



INTEGRATED MANAGEMENT SYSTEM

Thabeban Wastewater Treatment Plant Recycled Water Management Plan

Management Plan: MP-4-003

Revision Number: 2

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SUPPLIER'S RECYCLED WATER MANAGEMENT PLAN

January 2014

at

THABEBAN WASTEWATER TREATMENT PLANT
EFFLUENT REUSE SCHEME

Scheme Reference Number: 00050

Lot 1 RP175012 and Lot 5 on RP194419

Three Chain Road, Thabeban Q 4670

by

BUNDABERG REGIONAL COUNCIL

Contacts:

Primary

Brett Kronk or Bronwyn Edwards
Technical Officers

Secondary

Jeff Rohdman
Manager – Water & Wastewater Process Operations

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ENDORSEMENT OF PLAN

Recycled Water Provider:	BUNDABERG REGIONAL COUNCIL
Recycled Water Provider Registered Number:	
Name of Scheme:	THABEBAN WASTEWATER TREATMENT PLANT EFFLUENT REUSE
This Recycled Water Management Plan for Thabeban Wastewater Treatment Plant Effluent Reuse has been endorsed by me:	<p>.....</p> <p>[Tom McLaughlin] Group Manager – Water and Wastewater</p>  <p>Signature:</p>
	<p>Date:</p>
Nominated Contact Details:	<p>Bundaberg Regional Council Water & Wastewater Process Operations PO Box 3130 Bundaberg Q 4670 Telephone: 1300 883 699 Fax: 07 4150 5410 Email: ceo@bundaberg.qld.gov.au</p>

1. INTRODUCTION

Bundaberg Regional Council (BRC) (recycled water supplier) owns and operates the Thabeban Wastewater Treatment Plant (WWTP) located at Three Chain Road , Thabeban, Queensland on land described as Lot 5 on RP194419 and Lot 1 on RP175012. Treated effluent from the Thabeban WWTP is supplied to a neighbouring property located at 4496 Goodwood Road, Bundaberg and described as [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] (Figure 1). The property is owned by [REDACTED] (recycled water user) for irrigating the following crops:



BRC also supplies recycled water to two (2) additional users for the irrigation of processed food crops.

BRC is required under Section 201 of the *Water Supply (Safety and Reliability) Act 2008* (the Act) to prepare a Recycled Water Management Plan (RWMP) to manage the production and supply of treated effluent.

2. BACKGROUND

Prior to Queensland local authority amalgamations in March 2008, Thabeban WWTP was owned and operated by the former Bundaberg City Council under Integrated Authority CM0334, effective from 8 March 2004. Bundaberg City Council was amalgamated with the former Burnett Shire Council, Isis Shire Council and Kolan Shire to become the Bundaberg Regional Council.

Bundaberg Regional Council has constructed a new WWTP to service the Thabeban WWTP catchment. This new WWTP is authorised under Environmental Authority EPPR02577614 (ERA 63 (1d)). The new WWTP will produce a more reliable higher quality effluent than the previous WWTP.

Bundaberg Regional Council commenced diverting flow to the new Thabeban WWTP on 8 December 2014. Bundaberg Regional Council has received a Process Operations Manual and an Equipment Operations and Maintenance Manual to assist with the operations of the Thabeban Wastewater Treatment Plant,

3. RECYCLED WATER POLICY STATEMENT

The BRC [Recycled Water Policy Statement](#) is attached as *Appendix 1*.

4. RISK MANAGEMENT METHOD

BRC's risk management process utilises the principles of AS/ISO 31000:2009 *Risk Management*.

The risk management process has been documented and is retained in BRC's Integrated Management System (IMS).

5. RISK MANAGEMENT TEAM

The personnel responsible for the risk assessment process and ongoing review are identified in *Table 1* below.

Table 1 Risk Management Team.

Name / Qualifications / Role	Completed Training of Risk Assessment Process
Mr Jeff Rohdman Manager Water and Wastewater Process Operations Qualifications: AD. App. CHEM, BSC (ENV), Grad. Cert. Process ENG, Grad.Dip. Process MNGT, MRACI CChem Role: Risk Assessment Team Coordinator	Yes
Mr Brett Kronk Environmental Technical Officer Qualifications: BSC (ENV) Role: Risk Assessment Team Coordinator	Yes
Ms Bronwyn Edwards Technical Officer Qualifications: BAppSc (Env.R.Mgt) Role: Risk Assessment Team Member	Yes
Ms Michele Flick Senior Chemist Qualifications: AD. App. CHEM, B. APP. SC. (Food Science) MRACICCHEM Role: Risk Assessment Team Member	Yes
Mr David Holloway Coastal Treatment Coordinator – Water & Wastewater Qualifications: Diploma in Water Operations Role: Risk Assessment Team Member	Yes
Mr Keith Nicolle Thabeban Wastewater Treatment Plant Operator Qualifications: CERT III in Water & Wastewater Operations Role: Risk Assessment Team Member	Yes

All members of the risk management team will receive training relating to the processes and procedures which will be implemented at the Thabeban WWTP. This training detailed the responsibilities of each member of the risk management team and the role they play in the correct management of the Thabeban Recycled Water Scheme.

6. SCHEME DESCRIPTION

6.1. Treatment Process

Treatment of wastewater is achieved using an extended aeration activated sludge process. Raw sewerage arrives at the inlet at an average on 10.5L/s. All flow received is passed through the band screen where screenings are removed, these screenings are washed, dewatered and discharged into a screening bin. Flow is then passed through a grit removal chamber where grit is removed and discharged to the grit bin. Flow which passes through the grit chamber continues to the Anaerobic Chamber then to the Bioreactor.

Biological treatment occurs in the Bioreactor in the form of mixed liquor, this mixed liquor is continuously cycled to achieve desired levels of Nitrification, Denitrification, Enhanced Biological Phosphorus removal and Biological oxidation. Following treatment, flow is cycled to the one of two secondary sedimentation tanks for gravity settling. Treated effluent flows over the launders of the secondary sedimentation tanks to the Chlorine Contact Tank. The Return Activated Sludge (RAS) is returned to the Anaerobic Tank for further treatment.

Waste Activated Sludge from the oxidation ditch is distributed to the Gravity Drainage Deck (GDD), following the GDD the sludge is distributed to the Aerobic Digester for further stabilisation. Following stabilisation, sludge is transferred to the belt filter press for dewatering, following dewatering sludge is stockpiled onsite awaiting distribution to a beneficial reuse site

Disinfection of the final effluent product is undertaken within the chlorine contact tank, the effluent is then gravity fed to storage lagoons. The [Thabeban WWTP Process Flow Diagram](#) (PFD) is contained in *Appendix 2*.

The Thabeban WWTP is staffed by BRC personnel Monday to Friday, while on weekends (and public holidays) critical operations are overseen via SCADA.

6.2. WWTP Catchment

The source water (refer *Section 6.4* for characterisation) destined for treatment and subsequent reuse is derived from the sewered areas of the suburb of Thabeban and part of the suburb of Avenell Heights. The majority of the wastewater is generated in domestic premises with a minor contribution from commercial establishments consisting of light industrial (ie motor vehicle workshops and food premises). There is no major industrial or agricultural discharge to the WWTP. All commercial premises must comply with the provisions of a Trade Waste Approval from Council. This approval sets trade waste discharge quality and quality limits to protect Council sewer infrastructure and downstream treatment processes. Since May 2012, all new trade waste approvals are required to have a compliant pre-treatment device which is inspected by Council. These pre-treatment devices are conditioned by Council under [Trade Waste Policy](#) (*Appendix 14*). Any existing approvals prior to May 2012 are monitored as required and a new approval is required if a business changes ownership.

6.3. Point of Supply

The treated effluent is transported via an underground gravity main (dia. 450 mm) directly from the Chlorine Contact Tank to 2 (two) storage lagoons located on the Thabeban WWTP grounds. Treated effluent is then pumped from the effluent storage lagoons via 200mm main to the on farm storage. The point of supply is shown in *Appendix 2* – [Thabeban WWTP Schematic Layout](#), this is the point where the monitoring of recycled water is completed.

The transfer of responsibility has been designated in the Third Party Agreement (*Appendix 3*) as the delivery point of the recycled water product. The delivery point can be described as the designated point of the boundary between Lot 1 on RP175012 and Lease A on SP203492.

The impoundment contains water taken from the irrigation scheme, water extracted from Yellow Waterholes Creek and the treated effluent. The resulting mix of waters is pumped directly into the irrigation reticulation system. Only minimal rainfall/runoff will be captured by the storage. Council has approval under Environmental Authority EPPR02577614 to release treated effluent to Yellow Waterholes Creek. Council also has the ability to divert the flow of treated effluent to existing on site irrigation sprays for land disposal. Release of treated effluent to Yellow Waterholes Creek or to land irrigation is considered not to cause any nuisance to downstream land holders. Land irrigation is the preferred disposal method if reuse is unavailable.

6.4. Source Water Characterisation

Daily influent volumes range from 0.5ML to 10.0ML, the influent volume can have significant variation due to high rainfall levels. The new Thabeban WWTP has been designed to treat a flow of 2.0ML ADWF with the capacity to treat up to 5 x ADWF (9.9ML), this will minimise the impact on final effluent quality during rainfall events.

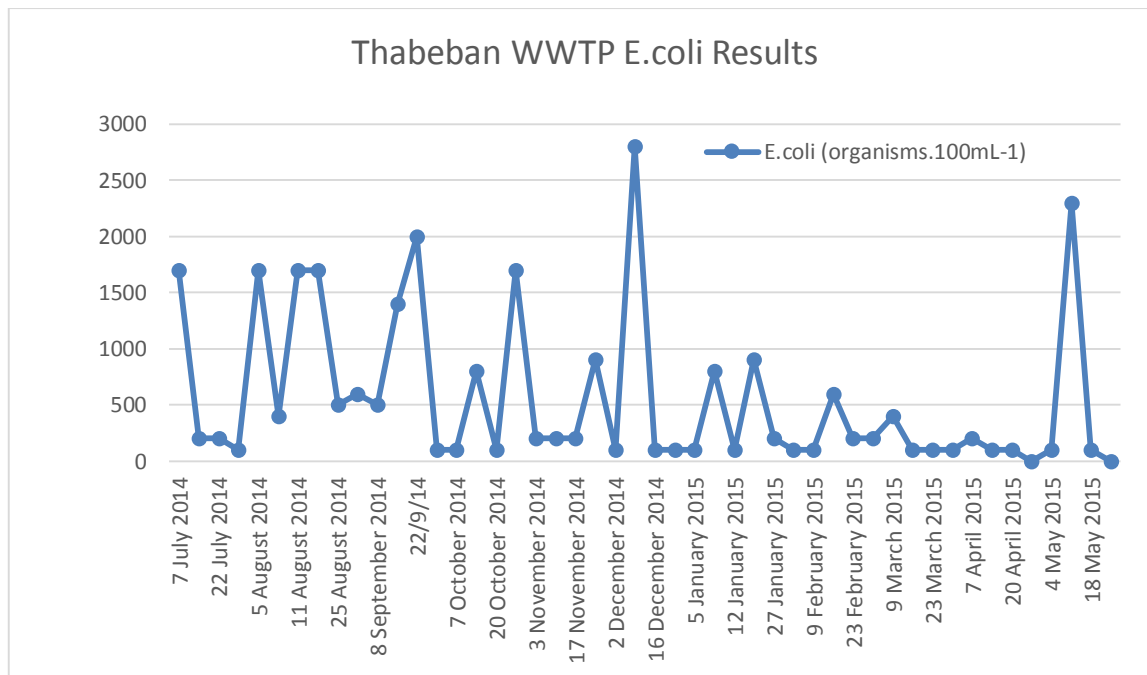
6.5. Recycled Water Product

Class C recycled water is to be supplied for the purposes of irrigating chilli's, peas (ie minimally processed food crops, *Public Health Regulation 2005*, Schedule 3E) and sugar cane.

Class C recycled water is defined in Schedule 3D of the *Public Health Regulation 2005* as having an annual value for *E. Coli* of less than 1000 cfu/100mL in 95% of samples collected on a weekly basis over a twelve (12) month period. Schedule 3E of the *Public Health Regulation 2005* designates Class C recycled water as being suitable for irrigation of the minimally proposed food crops, provided the application method is via sub-surface irrigation. Monitoring results have indicated that the recycled water product has met the quality requirements for class C recycled. Monitoring results for the Thabeban WWTP since the new WWTP has become online on 8 December 2014 provide an indication of the quality of the recycled water product that is supplied, [Appendix 4](#).

Please refer to Figure 4 for a summary of the results between July 2014 and May 2015. BRC acknowledges there has been previous concerns with the faecal spikes experienced; these spikes can be attributed to the susceptibility of the effluent storage lagoon to wildlife and hydraulic overload of the former WWTP. It can be seen in the below information the reliability of the effluent product has significantly improved since the development of the new Thabeban WWTP.

Figure 4 - Faecal Coliform Results from July 2014 to May 2015 (Effluent Storage Lagoon)



Monitoring and sampling of the recycled water previously occurred in the effluent storage lagoon and from the maturation pond. From the 8 December 2014 E.coli is now tested at two points; a sample point at the chlorine contact chamber (Sample Point A) and also a sample point at the storage lagoon (Sample Point B) which has a 7 day nominal storage capacity. Please refer to [Appendix 11](#) for process flow chart on the corrective actions to be taken in the event of an E.coli exceedance.

Before water is taken out of the effluent storage lagoons Council will confirm that the water is suitable for reuse purposes. During periods where recycled water is unable to reused, BRC will divert flow to on site disposal or allow for release to environment. There will be no supply of water to farmers when E.coli levels in the storage lagoon exceeds 10000 cfu/100ml. Distribution to the recycled water user will only resume when the water quality in the effluent storage lagoons is again compliant with Class C Recycled Water under *Public Health Regulation 2005*.

6.6. End Users

[REDACTED]

[REDACTED] will require water 12 months of the year due to the rotation of crops. There is no foreseen requirement for seasonal shutdowns or stoppages. Sub-surface irrigation of crops is conducted by laying trickle tape under black or white plastic mulch.

Council is in regular communication with the recycled water user regarding the use of recycled water. This communication generally relates to quality of recycled water, volumes taken and times which the water is

extracted. [REDACTED]

Supply of recycled water is in accordance with a Recycled Water Third Party Agreement commencing on 1 June 2013 for a period of five (5) years with the option to extend for an additional five 5 (five) years. The agreement documents the responsibilities and commitment of the BRC to supply and [REDACTED] use the recycled water from the Thabeban WWTP. A copy of the agreement is provided in *Appendix 3*.

6.7. Operating Environment

The scheme is owned and overseen by BRC. The WWTP is operated by BRC staff within the Water & Wastewater Process Operations division. No changes are proposed to this operating environment in the foreseeable future.

7. HAZARD IDENTIFICATION, RISK ASSESSMENT & CONTROL MEASURES

Risk assessment for the Thabeban WWTP has been documented in BRC's Integrated Management System (IMS) and can be considered as an AS/ISO 31000:2009-style risk management system. The risk assessment identified various scheme components which may cause a risk to public health if a hazardous event occurs. These risk assessments provides the risk level before and after preventative measures have been adopted. The threshold for an acceptable risk is a residual risk score of equal to or less than 40. Any residual risk score greater than 40 will require further action or controls. The completed Thabeban Recycled Water Scheme - Public Health Risk Matrix and Public Health Risk Score are contained in [Appendix 5](#).

8. CRITICAL CONTROL POINTS, CRITICAL LIMITS & ALERT LEVELS

Table 4 Critical Control Points, Critical Limits & Alert Levels for Production of Class C Quality Effluent.

Workstation	Source of hazard	CCP or QCP	Monitoring	Critical Operating Limits	Alert Limit(s)	Corrective Action & Process Operations Manual Section	Responsible Party
Oxidation Ditch	Poor Treatment (Ineffective Biology)	QCP - MLSS	Grab Sample Daily	MLSS - <800mg/L or >1500mg/L	MLSS – Operating Range 1000mg/L – 1500mg/L	Section 3.1.11 (Process Operations Manual)	Plant Operator
Clarifier	Poor Treatment (Ineffective Biology)	QCP – Suspended Solids	Grab Sample (Daily)	Suspended Solids – >15 mg/L	Suspended Solids – >10 mg/L	Section 3.3.4 (Process Operations Manual)	Plant Operator
Clarifier	Poor Treatment (Ineffective Biology)	QCP - Ammonia	Grab Sample Daily	Ammonia – > 1.0 mg/L	Ammonia – > 0.5 mg/L	Section 3.1.5 (Process Operations Manual)	Plant Operator
Chlorine Contact Tank	Poor Treatment (Ineffective Biology)	QCP – Suspended Solids	Grab Sample (Daily)	Suspended Solids – >15	Suspended Solids – >10 mg/L	Section 4.4 (Process Operations Manual)	Plant Operator
Chlorine Contact Tank	Non-compliant effluent	CCP – Free Chlorine Residual	Grab Sample (Daily)	0.0 mg/L	<0.02 mg/L	Section 4.4 (Process Operations Manual)	Plant Operator
Effluent Storage Lagoon	Non-compliant effluent	CCP- E.coli	Grab Sample (Weekly)	>10000 org/100ml Cease supply and conduct resample	> 1000 org/100ml	Section 4.4(Process Operations Manual) or Storage Lagoon Assessment	Plant Operator / Environmental Technical Officer

The critical control points for this scheme have been determined through consultation between water and wastewater staff who are involved in the running and management of this scheme. The critical control points have been determined by an assessment of the operating ranges for the specific functions of the WWTP before the recycled water product is affected. This assessment used previous operating records of plant functionality and the quality of effluent that has been produced. To determine whether the designated points identified throughout the treatment process are Critical Control Points (CCP's) or Quality Control Points (QCP's), the flow chart shown in [Appendix 15](#) was utilised. The critical control points and quality control points may be adjusted depending on the performance of the plant. The alert limits have been designated to give the operational staff at the plant time to make adjustments to treatment processes before a critical limit is breached and recycled water quality is affected. A process flow chart has been developed to assist in the response to a Critical Control Point being detected above operational limits ([Appendix 10](#)).

All records which pertain to the treatment plants compliance with the above mentioned critical control points are recorded on Council operated systems. Critical control points which are analysed in Council's Central Laboratory are recorded onto LIMS, all results entered onto LIMS is cross checked before entry onto the database. The Critical Control Point parameters which are analysed daily at the Thabeban are entered into the 'Thabeban WWTP Test Log' spreadsheet which is accessible on Council's network. This enables members of the risk assessment team to monitor the performance of the plant and its reliability to produce a consistent effluent.

9. SCHEME VALIDATION

Monitoring data for the previous year is shown in [Appendix 4](#), the recycled water product is discussed in Section 6.5 of this document. Management practises including responding to non-conformances and incidences are further discussed in Section 11 of this document.

An extract from the Asset Management and Maintenance System (AMMS) schedule relating to Thabeban WWTP is shown in [Appendix 6](#). This extract indicates the individual assets that are located at the Thabeban WWTP and when routine maintenance is scheduled for the asset.

An assessment relating to the exceedances of Critical Control Points and Alert Limits will be conducted by the Coastal Treatment Coordinator on a regular basis. Dependent on the number and the severity of the exceedances which have occurred, revalidation of the critical control points and the alert limits may be required; this will be at the discretion of the scheme coordinator.

If any major changes occur regarding inputs into the sewer network such as new industry, an assessment would occur to assess whether inputs into the sewer network would affect the quality of the effluent which is produced. Changes which will trigger revalidation of the scheme are as follows:

- Changes to source water
- Repeated Critical Operating Limit/Critical Alert Limit exceedances

10. TREATMENT PLANT OPERATIONAL VERIFICATION

Verification of process performance can be seen from the monthly validation testing undertaken by the Central Laboratory. Refer to [Appendix 4](#).

11. SCHEME MANAGEMENT

Data collected from portable instruments and measured on site (eg SS) are recorded by hand on A3 spreadsheets which are retained at the Thabeban WWTP office. The recorded data are then entered into Microsoft Excel® spreadsheets (*Thabeban Op Log.xls*) on a desktop computer, which is part of the BRC computer network. The Plant Operator and Coordinator are responsible for monitoring the data entry and the generation of a monthly WWTP performance report.

Monitoring equipment which is used for the validation of effluent quality is calibrated at documented intervals to ensure equipment accuracy is maintained. All instrument calibration is conducted in compliance with manufacturers standards. The results of instrument calibrations are recorded in spreadsheets which are managed by Council's Instrumentation Technical Officer.

11.1. Monitoring Procedures

11.1.1. Source Monitoring

Parameters monitored at the Inlet Works include total inflow, temperature, pH and suspended solids. Influent volumes are measured via an on-line flow meter. Temperature, pH and suspended solids are monitored manually using portable instruments. Table 5 sets out the monitoring parameters and frequency for Inlet Works:

Table 5 Source monitoring – parameters and frequency.

Location	Parameter	Monitoring frequency
Inlet Works	Total raw inflow	Daily (online)
Inlet Works	Temperature	As Required
Inlet Works	pH	As Required
Inlet Works	Suspended Solids	As Required

11.1.2. Operational Monitoring

Parameters monitored by WWTP staff for each unit process are detailed in Table 6 below.

Table 6 Operational monitoring – parameters and frequency.

Location	Parameter	Monitoring frequency
Aeration Basin	pH	At Least Three Times Weekly
	30 min Sludge Volume	At Least Three Times Weekly
	Mixed Liquor Suspended Solids	At Least Three Times Weekly
	Stirred Sludge Volume Index	At Least Three Times Weekly
Clarifier	pH	At Least Three Times Weekly
	Clarity	At Least Three Times Weekly
	Suspended Solids	At Least Three Times Weekly
	Ammonia, Nitrate, Nitrite	At Least Three Times Weekly
	Alkalinity	At Least Three Times Weekly
	Nitrite	As Required
Effluent Storage Lagoon	Escherichia coli	Weekly

Automated monitoring systems report to the SCADA system which issues alarms when data values are outside preset limits. The operation of the SCADA system is monitored by the SCADA Technical Officer.

11.2. Verification Monitoring

Frequent monitoring throughout the treatment process (described in Section 8 and Section 11.1.2) is conducted to ensure that correct levels are maintained. This monitoring ensures the Thabeban WWTP delivers effluent of the appropriate standard to the customer and will assist in reducing risks to public health from the supply of recycled water.

Previously this plan has discussed when and how this monitoring occurs and the critical control points which are to be maintained at various stages throughout the treatment process. Maintaining the critical control points mentioned above to the described levels will assist in the consistency of the effluent produced from the plant

On a monthly basis samples collected from the Thabeban WWTP monitoring location (M1) specified in EPPR00581713 are placed in Acid Wash Polypropylene (Physical) and Sodium Thiosulphate (Micro) bottles. The samples are collected using an auto sampler which takes a 410ml sample every hour for a 24 hour period. The sample is kept on ice in the auto sampler. A Chain of Custody form titled 'Sample Receival Register' is completed and submitted to the Central Laboratory with the samples which are packed in chilled eskies and delivered on the day of collection. All sampling that is conducted by operations staff and staff at the central laboratory is carried out in accordance with the *Monitoring and Sampling Manual 2009, Environmental Protection (Water) Policy 2009*.

Table 7 - Monthly composite sample analysis parameters

Parameter	BRC Method No.	Units
pH	PD-7-039	@25°C
Conductivity	PD-7-175	uS/cm
Ammonia Nitrogen	PD-7-041	mg/L as NH ₃ - N
TKN	PD-7-034	mg/L N
Nitrite	PD-7-033-05	mg/L NO ₂
Nitrite Nitrogen		mg/L as NO ₂ – N
Nitrate	PD-7-033-07	mg/L NO ₃
Nitrate Nitrogen		mg/L as NO ₃ – N
Total Nitrogen		mg/L N
Total Phosphorus	PD-7-040	mg/L P
Suspended Solids	PD-7-045	mg/L
BOD ₅	PD-7-178	mg/L
Sodium Absorption Ratio	NA	NA

Table 7 - Weekly sample analysis parameters

Parameter	BRC Method No.	Units
pH	PD-7-039	@25°C
Dissolved Oxygen	PD-7-117	mg/L
Free Chlorine	PD-7-174	mg/L
Faecal Coliforms	PD-7-037	Org/100ml@44.5°C
Escherichia coli		E.coli confirmed 100ml @ 45°C

The above verification monitoring will also assist in ensuring that the water that is produced at the Thabeban WWTP is compliant with the release limits outlined in Environmental Authority EPPR02577614.

11.3. Laboratory Analysis

Laboratory analysis of most samples taken at the Thabeban WWTP is undertaken at the BRC-operated Central Laboratory located at the East WWTP, Alexandra Street, Bundaberg. The Central Laboratory is NATA accredited for a number of tests. Current analytical methods are in accordance with the American Public Health Association (APHA) Standard Methods and standards recommended by equipment suppliers. Hard copies of analytical procedures are held at the laboratory. A Laboratory Testing Regime specifying the analyses required for wastewater samples is also held at the laboratory.

BRC have introduced (June 2010) Laboratory Information Management System (LIMS) software at the Central Laboratory. Formerly, the analytical results of batch samples were recorded by hand on tabulated forms. This data was then entered into a computer spreadsheet and a *Certificate of Analysis* form with a unique sample batch number was generated. With the introduction of the LIMS, all data is now entered directly into the LIMS computer database and a *Certificate of Analysis* with unique sample batch number is generated. Before monitoring results are entered into LIMS they are cross checked by another laboratory staff member to verify the results. Both data recording systems will remain in operation until the LIMS software is fully functional.

Council's central laboratory is progressing in the development of procedures to continue to improve reporting functionality within water and wastewater. These procedures will relate to:

- Notification when analytical results exceed licence limits;
- Actions to be undertaken when analytical exceedances occur; and
- Data management.

When these procedures are completed they will be held in Council's IMS to assist in the control of the procedures.

11.4. Quality Assurance / Quality Control

Council has developed a number of programs to ensure adequate Quality Assurance (QA) and Quality Control (QC) measures are in place for this scheme.

A number of quality controls such as routine on site testing are conducted by operations staff to ensure the Thabeban WWTP is being operated to a standard which will produce effluent of a consistent quality. The testing which is conducted on-site is validated through monthly full analysis which is conducted at Council's Central Laboratory. When a non-conformance is detected through analysis a non-compliance report is generated and referred to the appropriate Council staff member for action.

The testing which is conducted by Council's Central Laboratory is used as quality assurance to confirm the quality controls which have been adopted by operations staff are effective in the production of reliable recycled water product.

To assist in the reliability of the above quality controls all monitoring equipment which is used for the validation of effluent quality is calibrated at documented intervals to ensure equipment accuracy is maintained. All instrument calibration is conducted in compliance with manufactures standards. The results of instrument calibrations are recorded in spreadsheets which are managed by Council's Instrumentation Technical Officer.

11.5. Management Procedures

To assist Council in the correct operation of the Thabeban WWTP Council has prepared and developed a number documents and procedures. This includes the following;

- [Incident and Emergency Response Procedure](#) (Flow Chart) (*Appendix 9*)
- [Incident response – Critical Control Point above Operational Limits](#) (Flow Chart) (*Appendix 10*)
- [Incident response – E.coli exceedance \(greater than 1000 cfu/100ml\)](#) (Flow Chart) (*Appendix 11*)
- [Recycled Water Management Plan – Annual Review Procedure](#) (*Appendix 12*).
- Public Health Risk Assessment and Hazard Identification ([Appendix 5](#)).

These documents will assist Council in ensuring the treatment plant is operated at a level to deliver a consistent recycled water product.

11.6. Non-Conformance & Corrective/Preventive Actions

A non-conformance is defined as any monitoring or audit result acquired for the management of the recycled water scheme that indicates a failure to meet a predetermined parameter limit. This does not include verification monitoring of recycled water (refer *Section 11.2 Verification Monitoring*).

Council's Water and Wastewater section has developed an Incident/Exceedance Investigation Report [FM-8-012](#) (*Appendix 7*). This is used to document any non-conformances that occur relating to water and wastewater infrastructure operations. Corrective/preventative actions will be logged on this form as well as specific details of the non-conformance. Once this form has been completed it is forwarded to the Environmental Technical Officer where it is logged on the [Incident/Exceedance Register](#) *Appendix 7*.

Council has developed process flow charts relating to the correct reporting process when licence limit non-conformances occur. A flow chart for each type of non-conformance will be created which will detail the correct reporting process from when a licence non-conformance is identified to when it is recorded in the Incident Exceedance Register by the Environmental Technical Officer.

Table 8: Licence parameters for water quality criteria

Licence Parameter	Quality Criteria Type
E.coli	Public Health Regulation
BOD ₅	Environmental licence limit
Suspended Solids	Environmental licence limit
Total Nitrogen	Environmental licence limit
Total Phosphorus	Environmental licence limit
Dissolved Oxygen	Environmental licence limit
Faecal coliforms	Environmental licence limit
Ammonia	Environmental licence limit
Total Dissolved Salts	Environmental licence limit

11.7. Management of Incidents & Emergencies

In the event of an incident Council staff will utilise the relevant process flow charts and the Incident/Exceedance Investigation Report [FM-8-012](#), to manage and record incidents relating to water and wastewater operations. The process flow charts, Incident/Exceedance Investigation Report [FM-8-012](#) and associated processes will be

reviewed in association with the annual review of the RWMP. Flow charts and associated documentation is stored on Councils IMS system.

An important part of the management of incidents and emergencies is ensuring the all appropriate parties have been notified of the incident or emergency. This will include notification to the Office of the Water Supply Regulator, recycled water user and designated Council officials as outlined in [Incidents and Emergencies Response Procedure](#) (Appendix 9). An assessment will be conducted by the Risk Management Team on any major incident or emergency which is reported to the regulator to assess the responses and the actions which are taken throughout the incident/emergency event.

Council is aware of the need to formalise the management of incident and emergencies which occur regarding wastewater operations. To assist with this, Council is presently developing an Integrated Environmental Management System (IEMS). A component of the IEMS will be the development of procedures relating to the management of incident and emergencies which occur as part of the operation of water and wastewater infrastructure. It is expected that these procedures will detail the following;

- Council's statutory requirements for the reporting of incidents and emergencies
- Correct processes to be followed in response to an incident or an emergency
- Procedures relating to Council's contingencies to avoid incidents and emergencies.

All staff involved in the Thabeban Recycled Water Scheme will be trained in the management of incidents and responses when the plan is approved, this training will be refreshed at the completion of the annual review conducted by the Risk Management Team.

12. DOCUMENTATION, RECORD KEEPING & INTERNAL REPORTING

Control of Records Procedure [PD-8-003](#) and Control of Documents Procedure [PD-4-008](#) specifies the requirements for documentation and record keeping. Procedures [PD-8-004](#) specify Management Review and Environmental Management System Audit, respectively. All procedures form part of the Bundaberg Regional Council's IMS.

Records relating to the performance of each treatment plant are entered into the 'All 2013 – 2014' Spreadsheet by the coordinator of the treatment area at the end of each month. The spreadsheets are then checked by the Manager of Process Operation to ensure the data has been entered.

It is the policy of Council that all operational records will be retained for a minimum of 5 years on Council maintained back-up servers.

On finalisation and approval of this document the complete RWMP including all appendices will be placed on Council's Integrated Management System (IMS). This will provide document control procedures which will assist Council in ensuring that all documentation is updated when required and that key operational staff have the current documentation.

13. SUPPORTING PROGRAMS

Document	Appendix
BRC Recycled Water Policy Statement (MD-7-029)	1
Thabeban WWTP Process Flow Diagram (FC-7-218)	2
Thabeban WWTP Process Operations Manual	3
Recycled Water Third Party Agreement between BRC and [REDACTED]	4
Thabeban Wastewater Treatment Plant – Licence Results April 2012 – June 2013	5
Risk Management Program (MD-7-486 & MD-7-468)	6
Maintenance and Calibration (AMMS Schedule Extract)	7
Incident/Exceedance Investigation Report (FM-8-012) and Incident/Exceedance Register (RG-7-042)	8
[REDACTED]	9
Incident and Emergency Response Procedure for Recycled Water Scheme (FC-7-216)	10
Detection of Critical Control Point Above Operational Limit Procedure (FC-7-217)	11
Incident Response Flow Chart – E.coli Exceedance (FC-7-214)	12
Recycled Water Management Plan – Annual Review Procedure (PD-7-249)	13
Internal Quality Auditing Procedure (PD-8-004)	14
Trade Waste Policy (GP-3-042)	15
CCP/QCP Decision Tree (FC-7-215)	16

14. OPERATOR SKILLS & TRAINING

At present, qualifications of staff involved in production and delivery of recycled water are documented in individual position descriptions prepared by Council's Governance Human Resources section.

Qualifications, training requirements and relevant documentation will be reviewed upon the promulgation of regulations pertaining to operator skills and training.

15. MANAGEMENT REVIEW & CONTINUOUS IMPROVEMENT

Council has prepared the [Recycled Water Management Plan – Annual Review Procedure \(PD-7-249\)](#) (*Appendix 12*) to assist in the review and continual improvement of the RWMP. A review will be undertaken on an annual basis by members of the risk management team which have been identified in Table 1.

16. INTERNAL AUDITING

The document will be reviewed by Council's auditing team to ensure compliance with the plan. An audit plan will be developed with consultation between Water and Wastewater and Council Integrated Management Systems Team. The internal audit will bring a systematic, disciplined approach to evaluate and improve the effectiveness of risk management, control, and operational procedural processes. The internal audit will be conducted in accordance with Council's Internal Quality Auditing Procedure ([PD-8-004](#)) which can be found in Appendix 13.

17. IMPROVEMENT PLAN

Council is aware of the need for further development of procedures and processes relating to the management of the recycled water. Council has developed an improvement program with tentative target dates to assist in the management of these procedures, the improvement plan is located in Councils Electronic Data Records Management System.

18. REFERENCES

NWQMS, *Australian Guidelines for Water Recycling: Managing Health & Environmental Risks (Phase 1)* – 2006, November 2006, Natural Resource Management Ministerial Council, Environmental Protection & Heritage Council and Australian Health Ministers Conference.

Queensland Department of Natural Resources & Water, *Recycled water management plan and validation guidelines* – November 2008, Office of the Water Supply Regulator.

Queensland Department of Natural Resources & Water, *Water quality guidelines for recycled water schemes* – November 2008, Office of the Water Supply Regulator.

Queensland Environmental Protection Agency, *Manual for recycled water agreements in Queensland* – December 2005, Waterwise Queensland.

Queensland Government, *Public Health Regulation 2005, Reprint No. 2A*, (in force on 30 October 2009).

Queensland Government, *Water Supply (Safety and Reliability) Act 2008*, Act No. 34 of 2008.

Figure 1 Thabeban WWTP Location

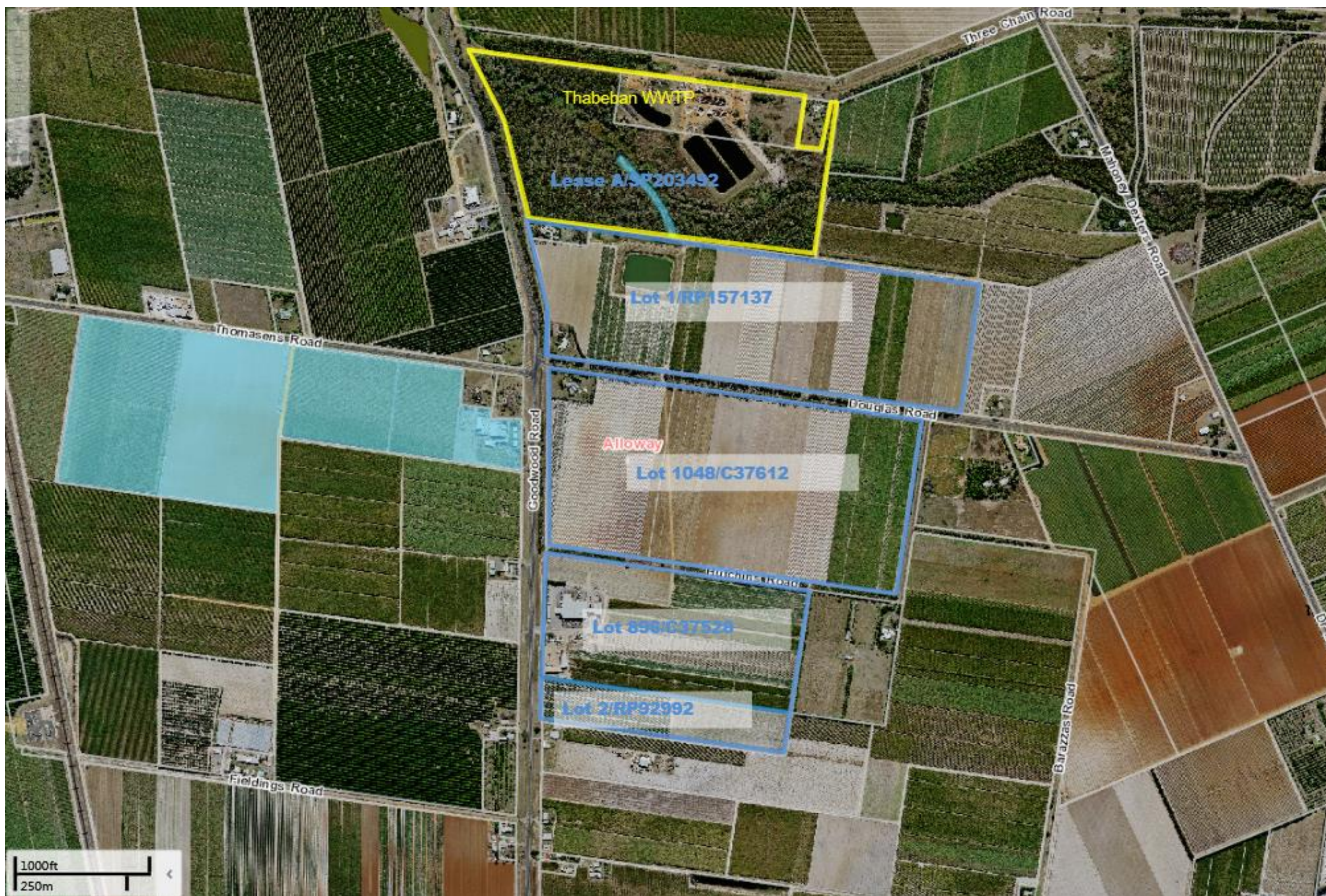


Figure 2 Thabeban Recycled Water Scheme Layout.



APPENDICES

- Appendix 1: BRC Recycled Water Policy Statement ([MD-7-029](#))
- Appendix 2: Thabeban WWTP Process Flow Diagram ([FC-7-218](#))
- Appendix 3: Thabeban WWTP Process Operations Manual
- Appendix 4: Recycled Water Third Party Agreement
- Appendix 5: [Thabeban Wastewater Treatment Plant – Licence Results April 2012 – June 2013](#)
- Appendix 6: Public Health Risk Assessment ([MD-7-486](#)) and Public Health Risk Matrix ([MD-7-468](#))
- Appendix 7: [Maintenance and Calibration \(MyData Extract\)](#)
- Appendix 8: Incidence/Exceedance Investigation Report ([FM-8-012](#)) and Incident/Exceedance Register ([RG-7-042](#))
- Appendix 9: [DTR Holdings Irrigation and Soil Information](#)
- Appendix 10: Incident and Emergency Response Procedure for Recycled Water Scheme ([FC-7-216](#))
- Appendix 11: Detection of a Critical Control Point Above Operation Limit ([FC-7-217](#))
- Appendix 12: Exceedance of Escherichia coli Level (>1000org/ml) ([FC-7-214](#))
- Appendix 13: Recycled Water Management Plan – Annual Review Procedure ([PD-7-249](#))
- Appendix 14: Internal Quality Auditing Procedure ([PD-8-004](#))
- Appendix 15: Trade Waste Policy ([GP-3-042](#))
- Appendix 16: CCP/QCP Decision Tree ([FC-7-215](#))

Appendix 1: BRC Recycled Water Policy Statement ([MD-7-029](#))

Appendix 2: Thabeban WWTP Process Flow Diagram ([FC-7-218](#))

Appendix 3: Thabeban WWTP Process Operations Manual

Appendix 4: Recycled Water Third Party Agreement

































Appendix 5: Thabeban Wastewater Treatment Plant – Licence Results July 2014 – May 2015

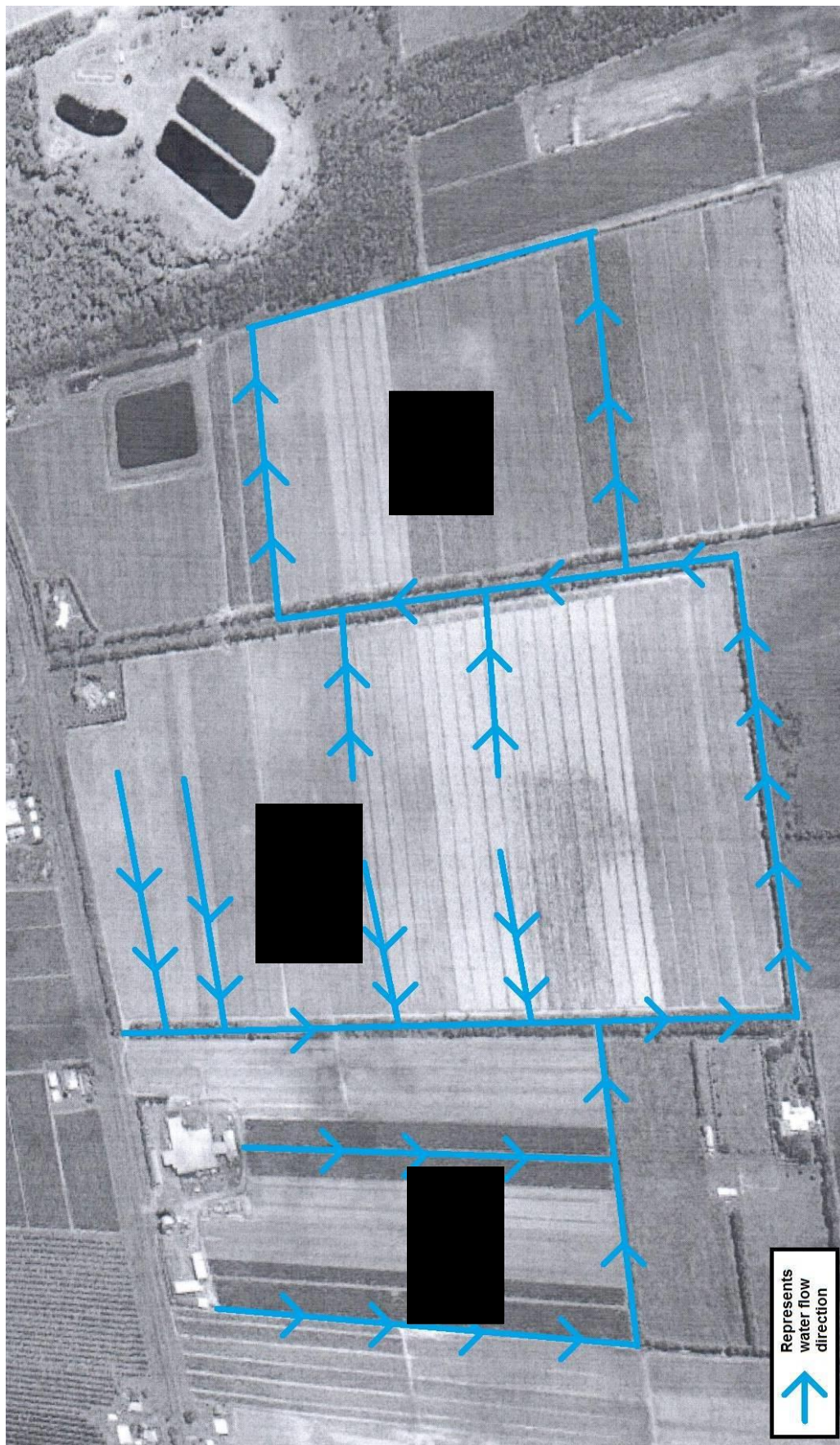
Appendix 6: Public Health Risk Assessment ([MD-7-486](#)) and Public Health Risk Matrix ([MD-7-468](#))

Appendix 7: Maintenance and Calibration (MyData Extract)

Appendix 8: Incident/Exceedance Investigation Report ([FM-8-012](#)) & Incident/Exceedance Register ([RG-7-042](#))

Appendix 9: [REDACTED] Irrigation and Soil information

Area of land available for recycled water irrigation	
Topography and drainage of farm	Refer to attached map
Irrigation methods used	<ul style="list-style-type: none">      
Soil types	Refer to attached map
Types of crops grown and area	<ul style="list-style-type: none">                 
Irrigation requirements of crops	<ul style="list-style-type: none">        
On farm storage capacity	Approximately 100ML
Sensitive receptors	No sensitive receptors will be affected by the use of recycled water



Appendix 10: Incident and Emergency Response Procedure for a Recycled Water Scheme ([FC-7-216](#))

Appendix 11: Detection of a Critical Control Point Above Operational Limit ([FC-7-217](#))

Appendix 12: Exceedance of *Escherichia coli* Level – (>1000org/ml) ([FC-7-214](#))

Appendix 13: Recycled Water Management Plan – Annual Review Procedure ([PD-7-249](#))

Appendix 14: Internal Quality Auditing Procedure ([PD-8-004](#))



Appendix 15: Trade Waste Policy ([GP-3-042](#))

Appendix 16: CCP/QCP Decision Tree ([FC-7-215](#))