



Central Irrigation Control System

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Outline

- Background
- Central Irrigation Control System
- Traditional versus Weather Based Watering
- Common Observations and Causes
- Working Together



Background



- Council has a target for a 12% reduction in potable water use from Council operations
- Audit of irrigation systems in 2012-13
- Multiple problems identified
 - Unable to apply water when needed or turn systems off rapidly
 - Very time consuming to adjust schedules
 - Many different controllers, sprinklers, valves
 - Unable to monitor system performance or identify problems

The Response



Obtained capital and operational funding to deliver a multi-faceted program of works over 5 years (from 2013-14):

1. Central irrigation control system
2. Modifications to existing systems
3. Complete replacement of ageing systems
4. New irrigation systems to replace manual watering
5. Maintenance program

Central Irrigation Control System



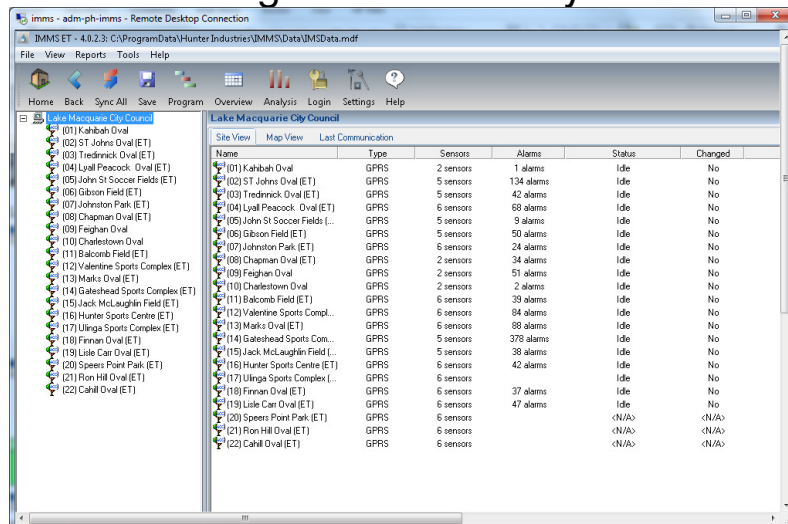
- Consistency of controllers – data communications
- Weather stations
- Monitoring of flows
- Complemented by data loggers on water meters (smart metering)

What does the Central Control mean?



- Council staff control scheduling, except for curation of turf wickets
- Specific requests (e.g. turf patching) – please e-mail in advance with dates and areas (ideally a week, 1 day is not great)
- Stations and programs can be turned off/on with a click of a mouse
- No manual watering on irrigated area
- Irrigation not scheduled on a weekend (Fri & Sat nights) except in extreme heat

Central Irrigation Control System



IMMS ET - 4.0.2.3: C:\ProgramData\Hunter Industries\UMMS\Data\UMSData.mdf

File View Reports Tools Help

Home Back Sync All Save Program Overview Analysis Login Settings Help

Lake Macquarie City Council

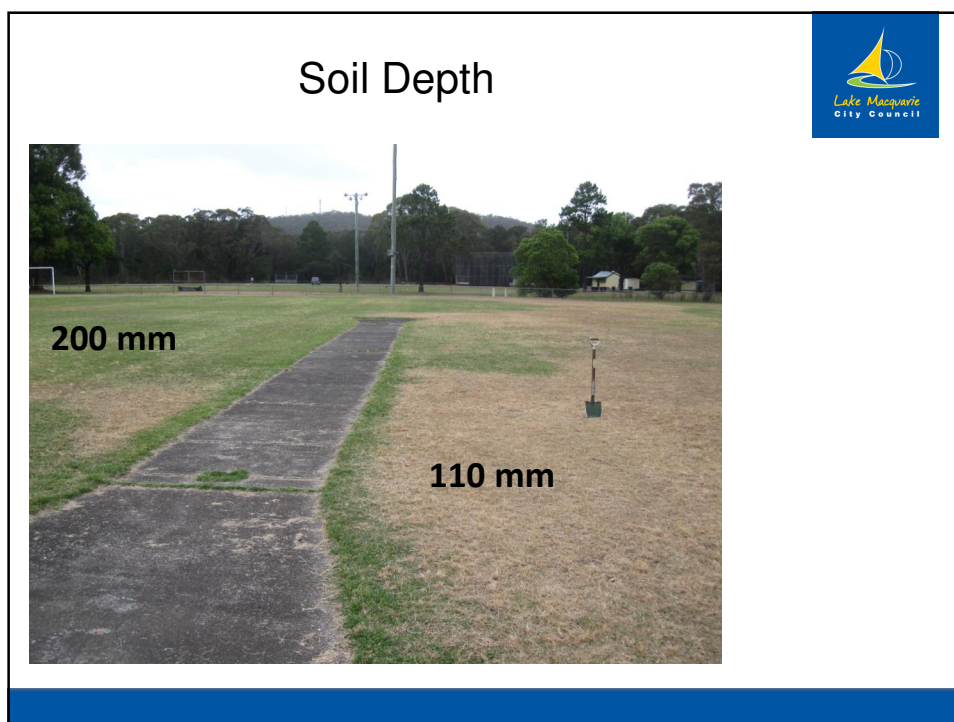
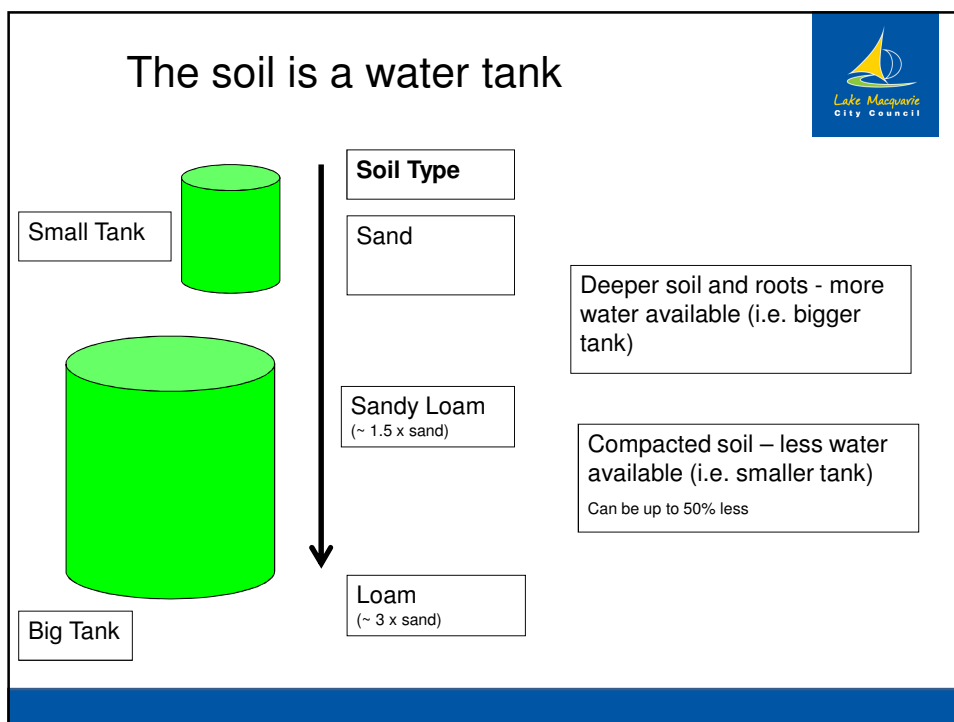
Site View Map View Last Communication

Name	Type	Sensors	Alarms	Status	Changed
(01) Kahlbah Oval	GPRS	2 sensors	1 alarms	Idle	No
(02) ST Johns Oval (ET)	GPRS	5 sensors	134 alarms	Idle	No
(03) Tredinnick Oval (ET)	GPRS	5 sensors	42 alarms	Idle	No
(04) Lyall Peacock Oval (ET)	GPRS	6 sensors	68 alarms	Idle	No
(05) John St Soccer Fields L...	GPRS	5 sensors	9 alarms	Idle	No
(06) Gibson Field (ET)	GPRS	5 sensors	50 alarms	Idle	No
(07) Johnston Park (ET)	GPRS	6 sensors	24 alarms	Idle	No
(08) Chapman Oval (ET)	GPRS	2 sensors	34 alarms	Idle	No
(09) Feighan Oval	GPRS	2 sensors	51 alarms	Idle	No
(10) Charlestown Oval	GPRS	2 sensors	2 alarms	Idle	No
(11) Balcomb Field (ET)	GPRS	6 sensors	39 alarms	Idle	No
(12) Valentine Sports Compl...	GPRS	6 sensors	84 alarms	Idle	No
(13) Marks Oval (ET)	GPRS	6 sensors	88 alarms	Idle	No
(14) Gateshead Sports Com...	GPRS	5 sensors	378 alarms	Idle	No
(15) Jack McLaughlin Field L...	GPRS	5 sensors	38 alarms	Idle	No
(16) Hunter Sports Centre (ET)	GPRS	6 sensors	42 alarms	Idle	No
(17) Ullinga Sports Complex L...	GPRS	6 sensors	...	Idle	No
(18) Finnan Oval (ET)	GPRS	6 sensors	37 alarms	Idle	No
(19) Lisle Carr Oval (ET)	GPRS	6 sensors	47 alarms	Idle	No
(20) Speers Point Park (ET)	GPRS	6 sensors	<N/A>	<N/A>	<N/A>
(21) Ron Hill Oval (ET)	GPRS	6 sensors	<N/A>	<N/A>	<N/A>
(22) Cahill Oval (ET)	GPRS	6 sensors	<N/A>	<N/A>	<N/A>


Received lots of questions – how does it work?


Received lots of questions

- How does it work?
- When will irrigation occur?
- These questions will be addressed in the following slides



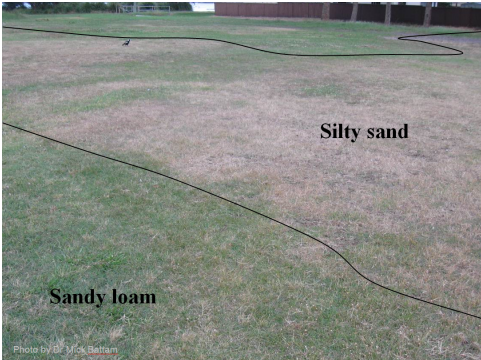
Soil Type





Drainage lines

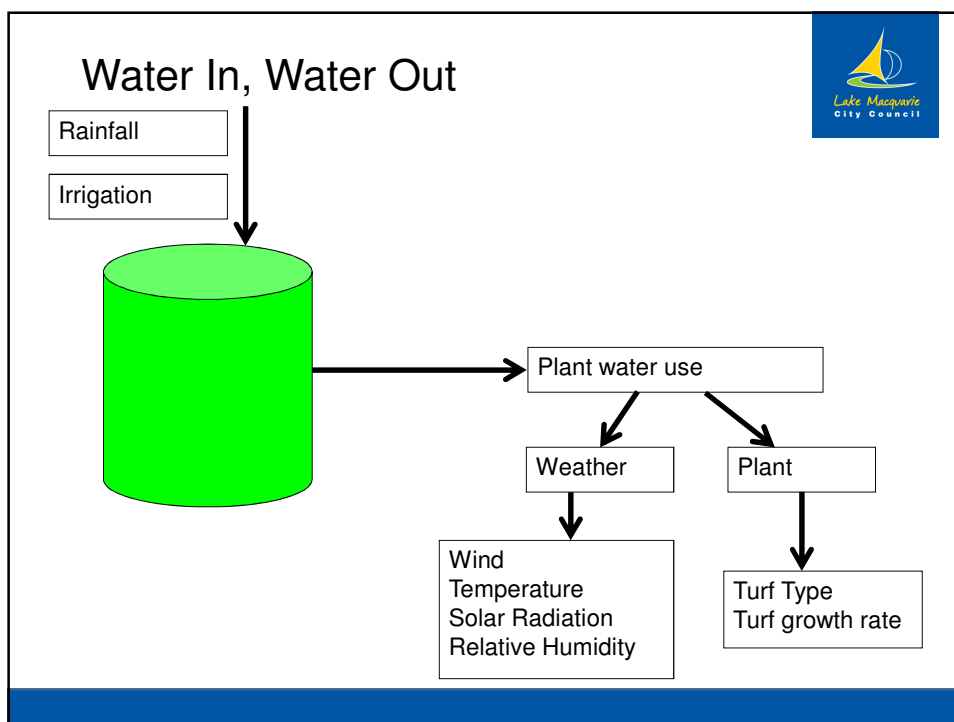
Soil Type



Silty sand

Sandy loam

Photo by Dr. Mark Bellam



Traditional Watering



- Fixed irrigation schedule (day, start time, run time)
- Some people describe run time (mins), others describe mm of water (same as rainfall)
- Applies the same amount of water regardless of how big the tank is or full or empty it is
- Usually results in over watering – requires time and availability to change schedules to weather conditions and plant growth

Weather Based Watering



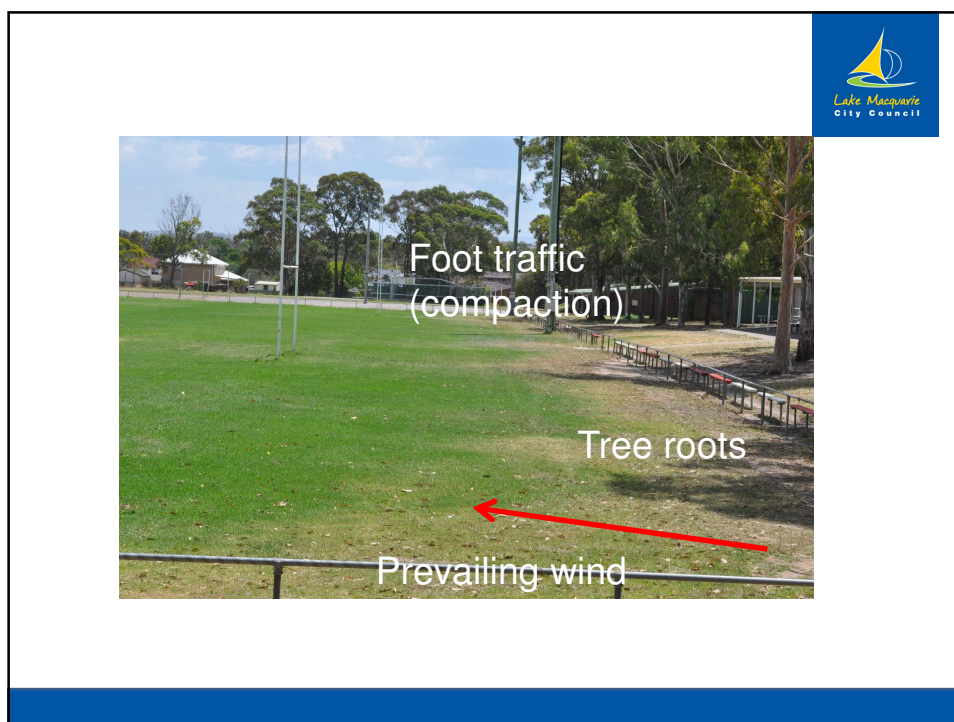
- No fixed schedule, but has a set start time and days allowed to water
- Irrigates based on water level in soil (tank)
- Weather data collected from stations across the City – 4 times a day
- Automatically adjusts run times
- Requires refinement of settings over time

Common Observations



- Dry Spots
 - Soils – water repellency, compaction, lack of depth
 - Sprinklers – not rotating, arcs need adjusting
 - Competition – e.g. tree roots
 - Wind direction
 - Station not operating – solenoid valves, water supply, wiring





Common Observations

- Wet Spots
 - Sprinkler not rotating, arcs need adjusting
 - Burst sprinklers or fittings
 - Leaking valves



Common Observations



- Ground too hard
 - Compacted soil – needs aeration
 - Don't use when wet



Common Observations



- Turf "Struggling"
 - Chemical imbalance (pH, nutrients)
 - Pests or disease
 - Heavy mowing after rapid growth
 - Different turf types, weeds
 - Wear from foot traffic
 - Shading
 - Soils – water repellent, compacted
 - May be too wet or too dry



Other known factors/issues

- Pumps
 - Lack of water (line blockages)
 - Pump settings
- Wiring
- Power outages
- Manual watering
- Top up valves failing
- Water meters don't work



Working Together

- Irrigation systems run early in the morning – don't visually see operation all the time
- System components do fail

Need monitoring systems and visual inspection

- Council staff are constantly monitoring irrigation systems
 - Central Control alarms
 - Alerts from water meters
- Greenkeepers are visiting sites on a regular basis
- Volunteers regularly on site

Photo: David McKechnie



Solving Problems

- Step 1: Pick up the phone or send an e-mail
 - Give as much descriptive information on symptoms and location as can
 - Don't manually water!!!
- Step 2: Investigate
 - Multiple potential causes – detective work required
 - Checking of system records
 - Site inspection and visual check of system
- Step 3: Fix it! Council staff or contractors

Want to know when irrigation occurred? Get an e-mail alert



Questions?

