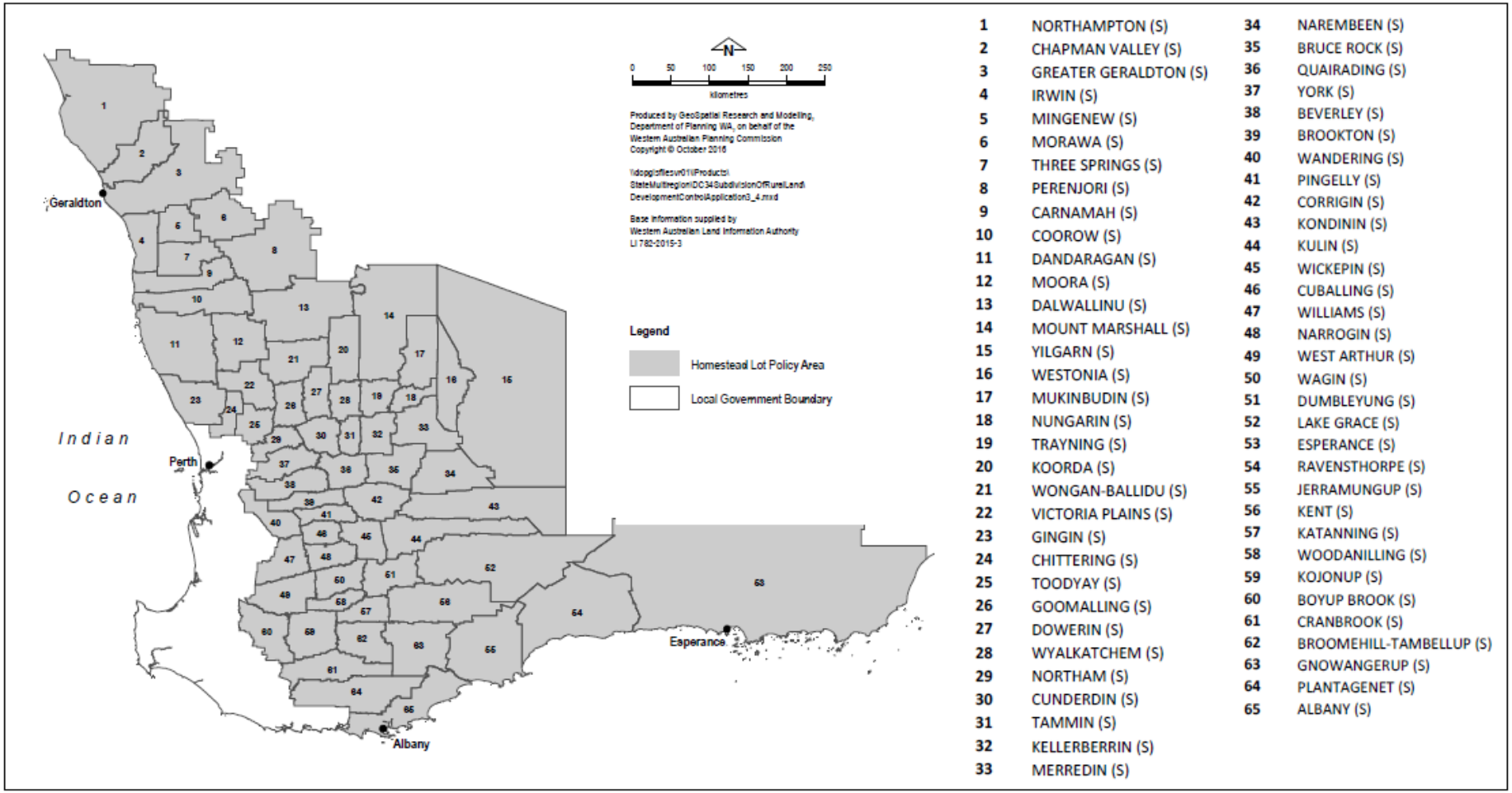
CONTACT:
ALAN MARSH
P.O. Box 355 Gosnells
Ph 9398 1994
Mob 043 858 2441
aj.marsh@westnet.com.au

CLIENTS:
GIMSON PTY LTD

DATE:	21/11/2018
SCALE:	1:5,000 @ A3
DATUM:	AHD
COORD:	ASSUMED
CONT INT:	1 m

ATTACHMENT 3 – WAPC HOMESTEAD POLICY AREA

Homestead lot policy area

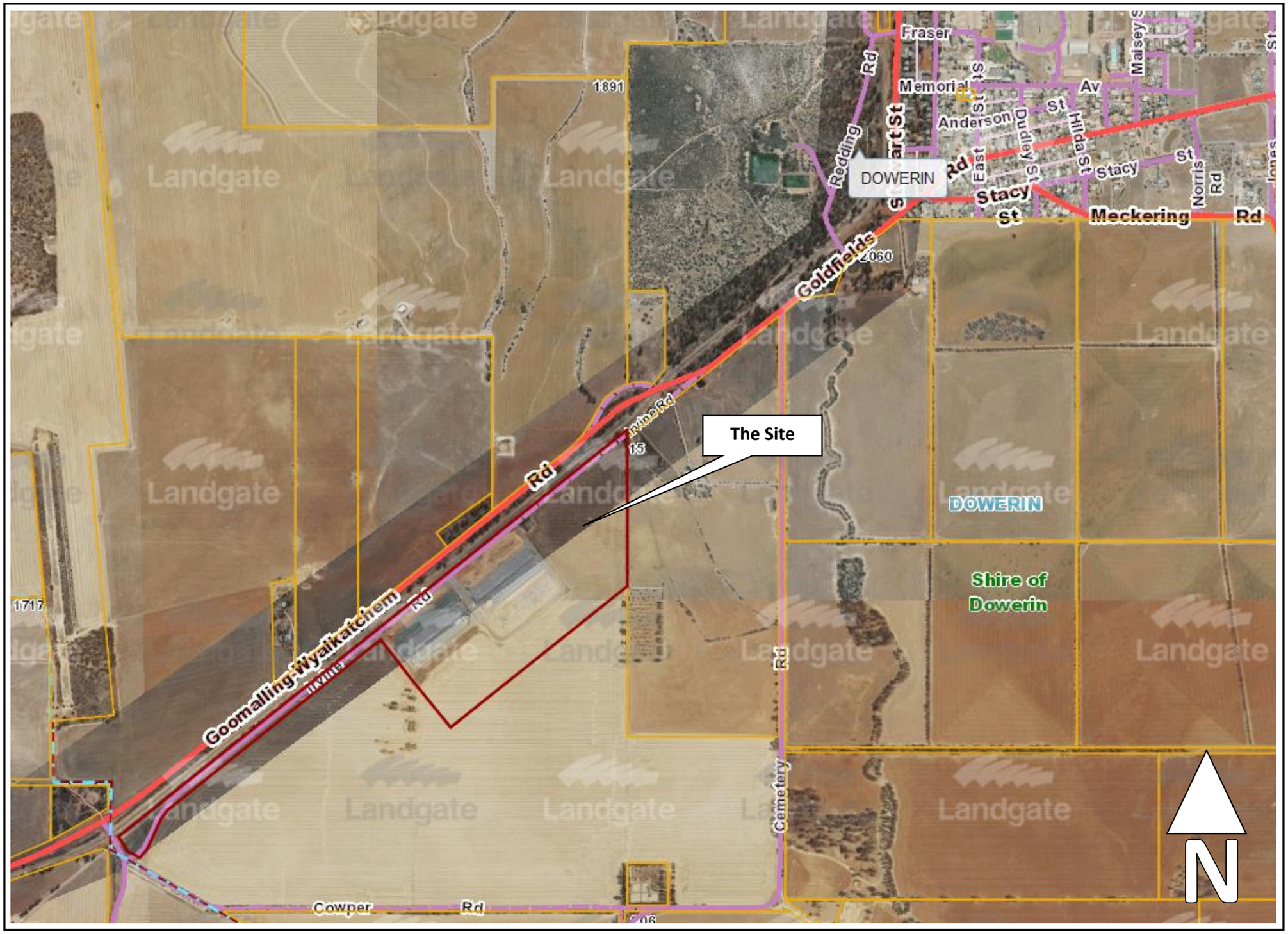


1	NORTHAMPTON (S)	34	NAREMBEEN (S)
2	CHAPMAN VALLEY (S)	35	BRUCE ROCK (S)
3	GREATER GERALDTON (S)	36	QUAIRADING (S)
4	IRWIN (S)	37	YORK (S)
5	MINGENEW (S)	38	BEVERLEY (S)
6	MORAWA (S)	39	BROOKTON (S)
7	THREE SPRINGS (S)	40	WANDERING (S)
8	PERENJORI (S)	41	PINGELLY (S)
9	CARNAMAH (S)	42	CORRIGIN (S)
10	COOROW (S)	43	KONDININ (S)
11	DANDARAGAN (S)	44	KULIN (S)
12	MOORA (S)	45	WICKEPIN (S)
13	DALWALLINU (S)	46	CUBALLING (S)
14	MOUNT MARSHALL (S)	47	WILLIAMS (S)
15	YILGARN (S)	48	NARROGIN (S)
16	WESTONIA (S)	49	WEST ARTHUR (S)
17	MUKINBUDIN (S)	50	WAGIN (S)
18	NUNGARIN (S)	51	DUMBLEYUNG (S)
19	TRAYNING (S)	52	LAKE GRACE (S)
20	KOORDA (S)	53	ESPERANCE (S)
21	WONGAN-BALLIDU (S)	54	RAVENSTHORPE (S)
22	VICTORIA PLAINS (S)	55	JERRAMUNGUP (S)
23	GINGIN (S)	56	KENT (S)
24	CHITTERING (S)	57	KATANNING (S)
25	TOODYAY (S)	58	WOODANILLING (S)
26	GOOMALLING (S)	59	KOJONUP (S)
27	DOWERIN (S)	60	BOYUP BROOK (S)
28	WYALKATCHEM (S)	61	CRANBROOK (S)
29	NORTHAM (S)	62	BROOMEHILL-TAMBELLUP (S)
30	CUNDERDIN (S)	63	GNOWANGERUP (S)
31	TAMMIN (S)	64	PLANTAGENET (S)
32	KELLERBERRIN (S)	65	ALBANY (S)
33	MERREDIN (S)		

Western Australian Planning Commission - December 2016

ATTACHMENT 1 – LOCATION PLAN

LOT 801 ON DP73758 IRVINE ROAD, DOWERIN



GOOMALLING - WYALKATCHEM ROAD

TO DOWERIN TOWNSITE

MATCH LINE BELOW

RAIL RESERVE BOUNDARY

SITE BOUNDARY

EXISTING GRAVEL ACCESS ROAD

REMOVE 270m SECTION OF STOCK FENCE

PROPOSED DETENTION DRAINAGE BASIN 01

EXISTING "E-PITS"

EXISTING OBH

EXISTING OBH

CONVEYOR ROAD

DOG ROAD

DOG ROAD WITH BYPASS LANE

PROPOSED OBH 06

340m x 35m

PROPOSED OBH 06/07 CONVEYOR

PROPOSED OBH 07

340m x 35m

PROPOSED OBH 08

340m x 35m

REMOVE 650m OF STOCK FENCE

PROPOSED RETENTION DRAINAGE BASIN 02

PROPOSED COMPRESSOR PAD

SITE BOUNDARY

PROPOSED E-PIT 06/07.

MATCH LINE ABOVE

PRELIMINARY ISSUE

DO NOT USE FOR CONSTRUCTION

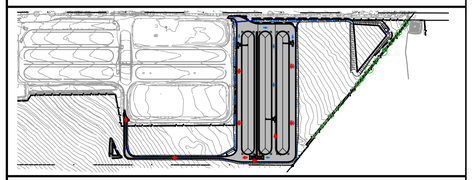
DATE 14.09.18

DIAL BEFORE YOU DIG www.1100.com.au

1:1000 @ A1
1:2000 @ A3

0 10 20 30 40 50 60 70 80 90 100 m

KEY PLAN



GENERAL NOTES

1. ALL WORKS TO BE IN ACCORDANCE WITH CBH SPECIFICATIONS, SCOPE OF WORKS AND GEOTECHNICAL REPORTS.
2. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL IDENTIFY, LOCATE AND VERIFY EXISTING SERVICES PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO VERIFY SETOUT PRIOR TO CONSTRUCTION.

SURVEY

COORDINATE SYSTEM	DOWERIN94
REF SYSTEM	HTD1001
HEIGHT DATUM	AUSTRALIAN HEIGHT DATUM

LEGEND

- EDGE OF PAVEMENT
- CENTRELINE OF ACCESS ROAD
- FILL BATTER
- CUT BATTER
- CULVERT
- DRAINAGE PATH
- BLEND TO EXISTING
- TRAFFIC MOVEMENTS (TRUCKS FULL)
- TRAFFIC MOVEMENTS (TRUCKS EMPTY)
- PROPOSED PAVEMENT

CBH GROUP HEAD OFFICE
30 DELHI STREET
WEST PERTH
W.A. 6005
PH (08) 9237 9600
FAX (08) 9322 3942

DO NOT SCALE FROM THIS DRAWING - ASK !!!

REF DRG No.	REFERENCE DRAWING TITLE
-	-

REV	DATE	REVISIONS	BY	CHK'D	APP'D
D	11.10.18	RE-ISSUED FOR TENDER			
C	14.09.18	ISSUED FOR TENDER	RHA	TDI	SEV
B	31.08.18	ISSUED FOR CLIENT REVIEW	RHA	TDI	SEV
A	31.08.18	ISSUED FOR INTERNAL REVIEW	RHA	TDI	SEV

SCALE 1:1000

NORTH POINT

DESIGNED		
DES. CHECK		
DRAWN	R. HARDY	31.08.18
CHECKED		
APPROVED		

DRAWING TITLE
INFRASTRUCTURE PLANNING
SITE DEVELOPMENT
STORAGE FACILITY UPGRADE OBH 06, 07 & OBH 08
GENERAL ARRANGEMENT PLAN

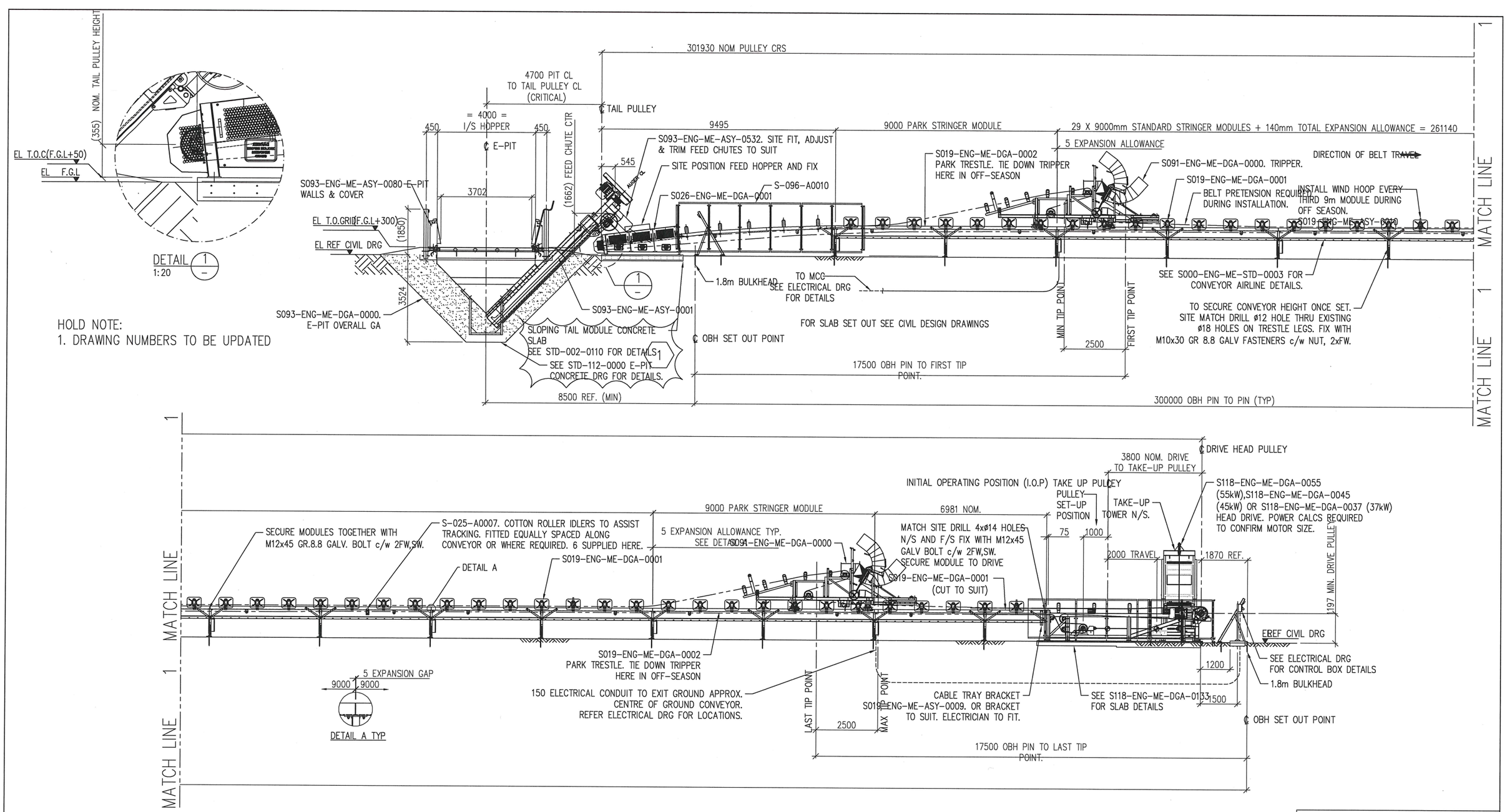
SITE DOWERIN WEST

SHEET SIZE A1

PROJECT M-2650

DRAWING NO 2018-361-0201

REV. D



HOLD NOTE:
1. DRAWING NUMBERS TO BE UPDATED

NOTE
ALL CONVEYOR TAKE UP MASS AND POWER REQUIREMENTS TO BE A SITE SPECIFIC CALCULATION WITH CONSIDERATIONS FOR CIVIL DESIGN R.L'S.

ADDITONAL EQUIPMENT TO CONSIDER

* 8FT SQUARE STORAGE CUBE, RWT-NMD-HS267-001.
* COMPRESSOR-INGERSOL RAND TYPE 30 COMPRESSOR 2475C7-8, 5.5kW 21CFM C/W 230L AIR RECEIVER.

BELT LENGTH CALCULATION TO BE CARRIED OUT PRIOR TO ORDERING

ELEVATION TYPICAL CLS GROUND CONVEYOR TO SUIT 300m 1.8m BULKHEAD C/W SLOPING TAIL FEED ON

CONVEYOR BELT	
SPEED	3.9 m/s
WIDTH	900 mm
DESIGNATION	EP600-3PLY
RATING RUN/START	- kN
TAPE LENGTH	615m + 3m SPLICE = 618
THICKNESS	MIN. 8.1 mm
TOP COVER/BOTTOM COVER	3.5/3.5mm
COVER GRADE	AS 1333 E GRADE
MASS	9.5 kg/m

CONVEYOR DATA	
CAPACITY	500 tph
CAPACITY MAX. FUTURE	- tph
LIFT (EFFECTIVE)	- m
WEIGHT REQ'D FOR G.T.U.TO BE CALCULATED	kg
MATERIAL	WHEAT
BULK DENSITY	770 kg/m³
SURCHARGE ANGLE	10 °
POWER DEMAND	TO BE CALCULATED kW
POWER INSTALLED	55, 45 OR 37kW

DRIVE CONFIGURATION	
MOTOR: TECO MAXe3. 015/H0055DD4R-Extd	
- POWER	55 kW
- SPEED	1485 rpm
- FRAME	250SC-V
DRIVE PULLEY:	ø530 mm
GEARBOX: BONFIG-A903 UH90 P250-70 10.5 B3 TA	

DRIVE CONFIGURATION	
MOTOR: TECO MAXe3 015/H0045DD4R-Extd	
- POWER	45 kW
- SPEED	1480 rpm
- FRAME	225MC-V
DRIVE PULLEY:	ø530 mm
GEARBOX: BONFIG-A803 UH90 P225 10.7 B3 TA	

DRIVE CONFIGURATION	
MOTOR: TECO MAXe3 015/H0037DD4R-Extd	
- POWER	37 kW
- SPEED	1480 rpm
- FRAME	225SC-V
DRIVE PULLEY:	ø530 mm
GEARBOX: BONFIG-A803 UH90 P225 10.7 B3 TA	

GENERAL NOTES (UNLESS NOTED OTHERWISE):
1. ALL STEELWORKS, WELDING & FABRICATION T WITH AS1554 CAT SP.
2. REMOVE ALL BURRS & SHARP EDGES.
3. ASSEMBLY TO BE CONTINUOUS FULLY WELDED WITH MINIMUM 3mm FILLET FOR 3mm PLATE
   6mm FILLET FOR 4mm TO <12mm PLATE
   8mm FILLET FOR 12mm TO <20mm PLATE
   10mm FILLET FOR 20mm TO <32mm PLATE
4. ALL FASTENERS TO BE GR.8.8 GALV.
5. ALL STEEL PLATE & SHEET TO BE MIN. GR.25
6. ALL STRUCTURAL STEEL TO BE MIN. GR.300
7. ALL GALVANISED STEEL TO BE IN ACCORDANC AS1397 AND OF GRADE G2Z275 OR EQUIV.

CBH GROUP HEAD OFFICE
30 DELHI STREET
WEST PERTH
W.A. 6005
PH (08) 9237 9600
FAX (08) 9322 3942

DO NOT SCALE FROM THIS DRAWING

REF DRG No.	REFERENCE DRAWING TITLE	REV	DATE	REVISIONS	BY	CHK'D	APP'D
-	-	A	25.06.18	COPIED FROM STD-999-0002 ISSUED FOR APPROVAL	VP	PJC	NH

SCALE NTS
NORTH POINT

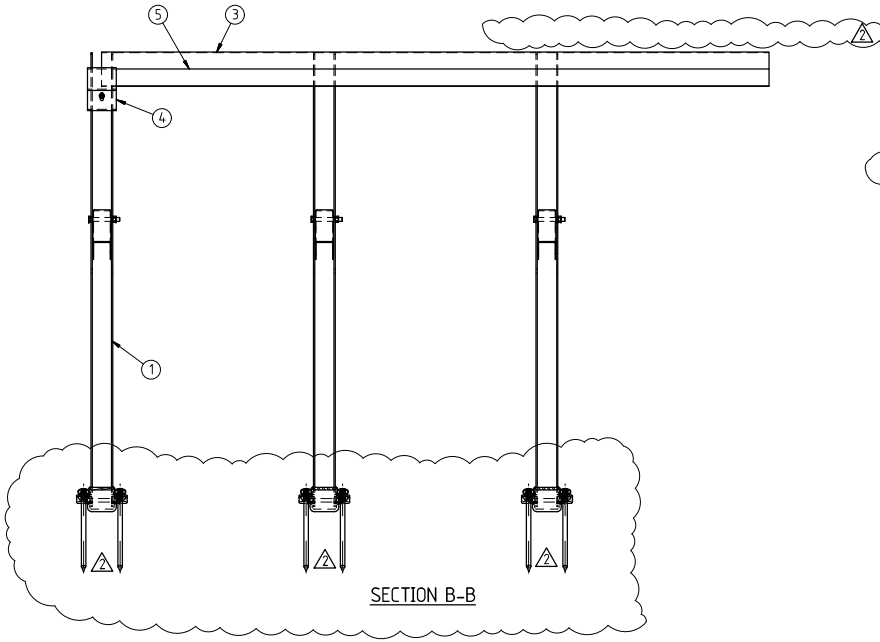
DESIGNED	-	-
DES. CHECK	PJC	-
DRAWN	VP	25.06.2018
CHECKED	PJC	-
APPROVED	NH	-

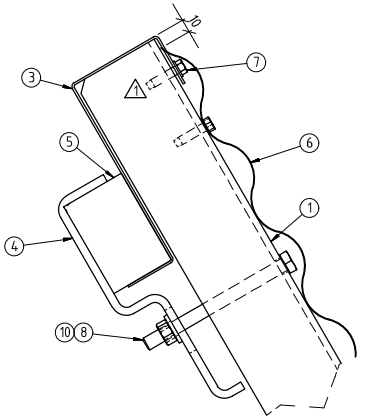
DRAWING TITLE
TYPICAL DRAWING
BELT CONVEYOR 900W BELT CLS 300M OBH
ø400 AUGER E-PIT C/W HEAD DRIVE
GENERAL ARRANGEMENT

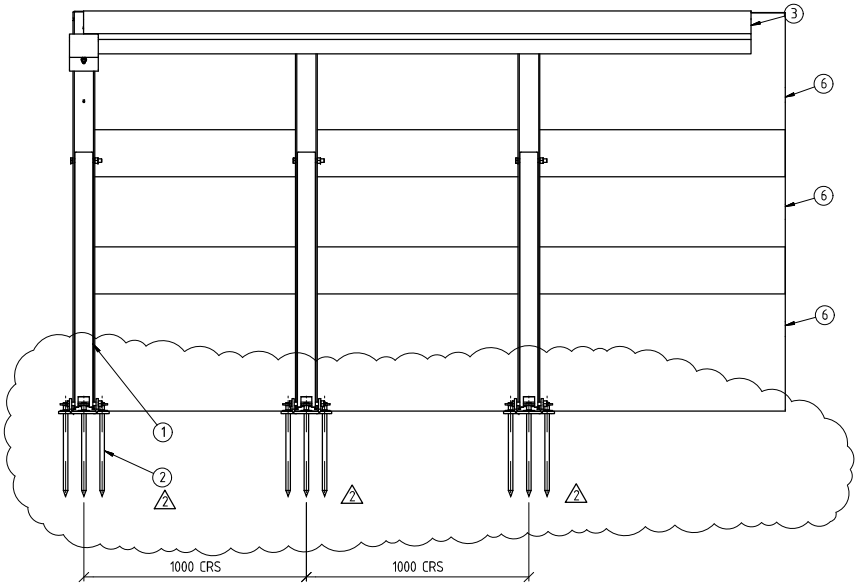
SITE VARIOUS
SHEET SIZE A1
PROJECT STANDARD
DRAWING NO S000-ENG-ME-STD-0002
REV.

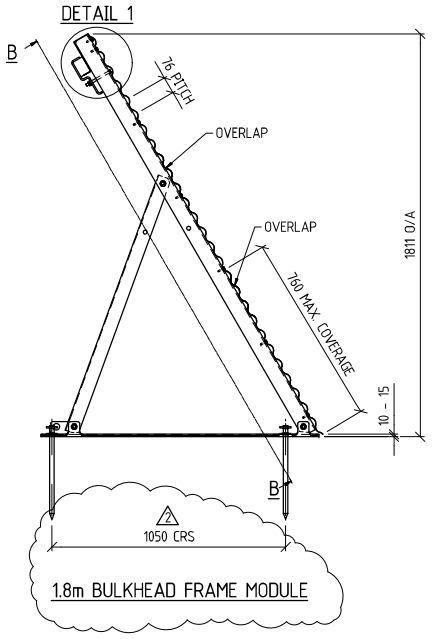
PARTS LIST (PER UNIT)

ITEM No	DESCRIPTION	WIDTH	LENGTH	QTY	CBH DRG OR SUPPLIER PART No	PROCESS	SAP Code	MASS Kg	TO DETAIL	SURFACE TREATMENT	COATING SPEC.
2	1.8m OBH FRAME ASSEMBLY			3	S-119-A0001	FITTING	N/A	36.5	Yes	N/A	N/A
2	DIA 20 STAKE		420	9	S-014-A0000	FIELD KIT	TBA	1.1	Yes	GALVANIZE	N/A
1	1.6PL PGI	300	3000	1	S-119-P0011	FAB SHEET	108015	11.4	Yes	N/A	N/A
4	6PL	130	257	1	S-119-P0012	FAB PROFILE	107901	1.6	Yes	GALVANIZE	N/A
5	TIMBER SAWN KARRI STRUCT 75MMx50MMx3M	75	3000	1	S-119-P0014	FITTING	108594	6.2	No	N/A	N/A
6	CUSTOM ORB ZINC ALUME 0.48mm		3200	3	ROOFMART	FITTING	102860	1.4	No	N/A	N/A
7	SCREW HI-TEK HEX 14-20x22mm WITH SEAL			7		FIELD KIT	501922	0.0	No	ZP	N/A
8	M10 x 120 GALV BOLT			1		FIELD KIT	109251	0.1	No	N/A	N/A
9	M10 GALV. NUT			1		FIELD KIT	109251	0.0	No	N/A	N/A
10	M10 GALV FW			1		FIELD KIT	110164	0.0	No	N/A	N/A
11	O.B.H CONSTRUCTION SPECS. 2009				DOC'S #770663	FIELD KIT					









CIVIL WORKS NOTE:
ALL OBH FRAMES SHALL BE SUPPORTED BY CEMENT STABILISED FOUNDATIONS AS PER S000-ENG-CI-STD-0002 SECTION 'A'

GENERAL NOTES (UNLESS NOTED OTHERWISE):
1. ALL STEELWORKS, WELDING & FABRICATION TO CONFORM WITH CURRENT AS1554 CAT SP.
2. REMOVE ALL BURRS & SHARP EDGES.
3. ASSEMBLY TO BE CONTINUOUS FULLY WELDED
   WITH MINIMUM 3mm FILLET FOR 3mm PLATE
   6mm FILLET FOR 4mm TO <12mm PLATE
   8mm FILLET FOR 12mm TO <20mm PLATE
   10mm FILLET FOR 20mm TO <32mm PLATE
4. ALL FASTENERS TO BE GR.8.8/TB
5. ALL STEEL PLATE & SHEET TO BE MIN. GR.250
6. ALL STRUCTURAL STEEL TO BE MIN. GR.300
7. ALL GALVANISED STEEL TO BE IN ACCORDANCE WITH AS1397 AND OF GRADE G2Z275 OR EQUIV.

ASSIGNED TO:	
DATE COMPLETED:	
QTY. COMPLETED:	
HOURS TAKEN:	
EST. HOURS:	
SIGNATURE:	
SURFACE TREATMENT:	N/A
COATING SPEC:	N/A
TOTAL MASS:	143.4 kg

CBH GROUP HEAD OFFICE
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DO NOT SCALE FROM THIS DRAWING - ASK!

REF DRG No.	REFERENCE DRAWING TITLE	REV	DATE	REVISIONS	BY	CHK	APP
		2	23.06.2018	3 MORE STAKES ADDED AS PER ENG REQUEST	VP	MR	NH
		1	16.04.2018	ORB CRECTED, TEK SCRWS ADDED, BRKET TO 6mm	DMS	DD	PC
		0	31/10/2017	DESIGN BASED ON CERTIFIED DRG STD-034-0020	TTW	VP	PC

DRAWN	TTW	31/10/2017
CHECKED	VP	31/10/2017
ENGINEER	DS	31/10/2017
APPROVED	PC	31/10/2017

DRAWING TITLE
1.8m PORTABLE BULKHEAD (TIMBER LOCK)
FLAT BOTTOM FRAME
TARP CLAMPING, TENSIONING
GENERAL ARRANGEMENT

SITE: VARIOUS
SIZE: A1
PROJECT: STANDARD
DRAWING No: S-119-A0000
SHEET: 1 OF 2
REV: 2

engenium
smart project delivery

CBH

DOWERIN STORAGE FACILITY UPGRADE OBH 06/07/08

DESIGN REPORT

361-26504500442887-CI-RPT-0001

0	Issued for Use				07.11.18
Rev	**Description**	**Author**	**Checked**	**Approved**	**Date**

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1. PURPOSE

The purpose of this Design Report is to provide detail on the design parameters and design calculations for CBH's proposed Dowerin Storage Facility Upgrade OBH 06, 07 and 08. The upgrades include three open bulkheads (OBH), an 'E' pit and associated conveyor, genset and compressor and three DOG stackers. The design includes the following:

- bulk earthworks,
- stormwater drainage,
- vehicle movements,
- access road layout, and
- pavement design by Golder.

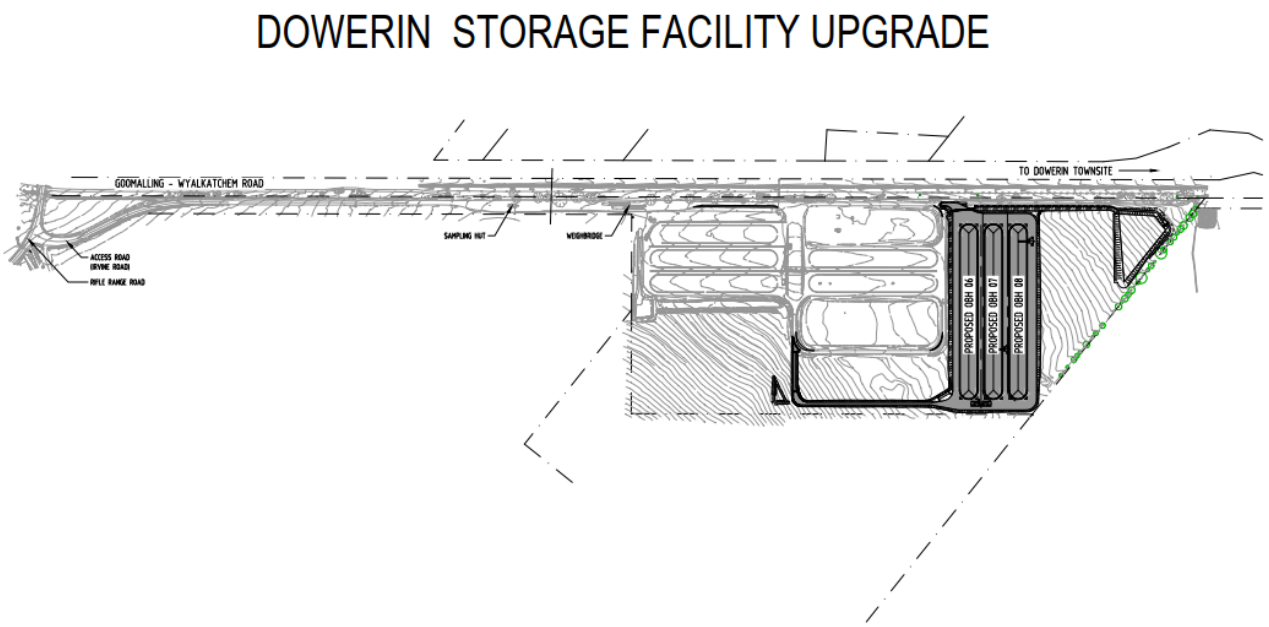


Figure 1.1 – Project Location

This Design Report defines the general and technical project specifications to which the engineering design shall conform, and details all mandatory requirements which affect the design, including Client requirements and those of any applicable statutory bodies.

2. SITE DATA

The survey data was provided by the Client on 19/07/18. Survey data characteristics are shown in Table 2.1.

Coordinate System	Dowerin94
Origin	HTD1001
Vertical Datum	Australian Height Datum

Contour Interval	0.2 m

Table 2.1 – Survey Data Characteristics

3. REFERENCES

The following documents shall be read in conjunction with this Design Report:

Document Number	Rev	Title
AR&R	-	Nathan, R and Weinmann, E, 2016, Estimation of Very Rare to Extreme Floods, Book 8 in Australian Rainfall and Runoff - A Guide to Flood Estimation, Commonwealth of Australia
AGRD05-13	-	Austroads Guide to Road Design Part 5, 5A and 5B
6702-02-2230	-	MRWA Floodway Design Guide
CBH-ENG-CI-557-0001	1	TS10A - Design Specification – Civil Earthworks, Roads and Drainage
CBH-ENG-CI-557-0002	1	TS10B - Construction Specification - Civil Earthworks, Roads and Drainage
STD-112-0000 to 0003	0	CBH 'E' pit Standard Drawings
STD-002-1000 to 14	-	Civil Design Standard Drawings
1791739-004-R-Rev A-Draft (Golder)	A	Geotechnical Investigation – Dowerin West Receival Facility Expansion (Draft)
361-26504500442233-CI-RPT-0001	0	Transport Impact Statement – CBH Dowerin – Facility Expansion
AGRD03-16	-	Guide to Road Design Part 3: Geometric Design

Table 3.1 – References

4. GENERAL AND STATUTORY REQUIREMENTS

All aspects of the design, material and equipment supply, erection and operation shall comply with the current relevant State and Federal Government Acts and Regulations including relevant Australian codes and standards.

5. CIVIL BASIS OF DESIGN

5.1 General

The engineering design has the following primary objectives:

- Be in accordance with (as a minimum) the relevant and latest Australian Standards;
- Be in accordance with CBH design standards and specifications;
- Minimise operational risk;
- Minimise impact on the environment during construction and operation;
- Provide a construction methodology consistent with safety during construction, operations and maintenance;
- Minimum CAPEX without compromising safety and quality; and
- Minimise construction period.

5.2 Design Life

Unless noted otherwise in the Design Report, the design life shall be 25 years for all components of the works. The design life assumes regular and routine maintenance of roads and drainage elements.

5.3 Existing Services

DBYD requests were made for the Dowerin Site and identified existing services including water, power and communications and have been accounted for in the design. Contractors should undertake a search for services prior to commencement of any construction on the site.

During a site visit undertaken on 13/08/18, existing infrastructure, including a water meter and power pole, were identified nearby the weighbridge. Due to proposed local widening at the weighbridge, bollards have been installed to protect the nearby existing power pole and water meter.

5.4 Bulk Earthworks

The bulk earthworks shall conform to the following:

- AS 3798 Guidelines on Earthworks for Commercial and Residential Developments.
- 1791739-004-R-Rev A-Draft *Geotechnical Investigation Dowerin West Receival Facility Expansion* by Golder.
- CBH-ENG-CI-SST-0001 TS10A Design Specification Civil Earthworks, including the following slope criteria:
  - Fill/Cut Batter Slopes at 1V:3H
  - OBH and DOG Road Short Cross/Long Sections: 1.0 % (minimum); 2.0 % (preferred); 3.0 % maximum.
- Finished earthworks surface shall be graded away from structures and building areas to redirect superficial runoff to specific drainage area.

- Future plant expansion opportunities and minimum earthworks requirements, i.e. space distribution and final levels, etc.
- Optimisation of earthworks covering:
  - Definition of minimum earthworks levels based on hydrologic assessment of extreme
  - flood events;
  - Assessment of cut materials suitability for fill;
  - Balancing cut and fill volumes to minimise waste;
  - Topsoil removal and stockpiling in defined areas and re-spread;
  - Avoidance of soft ground areas as much as practical;
  - Management of unsuitable material: separation, stockpiling and appropriate disposal.
- Note that temporary earthworks may need to be provided to meet construction equipment maximum grades and ground bearing requirements.

5.5 'E' Pits

The proposed 'E' pit complies with CBH Standard Drawings STD-112-0000 to 0003, with the exception being the 'E' pit and ramp lengths due to the design surface sloping from west to east. The eastern and western paved ramp lengths are 16.5 m and 7 m respectively. The 'E' Pit shall be positioned at 300 mm above the pavement surface as per STD-112-0000.

5.6 Roads

5.6.1 General

- Road vertical and horizontal alignments have been designed in accordance with AUSTROADS / MRWA standards and guidelines, where appropriate.
- All entry roads and intersections shall be designed to accommodate one-way traffic flows, with the OBH 08 DOG Road wide enough to allow for overtaking.
- A Traffic Impact Assessment (TIA) for the Goomalling – Wyalkatchem Road Intersection has been carried out by Strada Road Project Consultants and a summary of results are provided in Appendix B - Transport Impact Assessment.

5.6.2 Design Speed, Sight Distances and Design Vehicle

The following design vehicle and speeds are adopted for the site:

- The design speed shall be 20 km/h and the posted speed limit shall be 20 km/h, within the entire site;
- Sight distances have been designed in accordance with Austroads 2009 - *Guide to Road Design Part 3: Geometric Design* and are based on the 20 km/h design speed across the site,
- The maximum design vehicle category is RAV 7 with the maximum length of less than or equal to 36.5 m, and

- Vehicle turning circles will be based on class RAV 7 with a maximum length of 36.5 m.

5.6.3 Internal Road and Access Road Design Criteria

Description	Criteria
Formation and Seal width	Minimum 5 m formation (4 m of seal with 0.5 m road shoulders), but vary pending on turning movements of RAV 7 vehicle
Pavement	Refer to Golder's draft report *Geotechnical Investigation – Dowerin West Receival Facility Expansion*
Bituminous surfacing	Refer to Golder's draft report *Geotechnical Investigation – Dowerin West Receival Facility Expansion*
Longitudinal Grades	Preferred max 2% but not to exceed 3%
Crossfall	1% minimum
Horizontal Alignment	Minimum 15 m radius for turning
OBH Longitudinal Grade	Minimum 0.75%
OBH Crossfalls	1% to 2.5%
OBH Levels	Maximum 300 mm level difference across OBH width
Batter in Cut	1V:3H
Batter in Fill	1V:3H

Table 5.1 – Road Design Criteria

5.6.4 Flexible Pavement Design

Pavement design and surface treatment seal will be in accordance with Golder's Geotechnical Investigation –1791739-004-R-Rev A-Draft *Geotechnical Investigation Dowerin West Receival Facility Expansion*.

5.7 Signage and Pavement Marking

Signage and pavement marking has been proposed to control the site's traffic flow and have been designed in accordance with AS 1742.2-2009 *Manual of uniform traffic control devices*. This is detailed in Design Drawing 2018-361-204.

Features include:

- The site's traffic control has been reversed.
- Sight boards used at 90° intersections to indicate to drivers that they must turn.
- '20 km/h' signs at the start of the new design area and along long straights to indicate the site design speed.
- A 'Give Way' sign around OBH 099 to indicate right of way at the road intersection.
- A Turn Left Arrow Sign for vehicles leaving the site towards the weighbridge.

- 'No Right/Left' and 'No Entry' signs to indicate the proposed flow direction.
- Guideposts used to mark the edges of the road formation.
- Pedestrian guardrails are to be installed at the top of the road batters above proposed culverts.
- Existing signs to be removed as per Design Drawing 2018-361-0204.

5.8 Fencing

There is currently 925 m of stock fencing surrounding the existing bulkheads. As the existing fencing crosses where a new drain is proposed and into an area left for future development, it is required that this fencing be removed. Extents of the new fencing to be installed is to be determined on site. This is detailed in Design Drawing 2018-361-0201.

5.9 Stormwater Drainage Hydrology

All stormwater drainage shall be designed in accordance with Australian Rainfall and Runoff (AR&R) where applicable, or other approved methods for urban and rural areas. The objective of stormwater drainage design are as follows:

- To ensure that inundation of private buildings and storage areas does not occur up to the 1 in 20 year critical storm event,
- That stormwater flows are safely conveyed through the site up to the 1 in 20 year critical storm event, and
- That the site's stormwater is detained to pre-developed flowrates up to the 1 in 20 year 24 hour storm event.

5.9.1 Rainfall Intensity Data

IFDs are provided for this project from the Australian Bureau of Meteorology website 2016 IFDs http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016.

	Annual Exceedance Probability (AEP) mm/hr						
Duration	63.2%	50%*	20%*	10%	5%	2%	1%
ARI (Yrs)	1	1.44	4.48	10	20	50	100
5 min	51	58.2	82.4	100	119	147	170
10 min	37.5	43.1	61.8	75.6	90.1	110	127
15 min	30.4	34.9	50.1	61.2	72.9	89.3	103
30 min	20.3	23.2	32.9	40.1	47.7	58.4	67.2
1 hour	13	14.8	20.7	25.1	29.8	36.6	42.4
2 hour	8.22	9.25	12.8	15.5	18.4	22.7	26.4

	Annual Exceedance Probability (AEP) mm/hr						
Duration	63.2%	50%*	20%*	10%	5%	2%	1%
ARI (Yrs)	1	1.44	4.48	10	20	50	100
3 hour	6.23	7	9.66	11.7	13.9	17.2	20.1
6 hour	3.83	4.31	5.97	7.27	8.7	10.8	12.6
12 hour	2.31	2.61	3.65	4.47	5.37	6.71	7.84
24 hour	1.36	1.54	2.16	2.65	3.19	4.01	4.68
48 hour	0.778	0.878	1.23	1.49	1.78	2.23	2.61
72 hour	0.558	0.628	0.865	1.04	1.23	1.53	1.79

Table 5.2 – Rainfall Intensity mm/hr

Note:
 # The 50% AEP IFD does not correspond to the 2 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 1.44 ARI.
*** The 20% AEP IFD does not correspond to the 5 year Average Recurrence Interval (ARI) IFD. Rather it corresponds to the 4.48 ARI.**

5.9.2 Peak Flow

The Rational Method was used to determine peak flows in accordance with AR&R and the requirements of the project.

5.9.3 Runoff Coefficient

The runoff coefficient for the sites upstream catchments are assumed to remain the same. Runoff coefficient values used in the design are listed in Table 5.3 and comply with CBH Design Specification TS 10A. Runoff coefficients have been scaled by the frequency factors provided in Table 5.4.

Land use	C (5 year ARI)	C (10 year ARI)	C (20 year ARI)
Overland non developed areas	0.19	0.2	0.21
Unpaved road and batters	0.655	0.70	0.735
Industrial and paved areas	0.855	0.9	0.945

Table 5.3 – Flow Runoff Coefficient

ARI (Years)	1	2	5	10	20	50	100
Frequency Factor (F_y)	0.80	0.85	0.95	1.00	1.05	1.15	1.20

Table 5.4 - ARI Frequency Factor for Runoff Coefficients

5.9.4 Design Average Recurrence Interval

The hydraulic design for the internal road and open bulk heads caters for a 1 in 20 year ARI. The design for detention basin has also been based on a 1 in 20 year ARI with the overflow weir based on a 1 in 5 year ARI.

Time of concentration for catchments for rural vegetative ground have been determined using the AR&R Equation for the Wheatbelt region. Time of concentrations for catchments over developed land have been determined using the Bransby William Equation. An absolute minimum time of concentration for sub-catchments has been allocated as 6 minutes.

5.10 Drainage Hydraulic Design

It shall be noted that a full hydraulic assessment of the existing drainage system around and downstream of the proposed development was not part of this current scope of work.

- The drainage strategy for the Project is based on no flooding of essential infrastructure during the 1 in 20 year ARI.
- Hydraulic design of the drainage system shall be in accordance with Australian Rainfall and Runoff (AR&R), Austroads Guide to Road Design Part 5, 5A and 5B.
- Downstream boundary conditions are assumed not to be constrained but free flowing.

5.10.1 Open Drains

- Top design water levels of all open drains shall be below the road pavement subgrade for the critical storm event to prevent the saturation of pavement material.
- For the safety of the personal working on site, average flow velocity times by average depth in paved areas shall be limited to 0.4 m^2/s.
- To reduce the erosion of open drains, scour protection shall be provided for flow velocities greater than 2 m/s.
- Manning formula is applicable to define flow characteristics in open channels.
- Manning roughness coefficients are provided in Table 5.5 and comply with CBH Design Specification TS 10A.

Channel Lining	n
Concrete Pipes or Box	0.012
Concrete (Trowel finish) (formed without finish)	0.014 0.016
Asphalt pavement (Smooth) (Rough)	0.013 0.016

Channel Lining	n
Bricks and pavement blocks	0.016
Pitcher or dressed stone on mortar	0.016
Bitumen Seal	0.018
Earth (Clear) (with weed or gravel)	0.022 0.028
Corrugated Metal	0.027
Rock Lining	0.028

Table 5.5 – Manning Roughness Coefficient

5.10.2 Culvert Infrastructure

- Culvert types shall either be RCBC or RCP.
- The minimum cover over culverts in trafficable areas will be as follows:
  - RCP: 600 mm minimum, and
  - RCBC: 450 mm minimum.
- In cases where cover is limited between the top of culvert and finished surface level as per above, then full depth cement stabilisation will need to be considered.
- Reinforced concrete headwalls have been used and include:
  - 2 x 1200w x 450h (Double Barrel Headwalls)
  - 2 x 300 mm diameter (Single Barrel Headwalls)

5.10.3 Detention Basin

Detention basins are measures which temporarily store stormwater to reduce peak discharge flows. Outflows are typically controlled by an overflow culvert and/or a high-level overflow spillway/weir for emergency events, but primarily pass the pre-development 1 in 20 year ARI flow.

Following is the design basis for sizing of the detention basin:

- Shall control frequently occurring flows,
- Shall achieve the required attenuation of flow in the design event,
- Shall be able to contain the difference in volumes between the pre and post developed site runoff volumes,
- Shall be assumed to have minimal infiltration as a means of controlling frequently occurring flows,
- Shall be structurally and hydraulically safe in a 20 year ARI event,
- Shall have internal pond batters of 1V:4H (nominally), and
- Shall have minimum 100 mm freeboard above the spillway headwater levels.

5.10.4 Scour Protection

Scour protection shall be required:

- If flow velocities are higher than 2 m/s in an unlined drain,
- If drain materials have high scour potential,
- At all culvert inlets and outlets,
- At substantial changes in direction of open channels and drains,
- At falls along any open drain alignment or changes in invert levels (dumped graded rock should be grouted if required based on the design drawings), and
- For concentrated flows off paved areas.

Geotextile Bidim A44 or approved equivalent should be used to protect interface surface between rock and earth materials.

6. STORMWATER DRAINAGE CALCULATIONS

6.1 Catchment Delineation

Catchment delineation has been based on the earthwork design and individual catchment areas are shown in Figure 6.1.

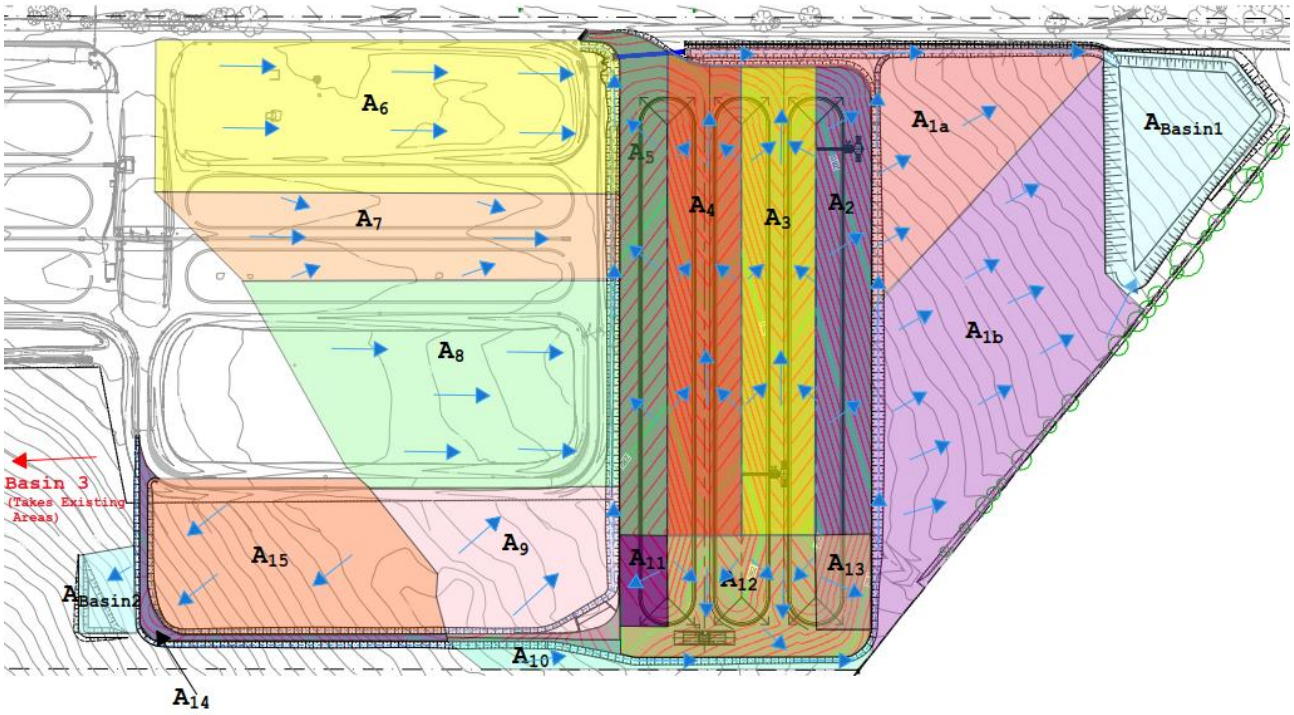


Figure 6.1 – Catchment Areas

6.1.1 Catchment Areas into Basin 1

A_{1a} = 14,403 m^2

A_{1b} = 31,495 m^2

A_2 = 11,060 m^2

A_3 = 14,470 m^2

A_4 = 14,760 m^2

A_5 = 10,200 m^2

A_6 = 30,540 m^2

A_7 = 12,420 m^2

A_8 = 25,200 m^2

A_9 = 12,990 m^2

A_{10} = 3,110 m^2

A_{11} = 1,900 m^2

A_{12} = 8,970 m^2

A_{13} = 2,250 m^2

A_{Basin1} = 11,170 m^2

Total Area into Basin 1 = 204,938 m^2 (includes A_{Basin1})

6.1.2 Catchment Areas into Basin 2

A_{14} = 2,060 m^2

A_{15} = 17,370 m^2

A_{Basin2} = 2,384 m^2

Total Area into Basin 2 = 21,814 m^2 (includes A_{Basin2})

6.2 Peak Flow for Drain Sizing

The Rational Method Equation has been used in determining the peak flows from the catchment areas.

$$Q_p = \frac{1}{360} CIA$$

Where:

- 'Qp' is the Peak Flow Rate (m^3/s)
- 'C' is the Runoff Coefficient
- 'I' is the Rainfall Intensity (mm/hr) which varies with Tc (Time of Concentration)
- 'A' is the Area (ha)

Time of Concentration (Tc) has been determined for overland areas using the AR&R Equation for the Wheatbelt region.

$$T_c = 0.76(A^{0.38})$$

Where:

- 'T_c' is the Time of Concentration (hours)
- 'A' is the Area (km^2)

Manning's Equation has been used in determining the drain sizes based on the peak flows.

$$Q = \frac{1}{n} A R^{\frac{2}{3}} S^{\frac{1}{2}}$$

Where:

- 'Q' is the flow rate (m^3/s)
- 'A' is the area (m^2)
- 'R' is the Hydraulic Radius (m)
- 'S' is the Bed Slope (m/m)

Calculation Assumptions:

- Drains sized for 20 year ARI storm events,
- Total time of concentration for drain sizing (T_c) = time of concentration for catchment area to drain (T_{c1}) + time of concentration from drain to outlet (T_{c2}),
- Assumed open channel flow velocity of 1 m/s for T_{c2} calculation,
- The absolute minimum total time of concentration (T_c) for drains is assumed to be 6 minutes,
- Assumed total A_{1A} runoff will contribute to Drain 3,
- Minimum drain depth of 0.4 m for open channels as per CBH Design Specification CBH-ENG-CI-SST-0001,
- 300 mm freeboard for culverts (water level a minimum of 300 mm from top of pavement),
- A_{14} and A_{15} contribute to Basin 2 and not Basin 1,
- A Manning's Coefficient of 0.014 and 0.022 have been used for the paved OBH drain (Drain 2) and the open channel bare earth drains respectively, and
- OBH drain (Drain 2) has been designed so that the water level does not exceed a flow width of 13 m and come into contact with the OBH supports.

The proposed drainage system is shown in Figure 6.2.

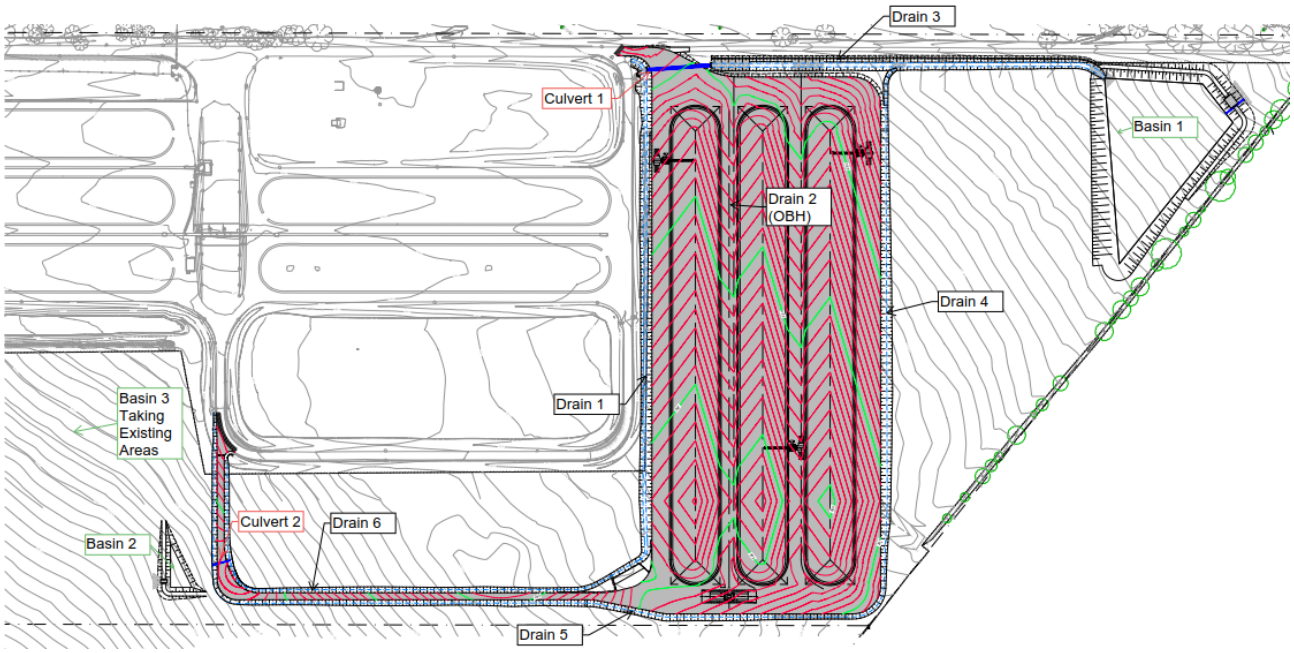


Figure 6.2 - Proposed Culverts/Drains

The 20 year ARI flow rates including peak flow rates for each of the drains is displayed in Figure 6.3 and Table 6.1.

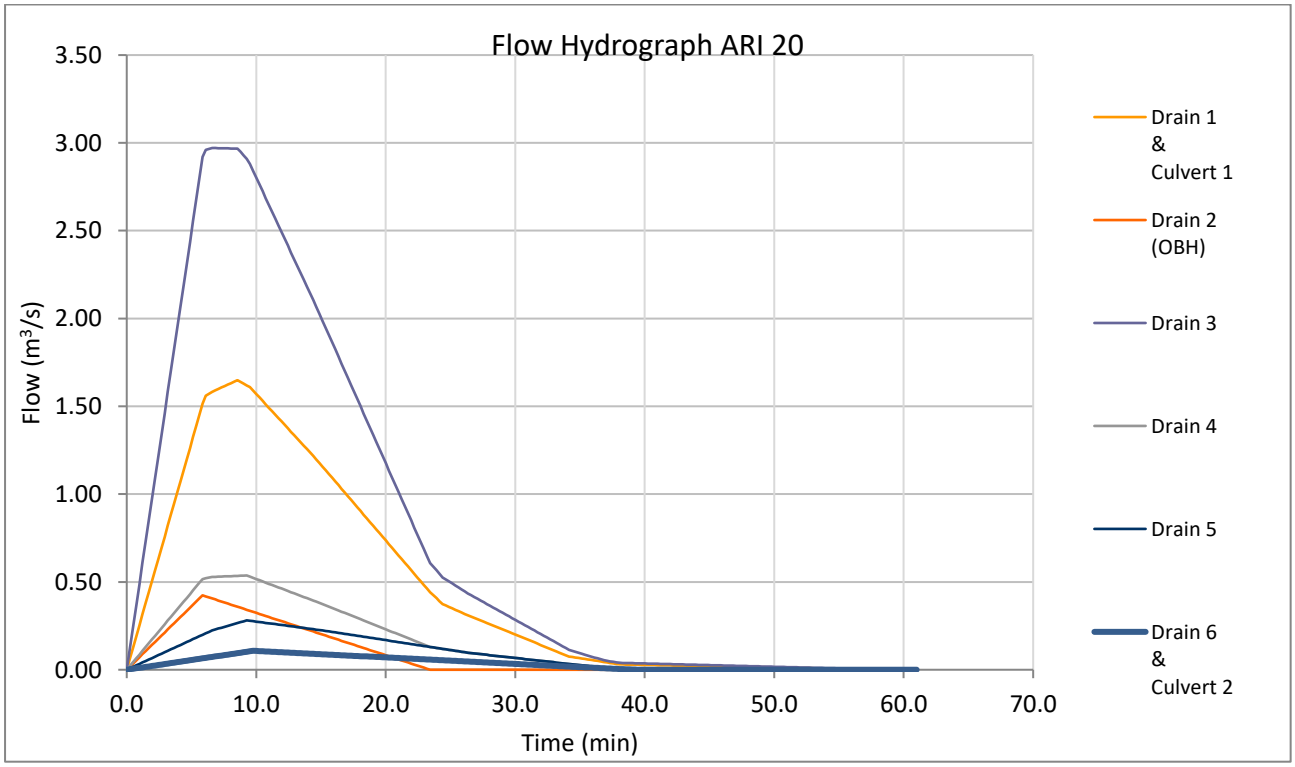


Figure 6.3 – 20 Year ARI Flow Hydrographs for Proposed Drains

	ARI 5	ARI 10	ARI 20	ARI 50	ARI 100
Drain 1 & Culvert 1	1.14	1.39	1.65	2.03	2.34
Drain 2 (OBH)	0.29	0.36	0.42	0.52	0.60
Drain 3	2.05	2.50	2.97	3.66	4.22
Drain 4	0.37	0.45	0.54	0.66	0.76
Drain 5	0.19	0.24	0.28	0.35	0.40
Drain 6 & Culvert 2	0.07	0.09	0.11	0.13	0.09

Table 6.1 – Peak Flow Rates (m^3/s) through each of the Proposed Drains

Using Manning's equation, drain sizes were determined and dimensions for these drains are provided in Appendix A - Stormwater Drainage Calculations

6.3 Peak Flow for Culvert Sizing

Two culverts, including a double barrel RCBC of size 2 x 1200 mm x 450 mm labelled as 'Culvert 1' and a 300 mm diameter RCP labelled as 'Culvert 2' have been proposed and are indicated in Figure 6.2.

Calculation Assumptions:

- Designed for the 20 year ARI peak flows indicated in Table 6.1 and Figure 6.3,
- Peak flow in Drain 1 = Inlet control through Culvert 1,
- Peak flow in Drain 6 = Inlet control through Culvert 2,
- 300 mm freeboard (water level a minimum of 300 mm from top of pavement),
- 450 mm cover for RCBC, and
- 600 mm cover for RCP.

The hydraulic analysis program HY-8 has been used to calculate the maximum headwater level at the two culvert inlets for a 20 year ARI flow rate. A report outputted by HY-8 is provided in Appendix A - Stormwater Drainage Calculations.

6.4 Existing Culverts Capacity Checks

Two existing culverts were identified from the site visit undertaken on 13/08/18. These include:

- 600 mm Diameter RCP with ~300 mm Cover.
- 450 mm Diameter RCP with ~600 mm Cover.

The two culvert capacities were checked and both were found to be insufficient for a 1 in 20 year ARI storm. This is due to the emergency works undertaken on OBH097 and OBH098, increasing the runoff to the existing culverts. It may be necessary to upgrade these culverts in future if drainage issues arise. A report outputted by HY-8 for these calculations was generated and is provided in Appendix A - Stormwater Drainage Calculations.

6.5 Basins

6.5.1 Basin 1 (Detention)

Determination of Volume

The proposed detention basin has been designed to provide enough capacity for the difference in volumes of the pre and post development floods from a 20 year ARI event over a 24 hr duration.

Calculation Assumptions:

- The Kinematic Wave Equation has been used in determining the time of concentration for the total catchments.

$$T_c = \frac{0.93L^{0.6}n^{0.6}}{i^{0.4}S^{0.3}}$$

Where:

  - 'L' is the overland flow length (m^3/s)
  - 'I' is the rainfall intensity (mm/hr)
  - 'n' is the surface roughness
  - 'S' is the bed slope (m/m)
- T_c = 72 min,
- T_b = 1440 min = 24 hours (Base time of the hydrograph),
- Total area of 204,938 m^2 with runoff coefficient = 0.21 used to determine pre development volume,
- Total area of 204,938 m^2 with weighted runoff coefficient = 0.67 used to determine post development volume.
- No infiltration assumed in basin sizing calculation.

In order to contain the difference in pre and post development runoff into the basin, a storage volume of 7,064 m^3 is required. Using 12D to model the basin, a volume of 7,678 m^3 has been proposed. Basin calculations can be found in Appendix A - Stormwater Drainage Calculations Outlet Pipe for Controlled Flow

A 225 mm diameter RCP outlet pipe has been located 300 mm above the base of the basin. The pipe was sized to restrict outflow and allow the accumulation of stormwater in the basin over the design storm event. The basin would gradually drain after the storm event ready for the next storm. The bottom 300 mm of the basin is to act as a silt collection zone, which will infiltrate over a 24 hour period.

A report outputted by HY-8 for these calculations was generated and is provided in Appendix A - Stormwater Drainage Calculations.

6.5.2 Overflow Weir

An overflow weir has been designed based on the broad crested weir capacity equation:

$$Q = C_w H^{\frac{3}{2}} L$$

Where:

- C_w is the weir discharge coefficient
- Q is the flow rate (m^3/s)
- H is the height of the weir (m)
- L is the length of the weir (m)

Calculation:

- The 5 yr ARI post development flow rate entering the basin Q_5 = 2.05 m^3/s.
- C_w = 1.7 (rectangular weir),
- L = 8 m
- H = 0.3 m
- Therefore Q = 2.23 $m^3/s \geq Q_5$

The weir has been designed with 100 mm freeboard and therefore the total weir height H_{Total} = 0.4 m. The weir has been designed to be 300 mm above the top water level in the basin. Calculations for the weir size have been included in Appendix A - Stormwater Drainage Calculations.

6.5.3 Basin 2 (Retention)

Determination of Volume

The proposed retention basin has been designed to provide enough capacity for the post development floods from a 20 year ARI event over a 24 hr duration.

Using the same calculation method and assumptions as used for the detention basin, a storage volume of 73 m^3 has been determined. Using 12D to model the basin, a volume of 91 m^3 has been proposed. Note that for this basin, an infiltration rate of 7 m/day has been used in the calculation based on preliminary advice provided by Golder. However the governing infiltration rate is based on a 100 mm thick clogged layer with an infiltration rate of 0.5 m/day. The basin would gradually drain after the storm event ready for the next storm.

6.5.4 Overflow Weir

Calculation:

- The 5 yr ARI post development flow rate entering the basin Q_5 = 0.106 m^3/s.
- C_w = 1.7 (rectangular weir),
- L = 2 m
- H = 0.1 m
- Therefore Q = 0.108 $m^3/s \geq Q_5$
- The weir has been designed with 100 mm freeboard and therefore the total weir height H_{Total} = 0.2 m. The weir has been designed to be 300 mm above

the top water level in the basin. Calculations for the weir size have been included in Appendix A - Stormwater Drainage Calculations.

7. ROAD LAYOUT

7.1 Vehicle Turning Movements

Turning movements have been checked for RAV 7 vehicles using AutoTurn. Refer to Appendix C - Vehicle Turning Templates.

7.2 Design Vehicle and Traffic Estimation

The Transport Impact Statement (TIS) found that traffic will increase due to the harvest period and intersection works should not be required, however MRWA will provide feedback during the Development Approval process. Refer to Appendix B - Transport Impact Assessment for details.

8. PAVEMENT DESIGN

8.1 Pavement Thicknesses

A summary of the pavement thicknesses used in the design is provided in Table 8.1 which has been taken from the geotechnical report. The table is subject to revision when new geotechnical results are available.

Area	Layer	Pavement Thickness Required (mm)
Subgrade Design CBR 5%		
Access Roads	14 mm intersection mix asphalt with C320 binder(1)	40
	Prime, 10/5 mm emulsion(2), tack coat	Nominal thickness
	Basecourse	200
	Sub-base	205
Bulkheads	Prime and seal	Nominal thickness
	Basecourse	200
	Sub-base	240
DOG Roads	14 mm intersection mix asphalt with A35P or A15E binder	40
	Prime, 10/5 mm emulsion(2), tack coat	Nominal thickness
	Basecourse (cement modified)	200

Area	Layer	Pavement Thickness Required (mm)
Subgrade Design CBR 5%		
	Sub-base	200
	Sub-base or Select Fill (minimum CBR 20%)	300
Conveyor Corridor	14 mm intersection mix asphalt with A35P or A15E binder	40
	Prime, 10/5 mm emulsion(2), tack coat	Nominal thickness
	Basecourse (cement modified)	200
	Sub-base	300

Table 8.1 - Granular Pavement Design

Notes:
(1) A15E binder could be considered to improve rut resistance.
(2) A 10 mm single coat seal with S35E binder may also be suitable; however, there is increased risk of reduced pavement life
A tack coat is required on all seals prior to asphalting
No allowance for construction is included in the above pavement designs

For further information, refer to Golder's report Geotechnical Investigation – Dowerin West Receival Facility Expansion (Draft).

9. ISSUES TO BE RESOLVED

9.1 Geotechnical Report

The current draft geotechnical report provided by Golder is incomplete as it only considers a few soil samples due to limited site access during the visit. It is recommended that Golder undertake another site visit after the harvesting period to obtain a wider range of samples and provide a more accurate representation of the various soils throughout the site. The design needs to be revisited once this information is available.

9.2 Transport Impact Statement

Based on the information provided in the Dowerin Site Transport Impact Statement, intersection modifications should not be required, however MRWA will provide feedback during the Development Approval process.

Feedback from the Shire of Dowerin indicates that they have previously initiated the application process to lift the RAV categorisation of Goomalling - Wyalkatchem Rd from current RAV 5 to RAV 7. The category change would not affect the permissible vehicle length, which would be maintained at 36.5m, however the Allowable Gross Vehicle Mass would be increased to 107.5 t.

Currently MRWA have Rifle Range Road and Irvine Road (CBH Access Road) listed as RAV 4 roads. An application to MRWA will be required to update their database to RAV 7 for the roads.

Appendix A - STORMWATER DRAINAGE CALCULATIONS

HY-8 Culvert Analysis Report

Table 1 - Culvert Summary Table: 225 mm Dia RCP

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	275.10	0.000	0.000	0-NF	0.000	0.000	0.070	0.000	0.000	0.000
0.00	0.00	275.17	0.069	0.073	3-M1t	0.050	0.050	0.070	0.000	0.379	0.000
0.01	0.01	275.20	0.099	0.105	2-M2c	0.072	0.071	0.071	0.000	0.746	0.000
0.01	0.01	275.22	0.125	0.000	1-S2n	0.089	0.089	0.089	0.000	0.794	0.000
0.02	0.02	275.25	0.148	0.152	2-M2c	0.105	0.104	0.104	0.000	0.888	0.000
0.02	0.02	275.27	0.168	0.173	2-M2c	0.120	0.117	0.117	0.000	0.957	0.000
0.02	0.02	275.29	0.186	0.192	2-M2c	0.135	0.128	0.128	0.000	1.026	0.000
0.03	0.03	275.31	0.204	0.210	2-M2c	0.150	0.138	0.138	0.000	1.094	0.000
0.03	0.03	275.32	0.213	0.220	2-M2c	0.158	0.144	0.144	0.000	1.116	0.000
0.04	0.04	275.35	0.240	0.251	7-M2c	0.225	0.158	0.158	0.000	1.211	0.000
0.04	0.04	275.38	0.260	0.276	7-M2c	0.225	0.167	0.167	0.000	1.265	0.000

****

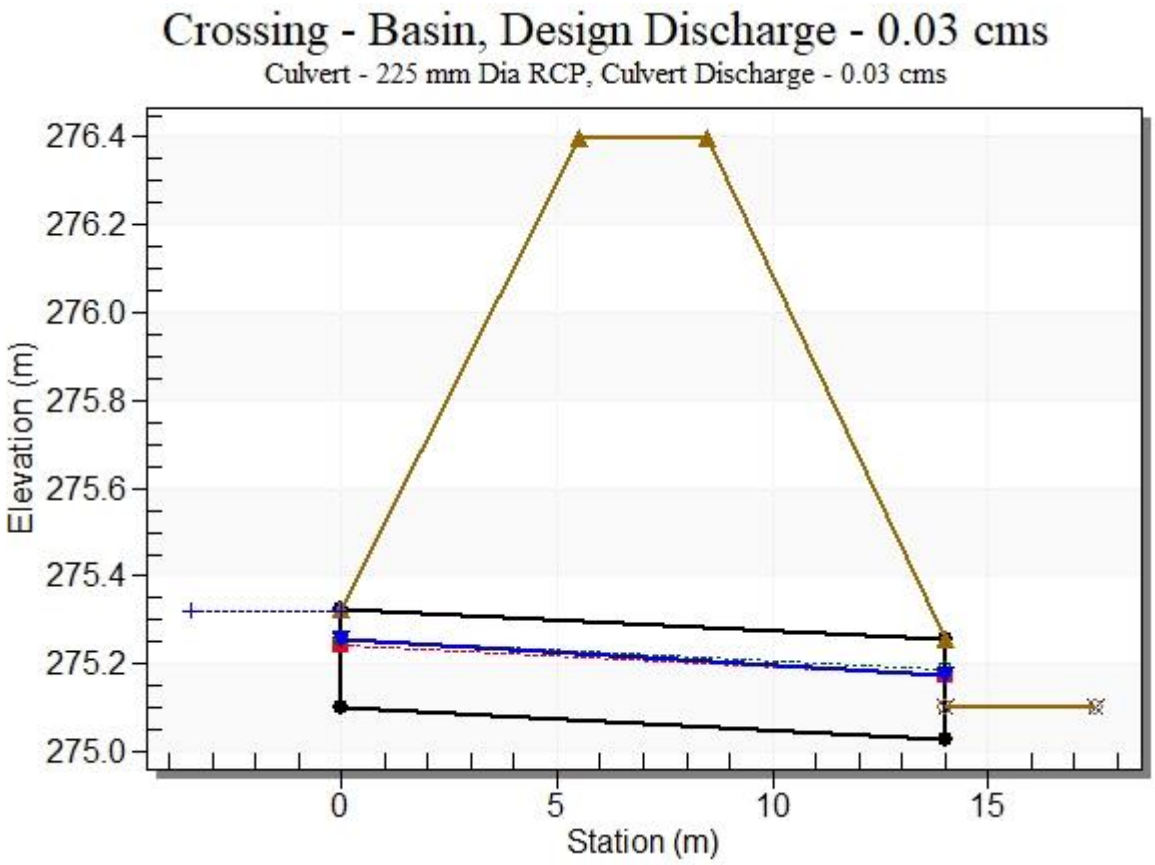
Straight Culvert

Inlet Elevation (invert): 275.10 m, Outlet Elevation (invert): 275.03 m

Culvert Length: 14.00 m, Culvert Slope: 0.0050

****

Water Surface Profile Plot for Culvert: 225 mm Dia RCP



HY-8 Culvert Analysis Report

Table 1 - Culvert Summary Table: 1200x450 Culvert

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	278.88	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.16	0.16	279.00	0.119	0.0*	1-S2n	0.059	0.078	0.059	0.070	1.169	0.736
0.33	0.33	279.07	0.190	0.0*	1-S2n	0.091	0.124	0.091	0.105	1.512	0.947
0.49	0.49	279.13	0.249	0.0*	1-S2n	0.118	0.163	0.118	0.133	1.751	1.093
0.66	0.66	279.18	0.303	0.0*	1-S2n	0.142	0.198	0.142	0.157	1.938	1.207
0.82	0.82	279.23	0.352	0.0*	1-S2n	0.164	0.229	0.164	0.179	2.093	1.302
0.99	0.99	279.28	0.399	0.0*	1-S2n	0.185	0.259	0.185	0.199	2.226	1.384
1.16	1.16	279.32	0.446	0.038	1-S2n	0.205	0.287	0.205	0.217	2.344	1.456
1.32	1.32	279.37	0.494	0.116	5-S2n	0.225	0.314	0.231	0.234	2.377	1.521
1.48	1.48	279.42	0.544	0.255	5-S2n	0.243	0.339	0.252	0.250	2.454	1.580
1.65	1.65	279.48	0.599	0.332	5-S2n	0.261	0.364	0.271	0.266	2.539	1.635

* Full Flow Headwater elevation is below inlet invert.

****

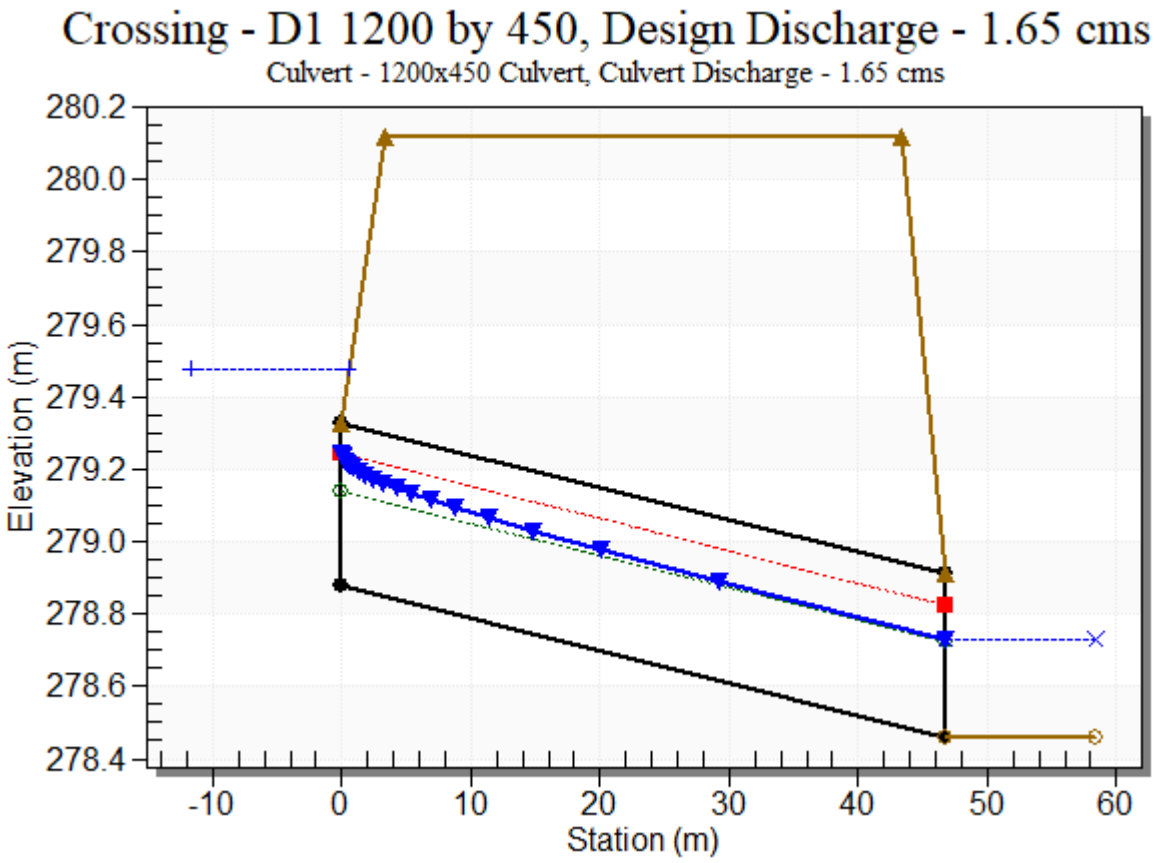
Straight Culvert

Inlet Elevation (invert): 278.88 m, Outlet Elevation (invert): 278.46 m

Culvert Length: 46.70 m, Culvert Slope: 0.0089

****

Water Surface Profile Plot for Culvert: 1200x450 Culvert



HY-8 Culvert Analysis Report

Table 1 - Culvert Summary Table: Culvert 2

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	279.68	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.03	0.03	279.89	0.191	0.214	2-M2c	0.221	0.132	0.132	0.000	0.997	0.000
0.06	0.06	280.00	0.296	0.326	7-M2c	0.300	0.189	0.189	0.000	1.275	0.000
0.09	0.09	280.15	0.412	0.470	7-M2c	0.300	0.233	0.233	0.000	1.530	0.000
0.11	0.11	280.26	0.514	0.589	7-M2c	0.300	0.255	0.255	0.000	1.719	0.000
0.15	0.15	280.55	0.787	0.878	7-M2c	0.300	0.282	0.282	0.000	2.173	0.000
0.18	0.16	280.61	0.842	0.936	7-M2c	0.300	0.283	0.283	0.000	2.269	0.000
0.21	0.16	280.62	0.853	0.946	7-M2c	0.300	0.286	0.286	0.000	2.275	0.000
0.24	0.16	280.63	0.860	0.953	7-M2c	0.300	0.284	0.284	0.000	2.295	0.000
0.27	0.16	280.64	0.866	0.959	7-M2c	0.300	0.284	0.284	0.000	2.306	0.000
0.30	0.16	280.64	0.872	0.966	7-M2c	0.300	0.287	0.287	0.000	2.305	0.000

****

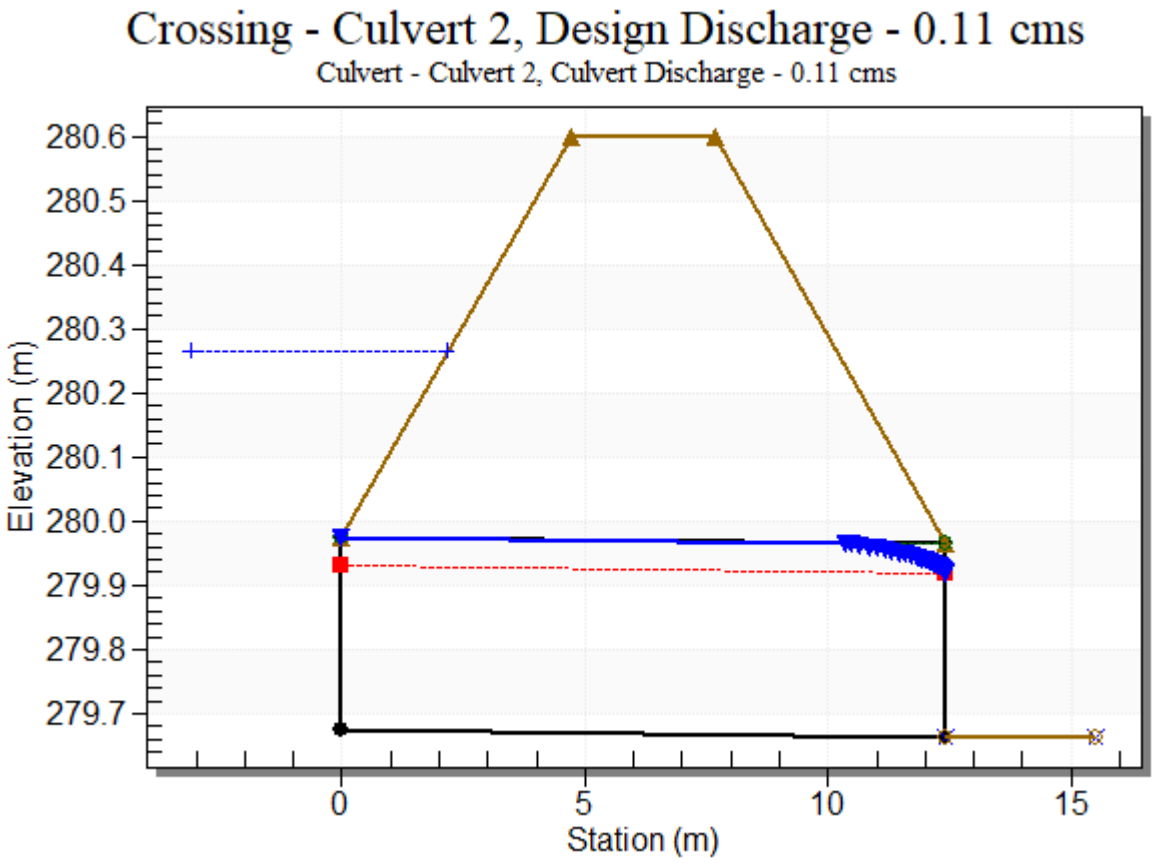
Straight Culvert

Inlet Elevation (invert): 279.68 m, Outlet Elevation (invert): 279.66 m

Culvert Length: 12.40 m, Culvert Slope: 0.0010

****

Water Surface Profile Plot for Culvert: Culvert 2



HY-8 Culvert Analysis Report

Table 1 - Culvert Summary Table: Existing 600 RCP

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	280.65	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.06	0.06	280.86	0.212	0.098	1-S2n	0.141	0.153	0.141	0.060	1.145	0.462
0.12	0.12	280.96	0.307	0.178	1-S2n	0.201	0.220	0.207	0.089	1.339	0.592
0.18	0.18	281.05	0.396	0.253	1-S2n	0.251	0.273	0.251	0.113	1.556	0.681
0.24	0.24	281.12	0.472	0.328	1-S2n	0.295	0.317	0.304	0.133	1.616	0.750
0.30	0.30	281.19	0.543	0.406	1-S2n	0.339	0.356	0.348	0.152	1.709	0.807
0.36	0.36	281.26	0.615	0.491	5-S2n	0.383	0.392	0.383	0.168	1.835	0.856
0.42	0.42	281.37	0.692	0.717	7-M2c	0.430	0.423	0.423	0.183	1.969	0.899
0.48	0.48	281.43	0.778	0.778	7-M2c	0.600	0.453	0.453	0.197	2.094	0.938
0.54	0.54	281.52	0.874	0.850	7-M2c	0.600	0.480	0.480	0.211	2.229	0.973
0.60	0.57	281.57	0.919	0.883	7-M2c	0.600	0.490	0.490	0.224	2.289	1.005

****

Straight Culvert

Inlet Elevation (invert): 280.65 m, Outlet Elevation (invert): 280.59 m

Culvert Length: 12.00 m, Culvert Slope: 0.0050

****

Water Surface Profile Plot for Culvert: Existing 600 RCP

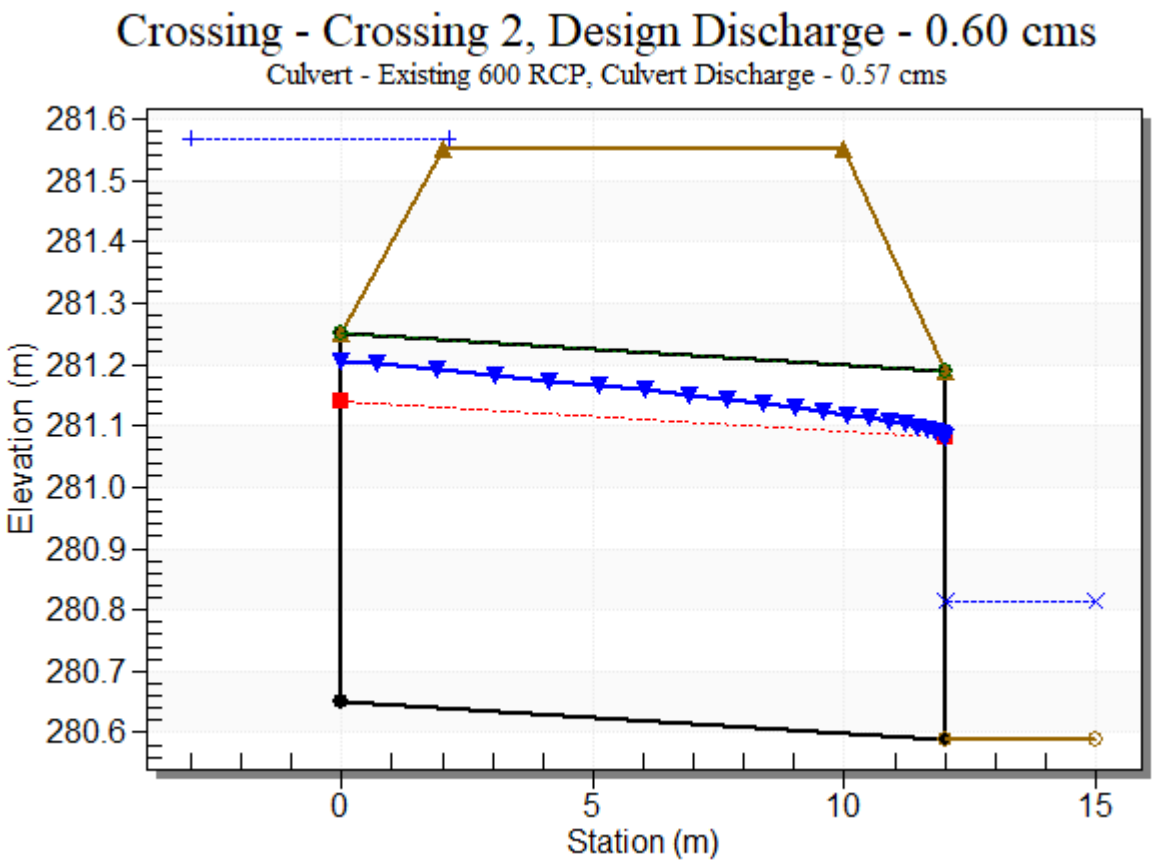


Table 2 - Culvert Summary Table: Existing 450 RCP

Total Discharge (cms)	Culvert Discharge (cms)	Headwater Elevation (m)	Inlet Control Depth (m)	Outlet Control Depth (m)	Flow Type	Normal Depth (m)	Critical Depth (m)	Outlet Depth (m)	Tailwater Depth (m)	Outlet Velocity (m/s)	Tailwater Velocity (m/s)
0.00	0.00	279.75	0.000	0.000	0-NF	0.000	0.000	0.000	0.000	0.000	0.000
0.05	0.05	279.96	0.211	0.106	1-S2n	0.142	0.152	0.142	0.053	1.117	0.433
0.10	0.10	280.07	0.322	0.205	1-S2n	0.208	0.220	0.208	0.080	1.346	0.555
0.15	0.15	280.16	0.414	0.308	1-S2n	0.267	0.271	0.267	0.102	1.481	0.639
0.20	0.20	280.28	0.509	0.526	7-M2c	0.330	0.314	0.314	0.120	1.688	0.705
0.25	0.25	280.37	0.622	0.614	7-M2c	0.450	0.350	0.350	0.137	1.882	0.760
0.30	0.30	280.51	0.761	0.736	7-M2c	0.450	0.381	0.381	0.152	2.088	0.807
0.35	0.35	280.68	0.928	0.888	7-M2c	0.450	0.404	0.404	0.165	2.326	0.848
0.40	0.38	280.81	1.061	1.002	7-M2c	0.450	0.415	0.415	0.178	2.508	0.885
0.45	0.39	280.83	1.078	1.017	7-M2c	0.450	0.416	0.416	0.190	2.531	0.919
0.49	0.39	280.84	1.088	1.025	7-M2c	0.450	0.417	0.417	0.200	2.546	0.944

****

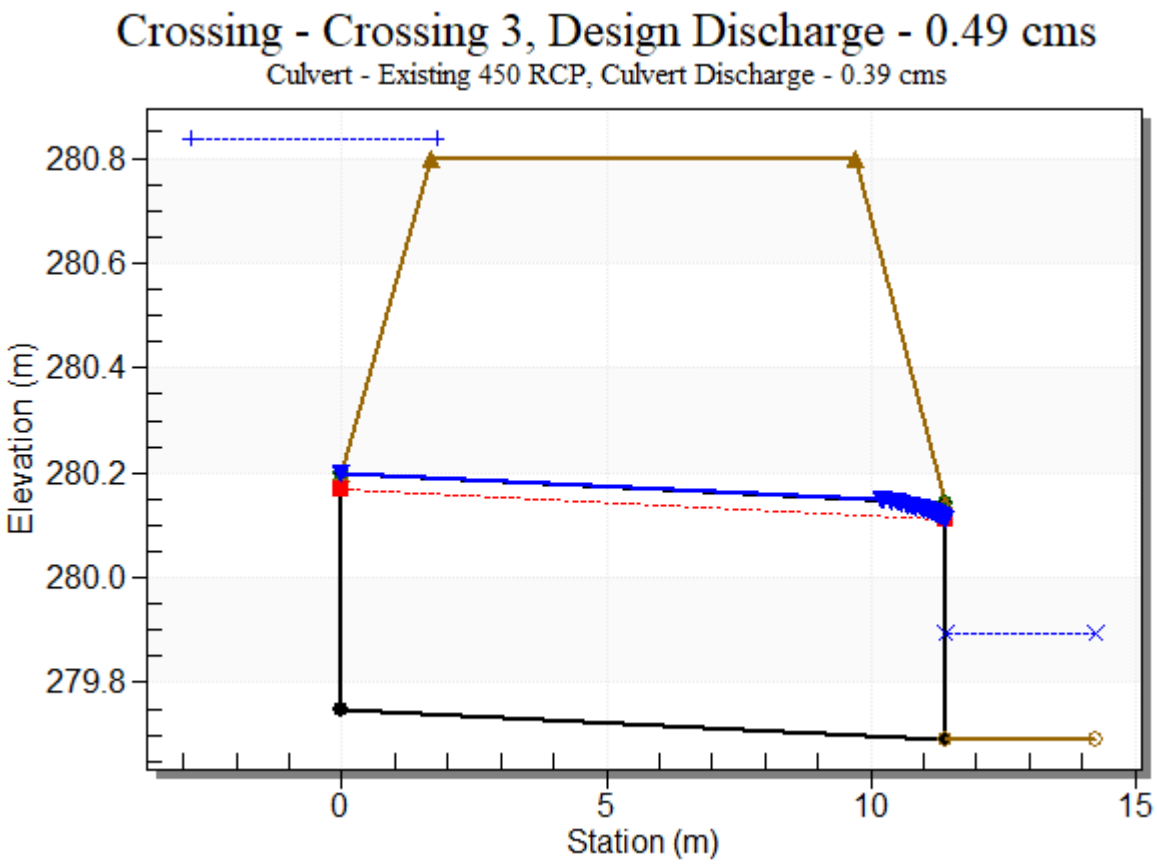
Straight Culvert

Inlet Elevation (invert): 279.75 m, Outlet Elevation (invert): 279.69 m

Culvert Length: 11.40 m, Culvert Slope: 0.0050

****

Water Surface Profile Plot for Culvert: Existing 450 RCP



Input from Microstation Catchment Stream Vertical Profile (Cut from Text file output)
File Reference: P:\P18369 CBH Dowerin Upgrade\P18369A\02 Enging\02.05 Civil\Engineering\Drainage Spreadsheets\[P18369A-CAL-Y-001 Basin 1 Design Rev A.xlsx]Basin Volumes
Horizontal Alignment File Reference:

BASIN 01

Kinematic Wave Calculated 'tc' (min)	Catchment Length 'L' (m)	'n'	Intensity 'i' (mm/hr)	Slope 'S' (m/m)	Nominated 'tc' (min)	
17.18179339	600	0.5	**112.0**	0.01	**6**	
17.26611836	600	0.5	110.6	0.01	6.17	
17.46922008	600	0.5	107.4	0.01	6.59	
17.58681509	600	0.5	105.7	0.01	6.84	
18.10436628	600	0.5	98.3	0.01	8	
18.31495042	600	0.5	95.5	0.01	8.5	
18.51897707	600	0.5	92.9	0.01	9	
18.69353037	600	0.5	90.7	0.01	9.44	
18.9094621	600	0.5	88.1	0.01	10	
18.97747578	600	0.5	87.4	0.01	10.18	
19.63144209	600	0.5	80.3	0.01	12	
19.75425208	600	0.5	79.0	0.01	12.36	
20.290325	600	0.5	73.9	0.01	14	
20.60033621	600	0.5	71.2	0.01	15	
20.89908366	600	0.5	68.6	0.01	16	
21.18759037	600	0.5	66.3	0.01	17	
21.46673217	600	0.5	64.2	0.01	18	
21.73726608	600	0.5	62.2	0.01	19	
21.99985196	600	0.5	60.4	0.01	20	
22.25506926	600	0.5	58.7	0.01	21	
22.50343023	600	0.5	57.1	0.01	22	
22.74539043	600	0.5	55.5	0.01	23	Peak Tc
22.98135721	600	0.5	54.1	0.01	24	
23.2116966	600	0.5	52.8	0.01	25	
23.43673901	600	0.5	51.5	0.01	26	
23.65678388	600	0.5	50.4	0.01	27	
23.87210367	600	0.5	49.2	0.01	28	
24.0829471	600	0.5	48.2	0.01	29	
24.28954202	600	0.5	47.1	0.01	30	
24.69080712	600	0.5	45.2	0.01	32	
25.07738625	600	0.5	43.5	0.01	34	
25.45055421	600	0.5	41.9	0.01	36	
25.81141359	600	0.5	40.5	0.01	38	
26.1609257	600	0.5	39.2	0.01	40	
26.99036381	600	0.5	36.2	0.01	45	
27.76468921	600	0.5	33.7	0.01	50	
28.49208347	600	0.5	31.6	0.01	55	
29.17891882	600	0.5	29.8	0.01	**60**	

n' Values - Surface roughness (similar but not identical to Manning's n)
Concrete or Asphalt 0.010 - 0.013
Bare Sand 0.010 - 0.016
Graveled Surface 0.012 - 0.030
Bare Clay-Loam Soil (eroded) 0.012 - 0.033
Sparse Vegetation 0.053 - 0.130
Short Grass Prairie 0.100 - 0.200
Lawns 0.170 - 0.480

Check

	AR&R - Wheatbelt	ARR87
	t_c = 0.76 x A$^{0.38}$	
Area	204938	m2
tc	25.0	min

Kinematic Wave Equation

$$t_c = 0.93\left(\frac{L^{0.6} n^{0.6}}{i^{0.4} S^{0.3}}\right)$$

P18369 Dowerin OBH 06, 07 & 08

Client CBH

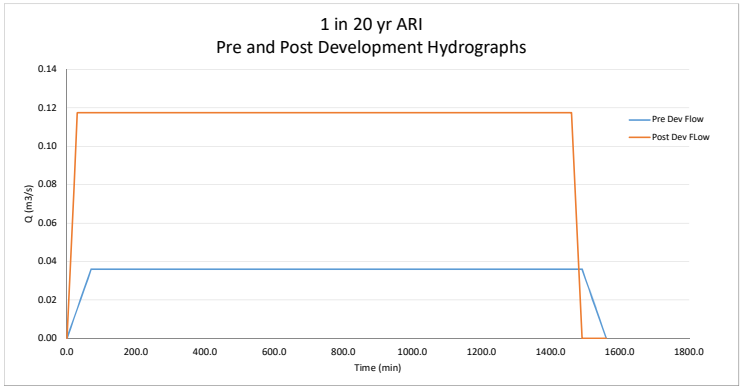
BASIN 01

Note:

Assumed there is no infiltration within the basin. Awaitng geotechnical investigation in the basin area.
Basin volume may be able to be reduced with geotech, but the basin is a cheap source of fill material.

ARI	20	years			
Predevelopment				**Post Development**	
Storm event	1440	mins		1440	mins
Time of Concentration tc	72	mins		30	mins
Rainfall Intensity	3.1	mm/hr		3.1	mm/hr
Assumed Peak Rainfall Duration	1368	mins		1410	mins
Peak Rainfall Duration Start	72	mins		30	mins
Peak Rainfall Duration Finish	1440	mins		1440	mins
Total Area	204938	m^2		204938	m^2
C20 value	0.21			0.67	
Effective Area	43036.98	m^2		136345.2514	m^2
Predeveloped peak flow	37.06	L/s		117.41	L/s
Predeveloped peak flow	0.0371	m3/s		0.1174	m3/s

Time Tc (mins)	Pre- Develop Q (m3/s)	Post-Develop Q (m3/s)	Pre-Develop Vol (m3)	Post-Develop Vol (m3)	Post - Pre Basin Volume Vol (m3)	Basin Depth D (m)	With Outlet Basin Volume Vol (m3)	Basin Depth D (m)	Outlet Flow Vol (m3)	
0.0	0.00	0.00			0	0.000	0.000	274.5		Storage for short duration storms
10.0	0.005	0.039	3.088	23.482	20.393	0.003	23.482	274.5033		and silt collection over time
20.0	0.010	0.078	6.177	46.963	61.180	0.009	70.445	274.5099		
30.0	0.015	0.117	9.265	70.445	122.360	0.017	140.890	274.5197		
40.0	0.021	0.117	12.353	70.445	180.452	0.025	211.335	274.5296		
50.0	0.026	0.117	15.442	70.445	235.456	0.033	281.780	274.5394		
60.0	0.031	0.117	18.530	70.445	287.371	0.040	352.225	274.5493		
70.0	0.036	0.117	21.618	70.445	336.198	0.047	422.670	274.5592		
80.0	0.036	0.117	21.618	70.445	385.025	0.054	493.115	274.5690		
90.0	0.036	0.117	21.618	70.445	433.852	0.061	563.560	274.5789		
100.0	0.036	0.117	21.618	70.445	482.679	0.068	634.005	274.5887		
110.0	0.036	0.117	21.618	70.445	531.506	0.074	704.450	274.5986		
120.0	0.036	0.117	21.618	70.445	580.332	0.081	774.896	274.6084		
130.0	0.036	0.117	21.618	70.445	629.159	0.088	845.341	274.6183		
140.0	0.036	0.117	21.618	70.445	677.986	0.095	915.786	274.6282		
150.0	0.036	0.117	21.618	70.445	726.813	0.102	986.231	274.6380		
160.0	0.036	0.117	21.618	70.445	775.640	0.109	1056.676	274.6479		
170.0	0.036	0.117	21.618	70.445	824.467	0.115	1127.121	274.6577		
180.0	0.036	0.117	21.618	70.445	873.294	0.122	1197.566	274.6676		
190.0	0.036	0.117	21.618	70.445	922.121	0.129	1268.011	274.6775		
200.0	0.036	0.117	21.618	70.445	970.948	0.136	1338.456	274.6873		
210.0	0.036	0.117	21.618	70.445	1019.775	0.143	1408.901	274.6972		
220.0	0.036	0.117	21.618	70.445	1068.602	0.150	1479.346	274.7070		
230.0	0.036	0.117	21.618	70.445	1117.429	0.156	1549.791	274.7169		
240.0	0.036	0.117	21.618	70.445	1166.256	0.163	1620.236	274.7268		
250.0	0.036	0.117	21.618	70.445	1215.083	0.170	1690.681	274.7366		
260.0	0.036	0.117	21.618	70.445	1263.910	0.177	1761.126	274.7465		
270.0	0.036	0.117	21.618	70.445	1312.737	0.184	1831.571	274.7563		
280.0	0.036	0.117	21.618	70.445	1361.563	0.191	1902.016	274.7662		
290.0	0.036	0.117	21.618	70.445	1410.390	0.197	1972.461	274.7760		
300.0	0.036	0.117	21.618	70.445	1459.217	0.204	2042.906	274.7859		225mm Outlet Starts to Flow
310.0	0.036	0.117	21.618	70.445	1508.044	0.211	2113.351	274.7958	0.000	RL 274.80
320.0	0.036	0.117	21.618	70.445	1556.871	0.218	2183.796	274.8056	0.001	
330.0	0.036	0.117	21.618	70.445	1605.698	0.225	2253.769	274.8154	0.002	Q=0.14 times the head
340.0	0.036	0.117	21.618	70.445	1654.525	0.232	2322.919	274.8251	0.004	
350.0	0.036	0.117	21.618	70.445	1703.352	0.238	2391.256	274.8347	0.005	
360.0	0.036	0.117	21.618	70.445	1752.179	0.245	2458.789	274.8441	0.006	
370.0	0.036	0.117	21.618	70.445	1801.006	0.252	2525.529	274.8535	0.007	
380.0	0.036	0.117	21.618	70.445	1849.833	0.259	2591.484	274.8627	0.009	
390.0	0.036	0.117	21.618	70.445	1898.660	0.266	2656.664	274.8718	0.010	
400.0	0.036	0.117	21.618	70.445	1947.487	0.273	2721.078	274.8808	0.011	
410.0	0.036	0.117	21.618	70.445	1996.314	0.279	2784.734	274.8897	0.013	
420.0	0.036	0.117	21.618	70.445	2045.141	0.286	2847.642	274.8985	0.014	
430.0	0.036	0.117	21.618	70.445	2093.967	0.293	2909.810	274.9072	0.015	
440.0	0.036	0.117	21.618	70.445	2142.794	0.300	2971.248	274.9158	0.016	
450.0	0.036	0.117	21.618	70.445	2191.621	0.307	3031.963	274.9243	0.017	
460.0	0.036	0.117	21.618	70.445	2240.448	0.314	3091.964	274.9327	0.019	
470.0	0.036	0.117	21.618	70.445	2289.275	0.320	3151.261	274.9410	0.020	
480.0	0.036	0.117	21.618	70.445	2338.102	0.327	3209.860	274.9492	0.021	
490.0	0.036	0.117	21.618	70.445	2386.929	0.334	3267.770	274.9573	0.022	
500.0	0.036	0.117	21.618	70.445	2435.756	0.341	3324.999	274.9653	0.023	
510.0	0.036	0.117	21.618	70.445	2484.583	0.348	3381.556	274.9733	0.024	
520.0	0.036	0.117	21.618	70.445	2533.410	0.355	3437.448	274.9811	0.025	



Volume		
Pre-development Volume	**3221**	**m3**
Post Development Volume	**10285**	**m3**
Volume req'd for retention	**7064**	**m3**

V	7145.333	m3	
D	1	m	
L	81	m	
W	80	m	
Z	4	ratio of slope	
A	6480	m2	

Stage Storage

Depth	Stage	Storage
0	274.5	0
0.1	274.6	654.4613
0.2	274.7	1321.931
0.3	274.8	2002.536
0.4	274.9	2696.405
0.5	275	3403.667
0.6	275.1	4124.448
0.7	275.2	4858.877
0.8	275.3	5607.083
0.9	275.4	6369.192
1	275.5	7145.333
1.1	275.6	7935.635
1.2	275.7	8740.224
1.3	275.8	9559.229
1.4	275.9	10392.78
1.5	276	11241
1.6	276.1	12104.02
1.7	276.2	12981.97
1.8	276.3	13874.98
1.9	276.4	14783.17
2	276.5	15706.67

530.0	0.036	0.117	21.618	70.445	2582.237	0.361	3492.682	274.9888	0.026
540.0	0.036	0.117	21.618	70.445	2631.064	0.368	3547.268	274.9964	0.028
550.0	0.036	0.117	21.618	70.445	2679.891	0.375	3601.211	275.0040	0.029
560.0	0.036	0.117	21.618	70.445	2728.718	0.382	3654.521	275.0115	0.030
570.0	0.036	0.117	21.618	70.445	2777.545	0.389	3707.203	275.0188	0.031
580.0	0.036	0.117	21.618	70.445	2826.371	0.396	3759.267	275.0261	0.032
590.0	0.036	0.117	21.618	70.445	2875.198	0.402	3810.718	275.0333	0.033
600.0	0.036	0.117	21.618	70.445	2924.025	0.409	3861.565	275.0404	0.034
610.0	0.036	0.117	21.618	70.445	2972.852	0.416	3911.814	275.0475	0.035
620.0	0.036	0.117	21.618	70.445	3021.679	0.423	3961.472	275.0544	0.036
630.0	0.036	0.117	21.618	70.445	3070.506	0.430	4010.546	275.0613	0.037
640.0	0.036	0.117	21.618	70.445	3119.333	0.437	4059.043	275.0681	0.038
650.0	0.036	0.117	21.618	70.445	3168.160	0.443	4106.971	275.0748	0.038
660.0	0.036	0.117	21.618	70.445	3216.987	0.450	4154.334	275.0814	0.039
670.0	0.036	0.117	21.618	70.445	3265.814	0.457	4201.141	275.0880	0.040
680.0	0.036	0.117	21.618	70.445	3314.641	0.464	4247.398	275.0944	0.041
690.0	0.036	0.117	21.618	70.445	3363.468	0.471	4293.111	275.1008	0.042
700.0	0.036	0.117	21.618	70.445	3412.295	0.478	4338.287	275.1071	0.043
710.0	0.036	0.117	21.618	70.445	3461.122	0.484	4382.931	275.1134	0.044
720.0	0.036	0.117	21.618	70.445	3509.949	0.491	4427.051	275.1196	0.045
730.0	0.036	0.117	21.618	70.445	3558.775	0.498	4470.652	275.1257	0.046
740.0	0.036	0.117	21.618	70.445	3607.602	0.505	4513.740	275.1317	0.046
750.0	0.036	0.117	21.618	70.445	3656.429	0.512	4556.322	275.1377	0.047
760.0	0.036	0.117	21.618	70.445	3705.256	0.519	4598.403	275.1436	0.048
770.0	0.036	0.117	21.618	70.445	3754.083	0.525	4639.990	275.1494	0.049
780.0	0.036	0.117	21.618	70.445	3802.910	0.532	4681.087	275.1551	0.050
790.0	0.036	0.117	21.618	70.445	3851.737	0.539	4721.702	275.1608	0.051
800.0	0.036	0.117	21.618	70.445	3900.564	0.546	4761.839	275.1664	0.051
810.0	0.036	0.117	21.618	70.445	3949.391	0.553	4801.504	275.1720	0.052
820.0	0.036	0.117	21.618	70.445	3998.218	0.560	4840.703	275.1775	0.053
830.0	0.036	0.117	21.618	70.445	4047.045	0.566	4879.441	275.1829	0.054
840.0	0.036	0.117	21.618	70.445	4095.872	0.573	4917.724	275.1882	0.054
850.0	0.036	0.117	21.618	70.445	4144.699	0.580	4955.557	275.1935	0.055
860.0	0.036	0.117	21.618	70.445	4193.526	0.587	4992.945	275.1988	0.056
870.0	0.036	0.117	21.618	70.445	4242.353	0.594	5029.893	275.2039	0.057
880.0	0.036	0.117	21.618	70.445	4291.179	0.601	5066.407	275.2091	0.057
890.0	0.036	0.117	21.618	70.445	4340.006	0.607	5102.492	275.2141	0.058
900.0	0.036	0.117	21.618	70.445	4388.833	0.614	5138.152	275.2191	0.059
910.0	0.036	0.117	21.618	70.445	4437.660	0.621	5173.394	275.2240	0.059
920.0	0.036	0.117	21.618	70.445	4486.487	0.628	5208.221	275.2289	0.060
930.0	0.036	0.117	21.618	70.445	4535.314	0.635	5242.638	275.2337	0.061
940.0	0.036	0.117	21.618	70.445	4584.141	0.642	5276.651	275.2385	0.061
950.0	0.036	0.117	21.618	70.445	4632.968	0.648	5310.264	275.2432	0.062
960.0	0.036	0.117	21.618	70.445	4681.795	0.655	5343.482	275.2478	0.063
970.0	0.036	0.117	21.618	70.445	4730.622	0.662	5376.310	275.2524	0.063
980.0	0.036	0.117	21.618	70.445	4779.449	0.669	5408.751	275.2570	0.064
990.0	0.036	0.117	21.618	70.445	4828.276	0.676	5440.811	275.2614	0.065
1000.0	0.036	0.117	21.618	70.445	4877.103	0.683	5472.495	275.2659	0.065
1010.0	0.036	0.117	21.618	70.445	4925.930	0.689	5503.806	275.2703	0.066
1020.0	0.036	0.117	21.618	70.445	4974.757	0.696	5534.748	275.2746	0.066
1030.0	0.036	0.117	21.618	70.445	5023.583	0.703	5565.327	275.2789	0.067
1040.0	0.036	0.117	21.618	70.445	5072.410	0.710	5595.547	275.2831	0.068
1050.0	0.036	0.117	21.618	70.445	5121.237	0.717	5625.411	275.2873	0.068
1060.0	0.036	0.117	21.618	70.445	5170.064	0.724	5654.924	275.2914	0.069
1070.0	0.036	0.117	21.618	70.445	5218.891	0.730	5684.090	275.2955	0.069
1080.0	0.036	0.117	21.618	70.445	5267.718	0.737	5712.914	275.2995	0.070
1090.0	0.036	0.117	21.618	70.445	5316.545	0.744	5741.398	275.3035	0.070
1100.0	0.036	0.117	21.618	70.445	5365.372	0.751	5769.548	275.3075	0.071
1110.0	0.036	0.117	21.618	70.445	5414.199	0.758	5797.366	275.3114	0.072
1120.0	0.036	0.117	21.618	70.445	5463.026	0.765	5824.858	275.3152	0.072
1130.0	0.036	0.117	21.618	70.445	5511.853	0.771	5852.026	275.3190	0.073
1140.0	0.036	0.117	21.618	70.445	5560.680	0.778	5878.876	275.3228	0.073
1150.0	0.036	0.117	21.618	70.445	5609.507	0.785	5905.409	275.3265	0.074
1160.0	0.036	0.117	21.618	70.445	5658.334	0.792	5931.630	275.3301	0.074
1170.0	0.036	0.117	21.618	70.445	5707.161	0.799	5957.544	275.3338	0.075
1180.0	0.036	0.117	21.618	70.445	5755.987	0.806	5983.152	275.3374	0.075
1190.0	0.036	0.117	21.618	70.445	5804.814	0.812	6008.460	275.3409	0.076
1200.0	0.036	0.117	21.618	70.445	5853.641	0.819	6033.470	275.3444	0.076
1210.0	0.036	0.117	21.618	70.445	5902.468	0.826	6058.186	275.3479	0.077
1220.0	0.036	0.117	21.618	70.445	5951.295	0.833	6082.611	275.3513	0.077
1230.0	0.036	0.117	21.618	70.445	6000.122	0.840	6106.750	275.3546	0.078
1240.0	0.036	0.117	21.618	70.445	6048.949	0.847	6130.604	275.3580	0.078
1250.0	0.036	0.117	21.618	70.445	6097.776	0.853	6154.178	275.3613	0.079
1260.0	0.036	0.117	21.618	70.445	6146.603	0.860	6177.475	275.3645	0.079
1270.0	0.036	0.117	21.618	70.445	6195.430	0.867	6200.499	275.3678	0.079
1280.0	0.036	0.117	21.618	70.445	6244.257	0.874	6223.251	275.3710	0.080
1290.0	0.036	0.117	21.618	70.445	6293.084	0.881	6245.736	275.3741	0.080
1300.0	0.036	0.117	21.618	70.445	6341.911	0.888	6267.957	275.3772	0.081

1310.0	0.036	0.117	21.618	70.445	6390.738	0.894	6289.916	275.3803	0.081
1320.0	0.036	0.117	21.618	70.445	6439.565	0.901	6311.617	275.3833	0.082
1330.0	0.036	0.117	21.618	70.445	6488.392	0.908	6333.063	275.3863	0.082
1340.0	0.036	0.117	21.618	70.445	6537.218	0.915	6354.257	275.3893	0.083
1350.0	0.036	0.117	21.618	70.445	6586.045	0.922	6375.202	275.3922	0.083
1360.0	0.036	0.117	21.618	70.445	6634.872	0.929	6395.901	275.3951	0.083
1370.0	0.036	0.117	21.618	70.445	6683.699	0.935	6416.356	275.3980	0.084
1380.0	0.036	0.117	21.618	70.445	6732.526	0.942	6436.571	275.4008	0.084
1390.0	0.036	0.117	21.618	70.445	6781.353	0.949	6456.548	275.4036	0.085
1400.0	0.036	0.117	21.618	70.445	6830.180	0.956	6476.291	275.4064	0.085
1410.0	0.036	0.117	21.618	70.445	6879.007	0.963	6495.801	275.4091	0.085
1420.0	0.036	0.117	21.618	70.445	6927.834	0.970	6515.082	275.4118	0.086
1430.0	0.036	0.117	21.618	70.445	6976.661	0.976	6534.136	275.4145	0.086
1440.0	0.036	0.117	21.618	70.445	7025.488	0.983	6552.966	275.4171	0.086
1450.0	0.036	0.117	21.618	70.445	7074.315	0.990	6571.575	275.4197	0.087
1460.0	0.036	0.117	21.618	70.445	7123.142	0.997	6589.965	275.4223	0.087
1470.0	0.036	0.078	21.618	46.963	7148.487	1.000	6584.658	275.4215	0.087
1480.0	0.036	0.039	21.618	23.482	7150.350	1.001	6555.930	275.4175	0.086
1490.0	0.036	0.000	21.618	0.000	7128.732	0.998	6504.059	275.4103	0.085
1500.0	0.031	0.000	18.530	0.000	7110.203	0.995	6452.798	275.4031	0.084
1510.0	0.026	0.000	15.442	0.000	7094.761	0.993	6402.140	275.3960	0.083
1520.0	0.021	0.000	12.353	0.000	7082.408	0.991	6352.077	275.3890	0.082
1530.0	0.015	0.000	9.265	0.000	7073.143	0.990	6302.602	275.3821	0.081
1540.0	0.010	0.000	6.177	0.000	7066.966	0.989	6253.709	275.3752	0.081
1550.0	0.005	0.000	3.088	0.000	7063.878	0.989	6205.391	275.3685	0.080
1560.0	0.000	0.000	0.000	0.000	7063.878	0.989	6157.641	275.3618	0.079
		Vol to contain	**3221.098783**	**10284.9768**	**m3**				

BASIN 01

Project: P18369 DESN CBH Dowerin Upgrade Rev C
User: rhardy
Organization: Engenium
Date: Wed Oct 03 13:18:14 2018
Report File: volumes DESN Dowerin Basin.rpt

Storage calculations to tin "DESN Dowerin Basin" - (with plan polygon "base->poly")

cut volumes are negative
fill volumes are positive

Height	Vol to Height	Plan Area	Slope Area	
Delta Ht	Delta Vol	Delta Area	Delta Area	
276.200	14139.386	9884.677	9962.400	Top of Wall
0.100	979.116	186.642	191.712	
276.100	13160.269	9698.035	9770.688	
0.100	960.527	185.401	190.417	
276.000	12199.742	9512.634	9580.272	
0.100	942.027	184.601	189.576	

275.900	11257.716	9328.034	9390.696	
0.100	923.607	196.600	201.536	
275.800	10334.109	9131.434	9189.160	Weir Level
0.100	903.850	185.700	190.566	
275.700	9430.259	8945.734	8998.594	
0.100	885.330	184.699	189.495	
275.600	8544.929	8761.035	8809.099	
0.100	866.910	183.699	188.423	
275.500	7678.019	8577.336	8620.676	TWL
0.100	848.590	182.698	187.352	
275.400	6829.428	8394.638	8433.324	
0.100	830.371	181.698	186.280	
275.300	5999.058	8212.940	8247.044	
0.100	812.251	180.697	185.209	
275.200	5186.807	8032.243	8061.835	
0.100	794.231	179.697	184.137	
275.100	4392.576	7852.546	7877.698	
0.100	776.311	178.696	183.066	
275.000	3616.264	7673.850	7694.632	
0.100	758.492	177.696	181.994	
274.900	2857.772	7496.154	7512.638	
0.100	740.772	176.695	180.923	
274.800	2117.000	7319.459	7331.715	Pipe Outlet Level
0.100	723.153	175.695	179.851	
274.700	1393.847	7143.764	7151.864	
0.100	705.633	174.694	178.780	
274.600	688.214	6969.070	6973.084	
0.100	688.214	6969.070	6973.084	
274.500	0.000	0.000	0.000	Base Level
1.000	0.000	0.000	0.000	
273.500	0.000	0.000	0.000	

==========

Polygon plan area = 10789.665

Input from Microstation Catchment Stream Vertical Profile (Cut from Text file output)
File Reference: P:\P18369 CBH Dowerin Upgrade\P18369A\02 Enging\02.05 Civil\Engineering\Drainage Spreadsheets\[P18369A-CAL-Y-002 Basin 2 Design Rev A.xlsx]Basin Volumes
Horizontal Alignment File Reference:

BASIN 02

Kinematic Wave Calculated 'tc' (min)	Catchment Length 'L' (m)	'n'	Intensity 'i' (mmm/hr)	Slope 'S' (m/m)	Nominated 'tc' (min)	
8.887830007	200	0.5	**112.0**	0.01	**6**	
8.931449785	200	0.5	110.6	0.01	6.17	
9.03651062	200	0.5	107.4	0.01	6.59	
9.097340387	200	0.5	105.7	0.01	6.84	
9.365060227	200	0.5	98.3	0.01	8	
9.473991581	200	0.5	95.5	0.01	8.5	
9.579530868	200	0.5	92.9	0.01	9	
9.669824122	200	0.5	90.7	0.01	9.44	
9.78152169	200	0.5	88.1	0.01	10	Peak Tc
9.816703933	200	0.5	87.4	0.01	10.18	
10.15498884	200	0.5	80.3	0.01	12	
10.21851622	200	0.5	79.0	0.01	12.36	
10.49581701	200	0.5	73.9	0.01	14	
10.65618019	200	0.5	71.2	0.01	15	
10.81071682	200	0.5	68.6	0.01	16	
10.95995611	200	0.5	66.3	0.01	17	
11.1043511	200	0.5	64.2	0.01	18	
11.24429339	200	0.5	62.2	0.01	19	
11.3801243	200	0.5	60.4	0.01	20	
11.51214358	200	0.5	58.7	0.01	21	
11.6406162	200	0.5	57.1	0.01	22	
11.76577782	200	0.5	55.5	0.01	23	
11.88783915	200	0.5	54.1	0.01	24	
12.00698954	200	0.5	52.8	0.01	25	
12.1233999	200	0.5	51.5	0.01	26	
12.23722512	200	0.5	50.4	0.01	27	
12.34860614	200	0.5	49.2	0.01	28	
12.45767162	200	0.5	48.2	0.01	29	
12.56453942	200	0.5	47.1	0.01	30	
12.77210658	200	0.5	45.2	0.01	32	
12.97207695	200	0.5	43.5	0.01	34	
13.16510997	200	0.5	41.9	0.01	36	
13.35177598	200	0.5	40.5	0.01	38	
13.53257225	200	0.5	39.2	0.01	40	
13.96162554	200	0.5	36.2	0.01	45	
14.36217002	200	0.5	33.7	0.01	50	
14.73843788	200	0.5	31.6	0.01	55	
15.09372534	200	0.5	29.8	0.01	**60**	

n' Values - Surface roughness (similar but not identical to Manning's n)
Concrete or Asphalt 0.010 - 0.013
Bare Sand 0.010 - 0.016
Graveled Surface 0.012 - 0.030
Bare Clay-Loam Soil (eroded) 0.012 - 0.033
Sparse Vegetation 0.053 - 0.130
Short Grass Prairie 0.100 - 0.200
Lawns 0.170 - 0.480

Check

	AR&R - Wheatbelt	ARR87
	t_c = 0.76 x A$^{0.38}$	
Area	21820	m2
tc	10.7	min

Kinematic Wave Equation

$$t_c = 0.93\left(\frac{L^{0.6}n^{0.6}}{i^{0.4}S^{0.3}}\right)$$

P18369 Dowerin OBH 06, 07 & 08

Client CBH

Basin 2

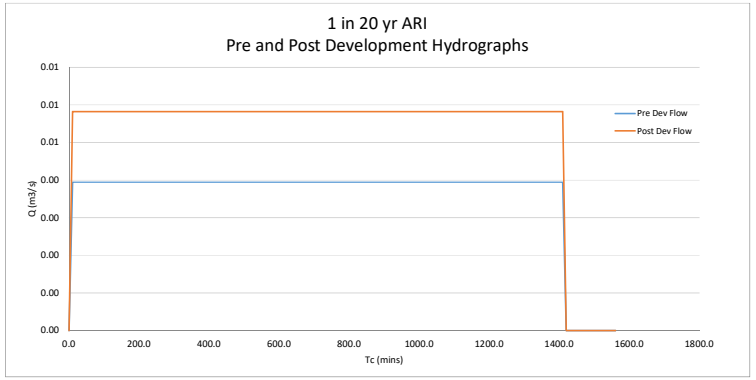
ARI	20	years			
Predevelopment				**Post Development**	
Storm event	1440	mins		1440	mins
Time of Concentration tc	10	mins		10	mins
Rainfall Intensity	3.1	mm/hr		3.1	mm/hr
Assumed Peak Rainfall Duration	1430	mins		1430	mins
Peak Rainfall Duration Start	10	mins		10	mins
Peak Rainfall Duration Finish	1440	mins		1440	mins
Total Area	21814	m^2		21814	m^2
C20 value	0.21			0.31	
Effective Area	4580.94	m^2		6762.34	m^2
Predeveloped peak flow	3.94	L/s		5.82	L/s
Predeveloped peak flow	0.0039	m3/s		0.0058	m3/s

From Channel Calculations

Basin Infiltration

Soil Permeability	7	m/day
Soil Permeability Kh	292	mm/hr
Clogged Layer K_h	20	mm/hr
Clogging Depth	100	mm

Time Tc (mins)	Pre- Develop Q (m3/s)	Post-Develop Q (m3/s)	Pre-Develop Vol (m3)	Post-Develop Vol (m3)	Post - Pre Basin Volume Vol (m3)	Basin Depth D (m)	With Infiltration Basin Volume Vol (m3)	Basin Depth D (m)	Outlet Flow (infiltration) (m3)	Infiltration m3/hr
0.0	0.00	0.00			0	0.000	0.000	278.8		
10.0	0.0039	0.0058	2.367	3.494	1.127	0.003	3.494	278.8086	0.926889	0.021723952
20.0	0.0039	0.0058	2.367	3.494	2.254	0.006	6.061	278.8150	0.980930	0.022990557
30.0	0.0039	0.0058	2.367	3.494	3.381	0.008	8.574	278.8212	1.033835	0.024230497
40.0	0.0039	0.0058	2.367	3.494	4.508	0.011	11.034	278.8272	1.085625	0.025444333
50.0	0.0039	0.0058	2.367	3.494	5.635	0.014	13.442	278.8332	1.136325	0.026632615
60.0	0.0039	0.0058	2.367	3.494	6.762	0.017	15.800	278.8390	1.185958	0.02779588
70.0	0.0039	0.0058	2.367	3.494	7.889	0.019	18.108	278.8447	1.234545	0.028934656
80.0	0.0039	0.0058	2.367	3.494	9.016	0.022	20.367	278.8502	1.282110	0.030049457
90.0	0.0039	0.0058	2.367	3.494	10.144	0.025	22.579	278.8557	1.328674	0.031140788
100.0	0.0039	0.0058	2.367	3.494	11.271	0.028	24.744	278.8610	1.374257	0.032209145
110.0	0.0039	0.0058	2.367	3.494	12.398	0.031	26.863	278.8663	1.418880	0.033255009
120.0	0.0039	0.0058	2.367	3.494	13.525	0.033	28.938	278.8714	1.462565	0.034278856
130.0	0.0039	0.0058	2.367	3.494	14.652	0.036	30.970	278.8764	1.505329	0.035281147
140.0	0.0039	0.0058	2.367	3.494	15.779	0.039	32.958	278.8813	1.547193	0.036262338
150.0	0.0039	0.0058	2.367	3.494	16.906	0.042	34.905	278.8861	1.588176	0.037222872
160.0	0.0039	0.0058	2.367	3.494	18.033	0.044	36.811	278.8908	1.628296	0.038163185
170.0	0.0039	0.0058	2.367	3.494	19.160	0.047	38.676	278.8954	1.667571	0.039083701
180.0	0.0039	0.0058	2.367	3.494	20.287	0.050	40.503	278.8999	1.706020	0.039984838
190.0	0.0039	0.0058	2.367	3.494	21.414	0.053	42.290	278.9043	1.743659	0.040867004
200.0	0.0039	0.0058	2.367	3.494	22.541	0.056	44.041	278.9087	1.780505	0.041730598
210.0	0.0039	0.0058	2.367	3.494	23.668	0.058	45.754	278.9129	1.816576	0.042576011
220.0	0.0039	0.0058	2.367	3.494	24.795	0.061	47.431	278.9170	1.851888	0.043403625
230.0	0.0039	0.0058	2.367	3.494	25.922	0.064	49.073	278.9211	1.886456	0.044213817
240.0	0.0039	0.0058	2.367	3.494	27.049	0.067	50.681	278.9250	1.920297	0.045006951
250.0	0.0039	0.0058	2.367	3.494	28.176	0.070	52.254	278.9289	1.953425	0.045783388
260.0	0.0039	0.0058	2.367	3.494	29.303	0.072	53.795	278.9327	1.985855	0.046543479
270.0	0.0039	0.0058	2.367	3.494	30.431	0.075	55.303	278.9364	2.017603	0.047287568
280.0	0.0039	0.0058	2.367	3.494	31.558	0.078	56.779	278.9401	2.048682	0.048015992
290.0	0.0039	0.0058	2.367	3.494	32.685	0.081	58.224	278.9436	2.079107	0.048729081
300.0	0.0039	0.0058	2.367	3.494	33.812	0.083	59.639	278.9471	2.108892	0.049427158
310.0	0.0039	0.0058	2.367	3.494	34.939	0.086	61.024	278.9506	2.138050	0.050110538
320.0	0.0039	0.0058	2.367	3.494	36.066	0.089	62.380	278.9539	2.166593	0.050779531
330.0	0.0039	0.0058	2.367	3.494	37.193	0.092	63.707	278.9572	2.194536	0.05143444
340.0	0.0039	0.0058	2.367	3.494	38.320	0.095	65.006	278.9604	2.221891	0.052075561
350.0	0.0039	0.0058	2.367	3.494	39.447	0.097	66.278	278.9635	2.248669	0.052703186
360.0	0.0039	0.0058	2.367	3.494	40.574	0.100	67.524	278.9666	2.274884	0.053317597
370.0	0.0039	0.0058	2.367	3.494	41.701	0.103	68.743	278.9696	2.300547	0.053919073
380.0	0.0039	0.0058	2.367	3.494	42.828	0.106	69.936	278.9725	2.325670	0.054507886
390.0	0.0039	0.0058	2.367	3.494	43.955	0.108	71.104	278.9754	2.350264	0.055084304
400.0	0.0039	0.0058	2.367	3.494	45.082	0.111	72.248	278.9782	2.374340	0.055648586
410.0	0.0039	0.0058	2.367	3.494	46.209	0.114	73.367	278.9810	2.397909	0.056200988
420.0	0.0039	0.0058	2.367	3.494	47.336	0.117	74.463	278.9837	2.420982	0.056741762
430.0	0.0039	0.0058	2.367	3.494	48.463	0.120	75.536	278.9864	2.443569	0.05727115
440.0	0.0039	0.0058	2.367	3.494	49.590	0.122	76.587	278.9889	2.465681	0.057789393
450.0	0.0039	0.0058	2.367	3.494	50.718	0.125	77.615	278.9915	2.487327	0.058296726
460.0	0.0039	0.0058	2.367	3.494	51.845	0.128	78.621	278.9940	2.508517	0.058793379
470.0	0.0039	0.0058	2.367	3.494	52.972	0.131	79.607	278.9964	2.529262	0.059279575
480.0	0.0039	0.0058	2.367	3.494	54.099	0.133	80.571	278.9988	2.549570	0.059755536
490.0	0.0039	0.0058	2.367	3.494	55.226	0.136	81.516	279.0011	2.569450	0.060221476
500.0	0.0039	0.0058	2.367	3.494	56.353	0.139	82.440	279.0034	2.588911	0.060677608
510.0	0.0039	0.0058	2.367	3.494	57.480	0.142	83.345	279.0056	2.607963	0.061124136
520.0	0.0039	0.0058	2.367	3.494	58.607	0.145	84.231	279.0078	2.626614	0.061561264
530.0	0.0039	0.0058	2.367	3.494	59.734	0.147	85.098	279.0099	2.644872	0.061989189
540.0	0.0039	0.0058	2.367	3.494	60.861	0.150	85.947	279.0120	2.662746	0.062408105
550.0	0.0039	0.0058	2.367	3.494	61.988	0.153	86.778	279.0141	2.680243	0.062818202
560.0	0.0039	0.0058	2.367	3.494	63.115	0.156	87.592	279.0161	2.697372	0.063219666



Volume	
Pre-development Volume	**334 m3**
Post Development Volume	**493 m3**
Volume req'd for retention	**73 m3**
Volume from Infiltration	**420 m3**

V	89	m3	
D	0.3	m	
L	16	m	
W	16	m	
Z	4	ratio of slope	
A	256	m2	

Stage Storage

Depth	Stage	Storage
0	278.8	0
0.1	278.9	26.90133
0.2	279.1	56.49067
0.3	279.4	88.896
0.4	279.8	124.2453
0.5	280.3	162.6667
0.6	280.9	204.288
0.7	281.6	249.2373
0.8	282.4	297.6427
0.9	283.3	349.632
1	284.3	405.3333
1.1	285.4	464.8747
1.2	286.6	528.384
1.3	287.9	595.9893
1.4	289.3	667.8187
1.5	290.8	744
1.6	292.4	824.6613
1.7	294.1	909.9307
1.8	295.9	999.936
1.9	297.8	1094.805
2	299.8	1194.667

570.0	0.0039	0.0058	2.367	3.494	64.242	0.158	88.388	279.0181	2.714141	0.063612677
580.0	0.0039	0.0058	2.367	3.494	65.369	0.161	89.168	279.0200	2.730556	0.063997415
590.0	0.0039	0.0058	2.367	3.494	66.496	0.164	89.931	279.0219	2.746626	0.064374053
600.0	0.0039	0.0058	2.367	3.494	67.623	0.167	90.679	279.0237	2.762358	0.064742761
610.0	0.0039	0.0058	2.367	3.494	68.750	0.170	91.410	279.0255	2.777758	0.065103708
620.0	0.0039	0.0058	2.367	3.494	69.878	0.172	92.126	279.0273	2.792834	0.065457055
630.0	0.0039	0.0058	2.367	3.494	71.005	0.175	92.827	279.0290	2.807593	0.065802963
640.0	0.0039	0.0058	2.367	3.494	72.132	0.178	93.514	279.0307	2.822041	0.06614159
650.0	0.0039	0.0058	2.367	3.494	73.259	0.181	94.185	279.0324	2.836185	0.066473087
660.0	0.0039	0.0058	2.367	3.494	74.386	0.184	94.843	279.0340	2.850031	0.066797605
670.0	0.0039	0.0058	2.367	3.494	75.513	0.186	95.487	279.0356	2.863586	0.067115292
680.0	0.0039	0.0058	2.367	3.494	76.640	0.189	96.117	279.0371	2.876855	0.06742629
690.0	0.0039	0.0058	2.367	3.494	77.767	0.192	96.734	279.0387	2.889845	0.067730741
700.0	0.0039	0.0058	2.367	3.494	78.894	0.195	97.338	279.0401	2.902561	0.068028783
710.0	0.0039	0.0058	2.367	3.494	80.021	0.197	97.930	279.0416	2.915010	0.06832055
720.0	0.0039	0.0058	2.367	3.494	81.148	0.200	98.509	279.0430	2.927197	0.068606174
730.0	0.0039	0.0058	2.367	3.494	82.275	0.203	99.075	279.0444	2.939127	0.068885785
740.0	0.0039	0.0058	2.367	3.494	83.402	0.206	99.630	279.0458	2.950806	0.06915951
750.0	0.0039	0.0058	2.367	3.494	84.529	0.209	100.173	279.0471	2.962239	0.069427472
760.0	0.0039	0.0058	2.367	3.494	85.656	0.211	100.705	279.0484	2.973431	0.069689793
770.0	0.0039	0.0058	2.367	3.494	86.783	0.214	101.225	279.0497	2.984388	0.069946591
780.0	0.0039	0.0058	2.367	3.494	87.910	0.217	101.735	279.0510	2.995114	0.070197983
790.0	0.0039	0.0058	2.367	3.494	89.037	0.220	102.233	279.0522	3.005614	0.070444083
800.0	0.0039	0.0058	2.367	3.494	90.165	0.222	102.722	279.0534	3.015893	0.070685001
810.0	0.0039	0.0058	2.367	3.494	91.292	0.225	103.200	279.0546	3.025956	0.070920848
820.0	0.0039	0.0058	2.367	3.494	92.419	0.228	103.668	279.0558	3.035807	0.071151729
830.0	0.0039	0.0058	2.367	3.494	93.546	0.231	104.126	279.0569	3.045451	0.07137775
840.0	0.0039	0.0058	2.367	3.494	94.673	0.234	104.574	279.0580	3.054891	0.071599012
850.0	0.0039	0.0058	2.367	3.494	95.800	0.236	105.013	279.0591	3.064133	0.071815616
860.0	0.0039	0.0058	2.367	3.494	96.927	0.239	105.443	279.0601	3.073180	0.07202766
870.0	0.0039	0.0058	2.367	3.494	98.054	0.242	105.863	279.0612	3.082037	0.07223524
880.0	0.0039	0.0058	2.367	3.494	99.181	0.245	106.275	279.0622	3.090707	0.07243845
890.0	0.0039	0.0058	2.367	3.494	100.308	0.247	106.678	279.0632	3.099195	0.072637382
900.0	0.0039	0.0058	2.367	3.494	101.435	0.250	107.073	279.0642	3.107504	0.072832126
910.0	0.0039	0.0058	2.367	3.494	102.562	0.253	107.459	279.0651	3.115638	0.07302277
920.0	0.0039	0.0058	2.367	3.494	103.689	0.256	107.838	279.0660	3.123601	0.0732094
930.0	0.0039	0.0058	2.367	3.494	104.816	0.259	108.208	279.0670	3.131396	0.073392101
940.0	0.0039	0.0058	2.367	3.494	105.943	0.261	108.570	279.0679	3.139027	0.073570956
950.0	0.0039	0.0058	2.367	3.494	107.070	0.264	108.925	279.0687	3.146498	0.073746046
960.0	0.0039	0.0058	2.367	3.494	108.197	0.267	109.273	279.0696	3.153811	0.073917449
970.0	0.0039	0.0058	2.367	3.494	109.324	0.270	109.613	279.0704	3.160970	0.074085244
980.0	0.0039	0.0058	2.367	3.494	110.452	0.272	109.946	279.0712	3.167979	0.074249507
990.0	0.0039	0.0058	2.367	3.494	111.579	0.275	110.272	279.0721	3.174840	0.074410311
1000.0	0.0039	0.0058	2.367	3.494	112.706	0.278	110.591	279.0728	3.181556	0.07456773
1010.0	0.0039	0.0058	2.367	3.494	113.833	0.281	110.903	279.0736	3.188132	0.074721835
1020.0	0.0039	0.0058	2.367	3.494	114.960	0.284	111.209	279.0744	3.194568	0.074872695
1030.0	0.0039	0.0058	2.367	3.494	116.087	0.286	111.508	279.0751	3.200870	0.07502038
1040.0	0.0039	0.0058	2.367	3.494	117.214	0.289	111.801	279.0758	3.207038	0.075164955
1050.0	0.0039	0.0058	2.367	3.494	118.341	0.292	112.088	279.0765	3.213077	0.075306487
1060.0	0.0039	0.0058	2.367	3.494	119.468	0.295	112.369	279.0772	3.218988	0.075445039
1070.0	0.0039	0.0058	2.367	3.494	120.595	0.298	112.644	279.0779	3.224775	0.075580674
1080.0	0.0039	0.0058	2.367	3.494	121.722	0.300	112.913	279.0786	3.230441	0.075713454
1090.0	0.0039	0.0058	2.367	3.494	122.849	0.303	113.176	279.0792	3.235987	0.075843438
1100.0	0.0039	0.0058	2.367	3.494	123.976	0.306	113.434	279.0799	3.241416	0.075970686
1110.0	0.0039	0.0058	2.367	3.494	125.103	0.309	113.686	279.0805	3.246731	0.076095255
1120.0	0.0039	0.0058	2.367	3.494	126.230	0.311	113.934	279.0811	3.251934	0.076217202
1130.0	0.0039	0.0058	2.367	3.494	127.357	0.314	114.175	279.0817	3.257027	0.076336581
1140.0	0.0039	0.0058	2.367	3.494	128.484	0.317	114.412	279.0823	3.262014	0.076453447
1150.0	0.0039	0.0058	2.367	3.494	129.612	0.320	114.644	279.0828	3.266895	0.076567852
1160.0	0.0039	0.0058	2.367	3.494	130.739	0.323	114.871	279.0834	3.271674	0.076679849
1170.0	0.0039	0.0058	2.367	3.494	131.866	0.325	115.093	279.0839	3.276352	0.076789488
1180.0	0.0039	0.0058	2.367	3.494	132.993	0.328	115.311	279.0845	3.280931	0.076896819
1190.0	0.0039	0.0058	2.367	3.494	134.120	0.331	115.524	279.0850	3.285414	0.077001891
1200.0	0.0039	0.0058	2.367	3.494	135.247	0.334	115.732	279.0855	3.289803	0.07710475
1210.0	0.0039	0.0058	2.367	3.494	136.374	0.336	115.936	279.0860	3.294099	0.077205444
1220.0	0.0039	0.0058	2.367	3.494	137.501	0.339	116.136	279.0865	3.298305	0.077304018
1230.0	0.0039	0.0058	2.367	3.494	138.628	0.342	116.332	279.0870	3.302422	0.077400517
1240.0	0.0039	0.0058	2.367	3.494	139.755	0.345	116.523	279.0875	3.306453	0.077494984
1250.0	0.0039	0.0058	2.367	3.494	140.882	0.348	116.711	279.0879	3.310398	0.077587463
1260.0	0.0039	0.0058	2.367	3.494	142.009	0.350	116.894	279.0884	3.314261	0.077677994
1270.0	0.0039	0.0058	2.367	3.494	143.136	0.353	117.074	279.0888	3.318042	0.07776662
1280.0	0.0039	0.0058	2.367	3.494	144.263	0.356	117.250	279.0893	3.321744	0.07785338
1290.0	0.0039	0.0058	2.367	3.494	145.390	0.359	117.422	279.0897	3.325368	0.077938313
1300.0	0.0039	0.0058	2.367	3.494	146.517	0.361	117.590	279.0901	3.328916	0.078021458
1310.0	0.0039	0.0058	2.367	3.494	147.644	0.364	117.755	279.0905	3.332388	0.078102853
1320.0	0.0039	0.0058	2.367	3.494	148.771	0.367	117.917	279.0909	3.335788	0.078182534
1330.0	0.0039	0.0058	2.367	3.494	149.899	0.370	118.075	279.0913	3.339116	0.078260538
1340.0	0.0039	0.0058	2.367	3.494	151.026	0.373	118.229	279.0917	3.342374	0.078336899
1350.0	0.0039	0.0058	2.367	3.494	152.153	0.375	118.381	279.0921	3.345564	0.078411653
1360.0	0.0039	0.0058	2.367	3.494	153.280	0.378	118.529	279.0924	3.348686	0.078484834

1370.0	0.0039	0.0058	2.367	3.494	154.407	0.381	118.674	279.0928	3.351743	0.078556473
1380.0	0.0039	0.0058	2.367	3.494	155.534	0.384	118.817	279.0931	3.354735	0.078626604
1390.0	0.0039	0.0058	2.367	3.494	156.661	0.386	118.956	279.0935	3.357664	0.078695259
1400.0	0.0039	0.0058	2.367	3.494	157.788	0.389	119.092	279.0938	3.360532	0.078762469
1410.0	0.0039	0.0058	2.367	3.494	158.915	0.392	119.225	279.0941	3.363339	0.078828263
1420.0	0.0000	0.0000	0.000	0.000	158.915	0.392	115.862	279.0858	3.292532	0.077168721
1430.0	0.0000	0.0000	0.000	0.000	158.915	0.392	112.569	279.0777	3.223216	0.075544116
1440.0	0.0000	0.0000	0.000	0.000	158.915	0.392	109.346	279.0698	3.155358	0.073953714
1450.0	0.0000	0.0000	0.000	0.000	158.915	0.392	106.191	279.0620	3.088930	0.072396794
1460.0	0.0000	0.0000	0.000	0.000	158.915	0.392	103.102	279.0544	3.023900	0.070872651
1470.0	0.0000	0.0000	0.000	0.000	158.915	0.392	100.078	279.0469	2.960239	0.069380595
1480.0	0.0000	0.0000	0.000	0.000	158.915	0.392	97.118	279.0396	2.897918	0.067919951
1490.0	0.0000	0.0000	0.000	0.000	158.915	0.392	94.220	279.0325	2.836909	0.066490057
1500.0	0.0000	0.0000	0.000	0.000	158.915	0.392	91.383	279.0255	2.777185	0.065090266
1510.0	0.0000	0.0000	0.000	0.000	158.915	0.392	88.606	279.0186	2.718718	0.063719945
1520.0	0.0000	0.0000	0.000	0.000	158.915	0.392	85.887	279.0119	2.661481	0.062378472
1530.0	0.0000	0.0000	0.000	0.000	158.915	0.392	83.226	279.0053	2.605450	0.061065241
1540.0	0.0000	0.0000	0.000	0.000	158.915	0.392	80.620	278.9989	2.550599	0.059779657
1550.0	0.0000	0.0000	0.000	0.000	158.915	0.392	78.070	278.9926	2.496902	0.058521138
1560.0	0.0000	0.0000	0.000	0.000	158.915	0.392	75.573	278.9864	2.444336	0.057289114
		Vol to contain	**333.721479**	**492.636469**	**m3**					

Project: P18369 DESN CBH Dowerin Upgrade Rev C
User: rhardy
Organization: Engenium
Date: Wed Oct 03 13:21:27 2018
Report File: volumes DESN Dowerin Basin 02.rpt

BASIN 02

Storage calculations to tin "DESN Dowerin Bulkheads" - (with plan polygon "base->poly")

cut volumes are negative
fill volumes are positive

Height	Vol to Height	Plan Area	Slope Area	
Delta Ht	Delta Vol	Delta Area	Delta Area	
279.600	343.536	622.105	630.687	
0.100	60.316	37.883	38.866	
279.500	283.220	584.222	591.821	
0.100	56.212	48.745	49.901	
279.400	227.007	535.478	541.920	Weir
0.100	50.664	57.153	58.401	
279.300	176.344	478.325	483.519	
0.100	45.107	53.969	55.148	
279.200	131.236	424.355	428.371	
0.100	39.870	50.785	51.894	
279.100	91.367	373.570	376.477	TWL
0.100	34.950	47.602	48.641	

279.000	56.416	325.968	327.836	
0.100	30.349	44.418	45.387	
278.900	26.067	281.550	282.449	
0.100	26.067	281.550	282.449	
278.800	0.000	0.000	0.000	Base
5.300	0.000	0.000	0.000	
273.500	0.000	0.000	0.000	

==========

Polygon plan area = 630.226

1. Time of concentration, T_c, is calculated using the Bransby William and AR&R (Wheatbelt specific) equation.

AR&R - Wheatbelt
$T_c = 0.76 \times A^{0.38}$

Bransby William
Tc=14.467LS^(-0.2)A^(-0.1)

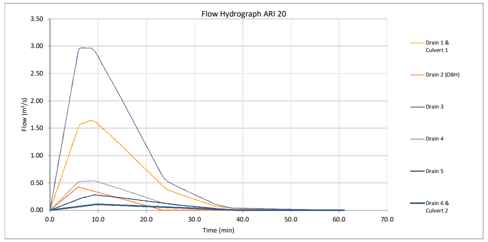
		Geometrical Data																		
Catchment	**Type**	**S**	**Catchment area, A**	**Catchment Length**	**Proportion Overland**	**Proportion Gravel**	**Proportion Paved**	**Average Runoff coeff, c**	**Time of concentration (T_{c1})**	**Length of runoff along drain to outlet**	**Channel Velocity**	**Runoff Time to Drain Outlet (T_{c2})**	**Total time of concentration, $T_c = T_{c1} + T_{c2}$**	**Comments**	**1**	**2**	**5**	**10**	**20**	**50**	**100**
		%	(m^2)	(km)					(min)	(m)	(m/s)	(min)	(min)		Flowrate, Q(m^3/s)						
Area 1A	Overland	1	14403	0.25	1	0	0	0.21	9.10	0	1	0	9.10	AR&R Wheatbelt Eq	0.03	0.04	0.05	0.07	0.08	0.10	0.11
Area 1B	Overland	1	31495	0.35	1	0	0	0.21	12.25	0	1	0	12.25	AR&R Wheatbelt Eq	0.06	0.07	0.10	0.12	0.15	0.18	0.21
Area 2	OBH	2	11060	0.03	0	0	1	0.945	0.59	300	1	5	6.00	Bransby William Eq	0.14	0.16	0.22	0.27	0.33	0.40	0.46
Area 3	OBH	2	14470	0.03	0	0	1	0.945	0.58	300	1	5	6.00	Bransby William Eq	0.18	0.21	0.29	0.36	0.43	0.52	0.60
Area 4	OBH	2	14760	0.03	0	0	1	0.945	0.58	300	1	5	6.00	Bransby William Eq	0.18	0.21	0.30	0.36	0.43	0.53	0.62
Area 5	OBH	1	10200	0.03	0	0	1	0.945	0.69	300	1	5	6.00	Bransby William Eq	0.13	0.15	0.21	0.25	0.30	0.37	0.43
Area 6	OBH	3	30540	0.275	0.05	0.85	0.1	0.730	4.53	100	1	2	6.19	Bransby William Eq	0.29	0.33	0.47	0.58	0.68	0.84	0.97
Area 7	OBH	0.3	12420	0.24	0.05	0	0.95	0.908	6.85	160	1	3	9.52	Bransby William Eq	0.12	0.14	0.20	0.24	0.28	0.35	0.40
Area 8	OBH	0.37	25200	0.16	0.05	0.85	0.1	0.730	4.08	280	1	5	8.75	AR&R Wheatbelt Eq	0.21	0.24	0.34	0.41	0.49	0.60	0.69
Area 9	Overland	1	12990	0.15	0.95	0	0.05	0.247	8.75	360	1	6	14.75	AR&R Wheatbelt Eq	0.03	0.03	0.05	0.06	0.07	0.08	0.09
Area 10	Overland	1	3110	0.03	0.9	0	0.1	0.284	5.08	610	1	10	15.25	AR&R Wheatbelt Eq	0.01	0.01	0.01	0.01	0.02	0.02	0.02
Area 11	OBH	1	1900	0.03	0	0	1	0.945	0.81	360	1	6	6.81	Bransby William Eq	0.02	0.03	0.04	0.05	0.05	0.07	0.08
Area 12	OBH	1	8970	0.03	0	0	1	0.945	0.70	520	1	9	9.36	Bransby William Eq	0.09	0.11	0.15	0.18	0.22	0.27	0.31
Area 13	OBH	2	2250	0.03	0	0	1	0.945	0.70	360	1	6	6.70	Bransby William Eq	0.03	0.03	0.04	0.05	0.06	0.08	0.09
ABasin1	Overland	1	11170	0.15	0	0	1	0.945	8.26	0	1	0	8.26	Runoff coefficient for Basin1 equals runoff coefficient for paved area	0.12	0.14	0.20	0.24	0.29	0.35	0.41
Area 14	OBH	1	2060	0.003	0	0	1	0.945	0.08	200	1	3	6.00	Sealed Looped Road Area	0.03	0.03	0.04	0.05	0.06	0.07	0.09
Area 15	Overland	2	17370	0.3	0.95	0	0.05	0.247	9.77	0	1	0	9.77	Runoff into Culvert2	0.05	0.05	0.07	0.09	0.11	0.13	0.15
Total Area into Basin1 (Post)	OBH/Overland	0.65	204938	0.6	0.31	0.23	0.45	0.6653	11.09	0	1	0	11.09	Bransby William Eq	1.41	1.61	2.28	2.78	3.31	4.07	4.70
Total Area into Basin1 (Pre)	OBH/Overland	0.65	204938	0.6	1.00	0.00	0.00	0.21	24.97	0	1	0	24.97	AR&R Wheatbelt Eq	0.28	0.32	0.45	0.54	0.65	0.80	0.92
													6.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Area adjacent to Basin2			2300					0.21					6.00		0.01	0.01	0.01	0.01	0.02	0.02	0.02
ABasin2			84	0.6	0.00	0.00	1.00	0.945					6.00	Runoff coefficient for Basin2 equals runoff coefficient for paved area	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Area into Basin2 (Post)			21814					0.312	10.66				10.66	Total Area into Basin2 and weighted runoff coefficient	0.07	0.08	0.11	0.14	0.16	0.20	0.23

	Area 1A	Area 1B	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Area 10	Area 11	Area 12	Area 13	Area 14	Area 15	ARI 5	10	20	50	100
Drain 1 & Culvert 1	0	0	0	0	0	1	1	1	1	1	0	1	0	0	0	0	1.11	1.39	1.65	2.03	2.34
Drain 2 (OBH)	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0.29	0.36	0.42	0.52	0.60
Drain 3	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	2.02	2.50	2.97	3.66	4.22
Drain 4	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0.37	0.45	0.54	0.66	0.76
Drain 5	0	0	0	0	0	0	0	0	0	0	1	0	1	1	0	0	0.19	0.24	0.28	0.35	0.40
Drain 6 & Culvert 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0.07	0.09	0.11	0.13	0.09

Note: '1' indicates that the catchment area is active while '0' indicates that the catchment area is inactive.

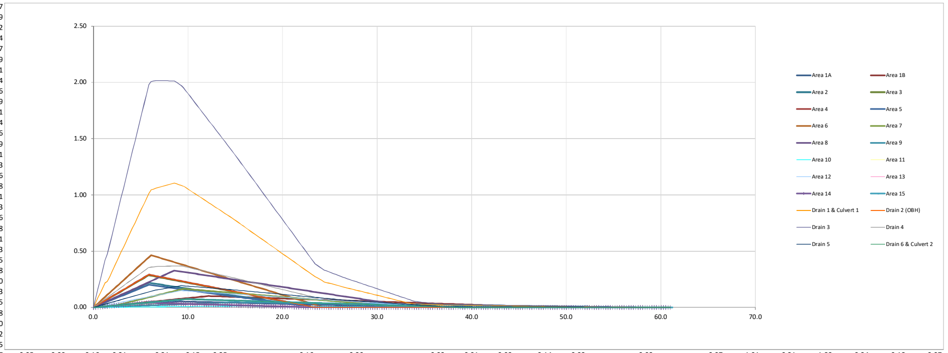
Peak flows

Catchment	t_c (min)	ARI	Q (m^3/s)	Catchment	t_c (min)	ARI	Q (m^3/s)	Catchment	t_c (min)	ARI	Q (m^3/s)	t_c (min)	ARI	t_c (min)	ARI	Q (m^3/s)
Area 1A	9.10	5	0.05	Area 1A	9.10	10	0.07	Area 1A	9.10	20	0.08	9.10	50	9.10	100	0.11
Area 1B	12.25	5	0.10	Area 1B	12.25	10	0.12	Area 1B	12.25	20	0.15	12.25	50	12.25	100	0.21
Area 2	6.00	5	0.22	Area 2	6.00	10	0.27	Area 2	6.00	20	0.33	6.00	50	6.00	100	0.46
Area 3	6.00	5	0.29	Area 3	6.00	10	0.36	Area 3	6.00	20	0.43	6.00	50	6.00	100	0.60
Area 4	6.00	5	0.30	Area 4	6.00	10	0.36	Area 4	6.00	20	0.43	6.00	50	6.00	100	0.62
Area 5	6.00	5	0.21	Area 5	6.00	10	0.25	Area 5	6.00	20	0.30	6.00	50	6.00	100	0.43
Area 6	6.19	5	0.47	Area 6	6.19	10	0.58	Area 6	6.19	20	0.68	6.19	50	6.19	100	0.97
Area 7	9.52	5	0.20	Area 7	9.52	10	0.24	Area 7	9.52	20	0.28	9.52	50	9.52	100	0.40
Area 8	8.75	5	0.34	Area 8	8.75	10	0.41	Area 8	8.75	20	0.49	8.75	50	8.75	100	0.69
Area 9	14.75	5	0.05	Area 9	14.75	10	0.06	Area 9	14.75	20	0.07	14.75	50	14.75	100	0.09
Area 10	15.25	5	0.01	Area 10	15.25	10	0.01	Area 10	15.25	20	0.02	15.25	50	15.25	100	0.02
Area 11	6.81	5	0.04	Area 11	6.81	10	0.05	Area 11	6.81	20	0.05	6.81	50	6.81	100	0.08
Area 12	9.36	5	0.15	Area 12	9.36	10	0.18	Area 12	9.36	20	0.22	9.36	50	9.36	100	0.31
Area 13	6.70	5	0.04	Area 13	6.70	10	0.05	Area 13	6.70	20	0.06	6.70	50	6.70	100	0.09
ABasin1	8.26	5	0.20	ABasin1	8.26	10	0.24	ABasin1	8.26	20	0.29	8.26	50	6.00	100	0.41
Area 14	6.00	5	0.04	Area 14	6.00	10	0.05	Area 14	6.00	20	0.06	6.00	50	9.77	100	0.09
Area 15	9.77	5	0.07	Area 15	9.77	10	0.09	Area 15	9.77	20	0.11	9.77	50	11.09	100	0.15
Total Area into Basin1 (	11.09	5	2.28	Total Area ir	11.09	10	2.78	Total Area into Basin1 (I	11.09	20	3.31	11.09	50	24.97	100	4.70
Total Area into Basin1 (	24.97	5	0.45	Total Area ir	24.97	10	0.54	Total Area into Basin1 (I	24.97	20	0.65	24.97	50	6.00	100	0.92

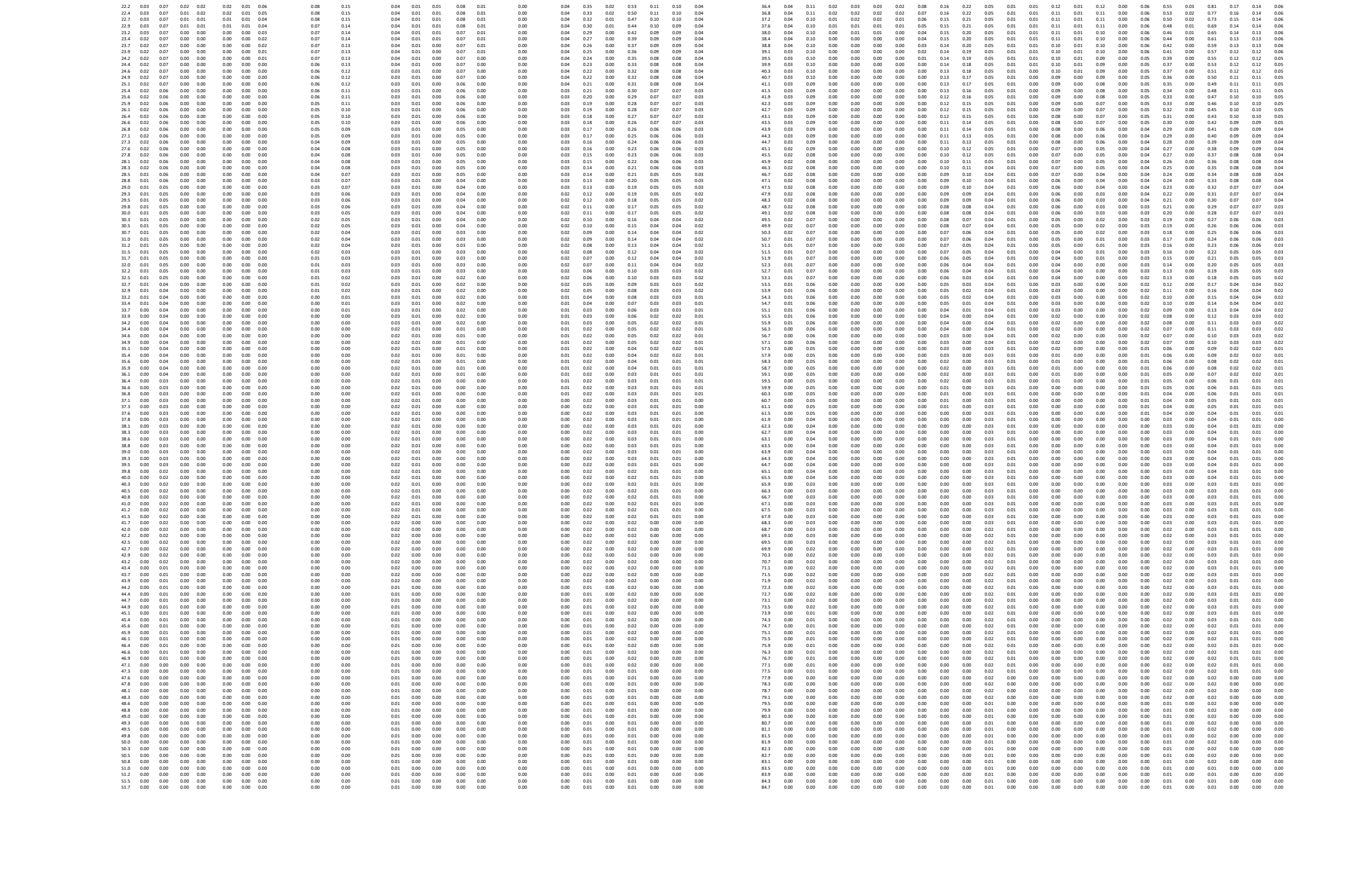


ARI 5

time	Area 1A	Area 1B	Area 2	Area 3	Area 4	Area 5	Area 6	Area 7	Area 8	Area 9	Area 10	Area 11	Area 12	Area 13	Area 14	Area 15	Drain 1 &	Drain 2 (O	Drain 3	Drain 4	Drain 5	Drain 6 & Culvert 2
0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.08	0.01	0.01	0.00
0.5	0.00	0.00	0.02	0.02	0.02	0.02	0.04	0.01	0.02	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.09	0.02	0.17	0.03	0.01	0.00
0.7	0.00	0.01	0.03	0.04	0.04	0.03	0.06	0.02	0.03	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.13	0.04	0.25	0.04	0.02	0.01
1.0	0.01	0.01	0.04	0.05	0.05	0.03	0.07	0.02	0.04	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.17	0.05	0.34	0.06	0.02	0.01



ARI 20

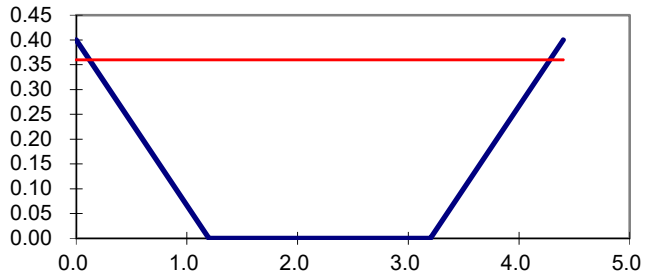


52.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
52.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
52.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
52.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
53.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
53.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
53.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
53.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
53.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
54.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
54.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
54.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
54.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
55.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56.4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
57.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58.6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60.8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

85.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
85.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
85.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
86.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
86.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
87.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
87.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
87.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
88.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
88.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
89.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
89.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
89.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
90.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00
90.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
91.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
91.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
91.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
92.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
93.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
94.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
95.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
96.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
97.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98.3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
98.7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99.9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Description : Drain 1

CHANNEL CAPACITY CALCULATIONS **Based on Manning's formula V = 1/n R^2/3 S^1/2**



Required Flow m^3/s	1.65
Manning's coefficient "n"	0.022
Bed slope 1 in..	153.9
Left bank slope (Sl)1 in..	3
Bed width (m)	2
Right bank slope(Sr)1 in..	3
For channel depth (m) of..	0.4
Minimum Water Level	0
Maximum Water Level	0.36
Required increments	0.01
Number of increments	200

CHANNEL DEPTH d (m)	CHANNEL CAPACITY Q(cumec)	CHANNEL VELOCITY V(m/s)	Vxd (m^2/s)	FLOW WIDTH Ww (m)	FLOW AREA (m^2)	WETTED PERIMETER m	HYDRAULIC RADIUS R (m)
0.00	0.00	0.00	0.00	2.0	0.00	2.00	0.00
0.01	0.00	0.17	0.00	2.1	0.02	2.06	0.01
0.02	0.01	0.26	0.01	2.1	0.04	2.13	0.02
0.03	0.02	0.34	0.01	2.2	0.06	2.19	0.03
0.04	0.03	0.41	0.02	2.2	0.08	2.25	0.04
0.05	0.05	0.47	0.02	2.3	0.11	2.32	0.05
0.06	0.07	0.53	0.03	2.4	0.13	2.38	0.05
0.07	0.09	0.58	0.04	2.4	0.15	2.44	0.06
0.08	0.11	0.63	0.05	2.5	0.18	2.51	0.07
0.09	0.14	0.68	0.06	2.5	0.20	2.57	0.08
0.10	0.17	0.72	0.07	2.6	0.23	2.63	0.09
0.11	0.20	0.76	0.08	2.7	0.26	2.70	0.10
0.12	0.23	0.80	0.10	2.7	0.28	2.76	0.10
0.13	0.26	0.84	0.11	2.8	0.31	2.82	0.11
0.14	0.30	0.88	0.12	2.8	0.34	2.89	0.12
0.15	0.34	0.91	0.14	2.9	0.37	2.95	0.12
0.16	0.38	0.95	0.15	3.0	0.40	3.01	0.13
0.17	0.42	0.98	0.17	3.0	0.43	3.08	0.14
0.18	0.46	1.01	0.18	3.08	0.46	3.14	0.15
0.19	0.51	1.05	0.20	3.1	0.49	3.20	0.15
0.20	0.56	1.08	0.22	3.2	0.52	3.26	0.16
0.21	0.61	1.11	0.23	3.3	0.55	3.33	0.17
0.22	0.66	1.14	0.25	3.3	0.59	3.39	0.17
0.23	0.72	1.16	0.27	3.4	0.62	3.45	0.18
0.24	0.78	1.19	0.29	3.4	0.65	3.52	0.19
0.25	0.84	1.22	0.30	3.5	0.69	3.58	0.19
0.26	0.90	1.25	0.32	3.6	0.72	3.64	0.20
0.27	0.97	1.27	0.34	3.6	0.76	3.71	0.20
0.28	1.03	1.30	0.36	3.7	0.80	3.77	0.21
0.29	1.10	1.32	0.38	3.7	0.83	3.83	0.22
0.30	1.17	1.35	0.40	3.8	0.87	3.90	0.22
0.31	1.25	1.37	0.43	3.9	0.91	3.96	0.23
0.32	1.32	1.40	0.45	3.9	0.95	4.02	0.24
0.33	1.40	1.42	0.47	4.0	0.99	4.09	0.24
0.34	1.48	1.44	0.49	4.0	1.03	4.15	0.25
0.35	1.57	1.47	0.51	4.1	1.07	4.21	0.25
0.36	1.65	1.49	0.54	4.2	1.11	4.28	0.26
0.37	1.74	1.51	0.56	4.2	1.15	4.34	0.27

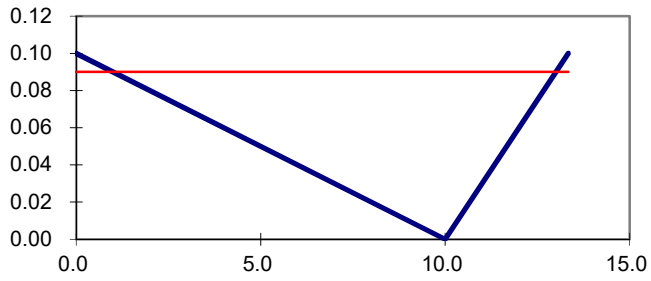
0.38	1.83	1.53	0.58	4.3	1.19	4.40	0.27
0.39	1.92	1.56	0.61	4.3	1.24	4.47	0.28
0.40	2.02	1.58	0.63	4.4	1.28	4.53	0.28
0.41	2.12	1.60	0.66	4.5	1.32	4.59	0.29
0.42	2.22	1.62	0.68	4.5	1.37	4.66	0.29
0.43	2.32	1.64	0.71	4.6	1.41	4.72	0.30
0.44	2.43	1.66	0.73	4.6	1.46	4.78	0.31
0.45	2.54	1.68	0.76	4.7	1.51	4.85	0.31
0.46	2.65	1.70	0.78	4.8	1.55	4.91	0.32
0.47	2.76	1.72	0.81	4.8	1.60	4.97	0.32

Trapezoidal Channel Capacity

Program : Trap_Cap
Version : 1.0

Description : Drain 2

CHANNEL CAPACITY CALCULATIONS — **Based on Manning's formula V = 1/n R^2/3 S^1/2**



Required Flow m^3/s	0.42
Manning's coefficient "n"	0.014
Bed slope 1 in..	133.333
Left bank slope (Sl)1 in..	100
Bed width (m)	0
Right bank slope(Sr)1 in..	33.3333
For channel depth (m) of..	0.1
Minimum Water Level	0
Maximum Water Level	0.09
Required increments	0.01
Number of increments	200

CHANNEL DEPTH d (m)	CHANNEL CAPACITY Q(cumec)	CHANNEL VELOCITY V(m/s)	Vxd (m^2/s)	FLOW WIDTH Ww (m)	FLOW AREA (m^2)	WETTED PERIMETER m	HYDRAULIC RADIUS R (m)
0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.00	0.00	#DIV/0!
0.01	0.00	0.18	0.00	1.3	0.01	1.33	0.00
0.02	0.01	0.29	0.01	2.7	0.03	2.67	0.01
0.03	0.02	0.38	0.01	4.0	0.06	4.00	0.01
0.04	0.05	0.46	0.02	5.3	0.11	5.33	0.02
0.05	0.09	0.53	0.03	6.7	0.17	6.67	0.02
0.06	0.14	0.60	0.04	8.0	0.24	8.00	0.03
0.07	0.22	0.66	0.05	9.3	0.33	9.33	0.03
0.08	0.31	0.72	0.06	10.7	0.43	10.67	0.04
0.09	0.42	0.78	0.07	12.0	0.54	12.00	0.04
0.10	0.56	0.84	0.08	13.3	0.67	13.34	0.05
0.11	0.72	0.89	0.10	14.7	0.81	14.67	0.05
0.12	0.91	0.95	0.11	16.0	0.96	16.00	0.06
0.13	1.13	1.00	0.13	17.3	1.13	17.34	0.06
0.14	1.37	1.05	0.15	18.7	1.31	18.67	0.07
0.15	1.65	1.10	0.17	20.0	1.50	20.00	0.07
0.16	1.96	1.15	0.18	21.3	1.71	21.34	0.08
0.17	2.30	1.20	0.20	22.7	1.93	22.67	0.08
0.18	2.68	1.24	0.22	24.00	2.16	24.00	0.09
0.19	3.10	1.29	0.24	25.3	2.41	25.34	0.09
0.20	3.55	1.33	0.27	26.7	2.67	26.67	0.10
0.21	4.05	1.38	0.29	28.0	2.94	28.00	0.10
0.22	4.58	1.42	0.31	29.3	3.23	29.34	0.11
0.23	5.16	1.46	0.34	30.7	3.53	30.67	0.11
0.24	5.78	1.50	0.36	32.0	3.84	32.00	0.12
0.25	6.44	1.55	0.39	33.3	4.17	33.34	0.12
0.26	7.15	1.59	0.41	34.7	4.51	34.67	0.13
0.27	7.91	1.63	0.44	36.0	4.86	36.01	0.13
0.28	8.72	1.67	0.47	37.3	5.23	37.34	0.14
0.29	9.57	1.71	0.50	38.7	5.61	38.67	0.14
0.30	10.48	1.75	0.52	40.0	6.00	40.01	0.15
0.31	11.43	1.78	0.55	41.3	6.41	41.34	0.15
0.32	12.44	1.82	0.58	42.7	6.83	42.67	0.16
0.33	13.51	1.86	0.61	44.0	7.26	44.01	0.16

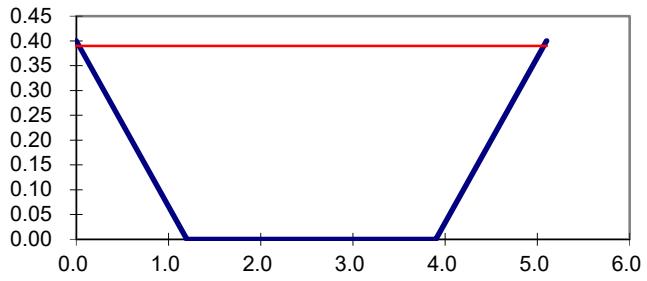
0.34	14.63	1.90	0.65	45.3	7.71	45.34	0.17
0.35	15.80	1.94	0.68	46.7	8.17	46.67	0.17
0.36	17.04	1.97	0.71	48.0	8.64	48.01	0.18
0.37	18.33	2.01	0.74	49.3	9.13	49.34	0.18
0.38	19.68	2.04	0.78	50.7	9.63	50.67	0.19
0.39	21.09	2.08	0.81	52.0	10.14	52.01	0.19
0.40	22.56	2.12	0.85	53.3	10.67	53.34	0.20

Trapezoidal Channel Capacity

Program : Trap_Cap
Version : 1.0

Description : Drain 3

CHANNEL CAPACITY CALCULATIONS — **Based on Manning's formula V = 1/n R^2/3 S^1/2**



Required Flow m^3/s	2.97
Manning's coefficient "n"	0.022
Bed slope 1 in..	100.0
Left bank slope (Sl)1 in..	3
Bed width (m)	2.7
Right bank slope(Sr)1 in..	3
For channel depth (m) of..	0.4
Minimum Water Level	0
Maximum Water Level	0.39
Required increments	0.01
Number of increments	200

CHANNEL DEPTH d (m)	CHANNEL CAPACITY Q(cumec)	CHANNEL VELOCITY V(m/s)	Vxd (m^2/s)	FLOW WIDTH Ww (m)	FLOW AREA (m^2)	WETTED PERIMETER m	HYDRAULIC RADIUS R (m)
0.00	0.00	0.00	0.00	2.7	0.00	2.70	0.00
0.01	0.01	0.21	0.00	2.8	0.03	2.76	0.01
0.02	0.02	0.33	0.01	2.8	0.06	2.83	0.02
0.03	0.04	0.43	0.01	2.9	0.08	2.89	0.03
0.04	0.06	0.52	0.02	2.9	0.11	2.95	0.04
0.05	0.08	0.59	0.03	3.0	0.14	3.02	0.05
0.06	0.12	0.67	0.04	3.1	0.17	3.08	0.06
0.07	0.15	0.73	0.05	3.1	0.20	3.14	0.06
0.08	0.19	0.80	0.06	3.2	0.24	3.21	0.07
0.09	0.23	0.86	0.08	3.2	0.27	3.27	0.08
0.10	0.27	0.91	0.09	3.3	0.30	3.33	0.09
0.11	0.32	0.97	0.11	3.4	0.33	3.40	0.10
0.12	0.37	1.02	0.12	3.4	0.37	3.46	0.11
0.13	0.43	1.07	0.14	3.5	0.40	3.52	0.11
0.14	0.49	1.12	0.16	3.5	0.44	3.59	0.12
0.15	0.55	1.16	0.17	3.6	0.47	3.65	0.13
0.16	0.61	1.21	0.19	3.7	0.51	3.71	0.14
0.17	0.68	1.25	0.21	3.7	0.55	3.78	0.14
0.18	0.75	1.29	0.23	3.78	0.58	3.84	0.15
0.19	0.83	1.34	0.25	3.8	0.62	3.90	0.16
0.20	0.91	1.38	0.28	3.9	0.66	3.96	0.17
0.21	0.99	1.41	0.30	4.0	0.70	4.03	0.17
0.22	1.07	1.45	0.32	4.0	0.74	4.09	0.18
0.23	1.16	1.49	0.34	4.1	0.78	4.15	0.19
0.24	1.25	1.53	0.37	4.1	0.82	4.22	0.19
0.25	1.35	1.56	0.39	4.2	0.86	4.28	0.20
0.26	1.45	1.60	0.42	4.3	0.90	4.34	0.21
0.27	1.55	1.63	0.44	4.3	0.95	4.41	0.22
0.28	1.65	1.67	0.47	4.4	0.99	4.47	0.22
0.29	1.76	1.70	0.49	4.4	1.04	4.53	0.23
0.30	1.87	1.73	0.52	4.5	1.08	4.60	0.23
0.31	1.98	1.76	0.55	4.6	1.13	4.66	0.24
0.32	2.10	1.79	0.57	4.6	1.17	4.72	0.25
0.33	2.22	1.82	0.60	4.7	1.22	4.79	0.25

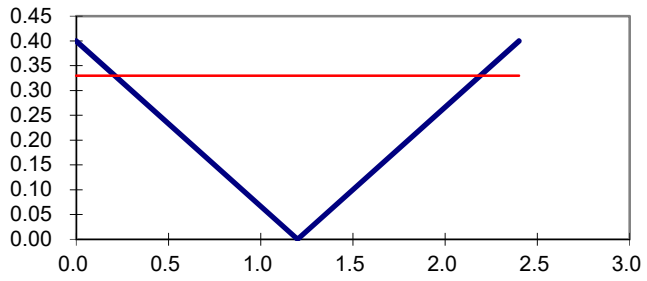
0.34	2.35	1.86	0.63	4.7	1.26	4.85	0.26
0.35	2.47	1.89	0.66	4.8	1.31	4.91	0.27
0.36	2.61	1.91	0.69	4.9	1.36	4.98	0.27
0.37	2.74	1.94	0.72	4.9	1.41	5.04	0.28
0.38	2.88	1.97	0.75	5.0	1.46	5.10	0.29
0.39	3.02	2.00	0.78	5.0	1.51	5.17	0.29
0.40	3.17	2.03	0.81	5.1	1.56	5.23	0.30

Trapezoidal Channel Capacity

Program : Trap_Cap
Version : 1.0

Description : Drain 4

CHANNEL CAPACITY CALCULATIONS — **Based on Manning's formula V = 1/n R^2/3 S^1/2**



Required Flow m^3/s	0.54
Manning's coefficient "n"	0.022
Bed slope 1 in..	62.5
Left bank slope (Sl)1 in..	3
Bed width (m)	0
Right bank slope(Sr)1 in..	3
For channel depth (m) of..	0.4
Minimum Water Level	0
Maximum Water Level	0.33
Required increments	0.01
Number of increments	200

CHANNEL DEPTH d (m)	CHANNEL CAPACITY Q(cumec)	CHANNEL VELOCITY V(m/s)	Vxd (m^2/s)	FLOW WIDTH Ww (m)	FLOW AREA (m^2)	WETTED PERIMETER m	HYDRAULIC RADIUS R (m)
0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.00	0.00	#DIV/0!
0.01	0.00	0.16	0.00	0.1	0.00	0.06	0.00
0.02	0.00	0.26	0.01	0.1	0.00	0.13	0.01
0.03	0.00	0.34	0.01	0.2	0.00	0.19	0.01
0.04	0.00	0.41	0.02	0.2	0.00	0.25	0.02
0.05	0.00	0.47	0.02	0.3	0.01	0.32	0.02
0.06	0.01	0.54	0.03	0.4	0.01	0.38	0.03
0.07	0.01	0.59	0.04	0.4	0.01	0.44	0.03
0.08	0.01	0.65	0.05	0.5	0.02	0.51	0.04
0.09	0.02	0.70	0.06	0.5	0.02	0.57	0.04
0.10	0.02	0.75	0.08	0.6	0.03	0.63	0.05
0.11	0.03	0.80	0.09	0.7	0.04	0.70	0.05
0.12	0.04	0.85	0.10	0.7	0.04	0.76	0.06
0.13	0.05	0.90	0.12	0.8	0.05	0.82	0.06
0.14	0.06	0.94	0.13	0.8	0.06	0.89	0.07
0.15	0.07	0.99	0.15	0.9	0.07	0.95	0.07
0.16	0.08	1.03	0.16	1.0	0.08	1.01	0.08
0.17	0.09	1.07	0.18	1.0	0.09	1.08	0.08
0.18	0.11	1.11	0.20	1.08	0.10	1.14	0.09
0.19	0.13	1.16	0.22	1.1	0.11	1.20	0.09
0.20	0.14	1.20	0.24	1.2	0.12	1.26	0.09
0.21	0.16	1.24	0.26	1.3	0.13	1.33	0.10
0.22	0.19	1.27	0.28	1.3	0.15	1.39	0.10
0.23	0.21	1.31	0.30	1.4	0.16	1.45	0.11
0.24	0.23	1.35	0.32	1.4	0.17	1.52	0.11
0.25	0.26	1.39	0.35	1.5	0.19	1.58	0.12
0.26	0.29	1.42	0.37	1.6	0.20	1.64	0.12
0.27	0.32	1.46	0.39	1.6	0.22	1.71	0.13
0.28	0.35	1.50	0.42	1.7	0.24	1.77	0.13
0.29	0.39	1.53	0.44	1.7	0.25	1.83	0.14
0.30	0.42	1.57	0.47	1.8	0.27	1.90	0.14
0.31	0.46	1.60	0.50	1.9	0.29	1.96	0.15
0.32	0.50	1.64	0.52	1.9	0.31	2.02	0.15
0.33	0.55	1.67	0.55	2.0	0.33	2.09	0.16

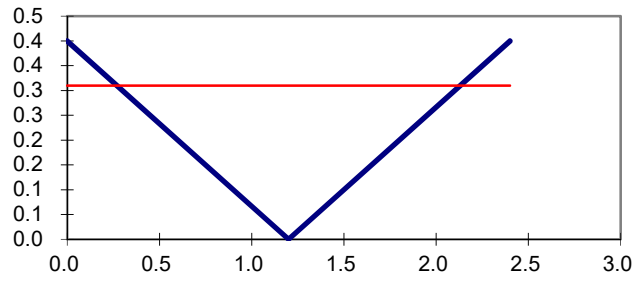
0.34	0.59	1.70	0.58	2.0	0.35	2.15	0.16
0.35	0.64	1.74	0.61	2.1	0.37	2.21	0.17
0.36	0.69	1.77	0.64	2.2	0.39	2.28	0.17
0.37	0.74	1.80	0.67	2.2	0.41	2.34	0.18
0.38	0.79	1.83	0.70	2.3	0.43	2.40	0.18
0.39	0.85	1.87	0.73	2.3	0.46	2.47	0.18
0.40	0.91	1.90	0.76	2.4	0.48	2.53	0.19

Trapezoidal Channel Capacity

Program : Trap_Cap
Version : 1.0

Description : Drain 5

CHANNEL CAPACITY CALCULATIONS — **Based on Manning's formula V = 1/n R^2/3 S^1/2**



Required Flow m^3/s	0.28
Manning's coefficient "n"	0.022
Bed slope 1 in..	178.6
Left bank slope (Sl)1 in..	3
Bed width (m)	0
Right bank slope(Sr)1 in..	3
For channel depth (m) of..	0.4
Minimum Water Level	0
Maximum Water Level	0.31
Required increments	0.01
Number of increments	200

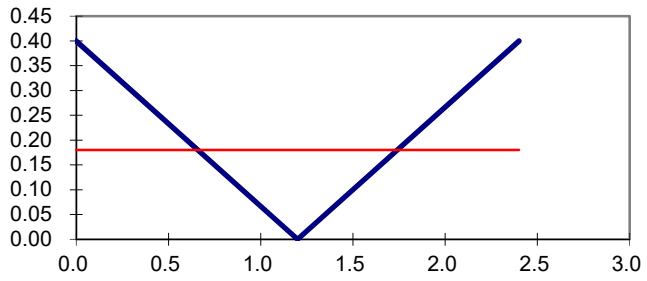
CHANNEL DEPTH d (m)	CHANNEL CAPACITY Q(cumec)	CHANNEL VELOCITY V(m/s)	Vxd (m^2/s)	FLOW WIDTH Ww (m)	FLOW AREA (m^2)	WETTED PERIMETER m	HYDRAULIC RADIUS R (m)
0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.00	0.00	#DIV/0!
0.01	0.00	0.10	0.00	0.1	0.00	0.06	0.00
0.02	0.00	0.15	0.00	0.1	0.00	0.13	0.01
0.03	0.00	0.20	0.01	0.2	0.00	0.19	0.01
0.04	0.00	0.24	0.01	0.2	0.00	0.25	0.02
0.05	0.00	0.28	0.01	0.3	0.01	0.32	0.02
0.06	0.00	0.32	0.02	0.4	0.01	0.38	0.03
0.07	0.01	0.35	0.02	0.4	0.01	0.44	0.03
0.08	0.01	0.38	0.03	0.5	0.02	0.51	0.04
0.09	0.01	0.42	0.04	0.5	0.02	0.57	0.04
0.10	0.01	0.45	0.04	0.6	0.03	0.63	0.05
0.11	0.02	0.47	0.05	0.7	0.04	0.70	0.05
0.12	0.02	0.50	0.06	0.7	0.04	0.76	0.06
0.13	0.03	0.53	0.07	0.8	0.05	0.82	0.06
0.14	0.03	0.56	0.08	0.8	0.06	0.89	0.07
0.15	0.04	0.58	0.09	0.9	0.07	0.95	0.07
0.16	0.05	0.61	0.10	1.0	0.08	1.01	0.08
0.17	0.06	0.63	0.11	1.0	0.09	1.08	0.08
0.18	0.06	0.66	0.12	1.1	0.10	1.14	0.09
0.19	0.07	0.68	0.13	1.1	0.11	1.20	0.09
0.20	0.08	0.71	0.14	1.2	0.12	1.26	0.09
0.21	0.10	0.73	0.15	1.3	0.13	1.33	0.10
0.22	0.11	0.75	0.17	1.3	0.15	1.39	0.10
0.23	0.12	0.78	0.18	1.4	0.16	1.45	0.11
0.24	0.14	0.80	0.19	1.4	0.17	1.52	0.11
0.25	0.15	0.82	0.21	1.5	0.19	1.58	0.12
0.26	0.17	0.84	0.22	1.6	0.20	1.64	0.12
0.27	0.19	0.86	0.23	1.6	0.22	1.71	0.13
0.28	0.21	0.89	0.25	1.7	0.24	1.77	0.13
0.29	0.23	0.91	0.26	1.7	0.25	1.83	0.14
0.30	0.25	0.93	0.28	1.8	0.27	1.90	0.14
0.31	0.27	0.95	0.29	1.9	0.29	1.96	0.15
0.32	0.30	0.97	0.31	1.9	0.31	2.02	0.15
0.33	0.32	0.99	0.33	2.0	0.33	2.09	0.16

Trapezoidal Channel Capacity

Program : Trap_Cap
Version : 1.0

Description : Drain 6

CHANNEL CAPACITY CALCULATIONS — **Based on Manning's formula V = 1/n R^2/3 S^1/2**



Required Flow m^3/s	0.11
Manning's coefficient "n"	0.022
Bed slope 1 in..	62.5
Left bank slope (Sl)1 in..	3
Bed width (m)	0
Right bank slope(Sr)1 in..	3
For channel depth (m) of..	0.4
Minimum Water Level	0
Maximum Water Level	0.18
Required increments	0.01
Number of increments	200

CHANNEL DEPTH d (m)	CHANNEL CAPACITY Q(cumec)	CHANNEL VELOCITY V(m/s)	Vxd (m^2/s)	FLOW WIDTH Ww (m)	FLOW AREA (m^2)	WETTED PERIMETER m	HYDRAULIC RADIUS R (m)
0.00	#DIV/0!	#DIV/0!	#DIV/0!	0.0	0.00	0.00	#DIV/0!
0.01	0.00	0.16	0.00	0.1	0.00	0.06	0.00
0.02	0.00	0.26	0.01	0.1	0.00	0.13	0.01
0.03	0.00	0.34	0.01	0.2	0.00	0.19	0.01
0.04	0.00	0.41	0.02	0.2	0.00	0.25	0.02
0.05	0.00	0.47	0.02	0.3	0.01	0.32	0.02
0.06	0.01	0.54	0.03	0.4	0.01	0.38	0.03
0.07	0.01	0.59	0.04	0.4	0.01	0.44	0.03
0.08	0.01	0.65	0.05	0.5	0.02	0.51	0.04
0.09	0.02	0.70	0.06	0.5	0.02	0.57	0.04
0.10	0.02	0.75	0.08	0.6	0.03	0.63	0.05
0.11	0.03	0.80	0.09	0.7	0.04	0.70	0.05
0.12	0.04	0.85	0.10	0.7	0.04	0.76	0.06
0.13	0.05	0.90	0.12	0.8	0.05	0.82	0.06
0.14	0.06	0.94	0.13	0.8	0.06	0.89	0.07
0.15	0.07	0.99	0.15	0.9	0.07	0.95	0.07
0.16	0.08	1.03	0.16	1.0	0.08	1.01	0.08
0.17	0.09	1.07	0.18	1.0	0.09	1.08	0.08
0.18	0.11	1.11	0.20	1.1	0.10	1.14	0.09
0.19	0.13	1.16	0.22	1.1	0.11	1.20	0.09
0.20	0.14	1.20	0.24	1.2	0.12	1.26	0.09
0.21	0.16	1.24	0.26	1.3	0.13	1.33	0.10
0.22	0.19	1.27	0.28	1.3	0.15	1.39	0.10
0.23	0.21	1.31	0.30	1.4	0.16	1.45	0.11
0.24	0.23	1.35	0.32	1.4	0.17	1.52	0.11
0.25	0.26	1.39	0.35	1.5	0.19	1.58	0.12
0.26	0.29	1.42	0.37	1.6	0.20	1.64	0.12
0.27	0.32	1.46	0.39	1.6	0.22	1.71	0.13
0.28	0.35	1.50	0.42	1.7	0.24	1.77	0.13
0.29	0.39	1.53	0.44	1.7	0.25	1.83	0.14
0.30	0.42	1.57	0.47	1.8	0.27	1.90	0.14

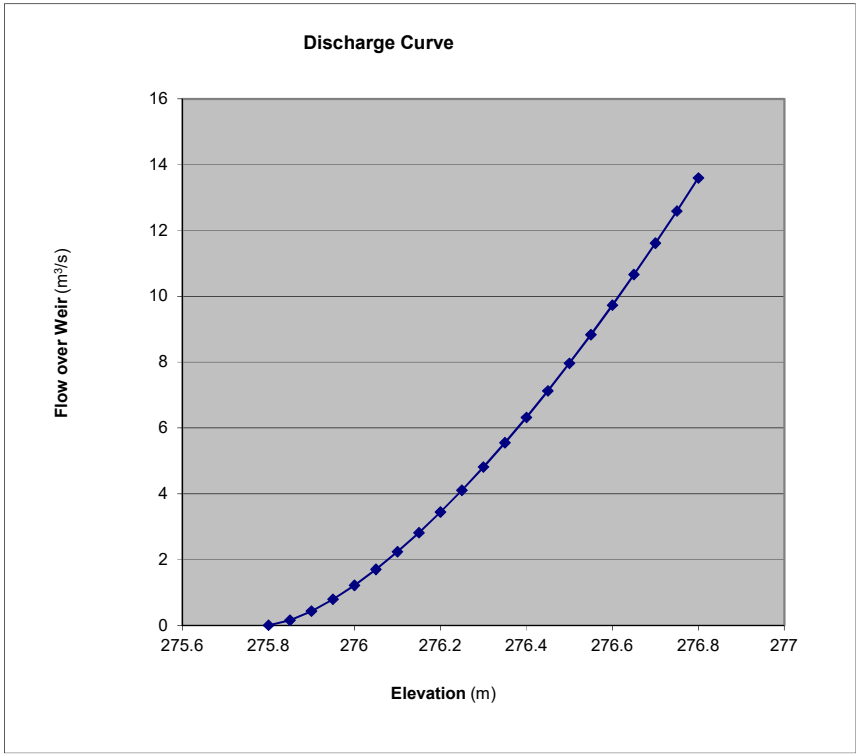
Weir No.	1	2	3	4	5	6	7	8	9	10
Crest Elevation (m AHD)	275.8									
Weir Width (m)	8									
Weir Coefficient	1.7									

The lowest weir should be placed first.

	Q5	Q10	Q20
Design Flow (m3/s)	2.05	2.50	2.97
Design Flow Type	Post	Post	Post

2. Fill in the Required Depths in the yellow column in the table below.

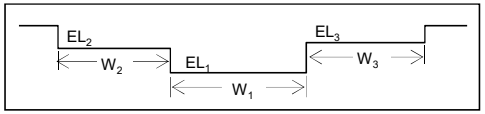
	Depth (m)	Elevation (m AHD)	Discharge (m^3/s)
	0	275.8	0
	0.05	275.85	0.152053
	0.1	275.9	0.43007
	0.15	275.95	0.790089
	0.2	276	1.216421
	0.25	276.05	1.7
Q5 Flow Level	0.3	276.1	2.234708
Q10 Flow Level	0.35	276.15	2.816054
Q20 Flow Level	0.4	276.2	3.440558
	0.45	276.25	4.105421
	0.5	276.3	4.808326
	0.55	276.35	5.547316
	0.6	276.4	6.320709
	0.65	276.45	7.127036
	0.7	276.5	7.965003
	0.75	276.55	8.833459
	0.8	276.6	9.731368
	0.85	276.65	10.65779
	0.9	276.7	11.61188
	0.95	276.75	12.59286
	1	276.8	13.6



Summary:
Weir discharge design based on Q5 post-development flow

1. Worksheet Calculating an Elevation-Discharge Relationship for a Series of Weirs

This can be used to model a number of rectangular weirs at different levels.



FOLLOW THE PROCEDURES BELOW, ENTERING VALUES IN THE YELLOW BOXES.

1. Enter Parameters for 1 to 10 weirs.

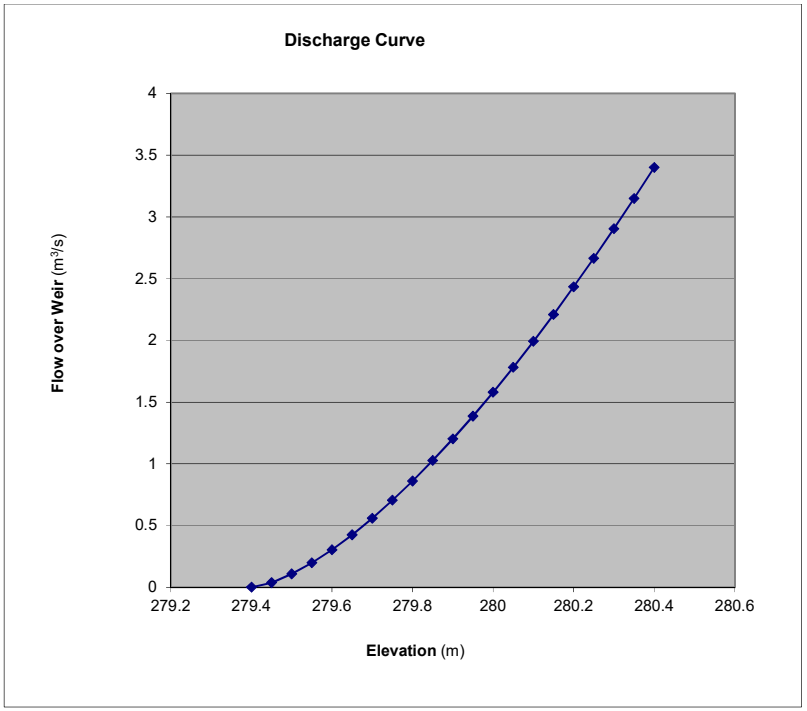
Weir No.	1	2	3	4	5	6	7	8	9	10
Crest Elevation (m AHD)	279.4									
Weir Width (m)	2									
Weir Coefficient	1.7									

The lowest weir should be placed first.

	Q5	Q10	Q20
Design Flow (m3/s)	0.11	0.13	0.15
Design Flow Type	Post	Post	Post

2. Fill in the Required Depths in the yellow column in the table below.

	Depth (m)	Elevation (m AHD)	Discharge (m^3/s)
	0	279.4	0
	0.05	279.45	0.038013
Q5 Flow Level	0.1	279.5	0.107517
Q10 Flow Level	0.15	279.55	0.197522
Q20 Flow Level	0.2	279.6	0.304105
	0.25	279.65	0.425
	0.3	279.7	0.558677
	0.35	279.75	0.704013
	0.4	279.8	0.86014
	0.45	279.85	1.026355
	0.5	279.9	1.202082
	0.55	279.95	1.386829
	0.6	280	1.580177
	0.65	280.05	1.781759
	0.7	280.1	1.991251
	0.75	280.15	2.208365
	0.8	280.2	2.432842
	0.85	280.25	2.664448
	0.9	280.3	2.902971
	0.95	280.35	3.148215
	1	280.4	3.4



Appendix B - TRANSPORT IMPACT ASSESSMENT

Suite 10/2 Hardy St
South Perth WA 6151
PO Box 111 South Perth WA 6951
E admin@strada-rpc.com

TRANSPORT IMPACT STATEMENT

CBH DOWERIN

FACILITY EXPANSION

LOCATION:	Irvine Rd Dowerin
CLIENT:	Engenium Consultants
AUTHOR:	Travis Green
SIGNATURE:	
DATE:	31.10.2018
DOCUMENT NO:	361-26504500442233-CI-RPT-0001
REVISION:	0

Revision Register

Revision	Date	Revision Description	Issued By	Reviewed By	Signature
A	27/09/2018	DRAFT – For Client Verification	Travis Green	Justin Kuipers	
B	24/10/2018	Various updates	Travis Green	Justin Kuipers	
0	31/10/2018	Issued For Use	Travis Green	Justin Kuipers	

Contents

GLOSSARY

Term	Definition
CAH	Controlled Access Highway
CAR	Corrective Action Report
FWY	Freeway
HVO	Heavy Vehicle Operations
HVS	Heavy Vehicle Services
HWY	Highway
LGA	Local Government Authority
MRWA	Main Roads Western Australia
RAV	Restricted Access Vehicle
RNOC	Road Network Operations Centre
RSA	Road Safety Audit(or)
SCATS	Sydney Co-ordinated Adaptive Traffic System
SIDRA	Signalised and un-signalised Intersection Design and Research Aid
VPD	Vehicles Per Day
VPLPH	Vehicles Per Lane Per Hour
VPH	Vehicles Per Hour

1 INTRODUCTION.

1.1 Site and Location.

This Transport Impact Assessment considers the proposed expansion of facilities at the CBH Dowerin grain handling site located on Irvine Road (parallel to Goomalling - Wyalkatchem Road), in the order of 2km west of the Dowerin town centre. The facility is remote, located approximately 160km north-east of Perth, within the local government district of the Shire of Dowerin, Western Australia as shown in Figure 1 below.

Based on the WAPC Publication *Transport Assessment Guidelines* (Vol 1, August 2016), the site represents a Low to Moderate impact traffic generating site (Low outside of harvest season and Moderate during the 4-6 week long harvest season).

All vehicular access to the site is provided by Goomalling - Wyalkatchem Road, Rifle Range Road and Irvine Road.

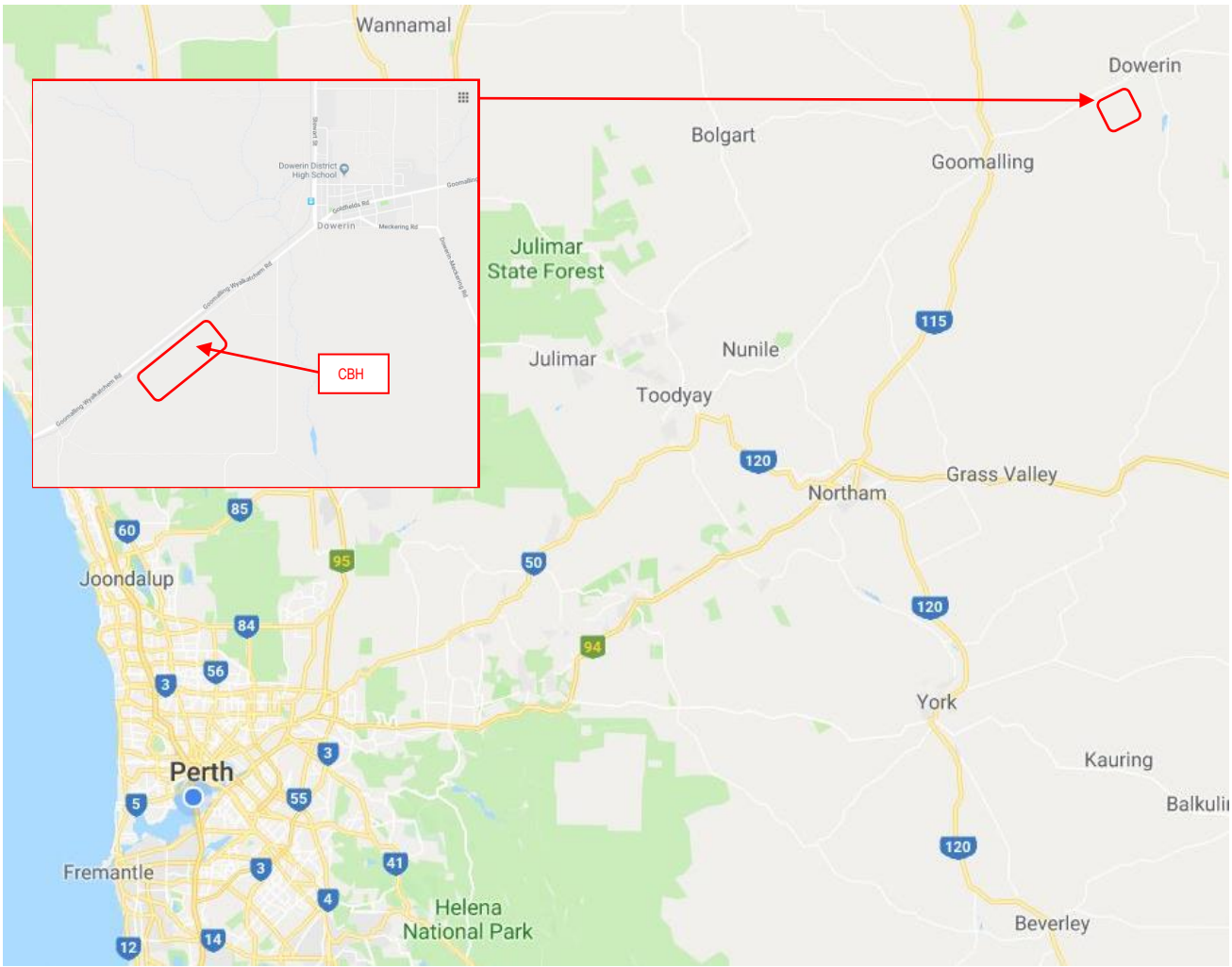


Figure 1: Site Location

1.2 Proposed Development.

The development comprises an increase in the storage and handling capacity and some localised modifications to some of the existing internal circulating road ways as detailed below:

- Increase of grain storage area by approximately 80 percent (three new open storage bulkheads);
- New internal roads to service the new storage bulkheads above;
- Additional storage and lay down for staging of vehicles through weighbridge facilities.
- Main Roads WA Heavy Vehicle Services certification for operation of 36.5m long RAV 7 class vehicles access and egress to the facility (in line with Shire of Dowerin application to upgrade Goomalling – Wyalkatchem Rd from RAV 5 to RAV 7)

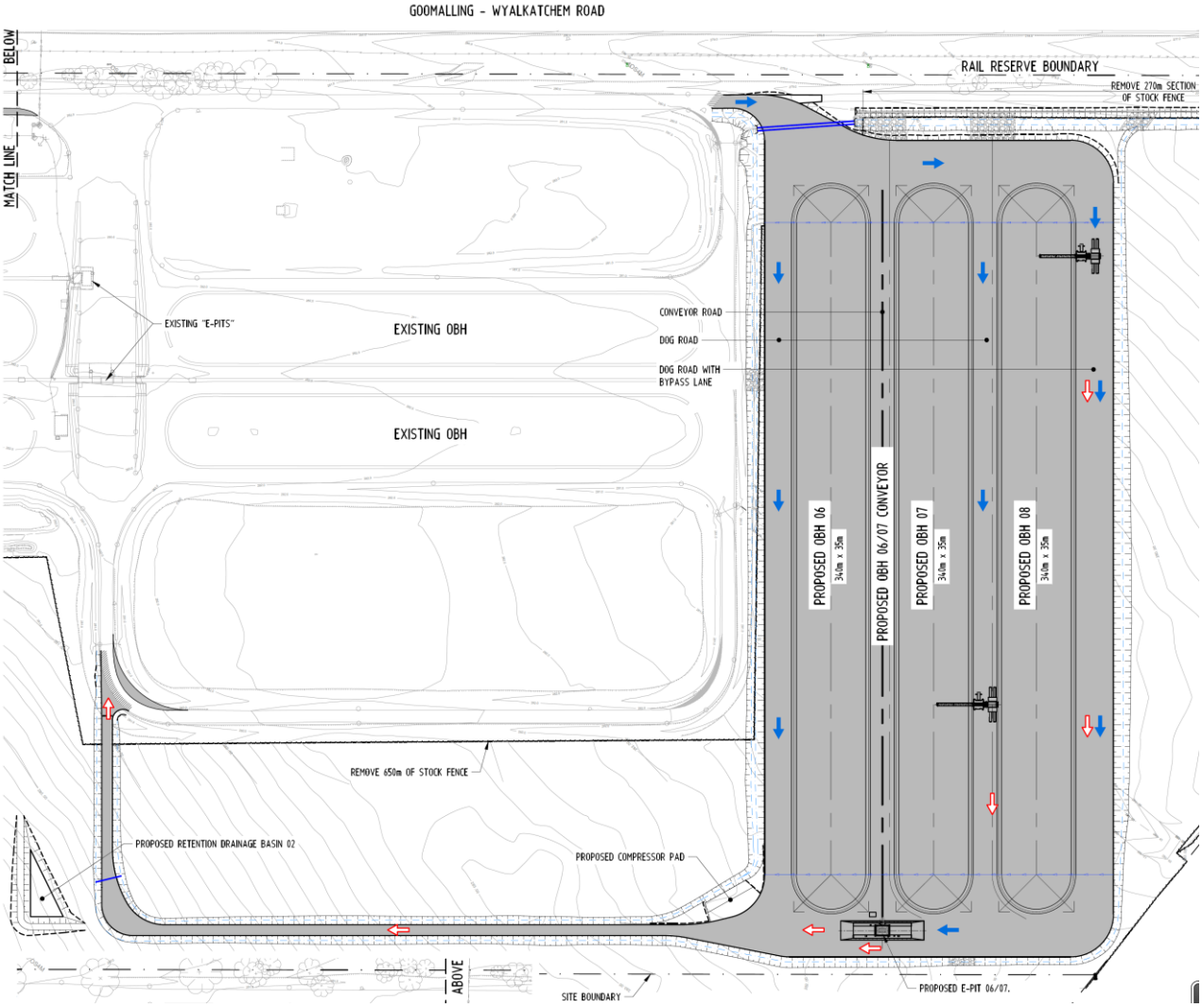


Figure 2: Site development layout

1.3 Hours of operation.

The site currently operates during daytime hours 0600 hours through 1800 hours. These hours may fluctuate during the peak of the harvest season where extended operation may result during high delivery turnover.

1.4 Adjacent land use.

The site currently surrounded by low traffic generating agricultural land uses only.

2 ROAD ENVIRONMENT

2.1 Adjacent Affected Roads.

All access and egress from the facility is serviced by Irvine Road and Rifle Range Road providing connection to Goomalling – Wyalkatchem Rd as shown below.

Figure 3: Site Access configuration

Irvine Rd is a regional access road, it comprises a single sealed carriageway formation of two 3.5m lanes with narrow unsealed shoulders sealed shoulder and 1.0m unsealed shoulder, currently Irvine Rd services only the CBH facility. The road is under the care and control of the Shire of Dowerin. At the site end of the route all traffic is zoned to 20km/h.

Rifle Range Rd is a regional access road, it comprises a single sealed carriageway formation of two 3.5m lanes with narrow unsealed shoulders and the road is under the care and control of the Shire of Dowerin.

Both regional access roads do not have posted speed zones, however are subject to state limit of 110km/h (RAV classes are speed restricted however – refer section Section 2.4. restricted to 60km/h on Rifle Range Rd and restricted to 40km/h on Irvine Rd).

Goomalling – Wyalkatchem Rd is state road and forms a connecting route between Goomalling and the Perth CBD. The existing road is a typical sealed single carriageway with unsealed shoulders (typical legacy format rural roadway). The route is zoned to a posted speed limit of 110km/h.

2.2 Adjacent Intersections

2.2.1 Goomalling – Wyalkatchem Rd and Rifle Range Rd

The intersection of Goomalling – Wyalkatchem Rd and Rifle Range Rd has been upgraded to comply with current MRWA rural interaction standards within the last 5 years. The intersection is based on a modified version of the Austroads Rural type CHR with turning and storage accommodation for multi-articulated vehicles (initial testing would indicate that at least RAV 4 class combinations are accommodated).

Sight distance available Goomalling Wyalkatchem Rd (looking west)

Sight distance available Goomalling Wyalkatchem Rd (looking east)

2.2.2 Rifle Range Rd and Irvine Rd

The intersection of Rifle Range Rd and Irvine Rd has been upgraded to comply with current interaction standards within the last 5 years. The intersection is based on a modified version of the Austroads Rural type BAL with widenings for turning accommodation for multi-articulated vehicles (initial testing would indicate that at least RAV 4 class combinations are accommodated).

Rifle Range Rd (looking south)

Rifle Range Rd (looking north to Goomalling Wyalkatchem Rd and level crossing)

2.2.3 Rifle Range Rd Level Crossing

Located between the Rifle Rage Rd intersections with Irvine Rd and Goomalling – Wyalkatchem Rd is a non-gate controlled rail level crossing under direction of traffic by sign and signal control.

Storage length between the holding lines of the two points of control is approximately 39m (sufficient for safe storage of largest currently permitted RAV class – Network 4 @ 27.5m).

Aerial photo (rail alignment shown as white dashes)

Rifle Range Rd (looking north to Goomalling Wyalkatchem Rd and level crossing)

2.3 Traffic Flow Data.

Classifier data sourced from MRWA indicate the following.

Goomalling – Wyalkatchem Rd –East of Berring Rd 2016 (9km west of Rifle Range Rd)

- 669 vpd total flow, both directions.
- Eastbound 335vpd, peak flow: 35 vph
- Westbound 334vpd, peak flow: 35 vph
- Approximately 25.6% heavy vehicles

No data was available for Irvine Road or Rifle Range Road, however on site observation indicates that daily flows are typically less than 100 vpd.

2.4 Existing RAV Networks and Restrictions

All routes servicing the CBH sites support the vehicle classes used for site delivery and transfer which are maximum B-Double 27.5m in length.

Road	RAV Networks	Conditions	Max Vehicle Length (m)	Max Vehicle Mass (t)
Goomalling – Wyalkatchem Rd	2, 3, 4, 5	Nil	(RAV5) 36.5 (RAV4) 27.5	84 87.5
Rifle Range Rd	2, 3, 4	• School buses use this road. Approval to use the road could be withdrawn unless drivers show courtesy to local traffic and take extra care on school days. • Maximum speed 60 km/h. • No operation on unsealed road segment when visibly wet, without road owner's approval.	27.5	87.5
Irvine Rd	2, 3, 4	• Westbound travel only • Maximum speed 40 km/h ***NOTE:*** *Irvine Rd conditions appear to be out of date and refer to the pre-upgrade unsealed format of the route, clarification on conditions to be sought from MRWA HVS.* *Generally Irvine Rd is used or CBH site access only.*	27.5	87.5

Advice from MRWA HVS indicates that the development proponent may liaise with the Shire of Dowerin (Rifle Range Rd and Irvine Rd road asset owner) to reassess the validity of current RAV restrictions identified above and propose lifting or modification to current conditions with MRWA HVS.

2.5 Crash History.

MRWA Crash database shows no recorded crashes for the intersection of Goomalling – Wyalkatchem Rd and Rifle Range Rd or the intersection of Rifle Range Rd and Irvine Rd.

3 TRAFFIC GENERATION

3.1 General.

Traffic generated by the site in both existing and post expansion operates in two modes, a typical daily operational format January through November annually, and an elevated peak generation during harvest season which is typically from late October or November through December annually with a clear peak window within these time frames (during the peak delivery window in the order of 80-90 percent of all deliveries will occur.

Beyond the harvest season trip generation is comparatively minimal (Refer to section 3.5 for details).

Typically the majority of traffic generated by the site is heavy vehicular with minimal passenger vehicle generation, sites do not have high numbers of permanent staff (less than 5) and hence passenger vehicle impacts are not taken into consideration.

Peak hourly generation has not been recorded and is assumed to be up to 20% of the daily total in a single hour, however with logistical management this number is likely to be more balanced throughout the day.

3.2 Historic Harvest Season Traffic Generation

Data from the previous 3 years harvest seasons has been collected by CBH Group and is summarised below.

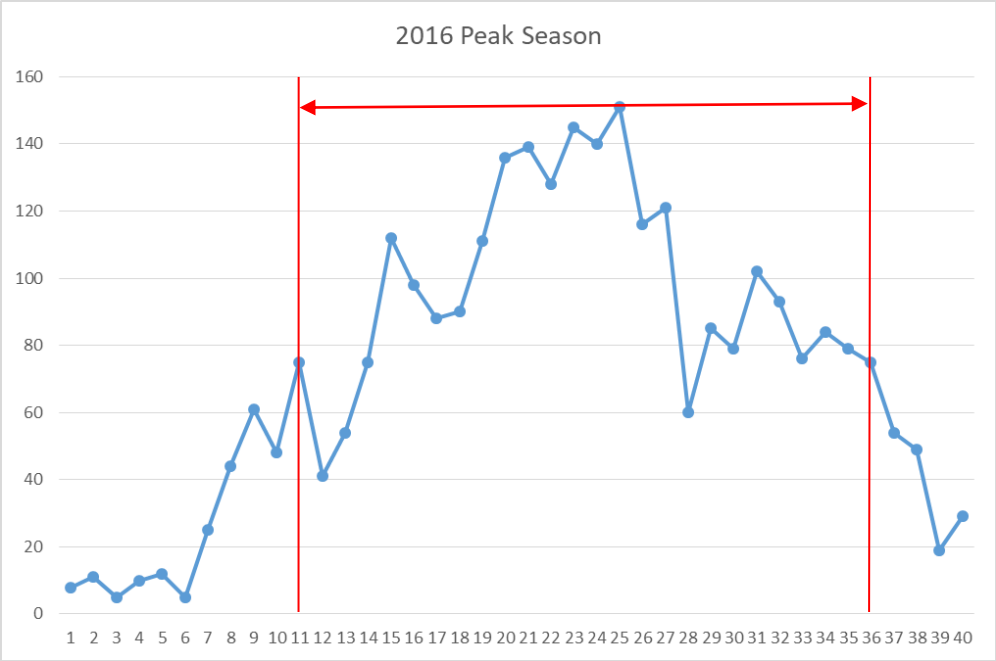
The data has been assessed over the whole season with a peak window within each season identified as the traffic critical window where trips generated are sustained at a consistent level for a 3-5 week window. The determination of the peak windows are shown graphically in the following sections.

Harvest Delivery Season Year	Mean Daily deliveries	Assumed hourly peak 20%	Peak daily delivery (single day max)	Indicative Peak Window	Harvest season duration (at Peak)
2016	98	19.6	151	16 Nov 15 - 16 Dec 15	4 weeks
2017	93.8	18.76	143	23 Nov 16– 31 Dec 16	5 weeks
2018	105	21	138	22 Nov 17 - 16 Dec 17	3 weeks

(*Note a delivery is considered to generate 2 vehicle movements, a laden arrival movement and an empty departure movement).

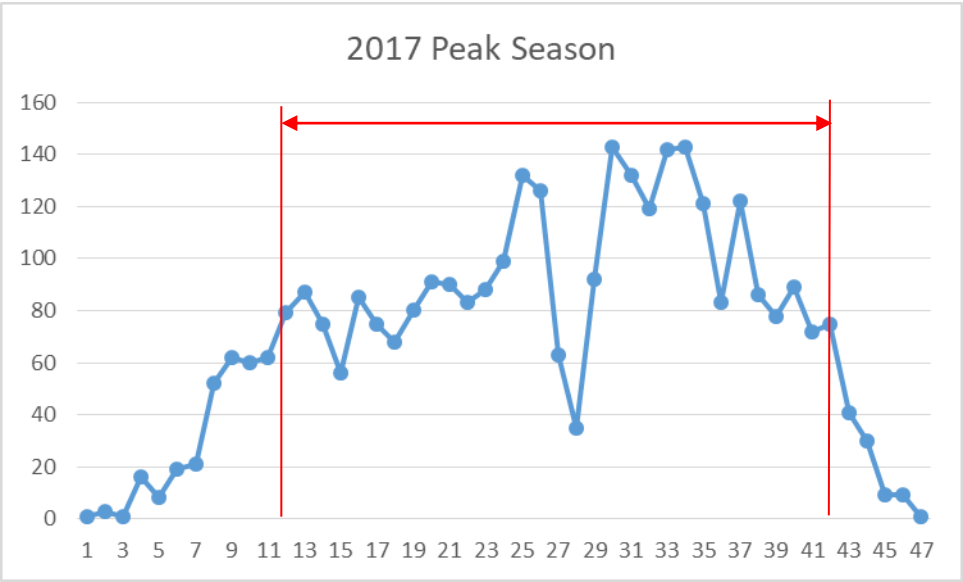
3.2.1 2016 Season Delivery Data Summary

The peak window has been assessed as the period where the number of deliveries per day increases to a sustained level of approximately 80 or more consistently. This period ran from 23 Nov 16 – 31 Dec 16 with an average of 98 daily deliveries (Assumed peak hour 20 deliveries).



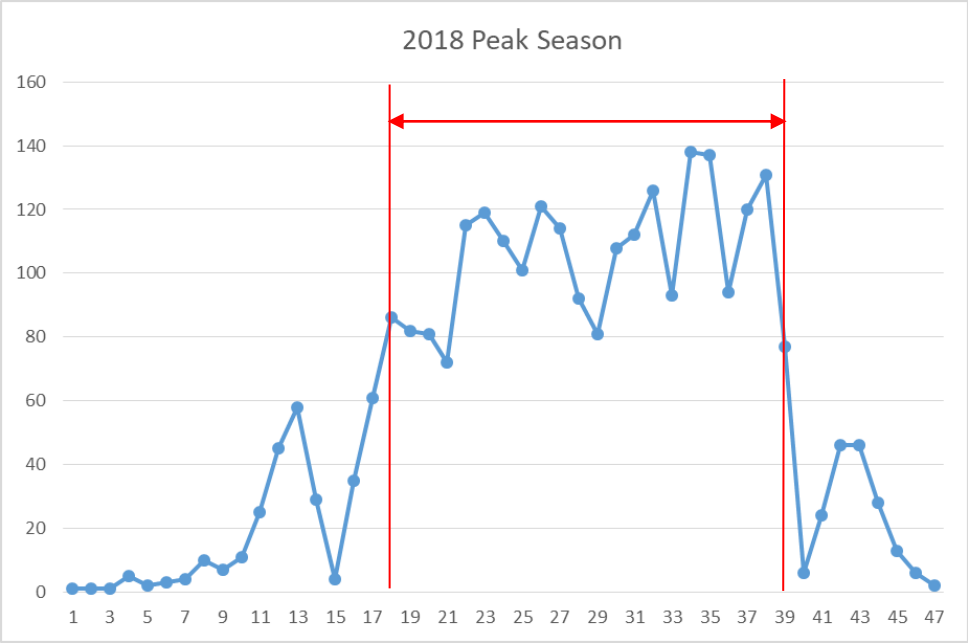
3.2.2 2017 Season Delivery Data Summary

The peak window has been assessed as the period where the number of deliveries per day increases to a sustained level of approximately 80 or more consistently. This period ran from 16 Nov 15 - 16 Dec 15 with an average of 94 daily deliveries (Assumed peak hour 19 deliveries).



3.2.3 2018 Season Delivery Data Summary

The peak window has been assessed as the period where the number of deliveries per day increases to a sustained level of approximately 80 or more consistently. This period ran from 22 Nov 17 - 16 Dec 17 with an average of 105 daily deliveries (Assumed peak hour 21 deliveries).



3.3 Post-Development Harvest Season Traffic Generation

Following the proposed site facility expansion CBH indicates that the facility will generate additional trips during a consistent harvest time window as summarised below.

Additional Deliveries	Additional Daily deliveries during peak (assume 85% over 4 weeks)	Additional hourly peak deliveries (20% of daily)	Mean Daily Total Deliveries	Peak Hour Deliveries
1,780	50	10	150	30

3.4 Impact on adjacent network

As the site impacts are limited to a window that is in the order of one twelfth of the year with limited impacts beyond this time frame it is considered suitable to maintain the existing (recently upgraded) road network and associated intersections in current form with no modification required to accommodate the increased site generated traffic.

3.5 Historic Post Harvest Season Traffic Generation

Beyond the harvest season, additional heavy movements are generated for purposes of balancing of storage levels between neighbouring sites. Trip generation varies year to year and month to month, however the generation is significantly lower than the Harvest season delivery rate (additionally the transfers only occur for a select number of days in any given month in which transfer operations occur).

Year to year data for 2017 and 2018 has been gathered by CBH Group, the data is summarised below.

Harvest Delivery Season Year	Mean Daily Transfer	Maximum Daily Transfer (single day max)	Mean Load Mass	Months Transfers carried out	Mean Transfer days per month
2017	27.5	44	55.9t	J, F, M, A, M, S	11
2018	42.5	62	56.5t	J, M, A	10

(*Note a transfer is considered to generate 2 vehicle movements, an empty arrival movement laden departure movement).

Post completion of the proposed site development the rate of trip generation is not anticipated to change measurably.

3.6 Future RAV Network modifications.

3.6.1 Goomalling – Wyalkatchem Rd

Feedback from the Shire of Dowerin indicates that they have previously initiated the application process to lift the RAV categorisation of Goomalling - Wyalkatchem Rd from current RAV 5 to RAV 7.

The above category change would not affect the permissible vehicle length which would be maintained at 36.5m.

Allowable Gross Vehicle Mass would be increased to 107.5 t.

3.6.2 Rifle Range Rd

In line with the above proposed change to the RAV category change to Goomalling - Wyalkatchem Rd from current RAV 4 to RAV 7, CBH will also seek to increase the permissible RAV category of Rifle Range Rd between Goomalling - Wyalkatchem Rd and Irvine Rd to RAV 7.

3.6.3 Irvine Rd

In line with the above proposed change to the RAV category change to Goomalling - Wyalkatchem Rd from current RAV 4 to RAV 7, CBH will also seek to increase the permissible RAV category of Irvine Rd to RAV 7 for its full length.

3.6.4 RAV Network Category Upgrade process

Uprating and certification of the desired sections or Rifle Range Rd and Irvine Rd to RAV 7 from current clasification requires a formal process of liaison and review between the developer (or designated technical consultant), Local Government Authority (as the road asset owner) and MRWA HVS. (* this process can occur following or in parallel with the DA process).

The indicative steps required as advised by MRWA HVS to commence what is typically a 3 month process are as follows:

1) Development proponent or a designated management consultant to lodge a MRWA HVS form titled *RAV Route Assessment form* available from the main roads website as applicable to the development intent. *Address shown in the link below. https://www.mainroads.wa.gov.au/UsingRoads/HVS/roadaccess/Pages/default.aspx
2) Engage in assessment process meetings/correspondence between the stakeholder group and provide technical input etc as required.

3.6.5 Indicative Swept path verification (Proposed RAV network changes)

Indicative testing of an Austroads B-Triple 35.4m in length overlaid on scaled (current) aerial photography indicates that increasing the RAV category for the proposed intersections would not result in adverse impacts as shown in the figures below.

Intersection swept paths

Level crossing storage

4 CONCLUSION.

This Transport Impact Statement has assessed the potential traffic impacts associated with the proposed expansion of the CBH facility in Dowerin. Overall all measurable impacts will remain constrained within the annual harvest period which typically spans a 4-6 week long window within the months of October to December. The site will generate approximately 50 percent more daily deliveries (from 100 up to 150) and peak hourly deliveries (from 20 up to 30) during harvest windows.

The short term nature of the traffic generated by the facility and under-saturation of the surrounding remote road network will provide sufficient capacity to accommodate the increases hourly and daily traffic.

The desired changes to the MRWA HVS defined RAV route categories of key site service roads and intersections requires undertaking a formal application and assessment process. Completion of the process as detailed will facilitate access to the site by vehicles of increased length and mass without need for special individual operational permits.

Travis Green.

Appendix C - VEHICLE TURNING TEMPLATES

GOOMALLING - WYALKATCHEM ROAD

RAILWAY

IRVINE ROAD

GOOMALLING - WYALKATCHEM ROAD

DUST MANAGEMENT PLAN

M-2650 Dowerin West Expansion - Construction Activities

SOW Document no : CBH-ENG-SOW Dowerin2650
Company Representative : Bradley Ashworth

Revision	Date	Preparation	Approval	Status	Comments
A	19/11/18	Graham Penter	Bradley Ashworth	Approved	

Contents

1. Purpose

This management plan defines the requirements associated with the process of minimising the impact of dust emissions during construction activities scheduled for the CBH Dowerin West Grain Storage Site as part of the 2019 site expansion project.

2. Objectives

The objectives of this dust management plan are to minimise significant impacts on amenity and the environmental impact of construction works and activities.

CBH is commitment to improving the overall environmental impacts of its business, and in achieving the environmental objectives outlined in the CBH Group Health, Safety and Environmental Policy.

3. Scope

All construction activities undertaken by the Contractor and its Sub-Contractors as part of the earth works and construction activities associated with CBH Dowerin West Grain Storage Site expansion project must comply with this Dust Management Plan.

4. Relevant Legislation

Relevant legislation or guideline	Application
Environmental Protection Act 1986	The principal statute relevant to environmental protection in WA. It provides for the establishment of the EPA, preparation and implementation of EPPs, environmental impact assessment and approvals for new developments, licensing and permitting, and waste management
National Environmental Protection Council (Western Australia) Act 1996	Establishes National Environmental Protection Measures (NEPM)
Ambient Air Quality (NEPM)	Prescription of acceptable air pollutant concentrations
Health Act 1911	Part VII Section 182 deals with nuisance dust

5. Dust Management Commitments

5.1 Risk Assessment

The Contractor shall be responsible to identify and assess all possible civil works or construction that have a risk of generating dust during the construction activities, this may include but is not limited to:

5.1.1 Top Soil Removal

The Contractor shall be responsible to ensure that they minimise the top soil disturbance in areas not requiring earthworks. The Contractor shall also be responsible to ensure that land clearing be minimised to reduce risk of dust generation.

5.1.2 Material Transportation (gravel, clay, sand etc.)

The Contractor shall be responsible to ensure sufficient resources are made available to minimise the risk of dust generation from the transportation of construction materials associated with the site works. This includes maintaining the construction area and transportation routes in a dust free state by suitable means. Such methods include:

a. Application of water via water tanker fitted with sprayer, dribble bars or cannons;
b. Cleaning affected surfaces with street sweeping equipment; and
c. Covering high risk material whilst being transported to and from the site.

5.1.3 Internal Vehicle Movement

The Contractor shall be responsible to ensure that frequently trafficable areas including any unsealed access roads are treated with dust suppression measures such as water.

5.1.4 External Vehicle Movement

Regular cleaning of machinery and vehicle tyres may be required to prevent track out dust to public roads.

5.1.5 Onsite Material Stockpiles

Should the Contractor be required to stockpile materials onsite during construction, then this stock pile shall be assessed for its risk of dust generation. Should the stockpile material have a medium to high risk of nuisance dust generation, then the Contractor shall treat the material via:

a. Application of water;
b. Use of a Geotextile covering or tarping; and
c. Application of a soil binding treatment

5.1.6 Remaining cleared and undeveloped areas

Those areas remaining cleared and undeveloped post the construction phase will require a soil binding treatment to minimise any ongoing dust or erosion issues.

5.2 Operating Conditions

The Contractor shall be to be mindful at all times of undertaking site works or construction activities which have a risk of nuisance dust generation, particularly during adverse weather conditions.

The following activities should be undertaken to reduce the dust emission potential of all medium to high risk dust generating activities:

a. Visual monitoring of dust on a daily level;
b. Review of 5 day weather forecast to identify any conditions likely to increase the risk of dust generation;
c. Ensure dust suppression equipment is located on site and remains operational for a 12 hour period prior to and after any 'extreme' risk weather conditions reports;
d. Water tanker is to be equipped and ready to use if required to control dust emissions around the work area;
e. Water tankers are to be full at all times whilst on standby;
f. Monitor worked areas, frequently trafficked areas and any stock plies;
g. Apply dust suppression over all affected areas, access roads and frequently trafficked areas; and
h. Ensure all vehicle movements are controlled and within site speed limits.

6. Contacts and Responsibilities

CBH will assign a 'Site Supervisor' for the entirety of the construction phase who will have overall responsibility for the site works and/or Contractor and Sub Contractors.

A CBH point of contact (*to be confirmed*) will be provided to the Shire of Dowerin for handling enquiries and complaints regarding the construction phase.

All relevant contact details relating to the site works are to be located on the outside of the site office and/or on the main entry to the site.

7. Internal Reporting

All CBH employees and Contractors will be required to report generation of significant dust plumes, and /or any increase in dust levels to the Site Supervisor and/or Project Manager.

8. Incident Reporting (including complaints process)

Any unplanned event with potential to cause harm to the environment will be investigated thoroughly to prevent a recurrence.

With regards complaints related to dust, in the first instance an investigation into the complaint should take place, site activities and procedures should be altered to reduce

nuisance issues and liaison should take place with the administrating authority and/or complainant over remedial action.

Details shall be recorded using the CBH Group online reporting system 'SHARE'.

For any complaint that is determined to be of a CBH environmental incident classification level 3 (moderate) or above then the Shire of Dowerin is to be informed of the nature of the complaint, any investigation findings, and/or remedial action taken.

9. Training

All employees and Sub-Contractors will be required to undergo a pre work induction, outlining environmental controls to be implemented and monitored during operations. The induction will provide necessary awareness of dust management and the procedures and work practices to minimise and report dust generation.

Regular toolbox meetings will also be held to reinforce a positive attitude to environmental matters and to highlight any issues that arise during the course of site operations.

10. Audit

Audit activities should take place during the construction phase to ensure the objectives of the Dust Management Plan are being met, and to identify any areas for improvement in the management of site activities. To assist with this process;

a. A copy of the Dust Management Plan will be available on site;
b. Actions undertaken by the Contractor in accordance with this Dust Management Plan are to be recorded in the daily log;
c. Water truck operator to detail all dust suppression treatments durations on timesheet;
d. Site staff and Contractors to review daily dust suppression plan, with any changes/issues to be forwarded to the Project Manager for assessment;
e. CBH Project Delivery Group and /or CBH Health, Safety and Environment staff to randomly audit site conditions and Contractor's logs entries to ensure compliance.

11. Definitions

Dust is considered to be any particle suspended within the atmosphere. Particles can range in size from as small as a few nanometres to 100 microns (um) and can become airborne through the action of wind turbulence, by mechanic disturbance of fine materials or through the release of particulate rich gaseous emissions.

Dust is measured using a variety of methods, the most common being Total Suspended Particulates (TSP), which normally measure up to 50um, and PM10 or PM2.5 (particulate matter less than 10um or 2.5um in size, respectively). Deposited matter measures the mass of any particulate falling out of suspension expressed in mass per

area per time, and is the least commonly used in determining dust concentrations (Environment Australia, 1998).

Other definitions include:

Nuisance Dust: Describes dust particles ranging in size from 1mm to 50um, which reduce environmental amenity without necessarily resulting in material environmental harm.

Fugitive Dust: Refers to dust derived from a mixture of sources or a source not easily defined and includes dust generated from vehicular traffic on unpaved roads, materials transport and handling and un vegetated soils and surfaces.

PM10: A criteria air pollutant consisting of small particles with an aerodynamic diameter less than or equal to a nominal 10 microns. Their small size allows them to make their way to the air sacs deep within the lungs where they may be deposited and result in adverse health effects.

PM2.5: Includes tiny particles with an aerodynamic diameter less than or equal to a nominal 2.5 microns. This fraction of particulate matter penetrates most deeply into the lungs.

12. Attachment

CBH Group Health, Safety and Environmental Policy [STORE ID: 10193562].

NOISE MANAGEMENT PLAN

M-2650 Dowerin West Expansion - Construction Activities

SOW Document no : CBH-ENG-SOW Dowerin2650
Company Representative : Bradley Ashworth

Revision	Date	Preparation	Approval	Status	Comments
A	19/11/18	Graham Penter	Bradley Ashworth	Approved	

Contents

1. Purpose

This management plan defines the requirements associated with the process of minimising the impact of noise emissions during construction activities scheduled for the CBH Dowerin West Grain Storage Site as part of the 2019 site expansion project.

2. Objectives

The objectives of this noise management plan are to minimise significant impacts on amenity and the environmental impact of construction works and activities.

CBH is commitment to improving the overall environmental impacts of its business, and in achieving the environmental objectives outlined in the CBH Group Health, Safety and Environmental Policy.

3. Scope

All construction activities undertaken by the Contractor and its Sub-Contractors as part of the earth works and construction activities associated with CBH Dowerin West Grain Storage Site expansion project must comply with this Noise Management Plan.

4. Relevant Legislation

Relevant legislation or guideline	Application
Environmental Protection Act 1986	The principal statute relevant to environmental protection in WA. It provides for the establishment of the EPA, preparation and implementation of EPPs, environmental impact assessment and approvals for new developments, licensing and permitting, and waste management
Environmental Protection (Noise) Regulations 1997	Prescribes standard for noise emissions. Applies where noise has potential to affect nearby sensitive premises (e.g. residences) above assigned noise levels

5. Noise Management Commitments

Noise Management will comply with *Environmental Protection (Noise) Regulations*, all applicable sections of *Australian Standard 2436 - 2010 Guide to Noise Control on Construction. Maintenance and Demolition Sites* and *Noise Management in the Construction Industry: A Practical Approach* (Work Safe Western Australia).

During the construction phase noise will be generated through several processes, including:

- Construction traffic;
- Unloading of construction materials;
- Preparation of site for earth works and construction;
- Constructing and make good of grain storages, pits, grain elevators, road ways, drainage and associated infrastructure.

The Noise Management Plan has been developed for use during all earth works and construction activities. This plan includes the following commitments.

- Construction will not involve blasting or pile driving;
- Restriction on working hours for construction to between 7.00am to 7:00pm on any day that is not Sunday or a public holiday;
- All plant equipment and vehicles fitted with appropriate noise suppression equipment to reduce noise levels as far as practicable;
- Any contractor involved in earth works or construction will need to demonstrate and have procedures in place to ensure that all equipment is operating in good condition;
- An induction process for contractors covering all on site environmental, health and safety and operational considerations will take place prior to site works being undertaken;
- All site workers will be informed of noise reduction strategies (such as proper use of machinery and the use of hearing protection) and informed of locations requiring the use of such equipment;
- Warning signs are to be set up in active work areas, prohibiting entry to persons without hearing protection;
- Any public complaints or concerns around noise emissions are logged and investigated, and directed through to the relevant manager or local CBH office.

6. Contacts and Responsibilities

CBH will assign a ‘Site Supervisor’ for the entirety of the construction phase who will have overall responsibility for the site works and/or Contractor and Sub Contractors.

A CBH point of contact (*to be confirmed*) will be provided to the Shire of Dowerin for handling enquiries and complaints regarding the construction phase.

All relevant contact details relating to the site works are to be located on the outside of the site office and/or on the main entry to the site.

7. Internal Reporting

All CBH employees and contractors will be required to report generation of significant noise emissions, and /or any increase in noise levels to the Site Supervisor and/or Project Manager.

8. Incident Reporting (including complaints process)

Any unplanned event with potential to cause harm to the environment will be investigated thoroughly to prevent a recurrence.

With regards complaints related to noise, in the first instance an investigation into the complaint should take place, site activities and procedures should be altered to reduce nuisance issues and liaison should take place with the administrating authority and/or complainant over remedial action.

Details shall be recorded using the CBH Group online reporting system 'SHARE'.

For any complaint that is determined to be of a CBH environmental incident classification level 3 (moderate) or above then the Shire of Dowerin is to be informed of the nature of the complaint, any investigation findings, and/or remedial action taken.

9. Training

All employees and subcontractors will be required to undergo a pre work induction, outlining environmental controls to be implemented and monitored during operations. The induction will provide necessary awareness of noise management and the procedures and work practices to minimise and report excessive noise generation.

Regular toolbox meetings will also be held to reinforce a positive attitude to environmental matters and to highlight any issues that arise during the course of site operations.

10. Audit

Audit activities should take place during the construction phase to ensure the objectives of the Noise Management Plan are being met, and to identify any areas for improvement in the management of site activities.

11. Definitions

Noise is defined in the Environmental Protection Act 1986 (the Act) to include vibration of any frequency, whether transmitted through air or any other physical medium. “Pollution” is defined in the Act to mean direct or indirect alteration of the environment (a) to its detriment or degradation; (b) to the detriment of any beneficial use; or (c) of a prescribed kind.

The Act does not define “Noise Pollution” however it is defined in NSW legislation as: the emission of offensive noise, which means noise that by reason of its level, nature, character or quality, or the time at which it is made, or any other circumstances, is harmful (or is likely to be harmful) to or interferes unreasonably (or is likely to interfere unreasonably) with the comfort or repose of a person outside the premises from which the noise is emitted’.

12. Attachment

CBH Group Health, Safety and Environmental Policy [STORE ID: 10193562].

SHIRE OF DOWERIN

MONTHLY FINANCIAL REPORT
(Containing the Statement of Financial Activity)
For the Period Ended 30 November 2018

LOCAL GOVERNMENT ACT 1995

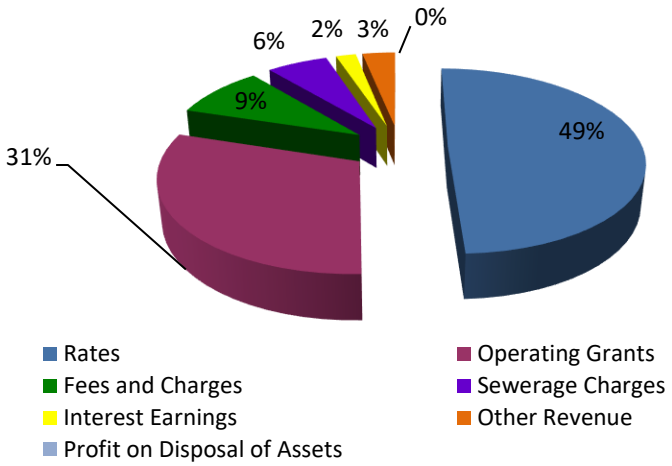
LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATIONS 1996

TABLE OF CONTENTS

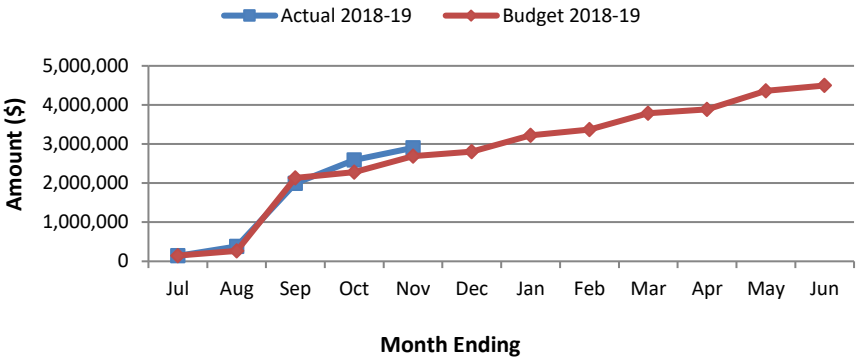
Note: The Statements and accompanying notes are prepared based on all transactions recorded at the time of preparation and may change with finalisation of the 2018 Annual Financial Report.

SHIRE OF DOWERIN
Information Summary
For the Period Ended 30 November 2018

Operating Income

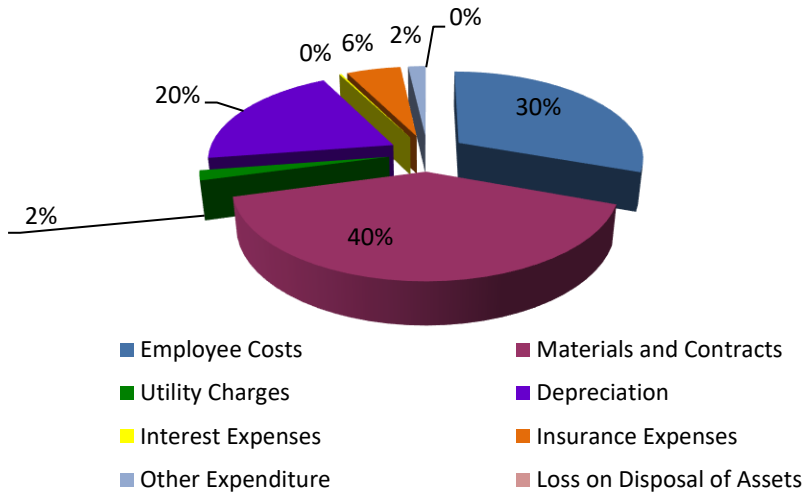


Budget Operating Income -v- YTD Actual
Refer Note 2

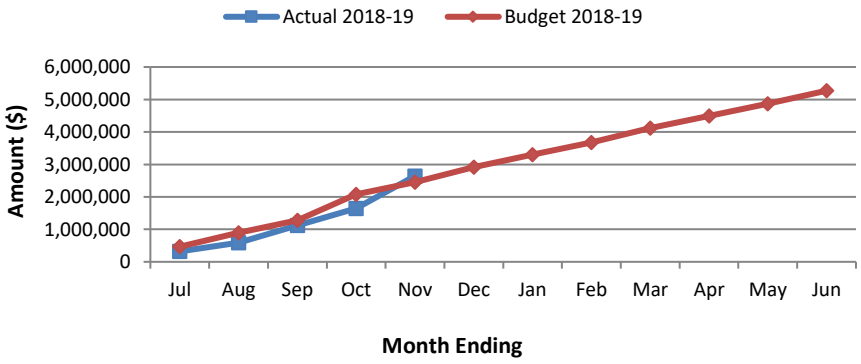


SHIRE OF DOWERIN
Information Summary
For the Period Ended 30 November 2018

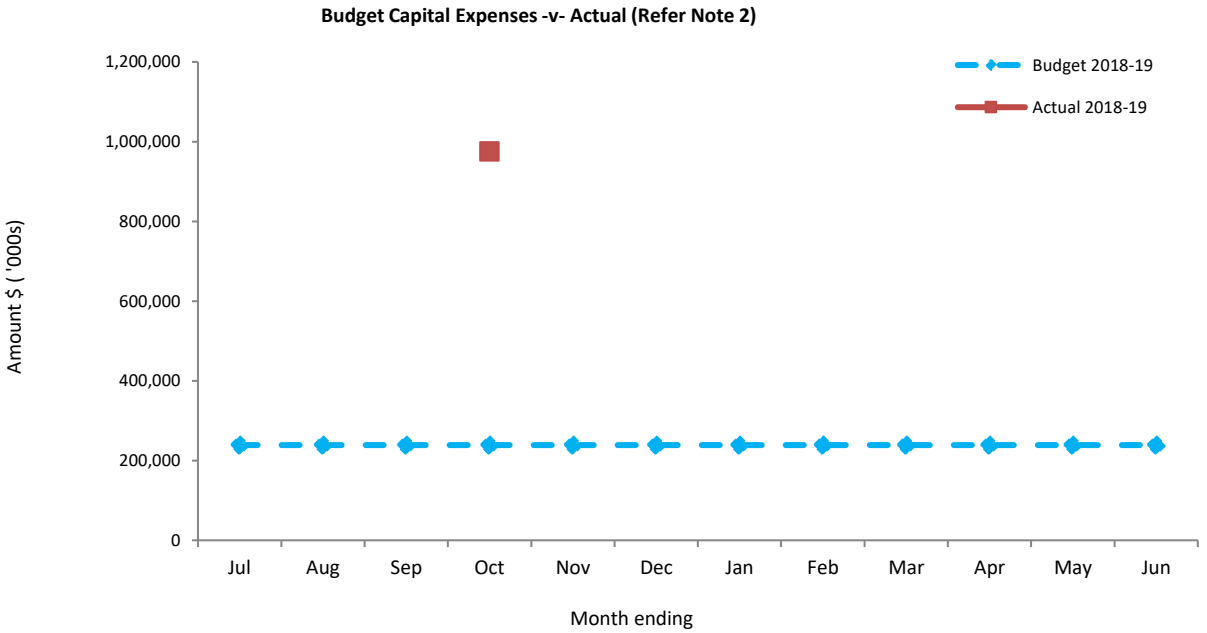
Operating Expenditure

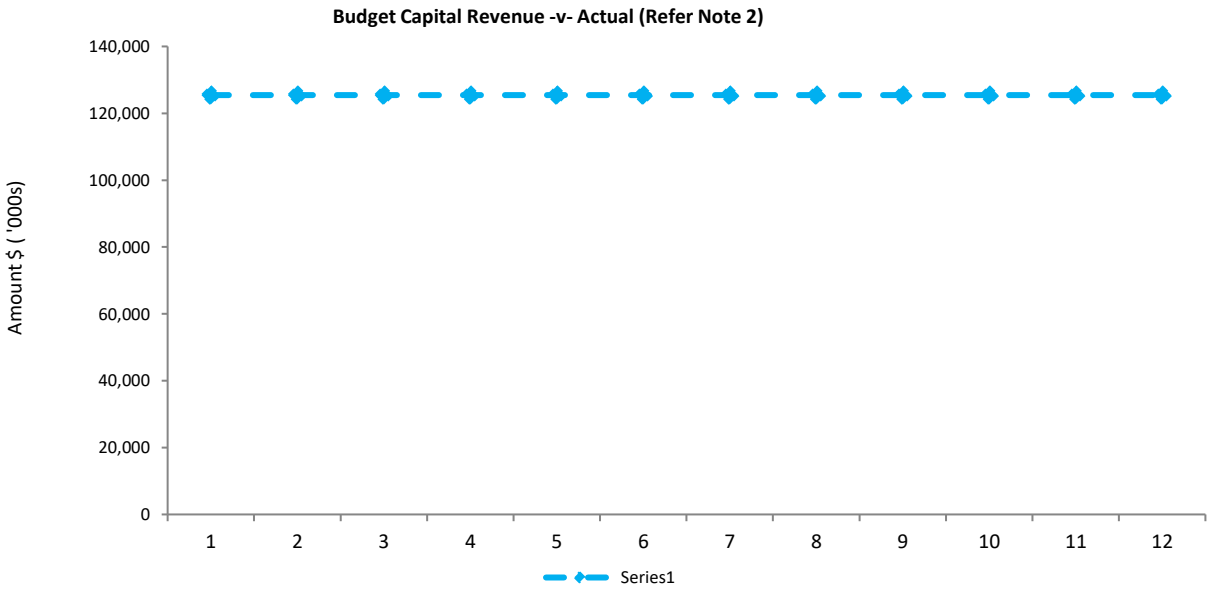


Budget Operating Expenditure -v- YTD Actual
Refer Note 2

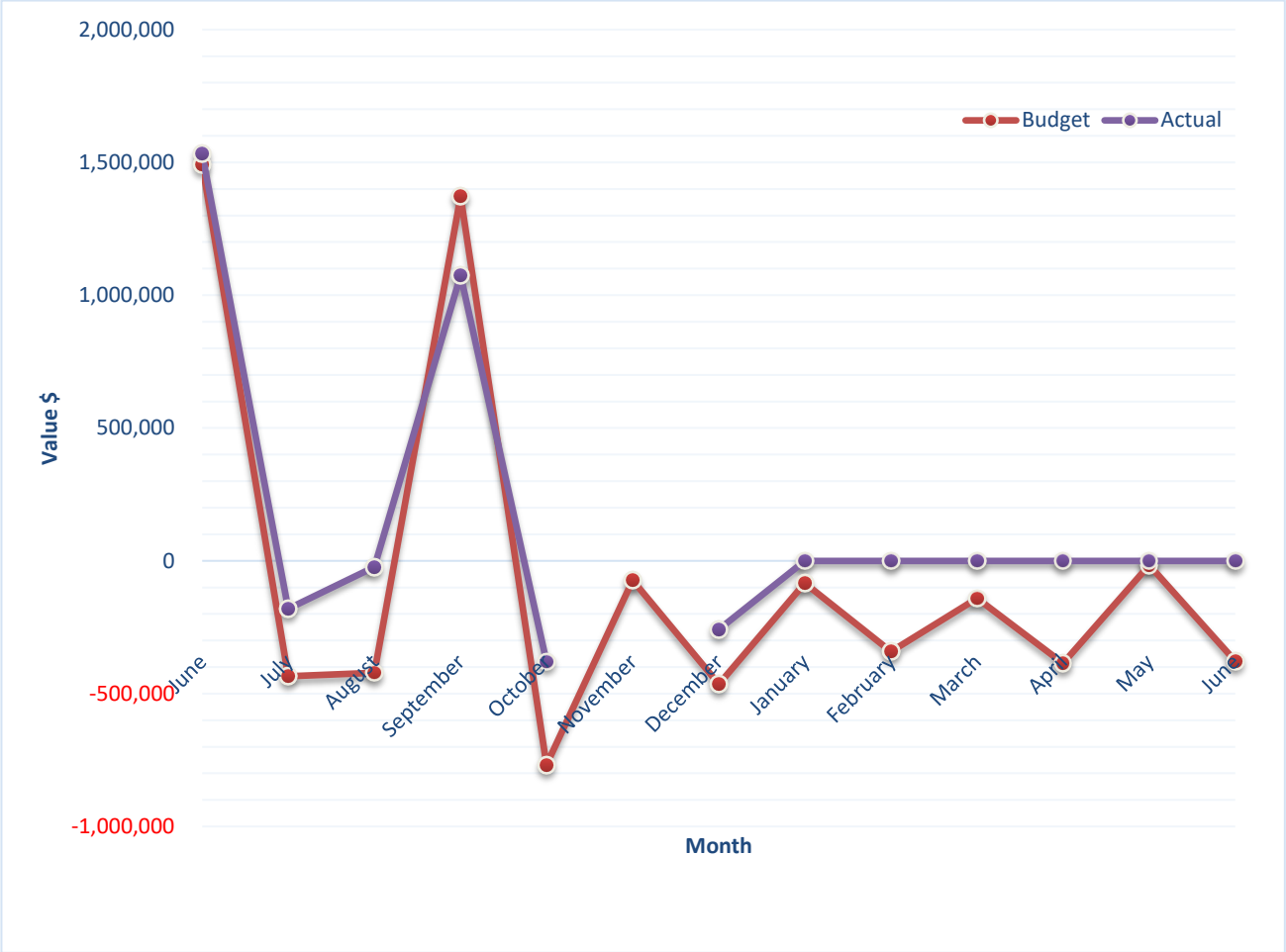


This information is to be read in conjunction with the accompanying Financial Statements and Notes.


Budget Capital Expenses -v- Actual (Refer Note 2)
Budget 2018-19
Actual 2018-19
Amount $ ('000s)
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Month ending


Budget Capital Revenue -v- Actual (Refer Note 2)
Amount $ ('000s)
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
1
2
3
4
5
6
7
8
9
10
11
12
Series1

Cash Flows - 2018/2019



SHIRE OF DOWERIN
STATEMENT OF FINANCIAL ACTIVITY
(Statutory Reporting Program)
For the Period Ended 30 November 2018

	Note	Original Annual Budget	Annual Budget	YTD Budget (a)	YTD Actual (b)	(b)-(a)	(b)-	Var.
		$	$	$		$	%	
Opening Funding Surplus(Deficit)	3	1,492,612	1,492,612	1,492,612	**1,532,609**	39,997	3%	
Revenue from operating activities								
Governance		5,730	5,730	2,380	**4,686**	2,306	97%	
General Purpose Funding - Rates	8a	1,309,983	1,309,983	1,336,057	**1,324,020**	(12,037)	(1%)	
General Purpose Funding - Other		758,336	758,336	424,148	**410,578**	(13,570)	(3%)	
Law, Order and Public Safety		14,234	14,234	5,710	**13,922**	8,212	144%	☺
Health		237,241	237,241	117,241	**117,792**	551	0%	
Education and Welfare		135,160	135,160	56,315	**46,013**	(10,302)	(18%)	☹
Housing		181,870	181,870	67,010	**59,335**	(7,675)	(11%)	☹
Community Amenities		262,387	262,387	202,715	**255,781**	53,066	26%	☺
Recreation and Culture		48,421	48,421	16,830	**11,987**	(4,843)	(29%)	
Transport		672,953	672,953	221,340	**351,380**	130,040	59%	☺
Economic Services		137,652	137,652	57,340	**56,301**	(1,039)	(2%)	
Other Property and Services		15,362	15,362	6,568	**29,288**	22,720	346%	☺
		3,779,329	**3,779,329**	**2,513,654**	**2,681,084**	167,430		
Expenditure from operating activities								
Governance		(503,348)	(503,348)	(214,085)	**(221,227)**	(7,142)	(3%)	
General Purpose Funding		(146,063)	(146,063)	(63,231)	**(81,961)**	(18,730)	(30%)	☹
Law, Order and Public Safety		(54,449)	(54,449)	(30,076)	**(35,294)**	(5,218)	(17%)	☹
Health		(334,824)	(334,824)	(130,095)	**(147,155)**	(17,060)	(13%)	☹
Education and Welfare		(174,454)	(174,454)	(72,650)	**(61,765)**	10,885	15%	☺
Housing		(296,845)	(296,845)	(99,355)	**(119,056)**	(19,701)	(20%)	☹
Community Amenities		(302,336)	(302,336)	(125,865)	**(109,978)**	15,887	13%	☺
Recreation and Culture		(831,932)	(831,932)	(344,550)	**(352,434)**	(7,884)	(2%)	
Transport		(2,263,582)	(2,263,582)	(1,182,203)	**(1,230,315)**	(48,112)	(4%)	
Economic Services		(347,332)	(347,332)	(165,990)	**(141,056)**	24,934	15%	☺
Other Property and Services		(15,415)	(15,415)	(22,893)	**(143,837)**	(120,944)	(528%)	☹
		(5,270,579)	**(5,270,579)**	**(2,450,993)**	**(2,644,077)**	(193,084)		
Operating activities excluded from budget								
Add back Depreciation		1,331,346	1,331,346	554,655	**522,880**	(31,776)	(6%)	☺
Adjust (Profit)/Loss on Asset Disposal	8	45,627	45,627	(1,313)	**0**	1,313	(100%)	
Movement in Deferred Pensioner		0	0	0	**(3,580)**	(3,580)		
Movement in Leave Reserve and Accruals		1,109	1,109	1,064	**1,062**	(2)	(0)	
		1,378,082	**1,378,082**	**554,406**	**520,361**	(34,045)		
Amount attributable to operating activities		**(113,169)**	**(113,169)**	**617,066**	**557,368**	(59,698)		
Investing Activities								
Non-operating grants and Contributions	10	717,862	717,862	179,466	**221,394**	41,928	23%	☺
Proceeds from Disposal of Assets	8	283,000	283,000	0	**0**	0		
Land Held for Resale		0	0	0	**0**	0		
Land and Buildings	12	(616,716)	(616,716)	(256,960)	**(339,361)**	(82,401)	32%	
Infrastructure Assets - Roads	12	(1,350,333)	(1,350,333)	(562,635)	**(355,267)**	207,368	(37%)	
Infrastructure Assets - Footpaths	13	(30,000)	(30,000)	0	**0**	0		
Infrastructure Assets - Other	13	0	0	0	**0**	0		
Plant and Equipment	12	(742,000)	(742,000)	(632,000)	**(254,044)**	377,956	(60%)	
Furniture and Equipment	12	0	0	0	**0**	0		
Amount attributable to investing activities		**(1,738,187)**	**(1,738,187)**	**(1,272,129)**	**(727,277)**	**544,852**		
Financing Actvities								
Proceeds from New Debentures		480,000	480,000	280,000	**280,000**	0	0%	
Self-Supporting Loan Principal		24,534	24,534	12,168	**12,168**	0	0%	
Transfer from Reserves	7	299,520	299,520	0	**0**	0		
Repayment of Debentures	9	(126,735)	(126,735)	(27,107)	**(27,107)**	0	0%	
Transfer to Reserves	7	(314,092)	(314,092)	(37,254)	**(37,254)**	0	0%	
Amount attributable to financing activities		**363,227**	**363,227**	**227,807**	**227,807**	**0**		
Closing Funding Surplus(Deficit)	3	**4,483**	**4,483**	**1,065,357**	**1,590,508**	**525,151**		

☺ **More Revenue OR Less Expenditure**
☹ **Less Revenue OR More Expenditure**

Indicates a variance between Year to Date (YTD) Budget and YTD Actual data as per the adopted materiality threshold.
Refer to Note 2 for an explanation of the reasons for the variance.
This statement is to be read in conjunction with the accompanying Financial Statements and notes.

SHIRE OF DOWERIN

STATEMENT OF FINANCIAL ACTIVITY

(By Nature or Type)

For the Period Ended 30 November 2018

	Note	Original Annual Budget	Annual Budget	YTD Budget (a)	YTD Actual (b)	Var. $ (b)-(a)	Var. % (b)-(a)/(a)	Var.
			$	$	$	$	%	
Opening Funding Surplus (Deficit)	3	1,492,612	1,492,612	1,492,612	**1,532,609**	39,997	3%	
Revenue from operating activities								
Rates	8a	1,336,057	1,336,057	1,336,057	**1,324,020**	(12,037)	(1%)	
Operating Grants, Subsidies and Contributions	10	1,535,380	1,535,380	743,903	**815,174**	71,271	10%	☺
Fees and Charges		470,855	470,855	187,150	**243,198**	56,048	30%	☺
Sewerage Charges		160,100	160,100	160,100	**160,100**	0	0%	
Interest Earnings		63,111	63,111	8,310	**52,758**	44,448	535%	☺
Other Revenue		192,550	192,550	76,415	**85,834**	9,419	12%	☺
Profit on Disposal of Assets		21,276	21,276	1,722	**0**	(1,722)	(100%)	
		3,779,329	**3,779,329**	**2,513,656**	**2,681,084**	167,427		
Expenditure from operating activities								
Employee Costs		(1,712,602)	(1,712,602)	(731,445)	**(806,103)**	(74,658)	(10%)	☹
Materials and Contracts		(1,661,763)	(1,661,763)	(942,478)	**(1,065,266)**	(122,788)	(13%)	☹
Utility Charges		(193,792)	(193,792)	(80,695)	**(47,848)**	32,847	41%	☺
Depreciation on Non-Current Assets		(1,331,346)	(1,331,346)	(554,655)	**(522,880)**	31,776	6%	☺
Interest Expenses		(44,684)	(44,684)	(16,695)	**(5,802)**	10,893	65%	☺
Insurance Expenses		(159,868)	(159,868)	(86,165)	**(148,452)**	(62,287)	(72%)	☹
Other Expenditure		(99,622)	(99,622)	(38,451)	**(47,727)**	(9,276)	(24%)	☹
Loss on Disposal of Assets		(66,903)	(66,903)	(409)	**0**	409	100%	
		(5,270,579)	**(5,270,579)**	**(2,450,993)**	**(2,644,077)**	(193,084)		
Operating activities excluded from budget								
Add back Depreciation		1,331,346	1,331,346	554,655	**522,880**	(31,776)	(6%)	☺
Adjust (Profit)/Loss on Asset Disposal	8	45,627	45,627	(1,313)	**0**	1,313	(100%)	
Movement in Deferred Pensioner		0	0	0	**(3,580)**	(3,580)		
Movement in Leave Reserve and Accruals		1,109	1,109	1,064	**1,062**	(2)	(0%)	
		1,378,082	**1,378,082**	**554,406**	**520,361**	(34,045)		
Amount attributable to operating activities		**(113,169)**	**(113,169)**	**617,069**	**557,368**	(59,702)		
Investing activities								
Non-operating Grants, and Contributions	10	717,862	**717,862**	**179,466**	**221,394**	41,928	23%	☺
Proceeds from Disposal of Assets	8	283,000	**283,000**	**0**	**0**	0		
Land and Buildings	12	(616,716)	**(616,716)**	**(256,960)**	**(339,361)**	(82,401)	32%	
Infrastructure Assets - Roads	12	(1,350,333)	**(1,350,333)**	**(562,635)**	**(355,267)**	207,368	(37%)	
Infrastructure Assets - Footpaths	13	(30,000)	**(30,000)**	**0**	**0**	0		
Plant and Equipment	13	(742,000)	**(742,000)**	**(632,000)**	**(254,044)**	377,956	(60%)	
Amount attributable to investing activities		**(1,738,187)**	**(1,738,187)**	**(1,272,129)**	**(727,277)**	544,852		
Financing Activities								
Proceeds from New Debentures	8	480,000	480,000	280,000	**280,000**	0	0%	
Self-Supporting Loan Principal		24,534	24,534	12,168	**12,168**	0	0%	
Transfer from Reserves	7	299,520	299,520	0	**0**	0		
Repayment of Debentures	9	(126,735)	(126,735)	(27,107)	**(27,107)**	0	0%	
Transfer to Reserves	7	(314,092)	(314,092)	(37,254)	**(37,254)**	0	0%	
Amount attributable to financing activities		**363,227**	**363,227**	**227,807**	**227,807**	**0**		
Closing Funding Surplus (Deficit)	3	**4,483**	**4,483**	**1,065,358**	**1,590,508**	525,150	49%	☺

Indicates a variance between Year to Date (YTD) Budget and YTD Actual data as per the adopted materiality threshold.
Refer to Note 2 for an explanation of the reasons for the variance.

☺ **More Revenue OR Less Expenditure**
☹ **Less Revenue OR More Expenditure**

This statement is to be read in conjunction with the accompanying Financial Statements and notes.

SHIRE OF DOWERIN
STATEMENT OF CAPITAL ACQUSITIONS AND CAPITAL FUNDING
For the Period Ended 30 November 2018

Capital Acquisitions

	Note	Original Annual Budget	% Source of Funding	YTD Actual Total
		$		$
Land and Buildings	12	616,716		**339,361**
Infrastructure Assets - Roads	12	1,350,333		**355,267**
Infrastructure Assets - Footpaths	13	30,000		**0**
Infrastructure Assets - Other	13	0		**0**
Plant and Equipment	13	742,000		**254,044**
Furniture and Equipment	13	0		**0**
Capital Expenditure Totals		2,739,049		**948,671**
Capital acquisitions funded by:				
Capital Grants and Contributions	**10**	**717,862**	**26%**	**221,394**
Borrowings	**9**	**480,000**	**18%**	**280,000**
Other (Disposals & C/Fwd)		**541,000**	**20%**	**0**
Council contribution - Cash Backed Reserves	**7**	**299,520**	**11%**	**0**
Council contribution - operations		**700,667**	**26%**	**$447,277**
Capital Funding Total		**2,739,049**	**100%**	**948,671**

Note 1: Significant Accounting Policies

(a) Basis of Accounting

This statement comprises a special purpose financial report which has been prepared in accordance with Australian Accounting Standards (as they apply to local governments and not-for-profit entities), Australian Accounting Interpretations, other authoritative pronouncements of the Australian Accounting Standards Board, the Local Government Act 1995 and accompanying regulations. Material accounting policies which have been adopted in the preparation of this statement are presented below and have been consistently applied unless stated otherwise. Except for cash flow and rate setting information, the report has also been prepared on the accrual basis and is based on historical costs, modified, where applicable, by the measurement at fair value of selected non-current assets, financial assets and liabilities.

Critical Accounting Estimates

The preparation of a financial report in conformity with Australian Accounting Standards requires management to make judgements, estimates and assumptions that effect the application of policies and reported amounts of assets and liabilities, income and expenses. The estimates and associated assumptions are based on historical experience and various other factors that are believed to be reasonable under the circumstances; the results of which form the basis of making the judgements about carrying values of assets and liabilities that are not readily apparent from other sources. Actual results may differ from these estimates.

(b) The Local Government Reporting Entity

All Funds through which the Council controls resources to carry on its functions have been included in this statement. In the process of reporting on the local government as a single unit, all transactions and balances between those funds (for example, loans and transfers between Funds) have been eliminated. All monies held in the Trust Fund are excluded from the statement, but a separate statement of those monies appears at Note 12.

(c) Rounding Off Figures

All figures shown in this statement are rounded to the nearest dollar.

(d) Rates, Grants, Donations and Other Contributions

Rates, grants, donations and other contributions are recognised as revenues when the local government obtains control over the assets comprising the contributions. Control over assets acquired from rates is obtained at the commencement of the rating period or, where earlier, upon receipt of the rates.

(e) Goods and Services Tax

Revenues, expenses and assets are recognised net of the amount of GST, except where the amount of GST incurred is not recoverable from the Australian Taxation Office (ATO). Receivables and payables are stated inclusive of GST receivable or payable. The net amount of GST recoverable from, or payable to, the ATO is included with receivables or payables in the statement of financial position. Cash flows are presented on a gross basis. The GST components of cash flows arising from investing or financing activities which are recoverable from, or payable to, the ATO are presented as operating cash flows.

(f) Cash and Cash Equivalents

Cash and cash equivalents include cash on hand, cash at bank, deposits available on demand with banks and other short term highly liquid investments that are readily convertible to known amounts of cash and which are subject to an insignificant risk of changes in value and bank overdrafts. Bank overdrafts are reported as short term borrowings in current liabilities in the statement of financial position.

(g) Trade and Other Receivables

Trade and other receivables include amounts due from ratepayers for unpaid rates and service charges and other amounts due from third parties for goods sold and services performed in the ordinary course of business.

Receivables expected to be collected within 12 months of the end of the reporting period are classified as current assets. All other receivables are classified as non-current assets. Collectability of trade and other receivables is reviewed on an ongoing basis. Debts that are known to be uncollectible are written off when identified. An allowance for doubtful debts is raised when there is objective evidence that they will not be collectible.

(h) Inventories

General

Inventories are measured at the lower of cost and net realisable value. Net realisable value is the estimated selling price in the ordinary course of business less the estimated costs of completion and the estimated costs necessary to make the sale.

Land Held for Resale

Land held for development and sale is valued at the lower of cost and net realisable value. Cost includes the cost of acquisition, development, borrowing costs and holding costs until completion of development. Finance costs and holding charges incurred after development is completed are expensed. Gains and losses are recognised in profit or loss at the time of signing an unconditional contract of sale if significant risks and rewards, and effective control over the land, are passed on to the buyer at this point. Land held for sale is classified as current except where it is held as non-current based on Council's intentions to release for sale.

(i) Fixed Assets

All assets are initially recognised at cost. Cost is determined as the fair value of the assets given as consideration plus costs incidental to the acquisition. For assets acquired at no cost or for nominal consideration, cost is determined as fair value at the date of acquisition. The cost of non-current assets constructed by the local government includes the cost of all materials used in the construction, direct labour on the project and an appropriate proportion of variable and fixed overhead. Certain asset classes may be revalued on a regular basis such that the carrying values are not materially different from fair value. Assets carried at fair value are to be revalued with sufficient regularity to ensure the carrying amount does not differ materially from that determined using fair value at reporting date.

Note 1: Significant Accounting Policies

(j) Depreciation of Non-Current Assets

All non-current assets having a limited useful life are systematically depreciated over their useful lives in a manner which reflects the consumption of the future economic benefits embodied in those assets

Depreciation is recognised on a straight-line basis, using rates which are reviewed each reporting period. Major depreciation rates and periods are:

Asset	Years
Buildings	30 to 50 years
Furniture and Equipment	4 to 10 years
Plant and Equipment	5 to 15 years
Sealed roads and streets	
formation	not depreciated
pavement	50 years
seal	
bituminous seals	20 years
asphalt surfaces	25 years
Gravel Roads	
formation	not depreciated
pavement	50 years
gravel sheet	12 years
Formed roads	
formation	not depreciated
pavement	50 years
Footpaths - slab	40 years

(k) Trade and Other Payables

Trade and other payables represent liabilities for goods and services provided to the Council prior to the end of the financial year that are unpaid and arise when the Council becomes obliged to make future payments in respect of the purchase of these goods and services. The amounts are unsecured, are recognised as a current liability and are normally paid within 30 days of recognition.

(l) Employee Benefits

The provisions for employee benefits relates to amounts expected to be paid for long service leave, annual leave, wages and salaries and are calculated as follows:

(i) Wages, Salaries, Annual Leave and Long Service Leave (Short-term Benefits)

The provision for employees' benefits to wages, salaries, annual leave and long service leave expected to be settled within 12 months represents the amount the Shire has a present obligation to pay resulting from employees services provided to balance date. The provision has been calculated at nominal amounts based on remuneration rates the Shire expects to pay and includes related on-costs.

(ii) Annual Leave and Long Service Leave (Long-term Benefits)

The liability for long service leave is recognised in the provision for employee benefits and measured as the present value of expected future payments to be made in respect of services provided by employees up to the reporting date using the project unit credit method. Consideration is given to expected future wage and salary levels, experience of employee departures and periods of service. Expected future payments are discounted using market yields at the reporting date on national government bonds with terms to maturity and currency that match as closely as possible, the estimated future cash outflows. Where the Shire does not have the unconditional right to defer settlement beyond 12 months, the liability is recognised as a current liability.

(m) Interest-bearing Loans and Borrowings

All loans and borrowings are initially recognised at the fair value of the consideration received less directly attributable transaction costs. After initial recognition, interest-bearing loans and borrowings are subsequently measured at amortised cost using the effective interest method. Fees paid on the establishment of loan facilities that are yield related are included as part of the carrying amount of the loans and borrowings.

Borrowings are classified as current liabilities unless the Council has an unconditional right to defer settlement of the liability for at least 12 months after the balance sheet date.

Borrowing Costs

Borrowing costs are recognised as an expense when incurred except where they are directly attributable to the acquisition, construction or production of a qualifying asset. Where this is the case, they are capitalised as part of the cost of the particular asset.

(n) Provisions

Provisions are recognised when: The council has a present legal or constructive obligation as a result of past events; it is more likely than not that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated. Provisions are not recognised for future operating losses. Where there are a number of similar obligations, the likelihood that an outflow will be required in settlement is determined by considering the class of obligations as a whole. A provision is recognised even if the likelihood of an outflow with respect to any one of item included in the same class of obligations may be small.

Note 1: Significant Accounting Policies

(o) Current and Non-Current Classification

In the determination of whether an asset or liability is current or non-current, consideration is given to the time when each asset or liability is expected to be settled. The asset or liability is classified as current if it is expected to be settled within the next 12 months, being the Council's operational cycle. In the case of liabilities where Council does not have the unconditional right to defer settlement beyond 12 months, such as vested long service leave, the liability is classified as current even if not expected to be settled within the next 12 months. Inventories held for trading are classified as current even if not expected to be realised in the next 12 months except for land held for resale where it is held as non current based on Council's intentions to release for sale.

(p) Nature or Type Classifications

Rates

All rates levied under the Local Government Act 1995. Includes general, differential, specific area rates, minimum rates, interim rates, back rates, ex-gratia rates, less discounts offered. Exclude administration fees, interest on instalments, interest on arrears and service

Operating Grants, Subsidies and Contributions

Refer to all amounts received as grants, subsidies and contributions that are not non-operating grants.

Non-Operating Grants, Subsidies and Contributions

Amounts received specifically for the acquisition, construction of new or the upgrading of non-current assets paid to a local government, irrespective of whether these amounts are received as capital grants, subsidies, contributions or donations.

Profit on Asset Disposal

Profit on the disposal of assets including gains on the disposal of long term investments. Losses are disclosed under the expenditure

Fees and Charges

Revenues (other than service charges) from the use of facilities and charges made for local government services, sewerage rates, rentals, hire charges, fee for service, photocopying charges, licences, sale of goods or information, fines, penalties and administration fees. Local governments may wish to disclose more detail such as rubbish collection fees, rental of property, fines and penalties, other fees and charges.

Service Charges

Service charges imposed under Division 6 of Part 6 of the Local Government Act 1995. Regulation 54 of the Local Government (Financial Management) Regulations 1996 identifies these as television and radio broadcasting, underground electricity and neighbourhood surveillance services. Exclude rubbish removal charges. Interest and other items of a similar nature received from bank and investment accounts, interest on rate instalments, interest on rate arrears and interest on debtors.

Interest Earnings

Interest and other items of a similar nature received from bank and investment accounts, interest on rate instalments, interest on rate arrears and interest on debtors.

Other Revenue / Income

Other revenue, which can not be classified under the above headings, includes dividends, discounts, rebates etc.

Employee Costs

All costs associate with the employment of person such as salaries, wages, allowances, benefits such as vehicle and housing, superannuation, employment expenses, removal expenses, relocation expenses, worker's compensation insurance, training costs, conferences, safety expenses, medical examinations, fringe benefit tax, etc.

Materials and Contracts

All expenditures on materials, supplies and contracts not classified under other headings. These include supply of goods and materials, legal expenses, consultancy, maintenance agreements, communication expenses, advertising expenses, membership, periodicals, publications, hire expenses, rental, leases, postage and freight etc. Local governments may wish to disclose more detail such as contract services, consultancy, information technology, rental or lease expenditures.

Utilities (Gas, Electricity, Water, etc.)

Expenditures made to the respective agencies for the provision of power, gas or water. Exclude expenditures incurred for the reinstatement of roadwork on behalf of these agencies.

Insurance

All insurance other than worker's compensation and health benefit insurance included as a cost of employment.

Loss on asset disposal

Loss on the disposal of fixed assets.

Depreciation on non-current assets

Depreciation expense raised on all classes of assets.

Interest expenses

Interest and other costs of finance paid, including costs of finance for loan debentures, overdraft accommodation and refinancing expenses.

Other expenditure

Statutory fees, taxes, provision for bad debts, member's fees or State taxes. Donations and subsidies made to community groups.

Note 1: Significant Accounting Policies
(r) Program Classifications (Function/Activity)

Shire operations as disclosed in these financial statements encompass the following service orientated activities/programs.

GOVERNANCE
GENERAL PURPOSE FUNDING
LAW, ORDER, PUBLIC SAFETY
HEALTH
EDUCATION AND WELFARE
HOUSING
COMMUNITY AMENITIES
RECREATION AND CULTURE
TRANSPORT
ECONOMIC SERVICES
OTHER PROPERTY AND SERVICES

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 2: Explanation of Material

The material variance thresholds are adopted annually by Council as an indicator of whether the actual expenditure or revenue varies from the year to date budget or greater.

☺ **More Revenue OR Less Expenditure**
⊗ **Less Revenue OR More Expenditure**

Reporting Program	Var. $	Var. %	Var.	Timing/ Permanent	Explanation of Variance
Operating Income	$	%			
Governance	2,306	97%		Timing	Good driver reimbursement received in November
General Purpose Funding - Rates	(12,037)	(1%)		Timing	Grants revenue is anticipated that this will even out during the year.
General Purpose Funding - Other	(13,570)	(3%)		Timing	General Purpose Funding is anticipated to even out during the year.
Law, Order and Public Safety	8,212	144%	☺	Timing	Additional funds received for the Bush Fire brigade.
Health	551	0%			Within Variance Threshold
Education and Welfare	(10,302)	(18%)	⊗	Timing	Dowerin Childcare reimbursement below average; this is confirmed by expenditure decrease as per below.
Housing	(7,675)	(11%)	⊗	Timing	Housing rentals slightly reduced due to vacant units
Community Amenities	53,066	26%	☺	Timing	Rubbish and recycling charges invoiced in September with the rates billing.
Recreation and Culture	(4,843)	(29%)		Timing	Revenue is low this is anticipated to even out during the year.
Transport	130,040	59%	☺	Timing	Flood damage invoice has been approved for payment
Economic Services	(1,039)	(2%)			Within Variance Threshold
Other Property and Services	22,720	346%	☺	Timing	Internal over-recovery to be reviewed
Operating Expense	$	%			
Governance	(7,142)	(3%)		Timing	Subscriptions paid in advance
General Purpose Funding	(18,730)	(30%)	⊗	Timing	This is due to advance payment of insurances. This will even out during the year and will be part of the budget review
Law, Order and Public Safety	(5,218)	(17%)	⊗	Timing	This will even out during the year and will be part of the budget review.
Health	(17,060)	(13%)	⊗	Timing	Underexpenditure in the Hacc programs. This will even out during the year.
Education and Welfare	10,885	15%	☺	Timing	Dowerin Childcare expenditure below average, this should even out as the year is progressed
Housing	(19,701)	(20%)	⊗	Timing	Expenditure on maintenance, this should even out as the year is progressed.
Community Amenities	15,887	13%	☺	Timing	To be assessed during the budget review
Recreation and Culture	(7,884)	(2%)		Timing	To be assessed during the budget review
Transport	(48,112)	(4%)		Timing	Wandrra roads project nearing completion, budget phasing
Economic Services	24,934	15%	☺	Timing	To be assessed during the budget review, budget phasing
Other Property and Services	(120,944)	(528%)	⊗	Timing	Under-recovery of labour and plant expenses. Budget phasing of IT costs and other overheads
Operating activities excluded from budget					
Depreciation	31,776	(6%)	☺	Timing	Depreciate rates to be reviewed and budget reviewed
Capital Revenues					
Grants, Subsidies and Contributions	41,928	23%	☺	Timing	To be assessed during the budget review
Capital Expenses					***Refer to Note 12 For detail***
Land and Buildings	(82,401)				Groh house nearing completion, budget phasing
Infrastructure - Roads	207,368	(37%)			Capital road expenditure due to be expensed in the New Year
Plant and Equipment	377,956	(60%)			Plant and equipment expenditure to be expensed in the New Year.
Financing					
Proceeds from New Debentures	0	0			
Self-Supporting Loan Principal	0				
Transfer from Reserves	0				
Opening Funding Surplus(Deficit)	39,997	3%			

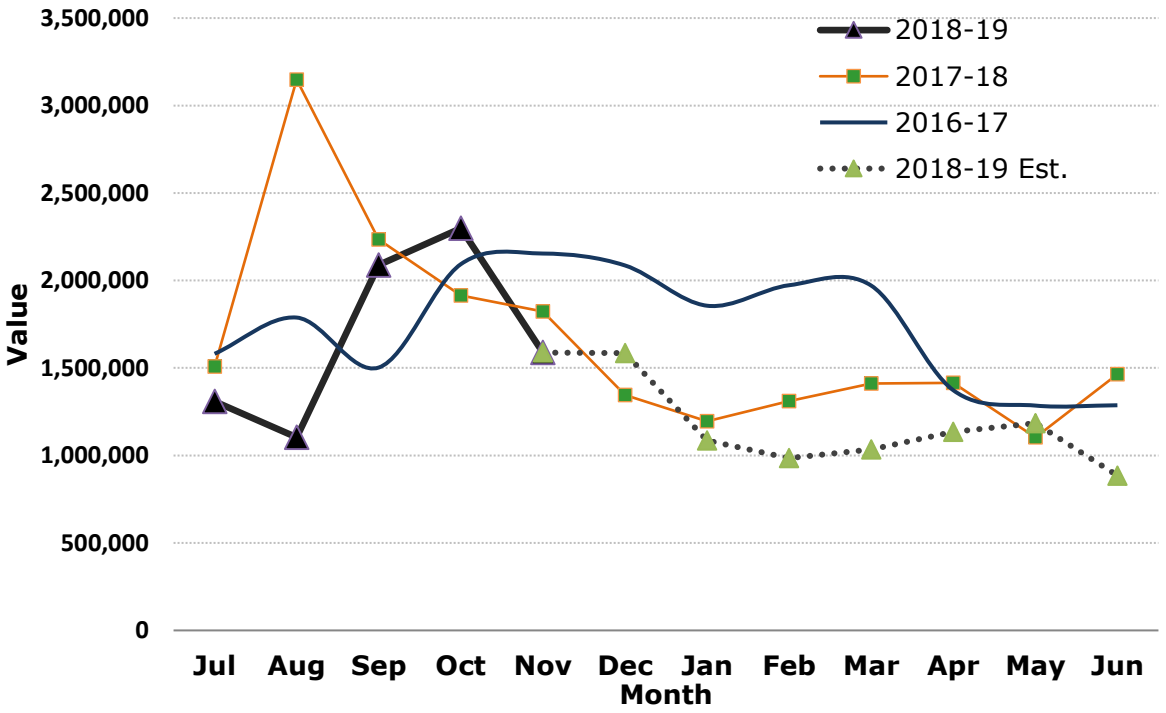
SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 3: Net Current Funding Position

Positive=Surplus (Negative=Deficit)

	Note	Last Years Actual Closing 30 June 2018	Current 30 Nov 2018
		$	$
Current Assets			
Cash Unrestricted	4	1,736,002	1,515,050
Cash Restricted	4	2,198,691	2,194,615
Receivables - Rates		62,263	341,495
Receivables - Other		174,715	254,635
Interest / ATO Receivable/Trust		30,362	141,688
Inventories		16,603	22,932
		4,218,637	4,470,416
Less: Current Liabilities			
Payables		(406,713)	(576,569)
Current Borrowings		(121,879)	(94,772)
Provisions		(151,636)	(151,636)
		(680,228)	(822,977)
Net Current Assets		3,538,408	3,647,438
Less: Cash Reserves	7	(2,157,361)	(2,194,615)
Plus: Current Borrowings included in Budget		97,344	82,406
Plus : Liabilities funded by Cash Backed Reserves		54,217	55,280
Net Current Funding Position		**1,532,609**	**1,590,508**

Note 3 - Liquidity Over the Year



Note: ..... 18/19 includes est. projections to 30 June 2019

Cash Restricted includes Cash Backed Reserves and the STA Retention Bond.
Payables include STA bond and GST to be paid to the ATO

Current Ratio equals 1:2.77

This means that for every $1.00 of liability Council has $2.77 of Current assets available to cover current debt

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 4: Cash and Investments

	Unrestricted	Restricted	Trust	Total Amount	Institution	Interest Rate	Maturity Date
	$	$	$	$			
(a) **Cash Deposits**							
Municipal Bank Account	206,666			206,666	NAB	Variable	At Call
Cash Maximiser	870,609	268,334		1,138,944	NAB	Variable	At Call
Trust Bank Account			12,108				
(b) **Term Deposits**							
TD 2712291	168,840	990,864		1,159,704	Bendigo	2.75%	24-Jun-19
TD 2671483		935,417		935,417	Bendigo	2.60%	07-Jan-19
	1,246,115	**2,194,615**	**12,108**	**3,440,731**			

Comments/Notes - Investments

The above balances are the funds held in bank accounts and on hand as at reporting date.
Note The $266,625 Fixed deposit has been released however this will be re-invested for the plant reserve

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 5: Budget Amendments

Amendments to original budget since budget adoption. Surplus/(Deficit)

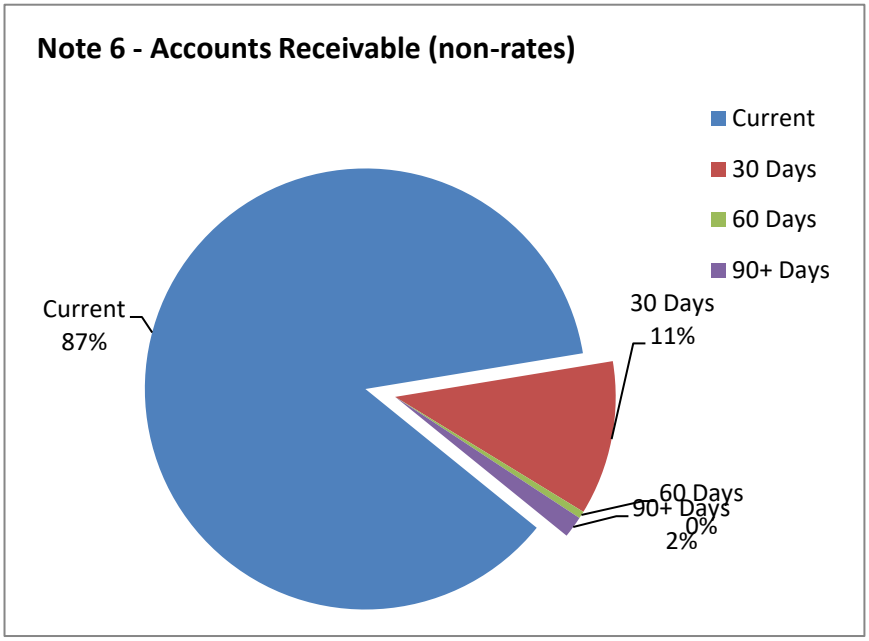
GL Account Code	Description	Council Resolution	Classification	Original Budget	Amended Budget	Increase in Available Cash	Decrease in Available Cash	Amended Budget Running Balance
						$	$	$
	Budget Adoption		Opening Surplus(Deficit)					**4,483**

There has been no budget amendments to date.

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 6: Receivables

Receivables - General	Current	30 Days	60 Days	90+ Days	Total
	$	$	$	$	$
Receivables - General	118,713	15,524	722	2,166	137,125
Balance per Trial Balance					
Sundry Debtors					137,125
Total Receivables General Outstanding					**137,125**



Comments/Notes - Receivables General

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 7: Cash Backed Reserve

Name	Opening Balance	Original Budget Interest Earned	Actual Interest Earned	Original Budget Transfers In (+)	Actual Transfers In (+)	Original Budget Transfers Out (-)	Actual Transfers Out (-)	Original Budget Closing Balance	Actual YTD Closing Balance
	$	$	$	$	$	$	$	$	$
Leave Reserve	**54,217**	1,109	1,064	0	0	0	0	55,326	55,281
Plant Reserve	**369,806**	1,874	5,361	0	0	(266,625)	0	105,055	375,167
Sewerage Asset Preservation Reserve	**1,161,589**	25,838	20,749	104,941	0	0	0	1,292,368	1,182,338
Land & Building Reserve	**148,579**	6,032	2,915	150,000	0	0	0	304,611	151,494
Swimming Pool Reserve	**32,895**	0	0	0	0	(32,895)	0	0	32,895
Recreation Facilities Reserve	**185,022**	3,782	4,275	0	0	0	0	188,804	189,297
Community Housing Project Reserve	**46,847**	958	919	0	0	0	0	47,805	47,766
Comunity Bus Reserve	**0**	0	0	0	0	0	0	(0)	(0)
Economic Development Reserve	**54,183**	1,108	239	0	0	0	0	55,291	54,422
All Hours Gym Reserve	**0**	0	0	0	0	0	0	0	0
Bowling Green Replacement Reserve	**72,293**	1,678	1,222	10,000	0	0	0	83,971	73,515
Tennis Court Replacement Reserve	**31,930**	772	509	6,000	0	0	0	38,702	32,439
Sporting Club Reserve									
	2,157,361	**43,151**	**37,254**	**270,941**	**0**	**(299,520)**	**0**	**2,171,933**	**2,194,615**

Reserve funds are fully cash-backed in a term Deposit and Bank Account - Refer Note 4.

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 8: Disposal of Assets

			YTD Actual				Budget			
Asset Number	Asset Description	Program	Net Book Value	Proceeds	Profit	(Loss)	Net Book Value	Proceeds	Profit	(Loss)
			$	$	$	$	$	$	$	$
	Housing Stock	Governance					208,233	150,000		(58,233)
	Skid Steer	Governance					11,000	5,000		(6,000)
D018	Toyota Hilux	Transport					278	2,000	1,722	
D007	Grader - ACT 12M	Transport					101,341	120,000	18,659	
D013	Toyota Hilux	Transport					2,409	2,000		(409)
D07	Ford Courier	Transport					1,105	2,000	895	
D008	Ford Ranger	Transport					4,261	2,000		(2,261)
			0	**0**	**0**	**0**	**328,627**	**283,000**	**21,276**	**(66,903)**

Comments

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 8: Rating Information		Number		YTD Actual				Budget			
	Rate in	of Properties	Rateable Value	Rate Revenue	Interim Rates	Back Rates	Total Revenue	Rate Revenue	Interim Rate	Back Rate	Total Revenue
RATE TYPE	$		$	$	$	$	$	$	$	$	$
Differential General Rate											
GRV - Residential	9.6915	134	1,325,547	128,465	0	0	128,465	128,465	0	0	128,465
GRV - Commercial/Indust	9.6915	15	256,474	24,856	0	0	24,856	24,856	0	0	24,856
GRV - Town Rural	9.6915	11	127,602	12,367	0	0	12,367	12,367	0	0	12,367
GRV - Other Towns	9.6915	0	0	0	0	0	0	0	0	0	0
UV - Rural Farmland	0.8306	227	122,034,500	1,013,619	0	0	1,013,619	1,015,965	0	0	1,015,965
Sub-Totals		**387**	**123,744,123**	**1,179,307**	**0**	**0**	**1,179,307**	**1,181,653**	**0**	**0**	**1,181,653**
	Minimum										
Minimum Rates	**$**					0					
GRV -Residential	741	48	260,468	35,568	0	0	35,568	35,582	0	0	35,582
GRV - Commercial/Indust	741	18	66,871	13,338	0	0	13,338	13,343	0	0	13,343
GRV - Town Rural	741	16	41,551	11,856	0	0	11,856	11,861	0	0	11,861
GRV - Other Towns	216	19	7,659	4,104	0	0	4,104	4,110	0	0	4,110
UV - Rural Farmland	741	65	3,675,800	48,165	0	0	48,165	57,596	0	0	57,596
UV - Commercial/Industri	741	4	400	2,964	0	0	2,964	2,965	0	0	2,965
UV - Town Rural	741	3	64,000	2,223	0	0	2,223	2,224	0	0	2,224
UV - Mining Tenement	216	3	5,867	648	216	474	1,338	649	0	0	649
Sub-Totals		**176**	**4,122,616**	**118,866**	**0**	**0**	**119,556**	**128,330**	**0**	**0**	**128,330**
		563	**127,866,739**	**1,298,173**	**0**	**0**	**1,298,863**	**1,309,983**	**0**	**0**	**1,309,983**
Concession							0				0
Amount from General Rates							**1,298,863**	1,309,983			**1,309,983**
Ex-Gratia Rates							32947	26,074			26,074
Penalty Interest							4440	11,669			11,669
Instalment Fees							4770	957			957
Legal Fees							4552	4,243			4,243
Rates Enquiries Income							200	1,061			1,061
Rates Written Off							-5452	0			0
Specified Area Rates							0	0			0
Totals							**1,340,320**	**1,353,987**			**1,353,987**

Comments - Rating Information

Rates were levied on 5th September 2018

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 9 : Information on Borrowings
(a) Debenture Repayments

		Actual	Principal Repayments		Principal Outstanding		Interest Repayments	
Particulars	**01 Jul 2018**	**New Loans**	**Actual**	**Budget**	**Actual**	**Budget**	**Actual**	**Budget**
			$	$	$	$	$	$
Recreation and Culture								
Loan 97 - Community Club	286,063		0	67,233	286,063	218,830	-673	11,019
Economic Services								
Loan 99 - Short Term Accommodation Projec	741,805		14,939	30,112	726,866	711,693	6,031	23,058
Self Supporting Loans								
Loan 98 - Dowerin Events	37,101		12,168	24,534	24,933	12,567	444	1,008
Housing						0		
Loan 101 - Pool		200,000	0		0	200,000		4,600
Loan 100 - Groh housing loan		280,000	0	4,856	0	275,144	-	4,998
	1,064,969	480,000	27,107	126,735	1,037,862	1,418,234	5,802	44,684
							*	
Self Supporting Loan Principal received			12,168					
							Accrual reversal	

Description of Debentures:	Expiry date	
Loan - 97	08.06.22	
Loan - 98	11.11.19	
Loan - 99	04.10.36	
Loan - 100	02.04.38	Loan drawn down in October 2018

(b) New Debentures
The Shire proposes to raise a debenture this financial year for the purposes of GROH House funding and Pool Renewal/Upgrade.

(c) Unspent Debentures

The Shire has no unspent debentures.

(d) Overdraft

Council has an overdraft facility of $60,000 with NAB.

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 10: Grants and Contributions

		Original Annual Budget (a)	YTD Actual Revenue (b)	YTD Variance (a)-(b)
		$	$	$
	General Purpose Funding			
OP	Grants Commission - General Purpose	428,995	223,100	44,350
OP	Grants Commission - Roads	234,903	125,801	(109,103)
	Law, Order and Public Safety			
OP	DFES Grant - Bush Fire Brigade	8,829	0	(8,829)
	Health			0
OP	HACC - Recurrent Grant	220,901	111,575	(109,326)
	Recreation and Culture			
OP	Grant - Youth Week	6,000	0	(6,000)
	Transport			
CAP	Grant - Regional Roads	423,883	221,394	(202,489)
CAP	Roads To Recovery Grant	293,979	0	(293,979)
OP	Main Roads - Direct Grant	72,769	123,506	50,737
OP	Flood Damage - WANDRRA	562,343	221,908	(340,435)
	Economic Services			
OP	Community Events	640	0	(640)
TOTALS		**2,253,242**	**1,027,283**	**(975,714)**
SUMMARY				
OP	Operating	1,535,380	805,889	(479,246)
CAP	Non-operating	717,862	221,394	(496,468)
		2,253,242	**1,027,283**	**(975,714)**

SHIRE OF DOWERIN
NOTES TO THE STATEMENT OF FINANCIAL ACTIVITY
For the Period Ended 30 November 2018

Note 11: Trust Fund

Funds held at balance date over which the Shire has no control and which are not included in this statement are as follows:

Description	Opening Balance 01 Jul 2018	Amount Received	Amount Paid	Closing Balance 30 Nov 2018
	$	$	$	$
Housing Bonds	3,228	0	0	**3,228**
Key Deposits	90	0	0	**90**
Tidy Towns	3,219	0	0	**3,219**
HACC Vehicle	691	0	0	**691**
Building Deposits	0	0	0	**0**
AROC Funds	0	0	0	**0**
HACC Fundraising	2,522	0	0	**2,522**
Recreation Steering Committee	0	0	0	**0**
Centenery Park	2,111	0	0	**2,111**
Nomination Deposits	0	0	0	**0**
Yellow Ribbon	247	0	0	**247**
	12,108	**0**	**0**	**12,108**

Note 12: Capital Acquisitions

Assets	Account	Program	YTD Actual New/Upgrade	YTD Actual Renewal	YTD Actual Total YTD	Budget Original Annual Budget	Budget Current Budget	Budget Current YTD Budget	Budget YTD Variance
			$	$	$	$		$	$
Level of completion indicator (based on expenditure), please see table at the end of this note for further detail.									
Buildings									
Shire Office	0364	Governance		0	0	20,821	20,821	8,675	(8,675)
HACC - Capex - Building Renewal	1605	Health		6,730	6,730	0	0	0	6,730
BUILDINGS - FIRE SHED PAD	0884	Law, Order And Public Saf	0		0	0	0	0	0
SWIM POOL CAPITAL EXPENDITURE	3444	Recreation & Culture		74,607	74,607	232,895	232,895	97,040	(22,433)
WHEATBELT HERITAGE RAIL PROJECT	7144	Economic Services		288	288	0	0	0	288
SHORT TERM ACCOMMODATION	7145	Economic Services	6,128		6,128	83,000	83,000	34,580	(28,452)
GROH Housing	2584	Housing	251,503		251,503	280,000	280,000	116,665	134,838
Buildings Total			**257,631**	**81,626**	**339,257**	**616,716**	**616,716**	**256,960**	**82,297**
Furniture & Office Equip.							0		
FURN - PHOTOCOPIER	374	Governance		0	0	0	0	0	0
FURN - OFFICE EQUIPMENT	0414	Governance		0	0	0	0	0	0
HACC - Capex - Furniture and Equipment	1624	Health		0	0	0	0	0	0
Furntiture & Equipment Total			**0**	**0**	**0**	**0**	**0**	**0**	**0**
Plant , Equip. & Vehicles									
Admin Vehicles	394	Governance		49,016	49,016	52,000	52,000	52,000	(2,984)
HACC - VEHICLE PURCHASE	1604	Health		0	0	0	0	0	0
Plant	6284	Case Tractor		0	0	0	0	0	0
ASSET - TOOLS	6291	Minor tools		28	28	0	0	0	28
PLANT - SKID STEER	6394	Transport		166,500	166,500	170,000	170,000	170,000	(3,500)
PLANT - WORKS VEHICLES	6244	Transport		0	0	120,000	120,000	60,000	(60,000)
PLANT - FINISHING MOWER	6396	Transport		38,500	38,500	50,000	50,000	0	38,500
PLANT - GRADER	6254	Transport		0	0	350,000	350,000	350,000	(350,000)
Plant & EquipmentTotal			**0**	**254,044**	**254,044**	**742,000**	**742,000**	**632,000**	**(377,956)**
Infrastructure - Roads									
ROADS - ROADS TO RECOVERY	4184	Transport		21,385	21,385	574,103	574,103	239,210	(217,825)
ROADS - UNCLASSIFIED	4604	Transport		0	0	0	0	0	0
ROADS - STATE 20/20-REGIONAL ROADS	4884	Transport		333,882	333,882	776,230	776,230	323,425	10,457
ROADS - SIGNS	4194	Transport		0	0	0	0	0	0
Roads Total			**0**	**355,267**	**355,267**	**1,350,333**	**1,350,333**	**562,635**	**(207,368)**
Infrastructure - Footpaths									
FOOTPATH/CYCLEWAYS	6094	Transport		0	0	30,000	30,000	0	0
Infrastructure - Footpaths TOTAL			**0**	**0**	**0**	**30,000**	**30,000**	**0**	**0**
Infrastucture - Other									
Infrastructure Other - Environment	2910	Transport		0	0	0	0	0	0
Infrastructure - other	4195	Transport		0	0	0	0	0	0
Infrastucture -Other Total			**0**	**0**	**0**	**0**	**0**	**0**	**0**
Capital Expenditure Total			**257,735**	**690,936**	**948,671**	**2,739,049**	**2,739,049**	**1,451,595**	**(502,924)**

Level of Completion Indicators

0%
20%
40%
60%
80%
100%
Over 100%

Percentage YTD Actual to Annual Budget
Expenditure over budget highlighted in red.

Susan Fitchat

From: Stratton Jones <Stratton.Jones@nab.com.au>
Sent: Thursday, 6 December 2018 9:03 AM
To: Susan Fitchat
Cc: Elliot Daniel
Subject: New Term Deposit

Hi Sue,

As discussed over the phone this morning, the quoted rate for a new $260,000 Term Deposit in the name of Dowerin Shire is 2.65% over a 3 month term.

Happy to assist with opening the deposit for you, please let me know how you wish to proceed.

Thanks & regards,

Stratton Jones
Agribusiness Analyst
Northam Agribusiness | National Australia Bank Limited
141 Fitzgerald St, Northam WA 6401
Tel: (08) 9690 2502
Stratton.Jones@nab.com.au

Susan Fitchat

From: Money Market Mailbox <MoneyMarket.Mailbox@bendigoadelaide.com.au>
Sent: Thursday, 6 December 2018 8:10 AM
To: Susan Fitchat; Money Market Mailbox
Subject: RE: Quote - 3 months investment

Hi Sue,

Hope you're well..

We can offer 2.60% today for the 3 month TD.
If that works for you please advise all the details and we can get a new one set up.

Regards,

Leon Griffin | Financial Markets
Bendigo and Adelaide Bank Limited
T: 1800 633 511 | F: 03 5485 7661
The Bendigo Centre, PO Box 480, Bendigo, Victoria 3552
Email: Leon.Griffin@bendigoadelaide.com.au

From: Susan Fitchat <sfitchat@dowerin.wa.gov.au>
Sent: Thursday, 6 December 2018 11:04 AM
To: Leon Griffin <Leon.Griffin@bendigoadelaide.com.au>
Subject: Quote - 3 months investment
Importance: High

Hi Leon,
Can we have a quote for 3 months investment.
Regards
Sue

Susan Fitchat
Finance Manager
Shire of Dowerin
PO Box 111
13 Cottrell Street
Dowerin WA 6461

Ph: 08 9631 1202
Fax: 08 9631 1193
Website: www.dowerin.wa.gov.au

Financial Reserves Policy

Policy Owner	Chief Executive Officer
Distribution	Management
Responsible Officer	Chief Executive Officer
Date Adopted	26 June 2018
File Reference	Organisation/Governance/Council Policies/Financial Reserves Policy

Objective

This policy ensures:

a. Responsible financial management of general revenue allocations for specific reserves, as well as tied contributions that have not been utilised in the year of receipt;
b. Council sets aside and maintains funds to meet specific liabilities;
c. There is a clear and shared understanding of the purpose of all Council reserves.

Policy

Council will consider the transfer to and from reserves as part of the annual budget process based on strategic direction as outlined in the Long Term Financial Plan, operational need and budgetary requirements.

3.1 Purpose of reserves

The purpose of reserve accounting includes:

a. to put aside funds in the current year for capital and other purchases to be made in future years. This practice eliminates fluctuations in Council's annual budget for capital and large purchases, and provides more consistency in the level of rates required each year;
b. to ensure responsible management of tied contributions that have not been utilised in the year of receipt.

3.2 Movement of reserves

During the annual budget process Council adopted movement of funds into and out of reserves. These transactions will be informed by the Long Term Financial Plan and this policy.

Financial reserves will be maintained in the following categories:

3.2.1 Leave Reserve

Council will maintain a reserve to cash back the cost of Long Service, Annual and Sick Leave where the leave cannot be absorbed within the annual budget. Given that Council is not expected to have to fund the full liability in any one year, this reserve should aim to maintain cash to the value of 100% of the current liability. This reserve will be maintained on an ongoing basis.

3.2.2 Plant Reserve
Council will maintain a reserve to ensure the cost of additional new plant and refurbishment or replacement can be met as per the Plant Replacement Program. The balance of this reserve will reflect Council adopted Plant Replacement program plus a 10% contingency for unexpected, emergency maintenance that cannot be met within the annual budget. This reserve will be maintained on an ongoing basis.

3.2.3 Sewerage Asset Preservation Reserve
Council will maintain a reserve to provide for the replacement and development of sewerage and stormwater infrastructure throughout the Shire. This reserve will be funded by transferring the net amount of funding remaining from revenue (rates) after expenditure on scheme maintenance. This reserve, including the amount to be maintained in the reserve, will be informed by the Asset Management Plan for this asset. This reserve will be maintained on an ongoing basis.

3.2.4 Land and Building Reserve
Council will maintain a reserve to assist with funding the development and purchase of land and building assets. The purpose of the reserve is to allow Council to take advantage of opportunities such as grants that allow for building developments and/or opportune land sales that have a strategic value. This reserve, including the amount to be maintained in the reserve, will be informed by the Asset Management Plan for this class of assets.

3.2.5 Recreation Facilities Reserve
Council will maintain a reserve to fund future maintenance, upgrades and developments of recreation facilities, including the swimming pool. This reserve will also allow Council to take advantage of grant opportunities as they arise. This reserve, including the amount to be maintained in the reserve, will be informed by the Asset Management Plan for this class of assets.

3.2.6 Community Housing Reserve
Council will maintain a reserve to enable participation in community housing projects such as independent living units for seniors. This reserve will be funded by transferring the net amount of funding remaining from revenue (rental income) after expenditure. This reserve will be reviewed in two years when this policy is reviewed.

3.2.7 Economic Development Reserve
Council will maintain a reserve to fund economic development initiatives. This reserve will allow Council to take advantage of grant funding opportunities as most grant funding programs require a co-contribution of approximately 30% to 50%. Council will consider transferring funds to this reserve based on strategic and operational requirements as part of the annual budget process.

3.2.8 Bowling Green Replacement Reserve
Council will maintain a reserve for the replacement of the Bowling Green. Council and the Bowling Club will each provide matching contributions of $5000. This reserve limit will be capped at the replacement cost of the bowling green.

3.2.9 Tennis Court Replacement Reserve
Council will maintain a reserve for the replacement of the Tennis Courts. Council and the Tennis Club will each provide matching contributions of $3000. This reserve limit will be capped at the replacement cost of the tennis court.

3.2.10 Sporting Club Reserve.
Council will maintain a reserve for the sporting clubs. This fund shall be funded by sporting club fees**.**

Roles and Responsibilities
Chief Executive Officer

Related Documentation
Nil

Related Legislation/Local Law/Policy/Procedure

Local Government Act 1995

Related Delegation

Chief Executive Officer

Review History

27 June 2017 (Item 10.1.1)

26 June 2018 (Item 10.1.8)

Current Leave Liability		
Leave Type	**Total Accrued & Entitled Liability**	**Total Entitled Liability**
Annual Leave	$114,498.16	$52,032.12
Long Service Leave	$65,085.12	$65,085.12
Rostered Days Off	$11,900.48	$11,797.37
Personal Leave	$131,610.97	$63,607.51
TOTAL		**$192,522.12**

Leave Reserve - Recommended Transfers										
For discussion during 2019/20 budget deliberations										
	2018-2019	**2019-2020**	**2020-2021**	**2021-2022**	**2022-2023**	**2023-2024**	**2024-2025**	**2025-2026**	**2026-2027**	**2027-2028**
Opening Balance	54,000	55,109	71,762	88,915	106,583	124,780	143,523	162,829	182,714	203,195
Interest	1,109	1,653	2,153	2,667	3,197	3,743	4,306	4,885	5,481	6,096
Transfers in		15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Transfers Out										
Closing Balance	55,109	71,762	88,915	106,583	124,780	143,523	162,829	182,714	203,195	224,291

Dowerin Australia Day Honours Committee
2018 Meeting
Council Chambers
Tuesday 27 November 2018 at 2.00pm

1. WELCOME, ATTENDANCES AND APOLOGIES

Opened at: 2.12pm
Present: Cr Darrel Hudson, Shire President
Cr Julie Chatfield
Cr Bev Ward
Rebecca McCall, Chief Executice Officer

2. CONFIRMATION OF PREVIOUS MINUTES

Nil

3. BUSINESS ARISING FROM MINUTES

Nil

4. AWARD NOMINATIONS

Using the Australia Day Councl of WA Selection Guide Toolkit, the Selection Panel assessed each nomination to determine eligibility and rated against a board selection criteria

4.1 COMMUNITY CITIZEN OF THE YEAR

- Five nominations received for rating
- One nomination deemed ineligible

The highest rated nominee determined the recipient of the the 2019 Citizen of the Year to be awarded to XXX (To be announced on 26th January 2019 at the Australia Day Breakfast). **Name to be added to minutes after this date.

4.2 SENIOR COMMUNITY CITIZEN OF THE YEAR (65 YEARS & OVER)

No nominations received

4.3 YOUNG COMMUNITY CITIZEN OF THE YEAR (UNDER 25 YEARS)

No nominations received

4.4 ACTIVE CITIZEN AWARD (COMMUNITY GROUP OR EVENT)

No nominations received

5. Next Meeting

To be determined

6. Meeting Closure

Closed at: 2.45pm

Shire of Dowerin

Finance Committee Meeting Minutes

12 December 2018

Committee Members

Cr D.P. Hudson
Cr R.I Trepp
Cr. B.N. Walsh

Staff

Ms R McCall, Chief Executive Officer
Ms S Fitchat, Finance Manager
Mr G Brigg, Works and Asset Manager

Apology

Nil

SHIRE OF DOWERIN
MINUTES OF THE FINANCE COMMITTEE MEETING HELD ON 12 DECEMBER 2018 at 9 AM
TABLE OF CONTENTS

Contents

1. DECLARATION OF OPENING

The Chair, Cr R Trepp opened the meeting at 2.58 pm.

2. ATTENDANCE

Members

Cr R.I Trepp, Chair
Cr D.P. Hudson
Cr. B.N. Walsh

Staff

Ms R McCall, Chief Executive Officer
Ms S Fitchat, Finance Manager
Mr G Brigg, Works and Asset Manager

3. DISCLOSURE OF INTEREST

Nil.

IMPORTANT: Committee members to complete a "Disclosure of Interest" form for each item on the agenda in which they wish to disclose a financial/proximity/impartiality interest. They should give the form to the Presiding Member before the meeting commences. After the meeting, the form is to be forwarded to the Administration Office for inclusion in the Corporate Financial Disclosures Register.

4. CONFIRMATION OF MINUTES

OFFICER RECOMMENDATION – ITEM 4.1

THAT THE MINUTES OF THE FINANCE COMMITTEE MEETING HELD ON 19TH NOVEMBER 2018 BE CONFIRMED AS A TRUE AND CORRECT RECORD OF PROCEEDINGS.

COMMITTEE RECOMMENDATION – ITEM 4.1

MOVED: CR D HUDSON ***SECONDED: CR B WALSH***

THAT THE MINUTES OF THE FINANCE COMMITTEE MEETING HELD ON 15 OCTOBER 2018 BE CONFIRMED AS A TRUE AND CORRECT RECORD OF PROCEEDINGS.

CARRIED 3/0

5. PRESENTATIONS

Nil

5.1 STANDING ITEM – BUSINESS ARISING FROM PREVIOUS MEETING/S

Date: 19 November 2018
File Ref: Organisation/Governance/Committees
Disclosure of Interest: Nil
Author: Susan Fitchat, Finance Manager
Attachments: Nil

Summary

This report provides an update on business arising from previous Finance Committee meetings.

Background

At the Finance Committee Meeting on the 19 November 2018, the Finance Committee followed up on:

Payments:

1. Outstanding Payments

   The balance outstanding for the tenant arrears as at the end of November is $5,043. Payments have not received. The Shire has tried on several occasions to liaise with the tenant to determine a satisfactory outcome. It is also known that the tenants have commenced vacating the property.

   Moving forward the CEO will manage this matter.

2. Financial Statements Cash Flow Forecast

   The Committee requested a cashflow projection graph of the estimated funding position for the whole of 2018-2019 to be inserted into the Monthly Financial Report. This has been included in Note 3.

   The Information Summary graphs include additional graphs to track income and expenditure.

3. Trust Fund Account

   The review and consideration of the closure of obsolete trust fund accounts shall be assessed within the requirements of the Local Government (Financial Management) Regulations 1996 and the Local Government Act 1995.

   The response obtain from the WALGA Governance Advisor is as follows:

6.9. Trust fund
(1) A local government is to hold in the trust fund all money or the value of assets —
(a) that are required by this Act or any other written law to be credited to that fund; and
(b) held by the local government in trust.
(2) Money or other property held in the trust fund is to be applied for the purposes of, and in accordance with, the trusts affecting it.
(3) Where money or other property is held in the trust fund, the local government is to —
(a) in the case of money, pay it to the person entitled to it together with, if the money has been invested, any interest earned from that investment;
(b) in the case of property, deliver it to the person entitled to it.
(4) Where money has been held in the trust fund for 10 years it may be transferred by the local government to the municipal fund but the local government is required to repay the money, together with any interest earned from its investment, from that fund to a person claiming and establishing a right to the repayment.

While there is no specific section dealing with the closure of a trust account, it would be advised to prepare a report to Council that it is recommended that an obsolete account be closed, that the funds if any are to be transferred to the consolidated trust account of the local government and that it is in accordance with the legislation.

A thorough investigation of the account must be undertaken prior to closure of the account by Council. What was the purpose of the account, why is it no longer required, what were the funds used for, what are the financial implications if any in closing the account, should be discussed. The account may have been opened under Section 522 of the Local Government Act 1960 if it was established prior to 1995."

Response from Management:

Management shall investigate the historic information in relation to the trust funds and put forward a recommendation in 2019 to Council to consider for approval.

Consultation

Chief Executive Officer

Financial Implications

Nil

Risk

The item ensures that recommendations arising from Finance Committee meetings are considered and actioned and updates provided to the Committee.

Policy Implications

Nil

Statutory Implications

Nil

Strategic Implications

Strategic Community Plan - Theme 4 – Local Government Leadership

OFFICER RECOMMENDATION – ITEM 5.1

THAT THE FINANCE COMMITTEE NOTES THE PROGRESS ON ACTIONS AND RECOMMENDATIONS ARISING FROM PREVIOUS MEETING/S.

COMMITTEE RECOMMENDATION – ITEM 5.1

MOVED: CR R TREP ***SECONDED: CR D HUDSON***

THAT COUNCIL NOTES THE PROGRESS ON ACTIONS AND RECOMMENDATIONS ARISING FROM PREVIOUS MEETING/S.

CARRIED 3/0

6. FINANCE REPORT

6.1 FINANCIAL ACTIVITY STATEMENTS – NOVEMBER 2018

Date:	12 December 2018
Applicant:	Shire of Dowerin
File Ref:	Organisation/Financial/Management/Reporting/Financial Statements
Disclosure of Interest:	Nil
Author:	Susan Fitchat, Finance Manager
Senior Officer:	Rebecca McCall, Chief Executive Officer
Attachments:	1. Monthly Financial Activity Statements-November2018

Summary

The Statement of Financial Activity, which includes Detailed Schedules, Statement of Financial Position, Current Ratios and Investment Register for the period ending 30th November 2018 are presented for the Finance Committee to review.

Please note, that the figures are actual at the time of reporting, and the depreciation year to date figures are in the reports as the financial year 2017-2018 audit has been finalised.

Background

Section 6.4 of the *Local Government Act* 1995 requires a Local Government to prepare financial reports.

The *Local Government (Financial Management) Regulations* 34 & 35 set out the form and content of the financial reports which have been prepared for the periods as above and are presented to Council for approval.

Comment

In order to fulfil statutory reporting requirements, and to provide the Council with a synopsis of the Shire's overall financial performance on a year to date basis, the following financial reports are attached.

- Statements of Financial Activity – Statutory Reports by Program and Nature or Type
  The Statements of Financial Activity provide details of the Shire's operating revenues and expenditures on a year to date basis. The reports further include details of non-cash adjustments and capital revenues and expenditures, to identify the Shire's net current position; which reconciles with associated Net Current Position note (Note 3).
- Capital Acquisitions
  This report provides year to date budget performance in respect of the following capital expenditure activities and their funding sources. Individual project information can be found at Note 12.
- Note 1 – Significant Accounting Policies
  This note provides details of the accounting policies relating to the Shire's accounts.
- Note 2 - Explanation of Material Variances

Council adopted (in conjunction with the Annual Budget) a material reporting variance threshold of 5% or $5,000, whichever is the greater. This note explains the reasons for any material variances identified in the Statements of Financial Activity at the end of the reporting period.

- Note 3 - Net Current Funding Position - Statutory Requirement

This note provides details of the composition of the net current asset position on a year to date basis and reconciles with the closing funding position as per the Statement of Financial Activity.

- Note 4 – Cash and Investments

This note provides Council with the details of the actual amounts in the Shire's bank accounts and/or Investment accounts as at reporting date.

- Note 5 – Budget Amendments

This note provides council with a list of all budget amendments to date.

- Note 6 – Receivables

This note provides Council with the sundry debtors outstanding as at reporting date.

- Note 7 - Cash Backed Reserves

This note provides summary details of transfers to and from reserve funds, and associated interest earnings on reserve funds, on a year to date basis.

- Note 8 – Rating Information

This note provides details of rates levied during the year.

- Note 9 – Information on Borrowings

This note shows the Shire's current debt position and lists all borrowings.

- Note 10 – Grants and Contributions received

This note is being redeveloped and will be provided as soon as possible.

- Note 11 – Trust Funds

This note shows the balance of funds held by the Shire in its Trust Fund on behalf of another person/entity.

- Note 12 – Capital Acquisitions

This note details the capital expenditure program for the year.

Consultation

At the Finance Committee meeting on 12th December 2018, the following was considered in relation to the financial statements.

1. Note 2: Explanation of Material variances

   Variances in the program Other Property and Services will require more detail before presentation to Council. The current variance is mainly attributed to the under-recovery of the plant and labour costs. This will be addressed during the Budget Review.

2. Note 3: Net Current Funding Position:
   Includes the tracking of the cash flow projection for the rest of the financial year in the liquidity graph. Additional graphs have been created for projection information purposes.

3. Note 11: Trust Funds
   The review and closure of obsolete trust funds accounts shall be assessed within the requirements of the Local Government (Financial Management) Regulations 1996 and the Local Government Act 1995. It is anticipated that this shall be completed by February 2019.

4. Note 12: Capital Assets
   1 vehicle has been traded in and a new utility vehicle purchased in December 2018.

5. Note 10: Grants and Contributions
   A column to be inserted to present the YTD Budget compared to the YTD Actual.
   Currently it is the whole annual budget compared to YTD Actual.
   The capital road expenditure shall be revised during the budget review.

Financial Implications

The budgeted opening funding surplus as per the Budget adopted on 21 August 2018 presents a $1,492,612 (Rate Setting Statement).

Risk Implications

Timely preparation of the monthly financial statements within statutory guidelines is vital to good financial management. Failure to submit compliant reports within statutory time limits will lead to non-compliance with the *Local Government Act 1995* and the *Local Government (Financial Management) Regulations 1996*.

Policy Implications

The Shire of Dowerin has a comprehensive suite of financial management policies. Finances have been managed in accordance with these policies.

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Simple Majority will be required at the Ordinary Meeting of Council.

Statutory Implications

Council is required to adopt monthly statements of financial activity to comply with Regulation 34(1) of the *Local Government (Financial Management) Regulations 1996*. The FMR r. 34(4) allows for the Statements to be presented to Council at an Ordinary Meeting of Council within 2 months after the end of the month to which the statements relate, therefore by presenting the financial statements in November, the Shire of Dowerin compiles with statutory obligations.

OFFICER RECOMMENDATION – ITEM 6.1

THAT THE FINANCE COMMITTEE RECEIVES THE STATUTORY FINANCIAL ACTIVITY STATEMENT REPORTS FOR THE PERIOD ENDING 30 NOVEMBER 2018 PURSUANT TO REGULATION 34(4) OF THE LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATIONS 1996.

COMMITTEE RECOMMENDATION – ITEM 6.1

MOVED: CR B WALSH ***SECONDED: CR R TREPP***

THAT THE COUNCIL RECEIVES THE STATUTORY FINANCIAL ACTIVITY STATEMENT REPORTS FOR THE PERIOD ENDING 30 NOVEMBER 2018 PURSUANT TO REGULATION 34(4) OF THE LOCAL GOVERNMENT (FINANCIAL MANAGEMENT) REGULATIONS 1996.

CARRIED 3/0

6.2 ACCOUNTS FOR PAYMENT – 1 to 30 NOVEMBER 2018

Date:	12 December 2018
Applicant:	Shire of Dowerin
File Ref:	Organisation/Financial Management/Reporting/Financial Statements/2018-2019 Monthly Payment List
Disclosure of Interest:	Nil
Author:	Kathleen Brigg – Finance Officer
Senior Officer:	Susan Fitchat – Finance Manager
Attachments:	2. List of accounts for November 2018 3. Credit Card Statement for November 2018 (tabled)

Background

The attached schedules of cheques drawn and electronic payments that have been raised under delegated authority during the month since the last Council Meeting are presented to Council to be received.

Comment

The list as presented has been reviewed by the Finance Manager and Chief Executive Officer.
The ending sequence number for October were as follows:

Cheque: 10581
EFT: 6290

The beginning sequence number for November were as follows:

Cheque: 10582
EFT: 6291

The credit card statement with supporting invoices was reviewed by the Finance Committee.

Consultation

At the Finance Committee meeting on 12th December 2018, the Finance Committee checked the sequencing of the payments and enquired about the following payments and contras:

- The Telstra accounts should be reviewed to investigate the cost of alternative provision of service.
- Fire Brigade expenditure are contras as they are subsidized by an operational grant funding from the Department of Fire and Emergency Services. The payment list has been updated accordingly.
- EFT6383: JS Roadside Products Pty Ltd - $16,967.50.
  Response: This is for the purchase of 500 roadside guideposts and the labour hire cost of the driver to install the posts.

Statutory Implications

Regulation 12 & 13 of the *Local Government (Financial Management) Regulations 1996* requires that a separate list be prepared each month for adoption by Council showing:

- Creditors paid under delegated authority from Council.

Policy Implications

The Shire of Dowerin has a comprehensive suite of financial management policies. Finances have been managed in accordance with these policies. Payments have been made under delegation.

Financial Implications

Funds expended are in accordance with Council's adopted budget for the 2018-19 financial year.

Risk Implications

Council would not be contravening to the *Local Government Act 1995* and *Local Government (Financial Management) Regulations 1996* if this item was not presented to Council.

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Simple Majority will be required at the Ordinary Meeting of Council.

OFFICER RECOMMENDATION – ITEM 6.2

THAT THE FINANCE COMMITTEE RECOMMEND THAT COUNCIL RECEIVE THE REPORT FROM THE CHIEF EXECUTIVE OFFICER ON THE EXERCISE OF DELEGATED AUTHORITY IN RELATION TO CREDITOR PAYMENTS FROM THE MUNICIPAL FUND FOR THE PERIOD 1 NOVEMBER 2018 TO 30 NOVEMBER 2018 AS PER THE ATTACHED SCHEDULE CHEQUE PAYMENTS 10582 TO 10597, AND EFT 6291 TO EFT 6398.

COMMITTEE RECOMMENDATION – ITEM 6.2

MOVED: CR B WALSH ***SECONDED: CR D HUDSON***

THAT THAT THE COUNCIL RECEIVE THE REPORT FROM THE ACTING CHIEF EXECUTIVE OFFICER ON THE EXERCISE OF DELEGATED AUTHORITY IN RELATION TO CREDITOR PAYMENTS FROM THE MUNICIPAL FUND FOR THE PERIOD 1 NOVEMBER 2018 TO 30 NOVEMBER 2018.

CARRIED 3/0

6.3 TERM INVESTMENT

Date:	12 December 2018
File Ref:	Organisation/Financial Management/Investments
Disclosure of Interest:	Nil
Author:	Susan Fitchat, Finance Manager
Senior Officer:	Rebecca McCall, Chief Executive Officer
Attachments:	3. Interest Quotes

Background

The Shire investment for plant replacement was released in November, however the purchase of the grader is anticipated to be postponed to February/March 2019.

- $266,625 term deposit invested with Bendigo on 15th November
- $268,334 is the amount to be invested with interest earned.

Comment

In accordance with Council policy, officers have invited two local banks, NAB and Bendigo to provide the Shire with their term deposit rates. See attachment for responses.

As the funds are required for the replacement of the grader which is anticipated to be purchased by March 2019, a term deposit for 3 months is recommended.

The interest rates quoted are disclosed below;

Term/Period	National Australia Bank Ltd	Bendigo and Adelaide Bank Ltd
3 months	2.65%	2.60%

It is recommended to re-invest the term deposit with National Australia Bank.

Financial Implications

An investment of $268,334 provides a return of approximately $1,777 for 3 months (based on a rate of 2.65%).

Risk Implications

Term deposits with banks are considered low risk. However, there are risks inherent in any investment. Changes to the rates can have a positive or negative impact on returns. Another risk to consider is that the Shire is one of the larger customers and a decision by the Shire to invest in either bank will impact on the other.

Consultation

Susan Fitchat, Finance Manager

Policy Implications

Council adopted the Shire of Dowerin Investment Policy at the Ordinary Meeting of Council on 27 June 2017. This matter has been considered in the context of that Council policy.

Statutory Implications

As outlined in the *Local Government Act 1995* and *Local Government (Financial Management) Regulations 1996.*

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Simple Majority is required is required for this recommendation.

Policy Implications

Nil

Statutory Implications

The *Local Government Act 1995*, Section 6.4 (2)(b).

Strategic Implications

Strategic Community Plan - Theme 4 – Our Leaders – Outcome 3 - Reference L5

Voting Requirements

Absolute Majority is required is required for this recommendation.

OFFICER RECOMMENDATION – ITEM 6.3

THAT THE FINANCE COMMITTEE RECOMMEND THAT COUNCIL INVEST THE FUNDS OF $268,334 INCLUDING INTEREST WITH NATIONAL AUSTRALIA BANK FOR A TERM OF 3 MONTHS

COMMITTEE RECOMMENDATION – ITEM 6.3

MOVED: CR B WALSH SECONDED: CR D HUDSON

THAT THE COUNCIL INVEST THE FUNDS OF $268,334 INCLUDING INTEREST WITH NATIONAL AUSTRALIA BANK FOR A TERM OF 3 MONTHS

CARRIED 3/0

6.4 FINANCIAL RESERVES POLICY FOR REVIEW

Date:	7 December 2018
File Ref:	Organisation/Governance/Council Policies
Disclosure of Interest:	Nil
Author:	Susan Fitchat, Finance Manager and
Senior Officer:	Rebecca McCall, Chief Executive Officer
Attachments:	4. Financial Reserves Policy

Background

As part of the preparation for the review of the budget, the attached policy has been updated to incorporate recommendations by a local government consultant. The policy should ensure that the Shire has adequate reserves and to aim to have adequate cash balances for employee leave provisions and to sustain plant purchases as per the adopted Budget and Long-Term Financial Plan.

- Financial Reserves Policy

  The following amendment have been made;

  i. Long Service Leave Reserve has been amended to Leave Reserve and incorporates all current leave that cannot be absorbed within the annual budget. 80% cash value has been increased to 100%.
  ii. Plant Replacement Reserve has been amended to Plant Reserve, and incorporates the cost of new additional plant, replacement and refurbishment.

A leave management policy will be drafted in the new calendar year to assist with the monitoring of due leave entitlement balances.

Comment

The policy has been reviewed by the management team.

Financial Implications

Funds expended are in accordance with Council's policy

Risk Implications

Nil

Consultant

Darren Friend, Financial Consultant

Policy Implications

Updated and to replace current policy once reviewed.

Statutory Implications

Section 6.11 (2) of the *Local Government Act 1995* requires that before a Local Government*:*

a. Change the purpose of a reserve account; or
b. Use the money in a reserve account for another purpose

It must give one month's notice of the proposed change of purpose of use.

Strategic Implications

Nil

Voting Requirements

Simple Majority will be required at the Ordinary Meeting of Council.

OFFICER RECOMMENDATION – ITEM 6.4

THAT THE FINANCE COMMITTEE RECOMMEND TO COUNCIL TO ADOPT AND ADVERTISE THE REVISED FINANCIAL RESERVES POLICY.

COMMITTEE RECOMMENDATION – ITEM 6.4

MOVED: CR R TREPP SECONDED: CR B WALSH

THAT THE COUNCIL ADOPT AND ADVERTISE THE REVISED FINANCIAL RESERVES POLICY.

CARRIED 3/0

7. QUESTIONS FROM MEMBERS

Nil

8. URGENT BUSINESS

Nil

9. DATE OF NEXT MEETING

Date: 14 January 2019

10. CLOSURE OF MEETING

The presiding member closed the meeting at 10.13 am.