

Institute of Hospital Engineers

Water Recycling

David Walker

Chief Engineer – Bendigo Health

February 23 2007

Agenda

- Grass?
- Housekeeping
- Stormwater Fund
- Smart Water Fund.



The 1990's Bendigo Hospital

Before Water Restrictions



Current state of gardens

- Need recycled water to fill this tank



Housekeeping

- To date the Bendigo Hospital Campus uses 100,000Litres less water per day than the same time last year

Coliban WATER
Emergency Service: 1300 363 208 (24 hours, 7 days)
Customer Enquiries: 1300 363 208 (local call cost) 9.00am to 5.00pm weekdays
ATN 05 543 352 200
TAX INVOICE
Issued on 2 Feb 2007

Property Address: **BENDIGO HOSPITAL, Lucas St, Bendigo 3550** -5 FEB 2007 Account Number: **15-2402-0100-02-4**

Next Scheduled Reading: 31 Jan 2007
Amount Due: **\$14,129.00**
Due By: **2 Mar 2007**

Bendigo Health Care Group
PO Box 128
BENDIGO VIC 3552

RECEIVED
1 FEB 2007

Flow usage in litres

Year	Jan	Feb	Mar	Apr	May	Jun
2006	10000	10000	10000	10000	10000	10000
2007	10000	10000	10000	10000	10000	10000

Balance Brought Forward
Opening Balance \$7,054.18
Total Payments Received to 2 Feb 2007 \$8.00
Balance \$7,046.18

Current Charges

Category	Amount
Water Consumption	\$3,081.23
Water Service Fee	\$108.58
Trade Waste COD Charge	\$108.19
Trade Waste Flow Charge	\$1,126.82
Trade Waste Nitrogen Charge	\$347.08
Trade Waste Phosphorus Charge	\$253.96
Trade Waste Suspended Solids Charge	\$418.14
Water & Sewerage Rebate	\$30.85
Less Accounting	\$0.32
Total	\$7,104.83

Amount Due: **\$14,129.00**
Total includes GST of \$8.00

ACCOUNTS PAYABLE INFORMATION

ACCOUNT NAME	DATE	AMOUNT
Coliban Water	15/02/07	14,129.00

HOW TO PAY - See reverse for details

Direct Debit
Payment by Mail: **15-2402-0100-02-4** Amount Due: **\$14,129.00**
Billor Code 29106
Please Quote Account Number

Payment in Person
Payment by Controlink

Victoria
The Place to Be

Barcode: 1524020100024

Housekeeping

- Basic, Cheap, Effective
- Fix leaks, float valves
- Change to low flow shower heads
- Install flow restrictors
- Change to dual flush W.C.s.

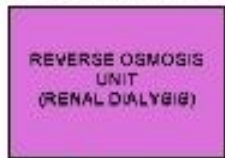
Stormwater Fund

- Recycle reverse osmosis waste water
- Install collection tanks
- Recycle filtration waste water
- Install rainwater collection tanks
- Collect & re-use fire sprinkler water.

Reverse Osmosis

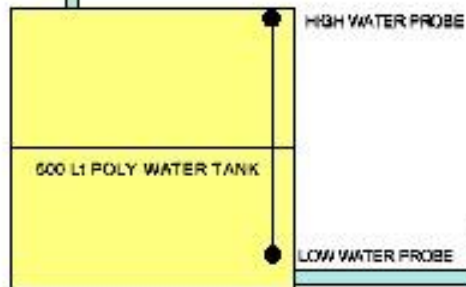
- Use water rejected from Reverse Osmosis Unit in Renal Dialysis to fill acute site toilet flushing tanks.
- Pumping water from Basement Stanistreet House to tanks in Level 5 Hyett.
- Saves 1.7Ml per year.

LEVEL 2 STANISTREET HOUSE

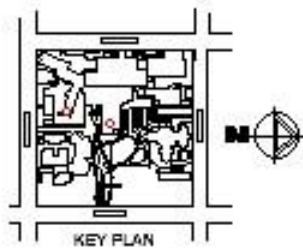
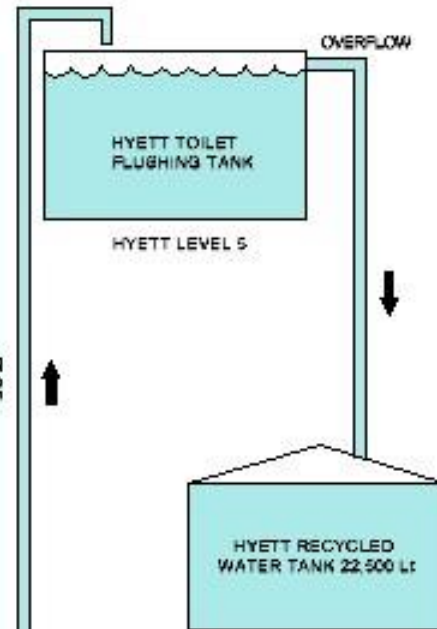
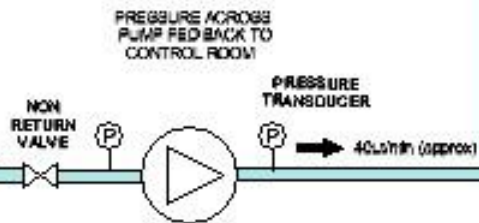


Ø 25

GRAVITY FEED @ 12L/min



BAGEMENT STANISTREET HOUSE



Engineering Department			B CG Reference	
Designed & Drawn By: GEB	Revised By: RL Aronson	File 181102.kiv	- - - -	
Title: WATER RECOVERY DIAGRAM FROM RENAL DIALYSIS REVERSE OSMOSIS UNIT TO HYETT FLUSHING TANK			Date: 10 / 10 / 06	Scale: N.T.S
			Revised: 0	Sheet: 1 of 1

Storage Tank and Controls



Toilet flushing Tank

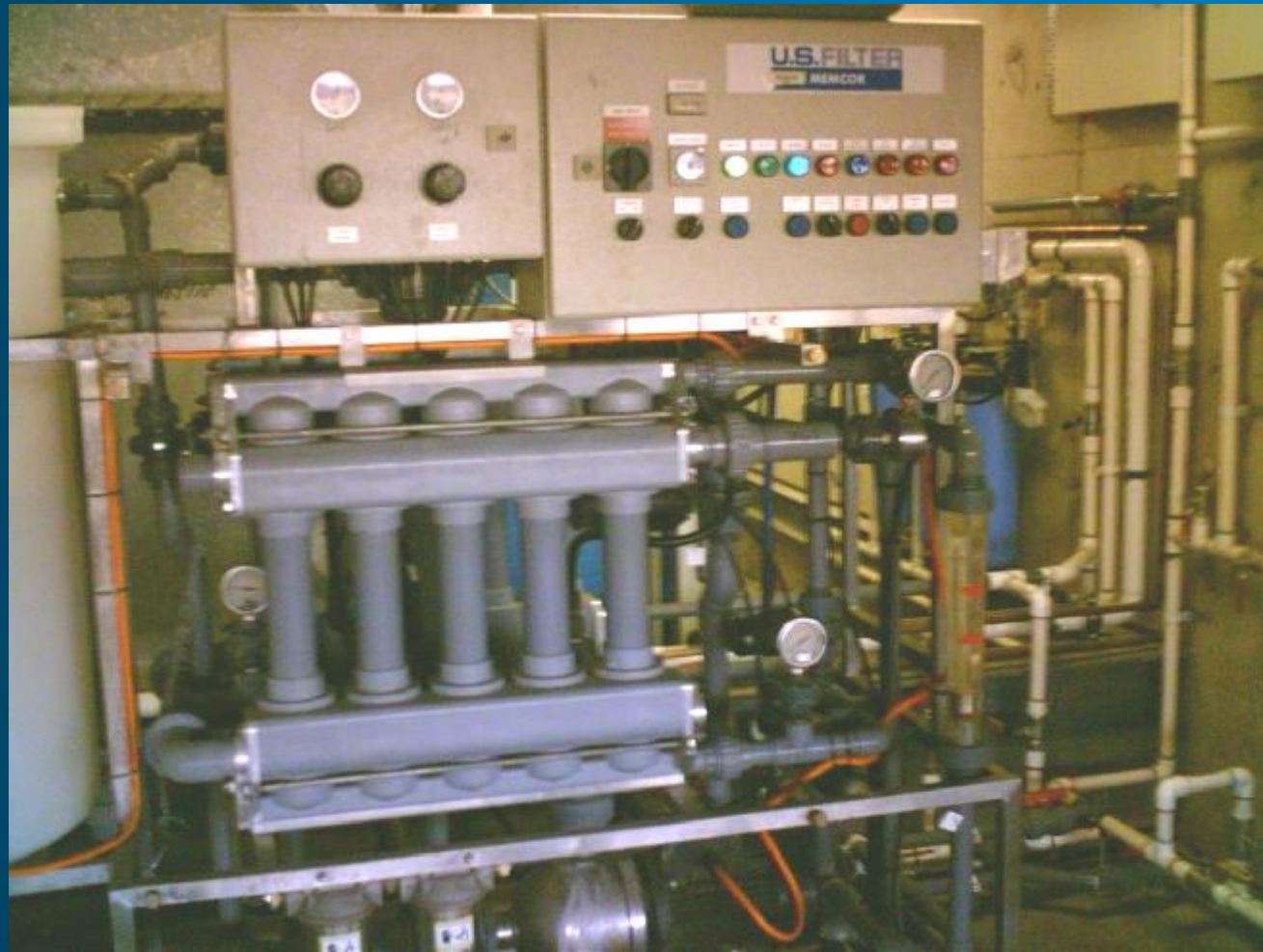
- 1.7MLt's per year into toilet flushing tank



Microfiltration Unit

- Back-flush water from micro-filtration unit cleans particles too large for membrane filter
- Waste water drains to 22,500Lt storage tank used to irrigate gardens at night
- Saves 4MLt's per year, and rising

Filtration Unit



Waste Water Storage Tank



Reusing pressure vessels

- 6,500Lt Calorifier previously used for storing domestic hot water



Connect to existing water storage

- Stormwater tank overflow to be connected to Calorifier



Stormwater Collection

- Infrastructure Required:
- Collection pit
- Level probes
- Stormwater Pit Pump: Water from pit to tank
- Irrigation Pump: Water from tank to garden
- Pressure controls
- Level Indicators

Infrastructure Required



Stormwater pit and Irrigation Pump

- Pressure controller to prevent pump running dry



Stormwater Fund Signage



Anne Caudle Centre Storm Water Storage Tank



This water storage tank and pump station is connected to the surrounding buildings and car parks behind you. It will capture at least 4 megalitres, (4 million litres) of water per year which previously would have gone down the drain.

The water stored in this tank will be used to irrigate the gardens of the Streams of Care building in front of you.

This project was made possible by a grant from the Department of Sustainability and Environment's Storm Water and Urban Water Conservation Fund. Installation work by the Bendigo Health Engineering Department.

21 Feb 07

Regulatory Signage, AS 3500

- Purple tap
- “Do not drink” sign within 100mm of tap



Stormwater Capturing Projects

Annual Water Savings

- **ACC: 12.3MI**
- **Joan Pinder: 200,000Litres**
- **Carshalton House: 240,000Litres**
- **Golden Oaks: 170,000Litres**
- **John Bomford: 100,000LtsLitres**
- **Stewart Cowen: 100,000Litres**
- **TBH: 8.3Ml....actual 36.5MI**

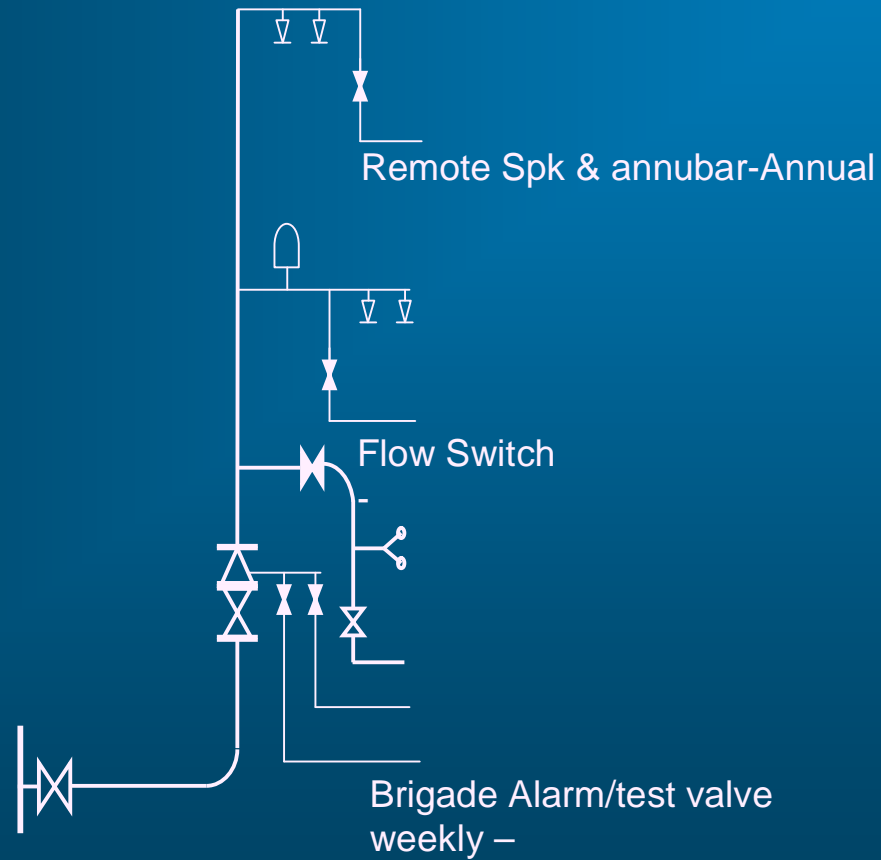
Sprinkler System Alarm Testing

- Each control valve assembly, flow switch alarms are tested weekly, quarterly, annually & 3 yearly
- Annual tests & drain system for repairs (isolations) etc approximately uses 60,000Lt per year

Sprinkler Isolation Valve

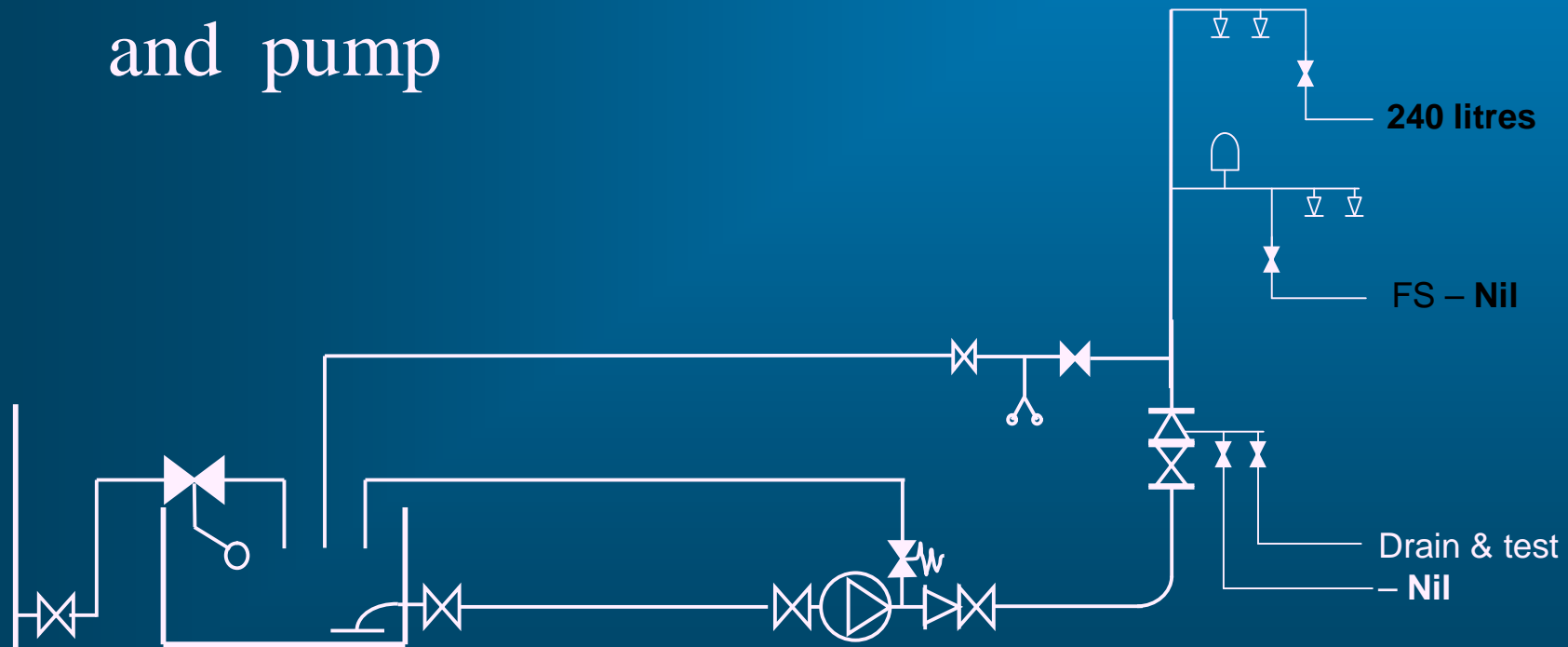


Sprinkler Network



Testing, Draining – Tank and Tank Return Lines

- Requires the installation of tank, return lines and pump



Final Installation

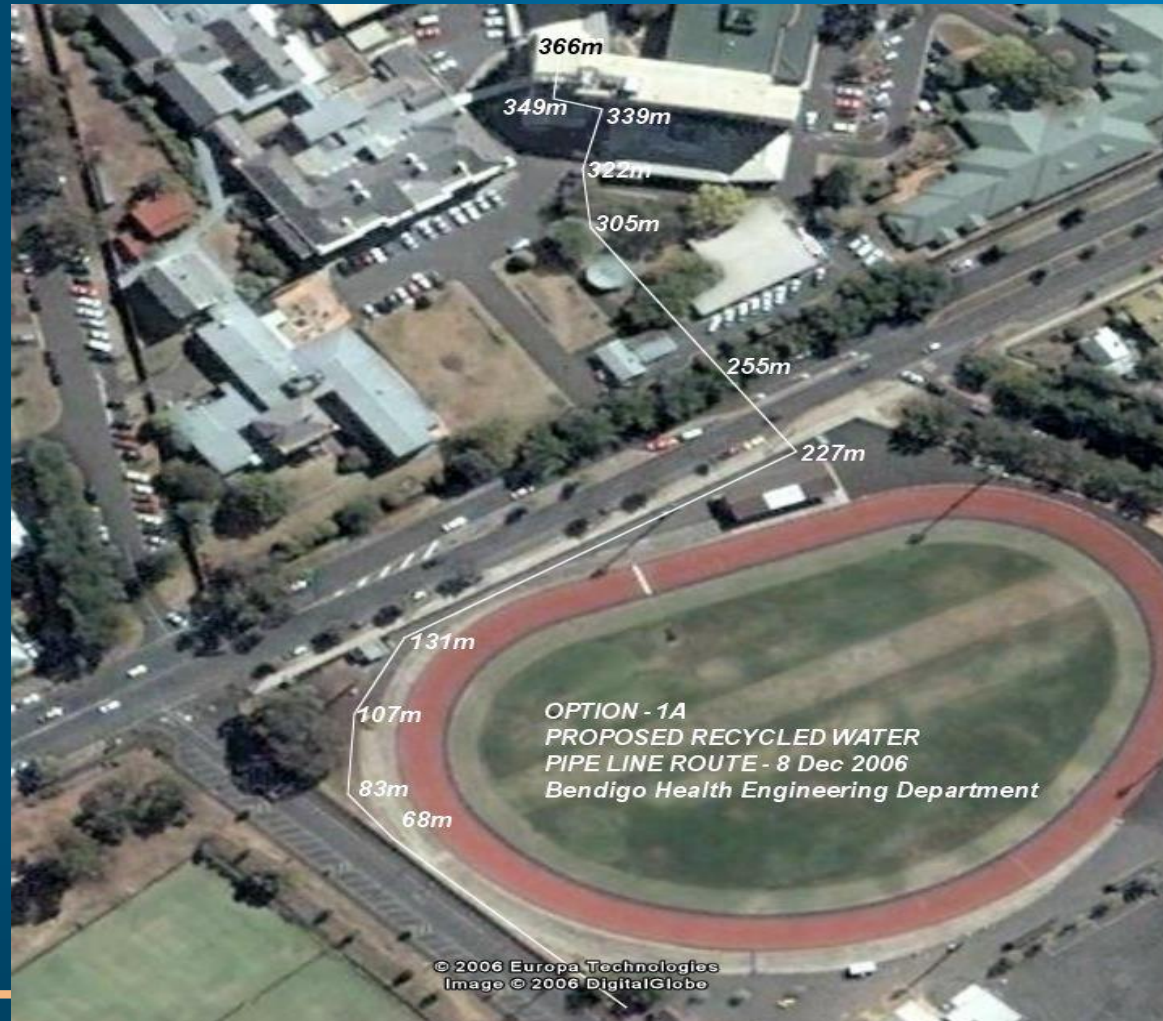
- Tank also collects stormwater



Future funded projects

- Class A recycled water to Laundry (60Ml per year) and boiler-house (67Ml)
- Class A recycled water to flush toilets (around 10Ml per year)
- Recycled hydrotherapy pool filter back-flush water to irrigate gardens
- Recycle boiler house cooling circuit water to irrigate gardens

Recycled water to Laundry



Hydrotherapy Pool

Divert back flush water to stormwater collection
pit



Public Health Requirements

- Formulate a risk management plan for each recycled water system
- Follow EPA Dual Pipe guidelines to conduct risk assessment
- Customer site health and environment management plan
- Involve Infection, prevention and control unit.

*Any
Questions?*
