Application to amend Licence W-31

Water Treatment

www.harveywater.com.au

South West Irrigation Management Cooperative t/a Harvey Water

PO Box 456 Harvey WA 6220

ABN: 54498176490

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Aled Lewis Project Engineer alewis@harveywater.com.au

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APPLICATION SUMMARY

South West Irrigation Management Cooperative t/a Harvey Water will provide the following services in addition to the provision of non-potable water as specified inthe current license WL-31:

Customer – MARBL Lithium

- Treatment of ground water (Leederville aquifer) to potable water (167m3/ day) for drinking, ablutions, irrigation, safety showers and wash down to a standard as defined by the Australian Drinking Water Guidelines (ADWG) 2018 –health guideline values. Monitoring and reporting of performance inline with ADWG requirements will comply with requirements.

Harvey Water will build (with MAK Water as the technology designer and supplier)install, maintain, and operate the infrastructure as a service to MARBL Lithium.
This includes maintaining efficient daily operation, scheduled and emergency maintenance, and managing the monitoring and reporting of water quality criteriain accordance with:

- Australian Drinking Water Guidelines 2018 (ADWG), The National Health and Medical research Council (NHMRC);
- Mine Sites and Exploration Camps Drinking Water Quality Monitoring Requirements (WA Department of Health (DoH) 2008;
- System compliance and routine reporting requirements for small community water providers (DoH) 2008;
- The conditions of the ERA and Harvey Water's operating license;
- Guidelines for the non-potable uses of recycled water in Western Australia (DoH) 2011.

The supply and treatment of water to MARBL Lithium (MARBL) is for use within the boundaries of the lithium plant in Kemerton and is not for delivery or consumption outside of these boundaries.

Whilst the water quality is of high interest to employees and other site-specific stakeholders the nature of this service will not be contrary to public interest.

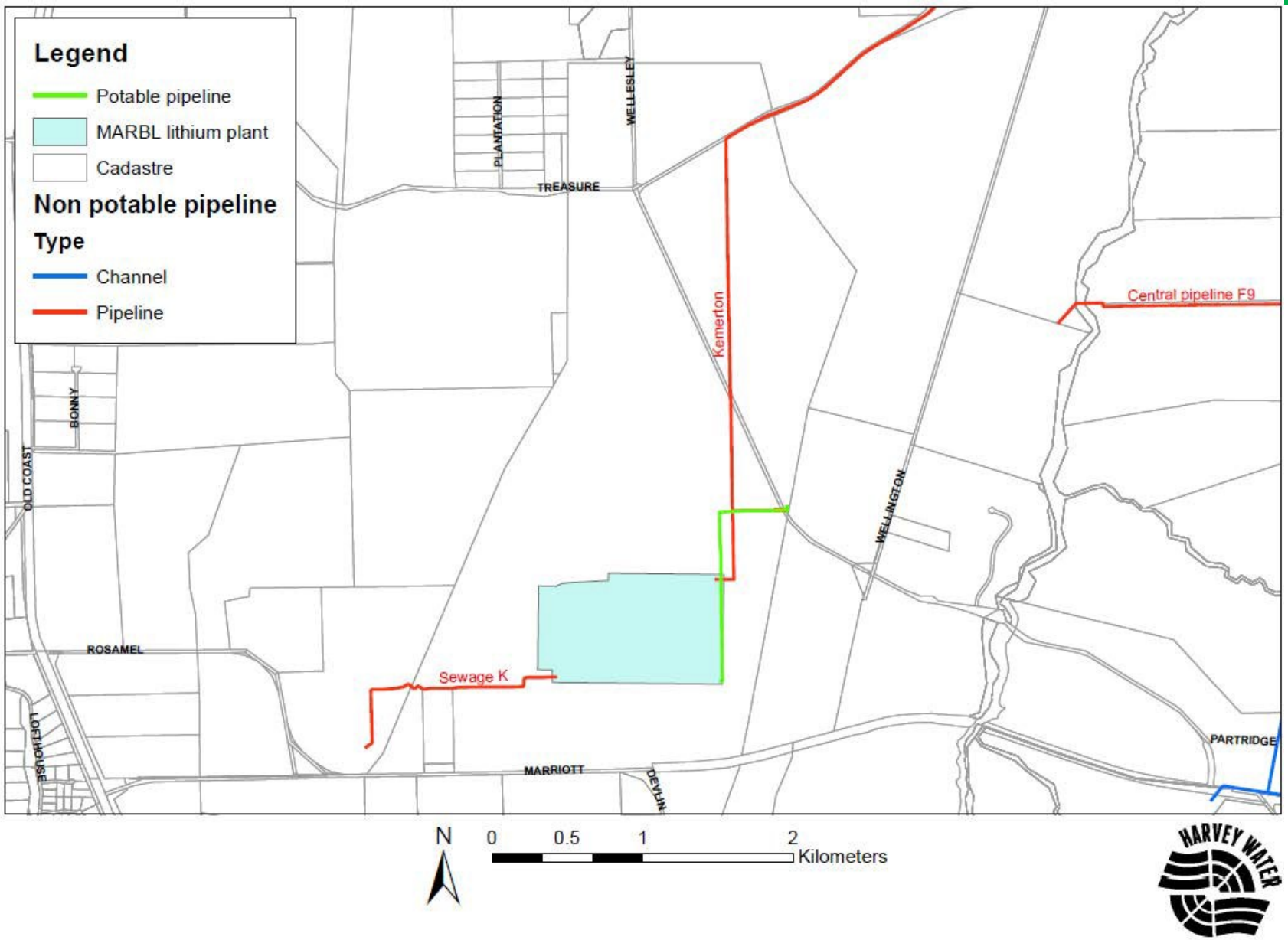
Harvey Water is currently sponsoring four employees to be trained in Water Treatment Operations to Certificate level III. The first phase of training was completed in May 2019 and a second week takes place July 2021. The course willbe completed in 2021. The training organisation is Simmonds & Bristow from Queensland.
The MARBL plant is located within the Kemerton the Industrial Area. As part of this application Harvey Water requests to extend our licensed area to encompass the whole of the Kemerton area for both potable and non-potable water provision; see the attached maps.

TECHNICAL INFORMATION

Harvey Water will produce two separate water treatment plants one to produce high quality industrial water and one for potable uses, these two plants will use separate water sources, suited for the end use. The water treatment plants and equipment will operate within the boundaries of the MARBL plant at Kemerton Industrial Area off Marriot Rd in Benger near Harvey. The site is controlled access with no public access.

Ground water is delivered from the Leederville bore site for the potable source, via an independent HDPE pipeline to the site for use as drinking water. The water is filtered and treated to meet the requirements of the ADWG. This water pipeline is kept separate from the non-potable source to avoid contamination with the alternative water source.

Shown in the below images are the two distinct pipelines that bring in the water from the separate sources. These pipelines are isolated from each other so to not contaminate the potable water supply form the Leederville aquifer.


Legend
Potable pipeline
MARBL lithium plant
Cadastre
Non potable pipeline
Type
Channel
Pipeline
PLANTATION
WELLESLEY
TREASURE
Kemerton
Central pipeline F9
BONNY
OLD COAST
WELLINGTON
ROSAMEL
Sewage K
LOFTHOUSE
MARRIOTT
DEVLIN
PARTRIDGE
N
0
0.5
1
2
Kilometers
HARVEY WATER


Legend
Potable pipeline
MARBL lithium plant
Cadastre
PLANTATION
WELLESLEY
TREASURE
BONNY
OLD COAST
WELLINGTON
ROSAMEL
LOFTHOUSE
MARRIOTT
DEVLIN
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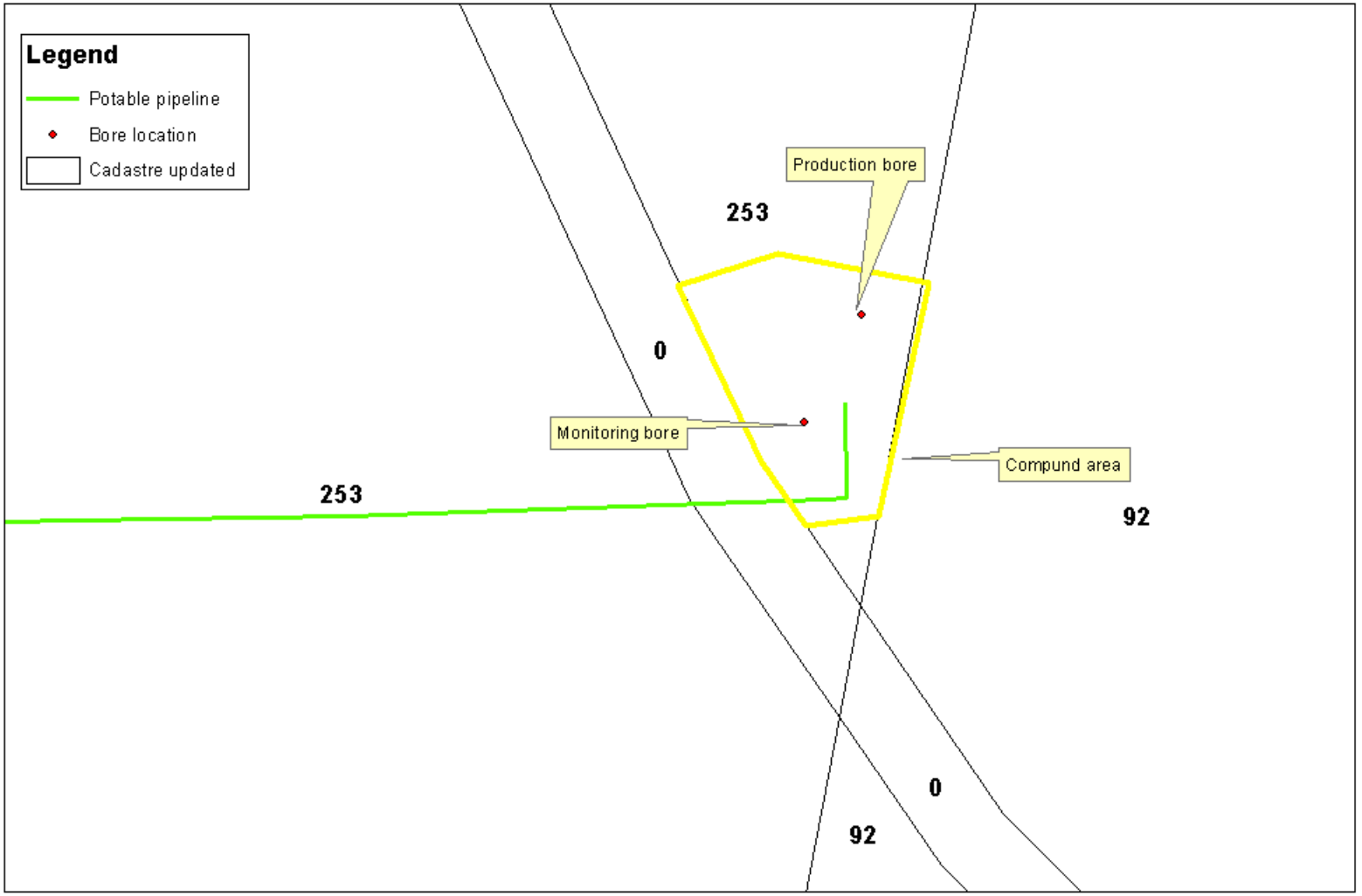
Kilometers


Legend
Potable pipeline
Bore location
Cadastre updated
Production bore
Monitoring bore
Compund area
253
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253
92
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92
N
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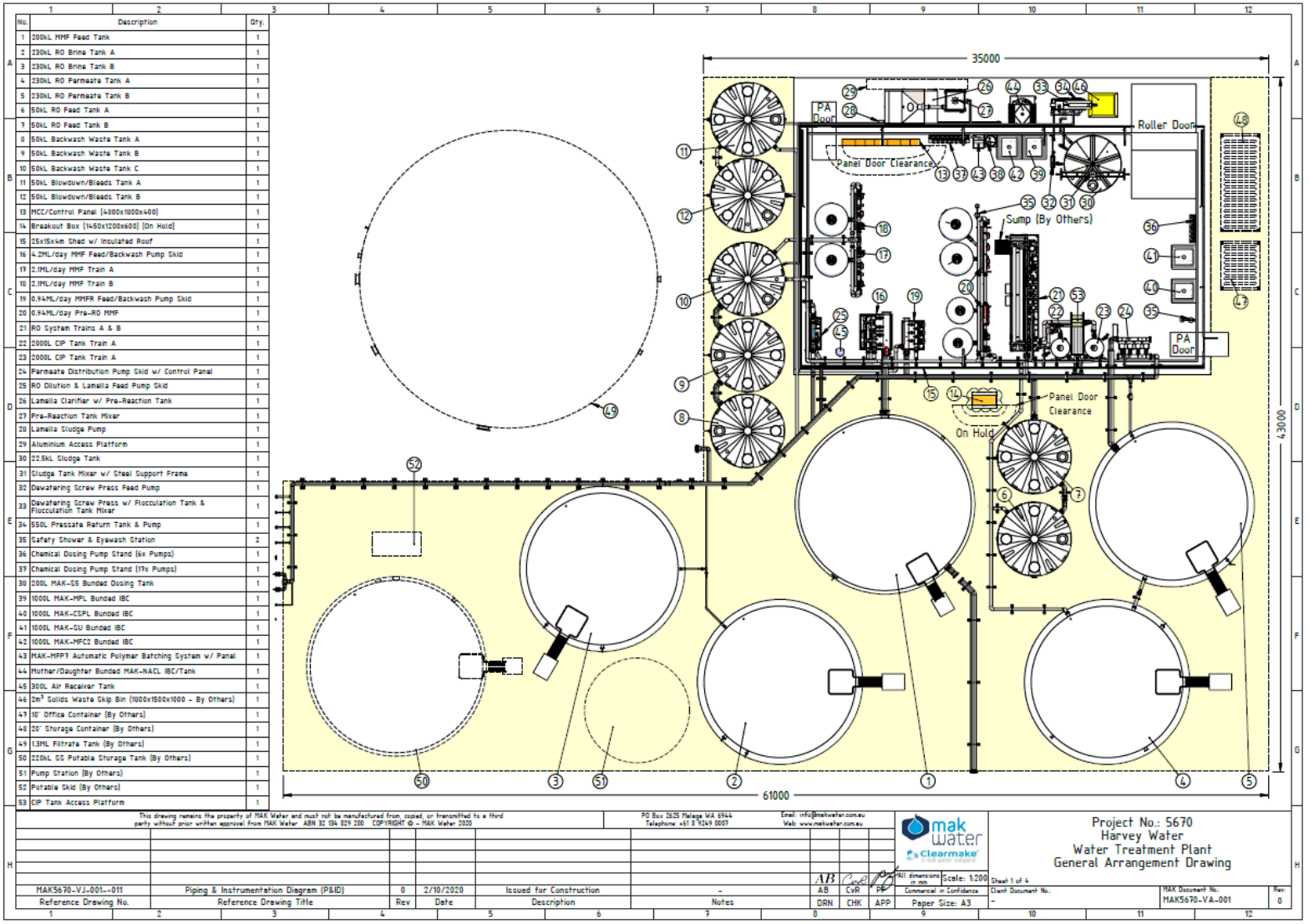
0.025
0.05
0.1
Kilometers
HARVEY WATER



No.	Description	Qty.
1	200kL MMF Feed Tank	1
2	230kL RO Brine Tank A	1
3	230kL RO Brine Tank B	1
4	230kL RO Permeate Tank A	1
5	230kL RO Permeate Tank B	1
6	50kL RO Feed Tank A	1
7	50kL RO Feed Tank B	1
8	50kL Backwash Waste Tank A	1
9	50kL Backwash Waste Tank B	1
10	50kL Backwash Waste Tank C	1
11	50kL Blowdown/Bleeds Tank A	1
12	50kL Blowdown/Bleeds Tank B	1
13	MCC/Control Panel (4800x1000x400)	1
14	Breakout Box (1450x1200x600) (On Hold)	1
15	25x15x4m Shed w/ Insulated Roof	1
16	4.2ML/day MMF Feed/Backwash Pump Skid	1
17	2.1ML/day MMF Train A	1
18	2.1ML/day MMF Train B	1
19	0.94ML/day MMFR Feed/Backwash Pump Skid	1
20	0.94ML/day Pre-RO MMF	1
21	RO System Trains A & B	1
22	2000L CIP Tank Train A	1
23	2000L CIP Tank Train A	1
24	Permeate Distribution Pump Skid w/ Control Panel	1
25	RO Dilution & Lamella Feed Pump Skid	1
26	Lamella Clarifier w/ Pre-Reaction Tank	1
27	Pre-Reaction Tank Mixer	1
28	Lamella Sludge Pump	1
29	Aluminium Access Platform	1
30	22.5kL Sludge Tank	1
31	Sludge Tank Mixer w/ Steel Support Frame	1
32	Dewatering Screw Press Feed Pump	1
33	Dewatering Screw Press w/ Flocculation Tank & Flocculation Tank Mixer	1
34	550L Pressate Return Tank & Pump	1
35	Safety Shower & Eyewash Station	2
36	Chemical Dosing Pump Stand (6x Pumps)	1
37	Chemical Dosing Pump Stand (17x Pumps)	1
38	200L MAK-SS Bunded Dosing Tank	1
39	1000L MAK-MPL Bundad IBC	1
40	1000L MAK-CSPL Bundad IBC	1
41	1000L MAK-SU Bundad IBC	1
42	1000L MAK-MFC2 Bundad IBC	1
43	MAK-MFP3 Automatic Polymer Batching System w/ Panel	1
44	Mother/Daughter Bundad MAK-NACL IBC/Tank	1
45	300L Air Receiver Tank	1
46	2m³ Solids Waste Skip Bin (1800x1500x1000 - By Others)	1
47	10' Office Container (By Others)	1
48	20' Storage Container (By Others)	1
49	1.3ML Filtrate Tank (By Others)	1
50	220kL SS Potable Storage Tank (By Others)	1
51	Pump Station (By Others)	1
52	Potable Skid (By Others)	1
53	CIP Tank Access Platform	1

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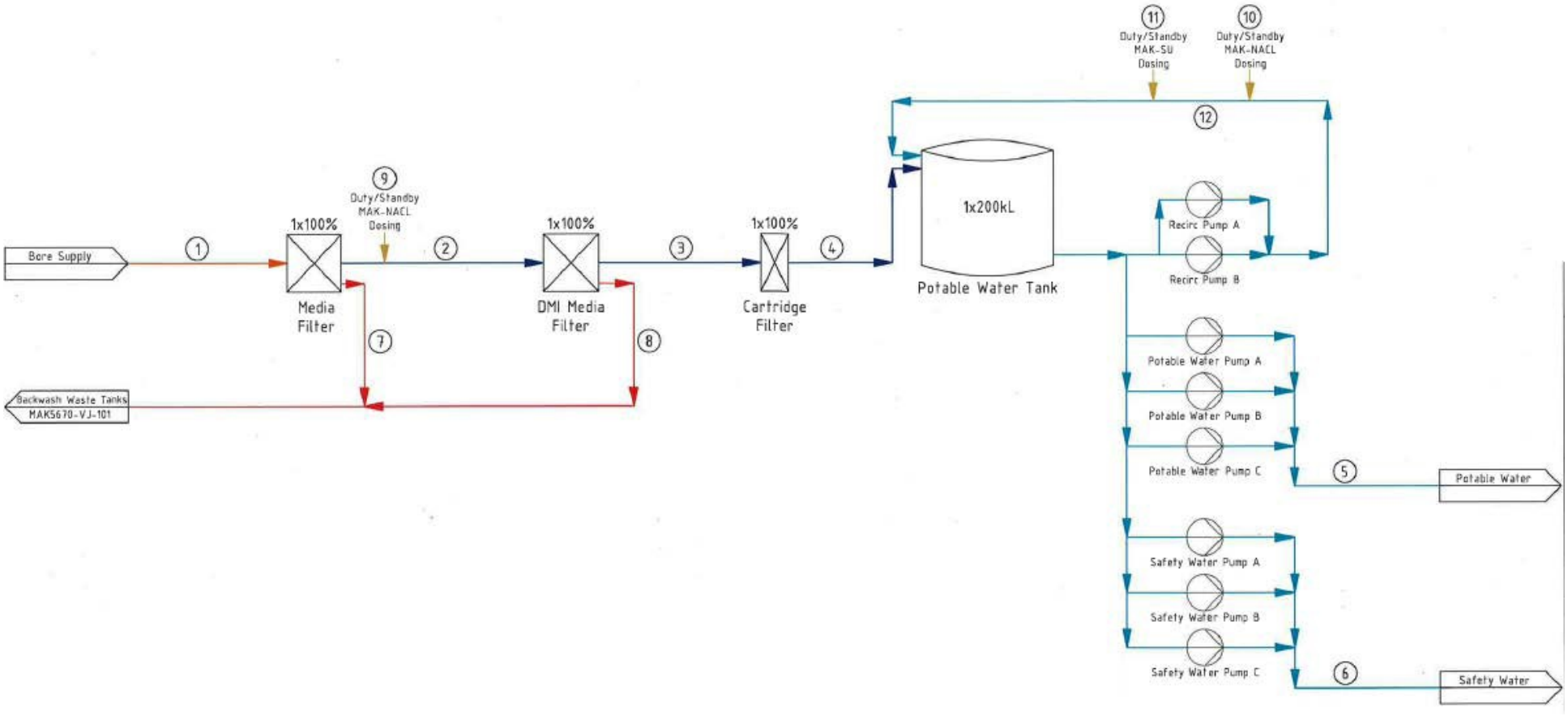
MAK Water treatment container



PFD of potable treatment system

Potable Water Supply

The water sourced from theLeederville aquifer is treated through a series of media filters including DMI and cartridge filtration.
This filtered water is stored in sealed water tanks with use of a chlorine recirculation system for disinfection.

This Water will be treated to a standard in line with the ADWG quality objectives.

Potable Safety Water

Sharing a common media filtration and disinfection as the aforementioned potable water supply to produce a safety shower water stream compliant with ADWG health guideline requirements.

TECHNOLOGICAL PARTNER

The water treatment plant will be supplied by **MAK Water**:

The construction of the industrial site commenced in January 2019. The watertreatment modules are to be installed in the first half of 2021.

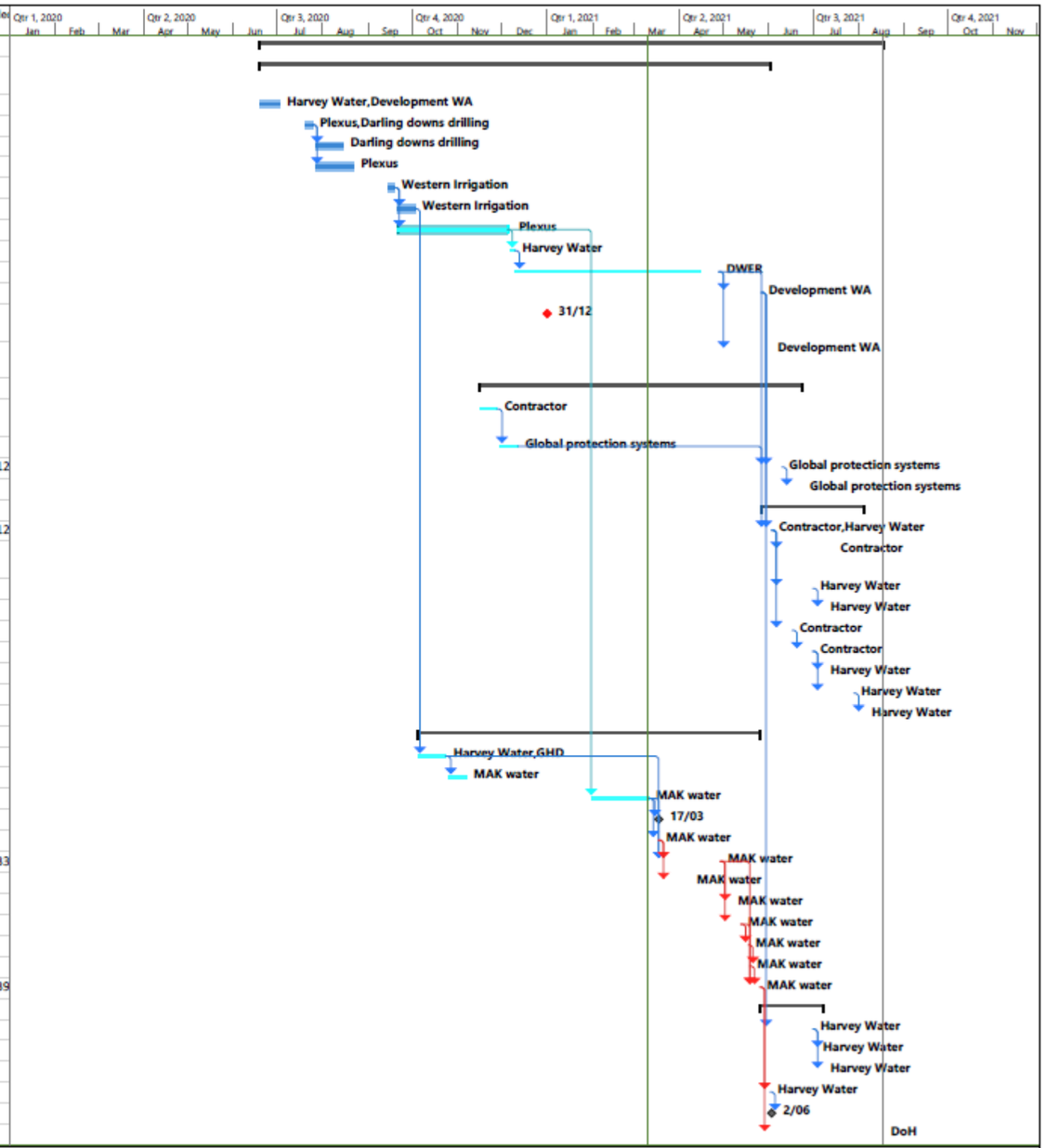
The water is metered through a magnetic flow meter Emflux i-500 by Aquamonix installed with a data-logger connecting back to our main office via an internet connection.

Our current Asset Management System (AMS) will be used to manage the plantmaintenance and record all maintenance events.

Harvey Water is training four people to a level of Certificate III in WaterTreatment Operations

https://www.makwater.com.au/

ID	Task Mode	Task Name	Duration	Start	Finish	Resource Names	Predec
1		**Ground water project**	**294 days**	**Fri 19/06/20**	**Tue 17/08/21**		
2		**Water quality and aquifer confirmation**	**239 days**	**Fri 19/06/20**	**Tue 1/06/21**		
3		Review land options	2 wks	Fri 19/06/20	Thu 2/07/20	Harvey Water,Developm	
4		Test Bore Locating	1 wk	Mon 20/07/20	Fri 24/07/20	Plexus,Darling downs dri	
5		Permanent Bore Construction	3 wks	Mon 27/07/20	Fri 14/08/20	Darling downs drilling	4
6		Water testing	4 wks	Mon 27/07/20	Fri 21/08/20	Plexus	4
7		Pumping test	4 days	Tue 15/09/20	Fri 18/09/20	Western Irrigation	
8		Test report	2 wks	Mon 21/09/20	Fri 2/10/20	Western Irrigation	7
9		Modelling and H2 Report	11 wks	Mon 21/09/20	Fri 4/12/20	Plexus	7
10		Harvey Water review	3 days	Mon 7/12/20	Wed 9/12/20	Harvey Water	9
11		Dwer licence finalisation	90 days	Thu 10/12/20	Tue 27/04/21	DWER	10
12		Land lease confirmation	21 days	Wed 28/04/21	Wed 26/05/21	Development WA	11
13		DevWA Licence expiry (transition to lease instrument)	0 days	Thu 31/12/20	Thu 31/12/20	Development WA	
14		Develop easement agreement for pipeline	5 wks	Wed 28/04/21	Tue 1/06/21	Development WA	11
15		**Power options**	**149 days**	**Mon 16/11/20**	**Wed 23/06/21**		
16		Abstraction pump design confirmation	2 wks	Mon 16/11/20	Fri 27/11/20	Contractor	
17		Solar design	2 wks	Mon 30/11/20	Fri 11/12/20	Global protection systen	16
18		Solar fabrication	2 wks	Thu 27/05/21	Wed 9/06/21	Global protection systen	17,12
19		Site works	2 wks	Thu 10/06/21	Wed 23/06/21	Global protection systen	18
20		**Site construction (Bore site)**	**50 days**	**Thu 27/05/21**	**Wed 4/08/21**		
21		Mobilisation	1 wk	Thu 27/05/21	Wed 2/06/21	Contractor,Harvey Wate	11,12
22		Pump headworks and instrumentation	6 wks	Thu 3/06/21	Wed 14/07/21	Contractor	21
23		Fencing install	4 wks	Thu 3/06/21	Wed 30/06/21	Harvey Water	21
24		Security installation	1 wk	Thu 1/07/21	Wed 7/07/21	Harvey Water	23
25		Concrete pad	2 wks	Thu 3/06/21	Wed 16/06/21	Contractor	21
26		Genset and control panel	2 wks	Thu 17/06/21	Wed 30/06/21	Contractor	25
27		Test and commisioning	1 wk	Thu 1/07/21	Wed 7/07/21	Harvey Water	26
28		Shed construction	4 wks	Thu 1/07/21	Wed 28/07/21	Harvey Water	26
29		Cleanup and demob	1 wk	Thu 29/07/21	Wed 4/08/21	Harvey Water	28
30		**Treatment plant**	**158 days**	**Mon 5/10/20**	**Tue 25/05/21**		
31		Confirm treatment method	3 wks	Mon 5/10/20	Fri 23/10/20	Harvey Water,GHD	8
32		Concept design	2 wks	Mon 26/10/20	Fri 6/11/20	MAK water	31
33		Detailed design	5.6 wks	Sun 31/01/21	Wed 10/03/21	MAK water	9
34		P&IDs, Data map, I/O list	1 wk	Thu 11/03/21	Wed 17/03/21	MAK water	33
35		Equipment list	1 wk	Thu 11/03/21	Wed 17/03/21	MAK water	33
36		Filter & Tank Procurement	6 wks	Thu 18/03/21	Wed 28/04/21	MAK water	31,33
37		Instrument Procurement	3 wks	Thu 18/03/21	Wed 7/04/21	MAK water	35
38		Install tank onsite	1 wk	Thu 29/04/21	Wed 5/05/21	MAK water	36
39		Skid fabrication	2 wks	Thu 29/04/21	Wed 12/05/21	MAK water	36
40		FAT	3 days	Thu 13/05/21	Mon 17/05/21	MAK water	39
41		Transport skids	1 day	Tue 18/05/21	Tue 18/05/21	MAK water	40
42		Install Filters onsite	5 days	Wed 19/05/21	Tue 25/05/21	MAK water	36,39
43		**Pipeline**	**31 days**	**Wed 26/05/21**	**Wed 7/07/21**		
44		Install Pipe to Alb	5 wks	Thu 27/05/21	Wed 30/06/21	Harvey Water	12
45		Pressure test	2 days	Thu 1/07/21	Fri 2/07/21	Harvey Water	44
46		Tie in to WTP	1 wk	Thu 1/07/21	Wed 7/07/21	Harvey Water	44
47		SAT	1 wk	Wed 26/05/21	Tue 1/06/21	Harvey Water	42
48		Practical completion	1 day	Wed 2/06/21	Wed 2/06/21	Harvey Water	47
49		DoH MoU	3 mons	Wed 26/05/21	Tue 17/08/21	DoH	42



Project: ALB 301 MARBL Potable WTP
Date: Wed 10/03/21

Task · Split · Milestone · Summary · Project Summary · Manual Task · Manual Summary Rollup · Manual Summary · Deadline · Critical · Progress · Manual Progress

Page 1

Reliable Mining Expertise

EXPERIENCED. From the extreme heat of remote Australia and Africa, to the cold climates of Mongolia and Kazakhstan, MAK Water has delivered solutions for mining projects in the most challenging environments around the world.

EQUIPMENT RELIABILITY. In mining, equipment reliability is paramount. MAK Water has an established track record of manufacturing fully automated, high quality equipment for maximum reliability and minimum operator intervention.

FLEXIBLE SOLUTIONS. Our wide range of standard designs can be fully customised to meet project specifications. For short term requirements, rapidly deployable hire plants are available. Where project funds are better employed in other areas, MAK Water can offer a build-own-operate, or lease-to-own solutions.

INNOVATIVE DESIGNS. Our award-winning, pre-tested modular designs save time, reduce risk, and minimise installation costs and environmental footprint.

Where installed, ClearAccess™ Remote Monitoring enables MAK Water's Operations Specialists to assist your site team to diagnose problems, preventing unnecessary service call-outs and improving reliability and plant uptime.

END TO END SOLUTIONS. From the supply of process technology only, to turnkey installations, we can design, build, install, operate and maintain all your project's water treatment plants.

HEALTH, SAFETY AND THE ENVIRONMENT

MAK Water places the Health and Safety of our people, clients and contractors, and care of the Environment as our highest priority.

Mine Site Applications

From drinking and process water, to sewage and wastewater treatment, MAK Water's wide range of plant designs means we can meet all your mine project's water and wastewater treatment plant requirements.

EXPLORATION, CONSTRUCTION AND PERMANENT ACCOMMODATION CAMPS

- Potable/drinking water treatment plants, treating ground, surface or sea water
- Sewage treatment plants, for compliant discharge, or onsite reuse
- Pumping, storage and sterilisation solutions for sewage, potable or fire water
- Hire filtration, reverse osmosis and sewage treatment plants for short-term construction requirements

NON-PROCESS INFRASTRUCTURE

- Potable/drinking water treatment plants, treating ground, surface or sea water
- Sewage treatment plants, for compliant discharge, or onsite reuse
- Pumping, storage and sterilisation solutions for sewage, potable or fire water
- Oily water treatment and recycling systems for vehicle wash bays and workshops
- Demineralised water for boilers and cooling towers

PROCESS INFRASTRUCTURE

- Process water treatment
- Process wastewater treatment for compliant discharge or recycling
- Mine site remediation and treatment of wastewater

Planning

It make sense to engage with MAK Water early in the planning phase. Understanding your water and wastewater treatment options reduces risk by preventing unnecessary delays and maximising the use of your valuable resources.

MAK Water works collaboratively with your environmental and engineering teams to develop solutions for every stage of the mining life cycle, to meet your project objectives.

Services provided to support the investigation and planning stage of the project include:

- Technology selection and expert process advice
- Budgeting and value engineering
- Assistance with obtaining environmental approvals
- Supply of trial plants and piloting equipment

Design and Construction

Products and services provided to support greenfield sites and expansion of mine infrastructure:

- Supply of hire plants for construction water and temporary camps
- Supply of permanent water and wastewater treatment plants
- Installation, commissioning, performance testing and training
- Development of water and wastewater quality management plans
- Remediation and treatment of wastewater
- Operation, service and maintenance of water and wastewater assets
- Supply of chemicals, consumables and spare parts

Operations

Products and services provided to support mine infrastructure include:

- Supply of water and wastewater treatment plants
- Operation, service and maintenance of water and wastewater assets
- Plant reviews, upgrades, modifications and refurbishments
- Implementation of water and wastewater quality management plans
- Regulatory compliance monitoring and reporting
- Supply of chemicals, consumables and spare parts
- Supply of hire plants for temporary plant outages, upgrades etc.

Closure

Post operational and rehabilitation services include:

- Contaminated wastewater treatment for compliant discharge
- Irrigation water for plant nurseries
- Decommissioning and demobilisation of plant and equipment
- Remediation and treatment of wastewater

Solutions

BRACKISH WATER REVERSE OSMOSIS

Treat brackish ground, surface or industrial water to achieve potable water quality. Standard process includes pre-treatment, RO desalination and a clean-in-place (CIP) system for membrane cleaning. Add additional treatment steps as required.

SEA WATER REVERSE OSMOSIS

Treat sea water or high salinity ground water to achieve potable water quality. Standard process includes pre-treatment, RO desalination, auto flushing and a clean-in-place (CIP) system for membrane cleaning. Add additional treatment steps as required.

DEMINERALISED WATER REVERSE OSMOSIS

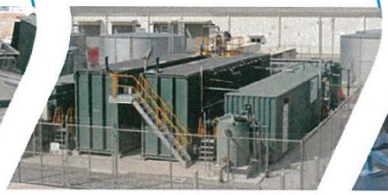
Treat fresh water to achieve high purity demineralised water. Standard process includes pre-treatment, two-pass RO desalination, permeate polishing with ion exchange or continuous electro-deionisation (CEDI), and a clean-in-place (CIP) system for membrane cleaning. Add additional treatment steps as required.

WASTEWATER / SEWAGE MOVING BED BIOREACTOR

Treat sewage to achieve Class C effluent for reuse in "low risk" applications, or spray field disposal. Standard process includes screening, biological degradation, clarification and sterilisation. With the optional Class A module, reuse in "medium risk" applications is possible.

WASTEWATER / SEWAGE MEMBRANE BIOREACTOR

Treat sewage to achieve Class A+ effluent for reuse in "high risk" applications. Standard process includes screening, biological degradation, ultrafiltration and sterilisation. Add additional treatment steps, such as enhanced nutrient removal, as required.



WORKSHOPS / WASH BAYS OIL WATER SEPARATOR

Remove free floating hydrocarbons (diesel, hydraulic fluid, oil) and heavier solids from wastewater (prior to discharge) for any wash bay where hydrocarbons are present. Add additional treatment steps for reuse as required.

MULTIMEDIA FILTRATION

Treat ground, surface, storm and waste water with suspended solids to achieve potable or process water. Standard process includes auto-backwashing multimedia filtration. Add additional filtration media and other treatment steps, such as sterilisation or pH correction, as required.

ULTRAFILTRATION

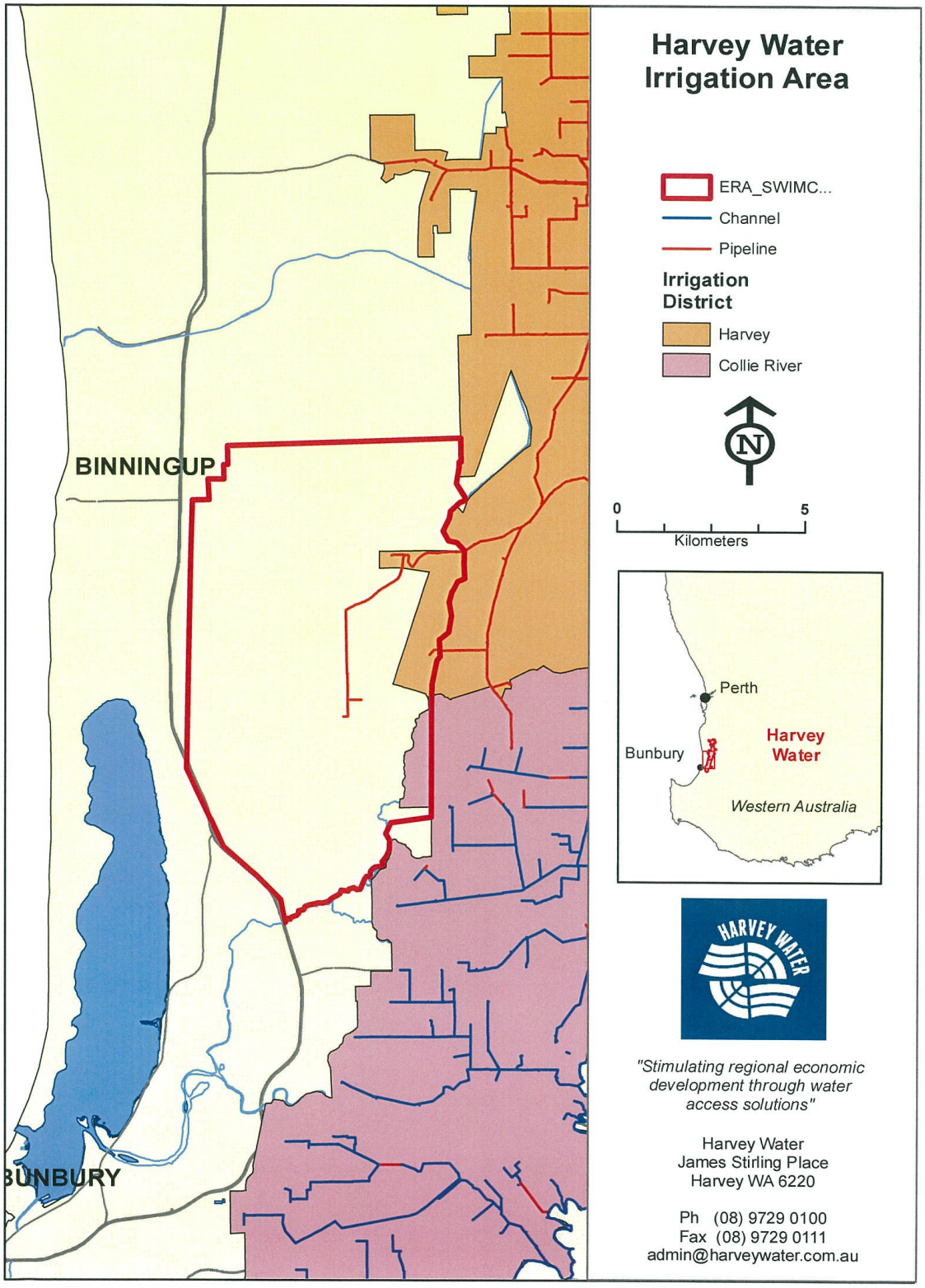
Treat ground, surface, storm and waste water to achieve ultra-clear filtrate that is free of viruses and bacteria. Standard process includes pre-filtration, ultrafiltration and automated membrane cleaning systems. Add additional treatment steps as required.

WATER STERILISATION

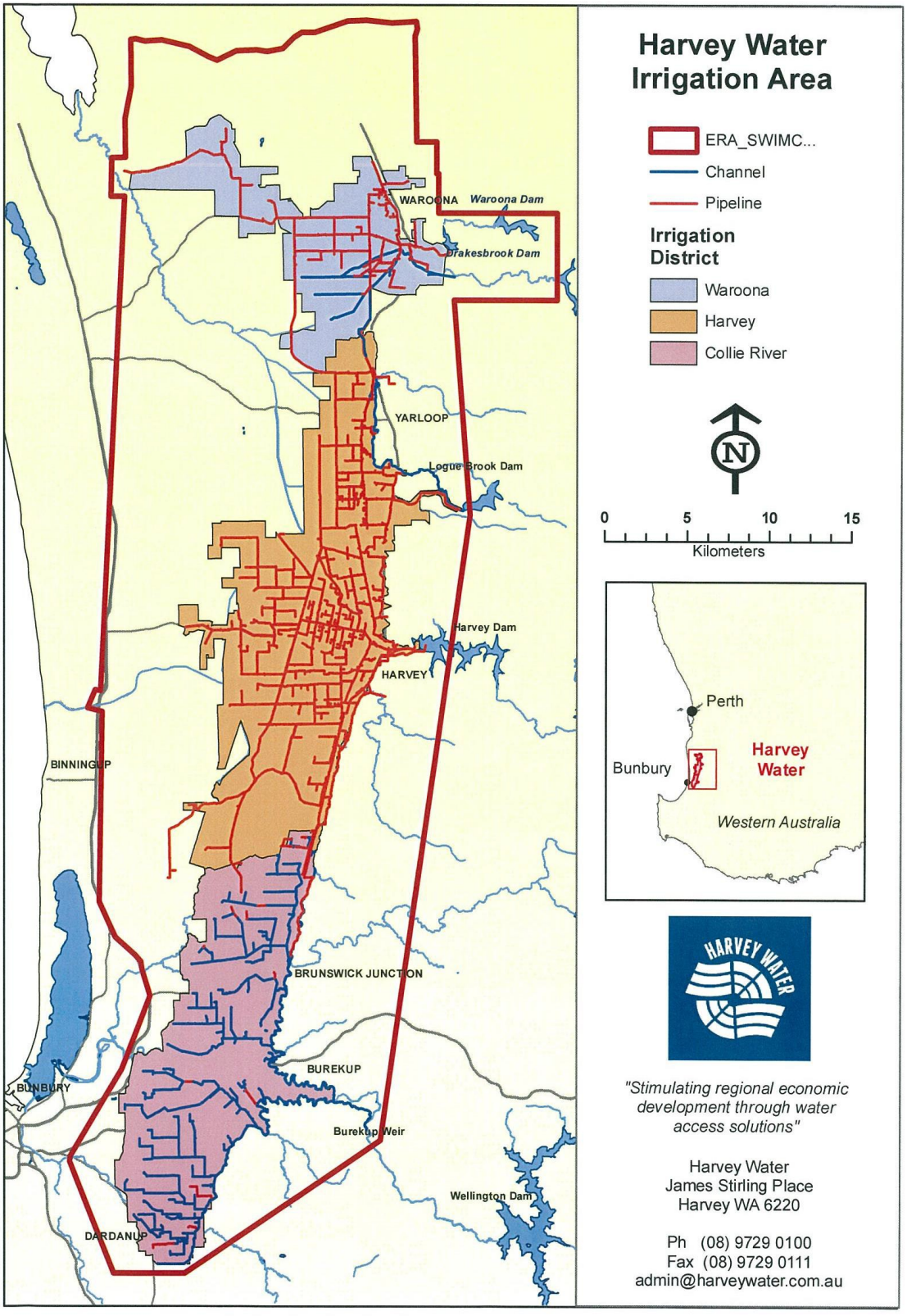
Automatically maintain the correct amount of free chlorine in a potable water storage tank, or use ultraviolet sterilisation to disinfect water, in accordance with Australian Drinking Water Guidelines.

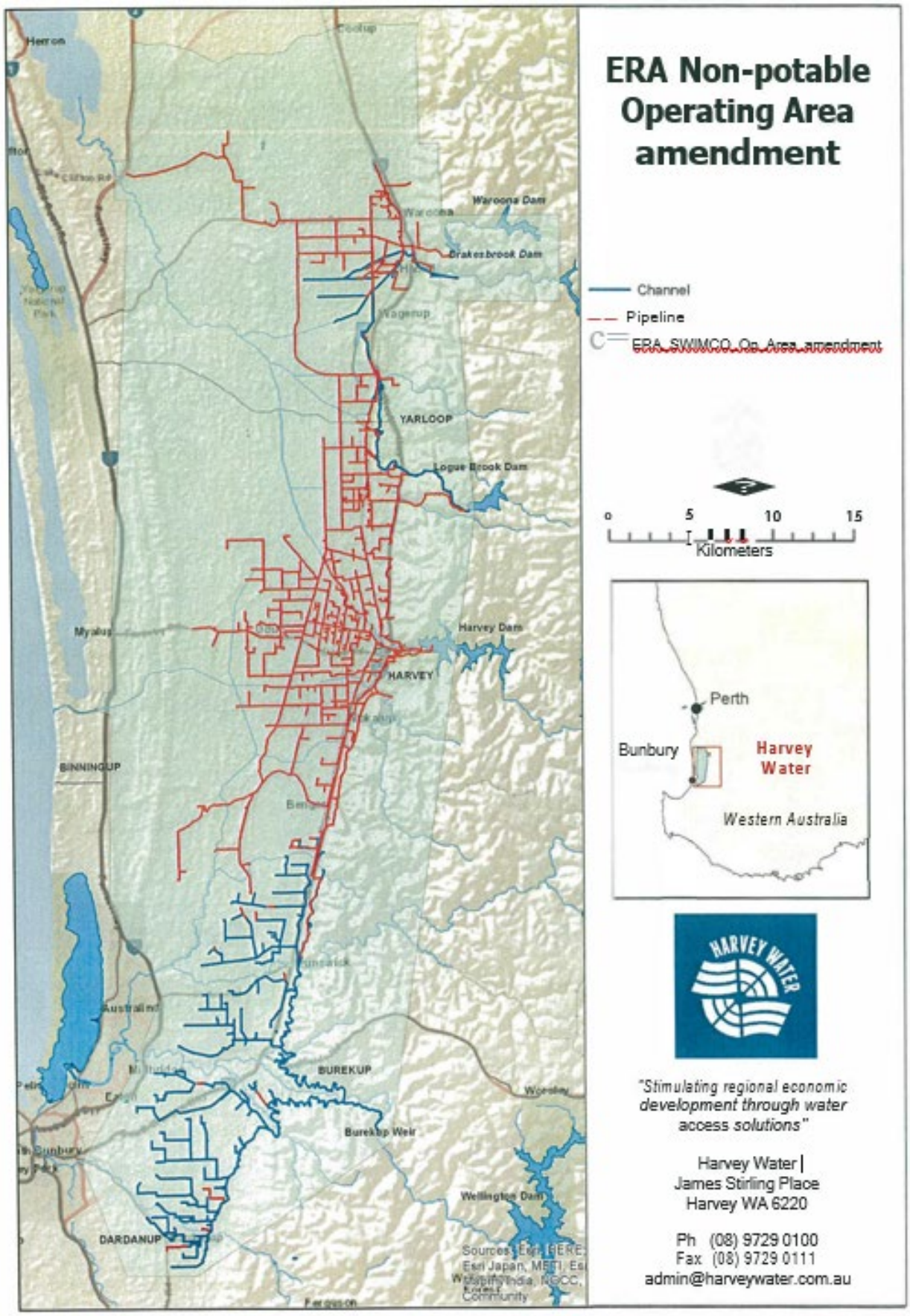
AREA MAPS

Harvey Water application to amend license to incorporate potable water provision at industrial locations – proposed area map.



Harvey Water application to amend license to incorporate the complete Kemerton Industrial Area into the licensed area for the provision of non-potable water




ERA Non-potable Operating Area amendment
Channel
Pipeline
ERA_SWIMCO_Op_Area_amendment
0 5 10 15
Kilometers
Perth
Bunbury
Harvey Water
Western Australia
"Stimulating regional economic development through water access solutions"
Harvey Water
James Stirling Place
Harvey WA 6220
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Fax (08) 9729 0111
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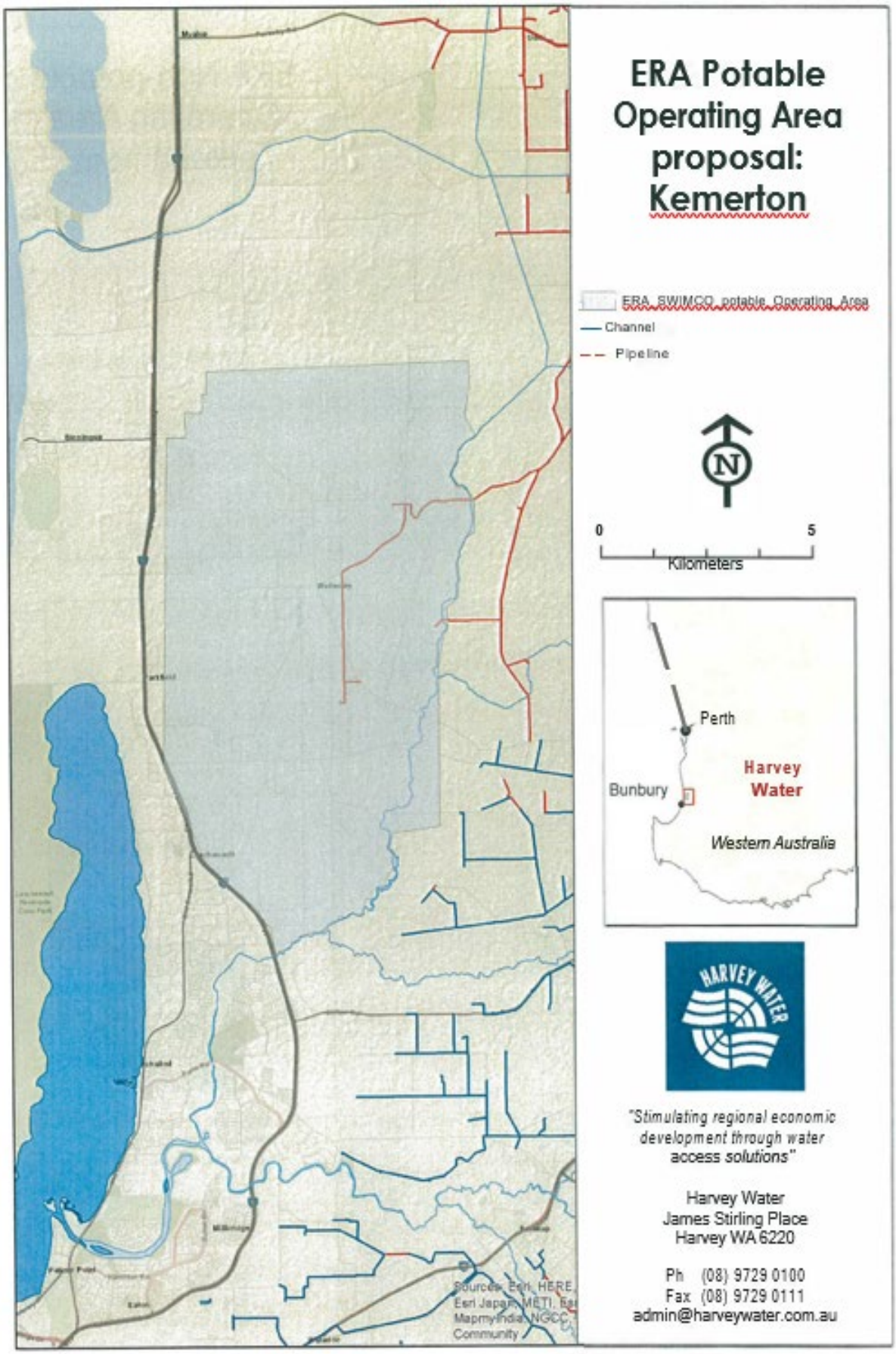
Waroona Dam
Drakesbrook Dam
YARLOOP
Logue Brook Dam
Harvey Dam
HARVEY
BINNINGUP
BUREKUP
DARDANUP
Wellington Dam


ERA Potable Operating Area proposal: Kemerton
ERA SWIMCO potable Operating Area
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Perth
Harvey Water
Bunbury
Western Australia
HARVEY WATER
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