PACKHOUSE
ACTION GROUP

Packhouse Action Group
Water Project Feedback

17 May 2018

BLUE NORTH
THINKING. FUTURE

Contents

- Project background
- Objectives
- Deliverables

PACKHOUSE
ACTION GROUP

Project Background

- The project was initiated by the Packhouse Action Group (PAG) steering committee in 2017.
- Blue North Sustainability was appointed as project managers in October 2017.

PACKHOUSE ACTION GROUP

Project Objectives

- Raise awareness of the strategic importance and direct benefits of identifying and managing water-related risks at Packhouse and Cold Storage levels.
- Identify a process packhouses can follow to understand and manage water-related risks.
- Encourage industry knowledge sharing.

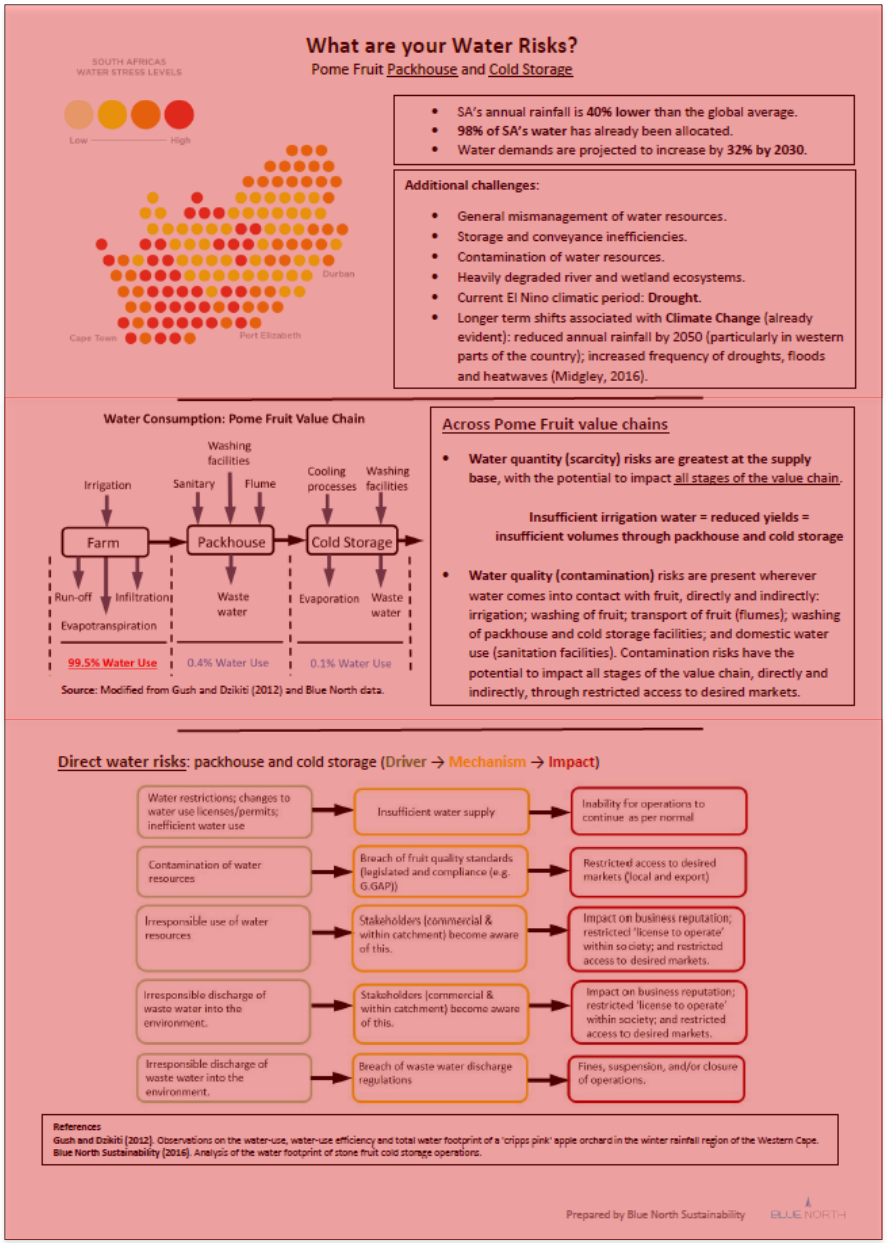
PACKHOUSE
ACTION GROUP

Project Deliverables

1. One page information sheet
2. Packhouse water management methodology
3. Case study
4. Industry benchmark
5. Workshops

PACKHOUSE
ACTION GROUP

One Page Information Sheet



What are your Water Risks?

Pome Fruit Packhouse and Cold Storage

SOUTH AFRICAS WATER STRESS LEVELS

Low — High

Durban

Cape Town

Port Elizabeth

- SA's annual rainfall is **40% lower** than the global average.
- **98% of SA's water** has already been allocated.
- Water demands are projected to increase by **32% by 2030**.

Additional challenges:

- General mismanagement of water resources.
- Storage and conveyance inefficiencies.
- Contamination of water resources.
- Heavily degraded river and wetland ecosystems.
- Current El Nino climatic period: **Drought**.
- Longer term shifts associated with **Climate Change** (already evident): reduced annual rainfall by 2050 (particularly in western parts of the country); increased frequency of droughts, floods and heatwaves (Midgley, 2016).

Water Consumption: Pome Fruit Value Chain

Source: Modified from Gush and Dzikiti (2012) and Blue North data.

Across Pome Fruit value chains

- **Water quantity (scarcity) risks are greatest at the supply base**, with the potential to impact all stages of the value chain.

  Insufficient irrigation water = reduced yields = insufficient volumes through packhouse and cold storage

- **Water quality (contamination)** risks are present wherever water comes into contact with fruit, directly and indirectly: irrigation; washing of fruit; transport of fruit (flumes); washing of packhouse and cold storage facilities; and domestic water use (sanitation facilities). Contamination risks have the potential to impact all stages of the value chain, directly and indirectly, through restricted access to desired markets.

Direct water risks: packhouse and cold storage (Driver → Mechanism → Impact)

Water restrictions; changes to water use licenses/permits; inefficient water use	Insufficient water supply	Inability for operations to continue as per normal
Contamination of water resources	Breach of fruit quality standards (legislated and compliance (e.g. G.GAP))	Restricted access to desired markets (local and export)
Irresponsible use of water resources	Stakeholders (commercial & within catchment) become aware of this.	Impact on business reputation; restricted 'license to operate' within society; and restricted access to desired markets.
Irresponsible discharge of waste water into the environment.	Stakeholders (commercial & within catchment) become aware of this.	Impact on business reputation; restricted 'license to operate' within society; and restricted access to desired markets.
Irresponsible discharge of waste water into the environment.	Breach of waste water discharge regulations	Fines, suspension, and/or closure of operations.

References
Gush and Dzikiti (2012). Observations on the water-use, water-use efficiency and total water footprint of a 'cripps pink' apple orchard in the winter rainfall region of the Western Cape.
Blue North Sustainability (2016). Analysis of the water footprint of stone fruit cold storage operations.

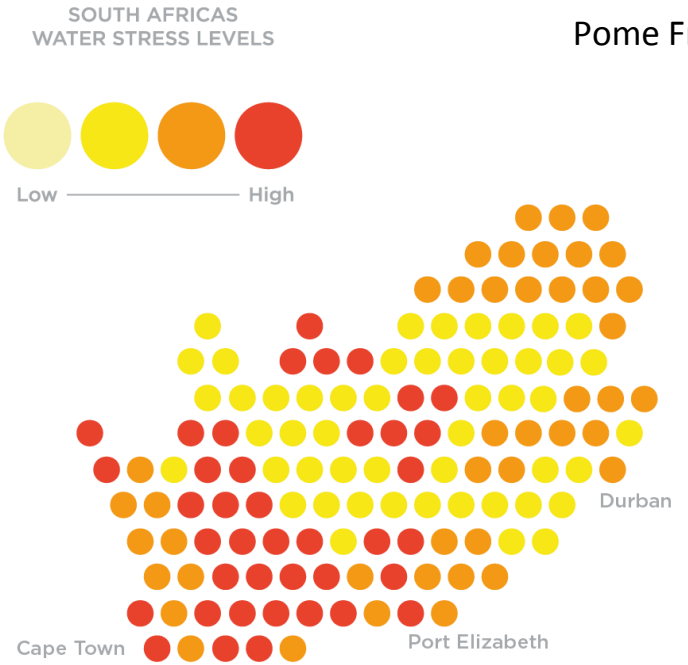
Prepared by Blue North Sustainability BLUE NORTH

PACKHOUSE ACTION GROUP

One Page Information Sheet

What are your Water Risks?

Pome Fruit Packhouse and Cold Storage



- SA's annual rainfall is **40% lower** than the global average.
- **98% of SA's water** has already been allocated.
- Water demands are projected to increase by **32% by 2030**.

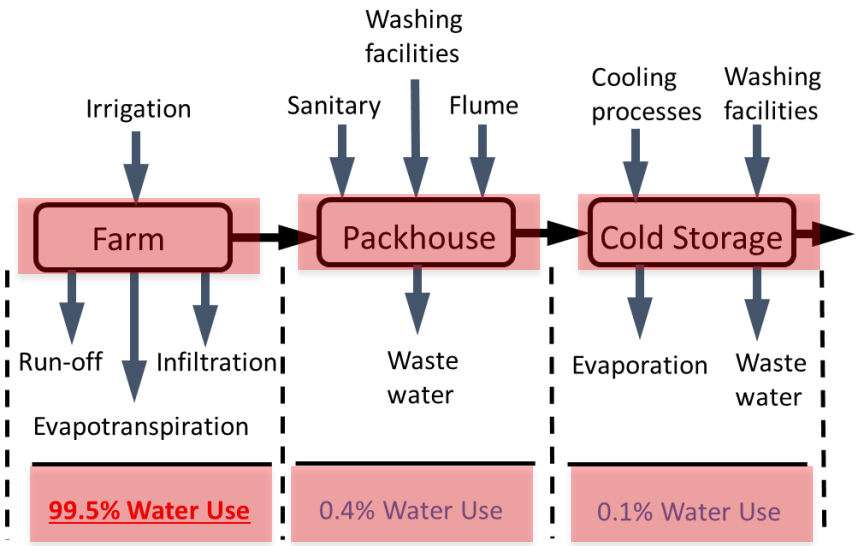
Additional challenges:

- General mismanagement of water resources.
- Storage and conveyance inefficiencies.
- Contamination of water resources.
- Heavily degraded river and wetland ecosystems.
- Current El Nino climatic period: **Drought**.
- Longer term shifts associated with **Climate Change** (already evident): reduced annual rainfall by 2050 (particularly in western parts of the country); increased frequency of droughts, floods and heatwaves (Midgley, 2016).

PACKHOUSE
ACTION GROUP

One Page Information Sheet

Water Consumption: Pome Fruit Value Chain



Source: Modified from Gush and Dzikiti (2012) and Blue North data.

Across Pome Fruit value chains

- **Water quantity (scarcity) risks are greatest at the supply base**, with the potential to impact all stages of the value chain.

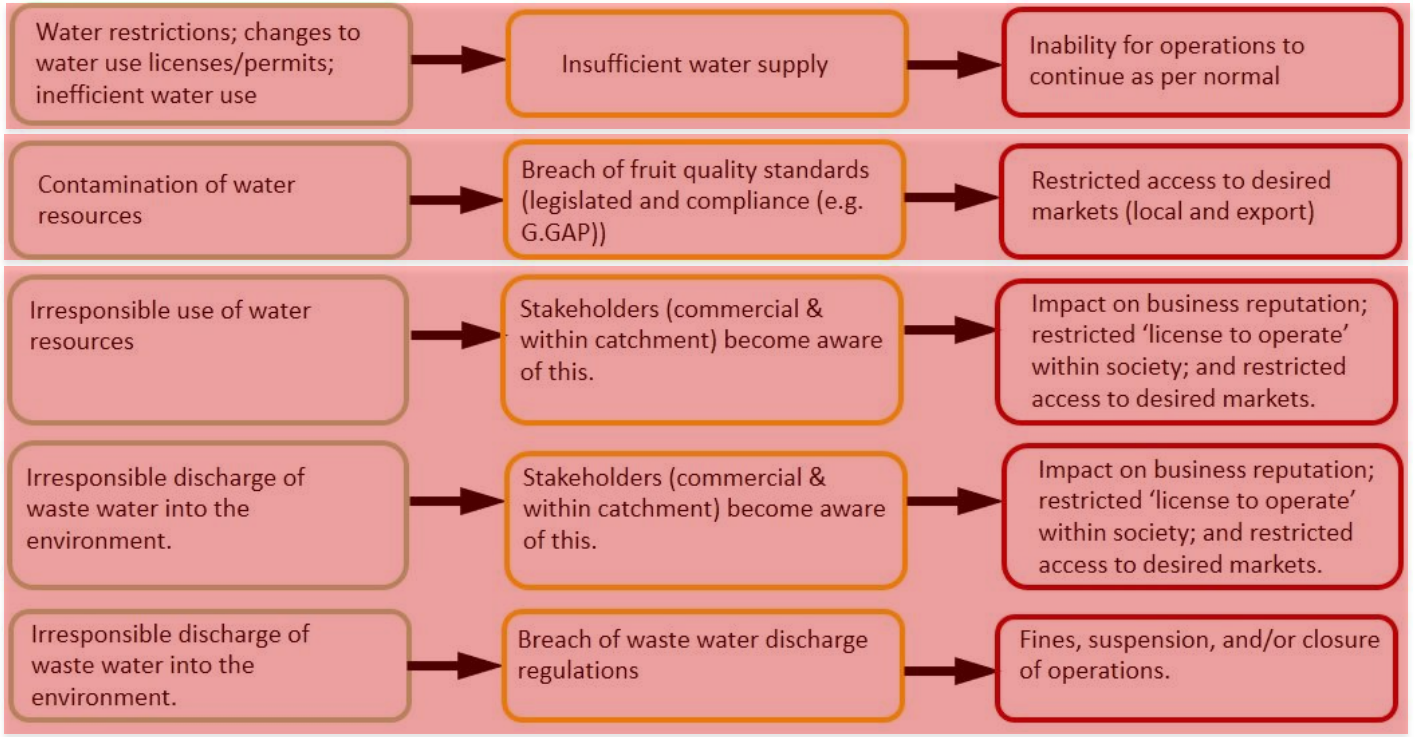
  Insufficient irrigation water = reduced yields = insufficient volumes through packhouse and cold storage

- **Water quality (contamination)** risks are present wherever water comes into contact with fruit, directly and indirectly: irrigation; washing of fruit; transport of fruit (flumes); washing of packhouse and cold storage facilities; and domestic water use (sanitation facilities). Contamination risks have the potential to impact all stages of the value chain, directly and indirectly, through restricted access to desired markets.

PACKHOUSE ACTION GROUP

One Page Information Sheet

Direct water risks: packhouse and cold storage (**Driver** → **Mechanism** → **Impact**)



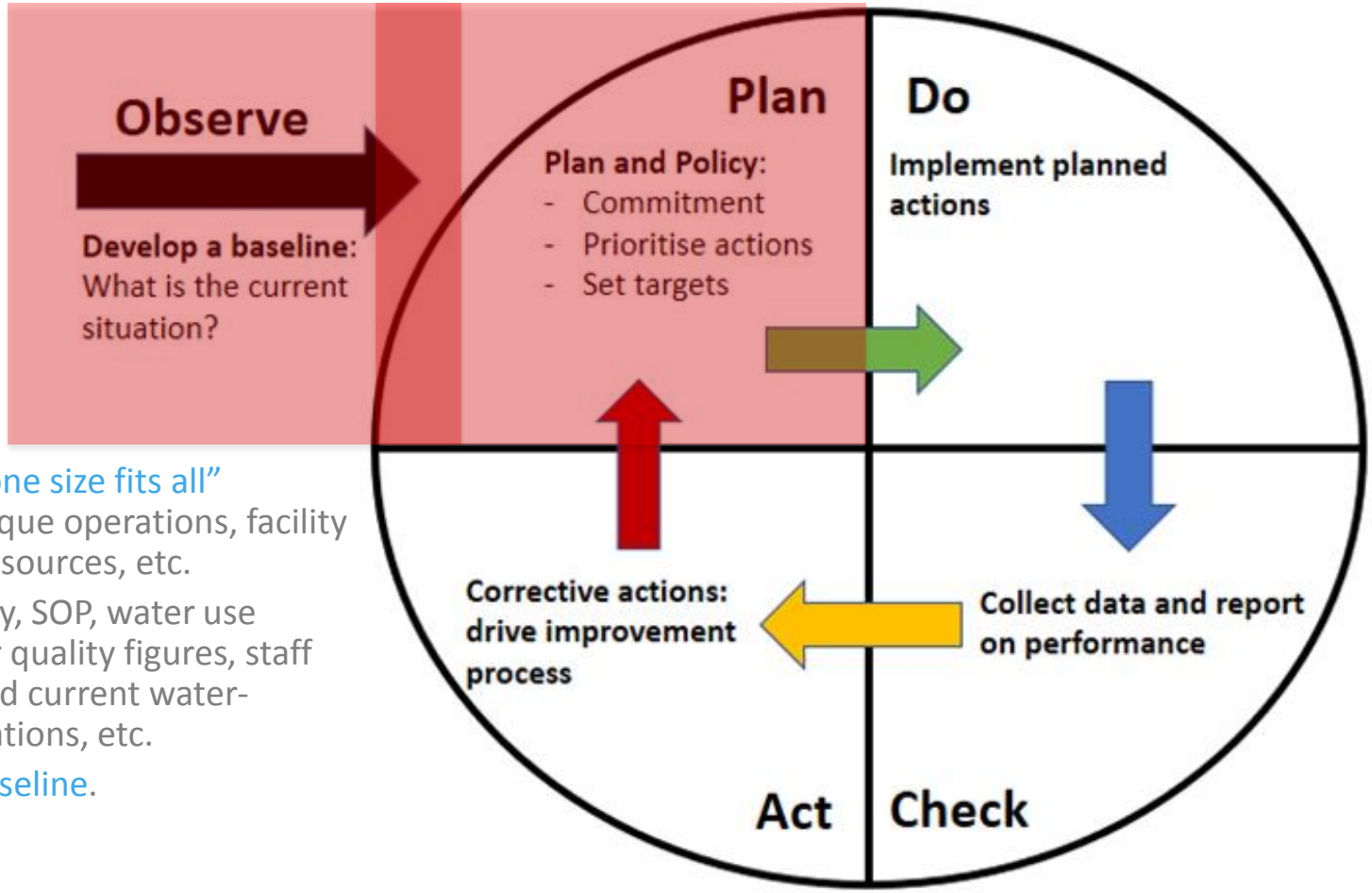
PACKHOUSE ACTION GROUP

Packhouse Water Management Methodology

- The purpose of this document is to give packhouses a starting point and process for manage their water risks.
- The methodology is based on continuous improvement.
- The methodology adopted is based on the:
  - Observe – Plan – Do – Check – Act methodology (All About Lean, 2016; ASQ, n.d.); and
  - the ISO 50001:2011 Energy Management Systems methodology.

PACKHOUSE ACTION GROUP

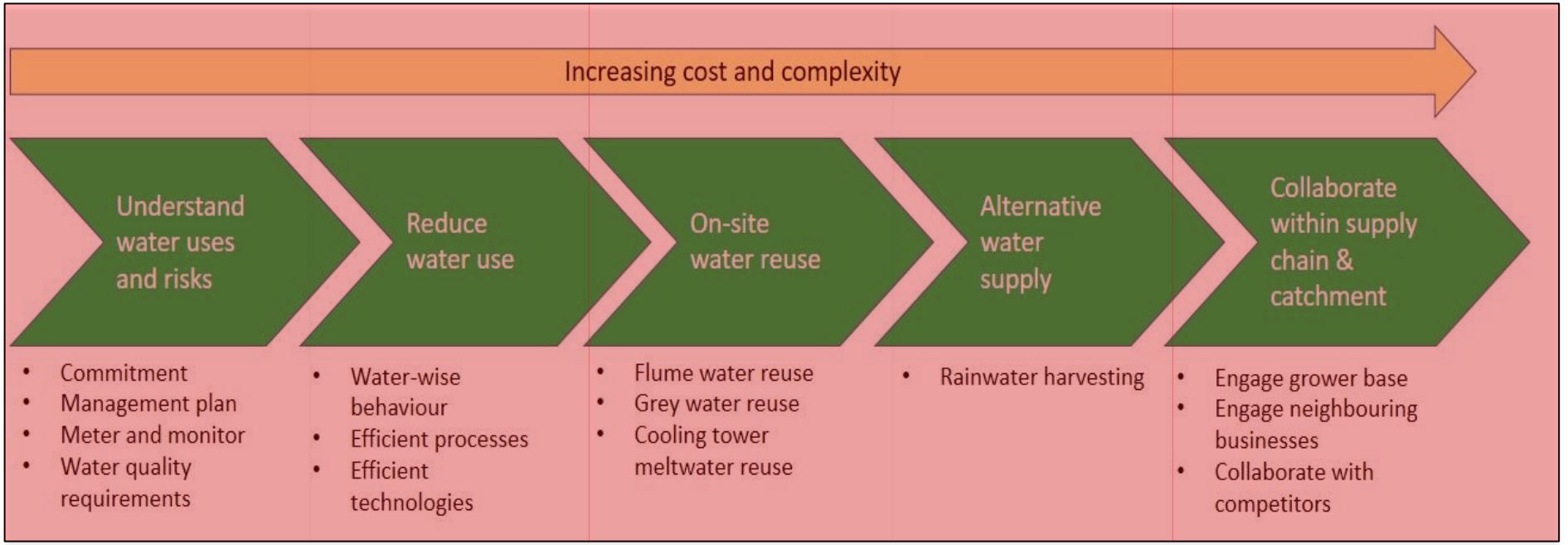
Packhouse Water Management Methodology



- There is no "one size fits all" solution - Unique operations, facility layout, water sources, etc.
- Includes Policy, SOP, water use figures, water quality figures, staff awareness and current water-related regulations, etc.
- Establish a baseline.

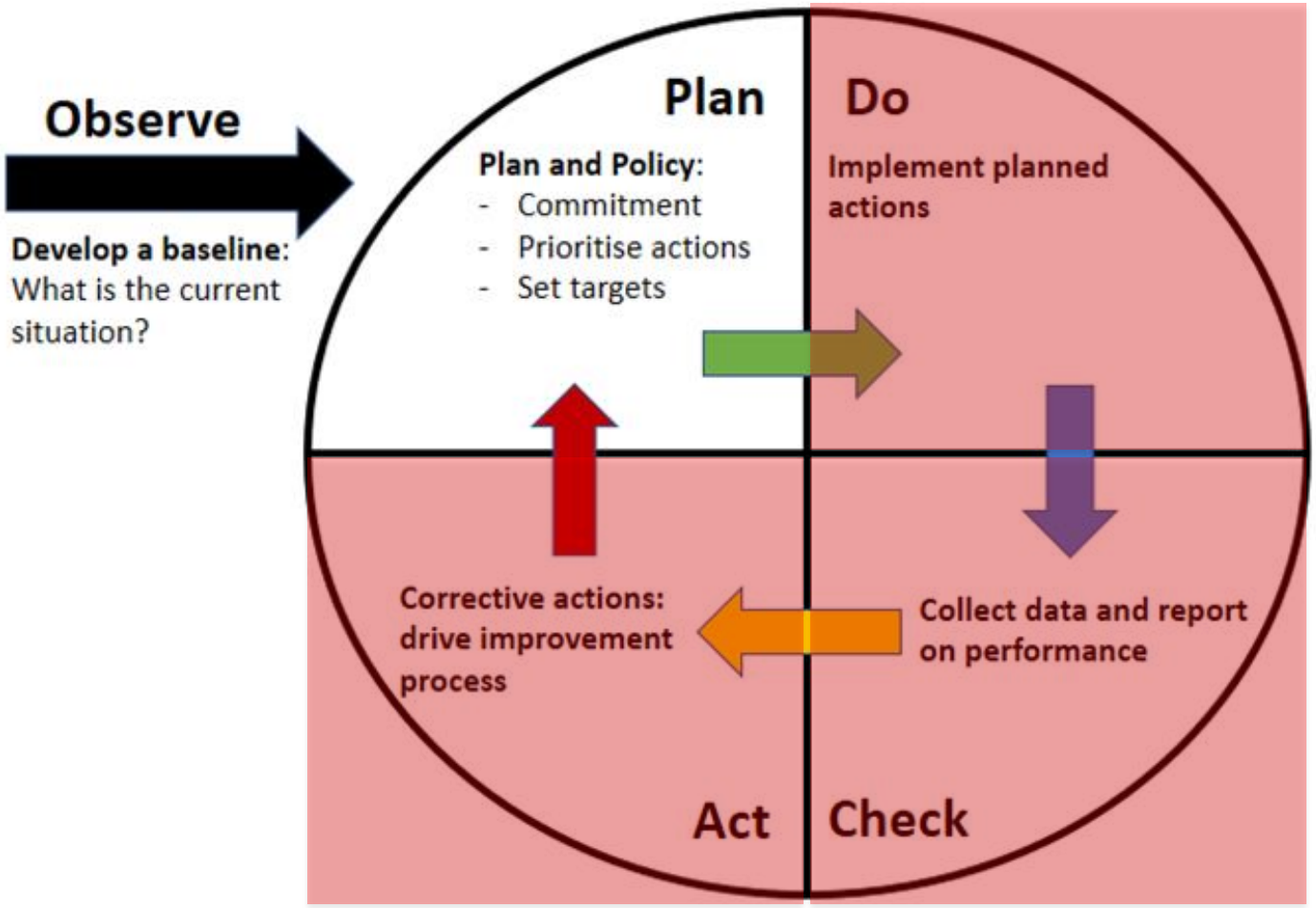
PACKHOUSE ACTION GROUP

Water Management Methodology – “Plan”



PACKHOUSE ACTION GROUP

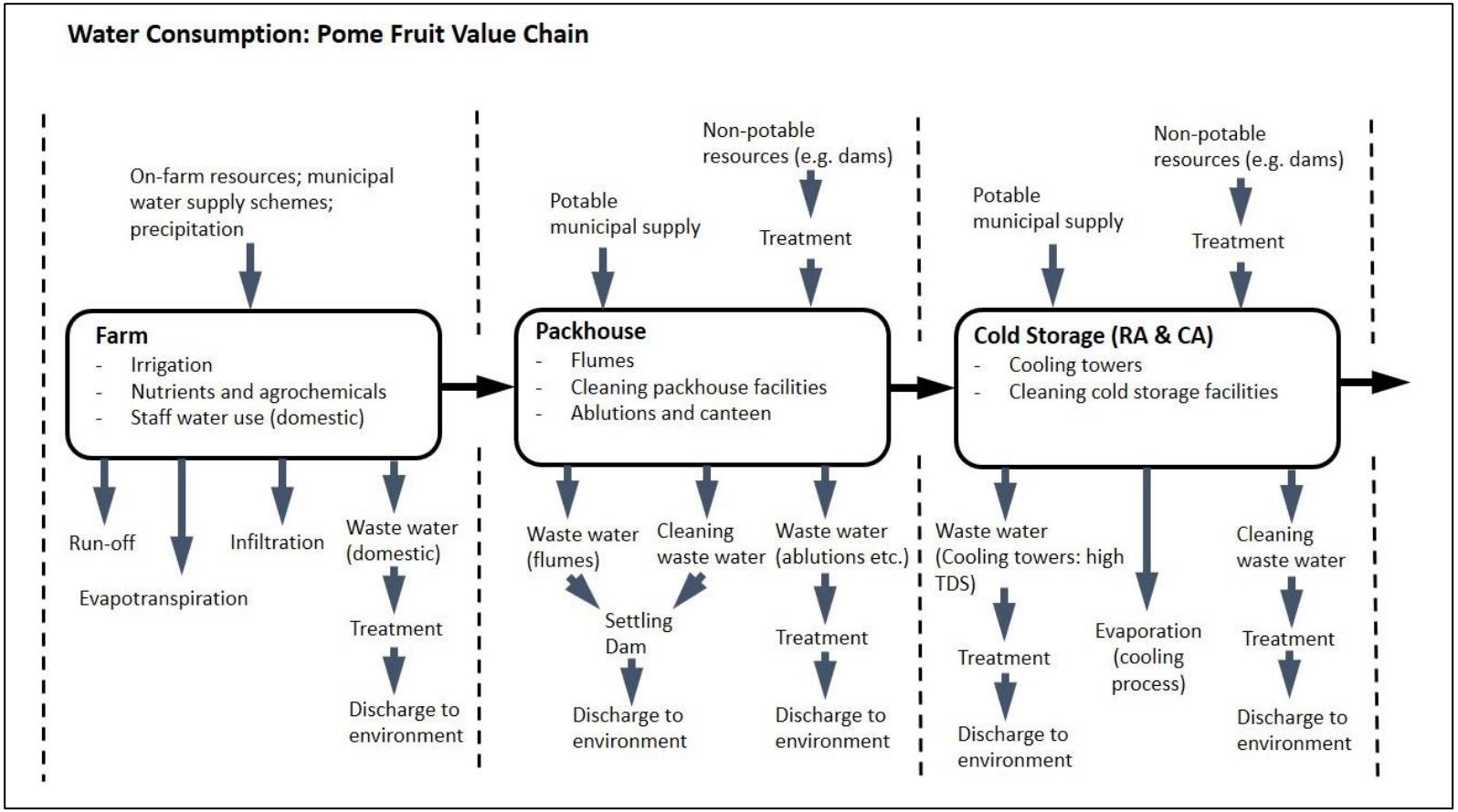
Packhouse Water Management Methodology



PACKHOUSE ACTION GROUP

Case Study

- System Map – Understanding the challenges and unique flow of water through the packhouse.



PACKHOUSE ACTION GROUP

Case Study – Solutions and Ideas

- Packhouse:
  - Challenge 1: Reducing flume water use – Technology.
  - Challenge 2: Increase the time between flume draining – Technology, processes & research.
  - Challenge 3: Augment water supply – Rainwater harvesting installation.
- Cold Storage:
  - Challenge 1: Reducing cooling tower water use – Technology & installation.
  - Challenge 2: Reuse of meltwater from cold room evaporators – Installation.
  - Challenge 3: Wetting of floors within the CA store – Research.
- Ablutions, Canteens & Offices:
  - Challenge 1: Reduce water use in ablution facilities – Training, technology & installation.

PACKHOUSE ACTION GROUP

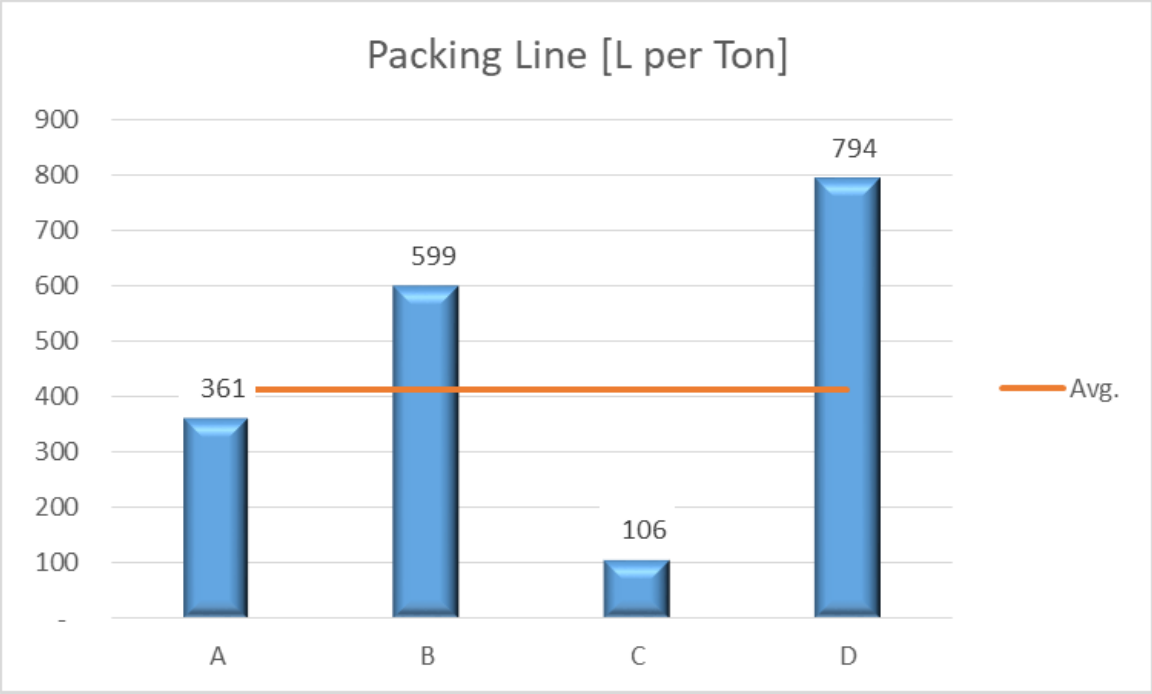
Industry Benchmarks

- Encourage industry knowledge sharing.
- Data was collected via a standardised data collection tool.
- Data was sense checked with packhouses.
- Notes are included where data issues were identified.

PACKHOUSE ACTION GROUP

Industry Benchmark – Packaging Line

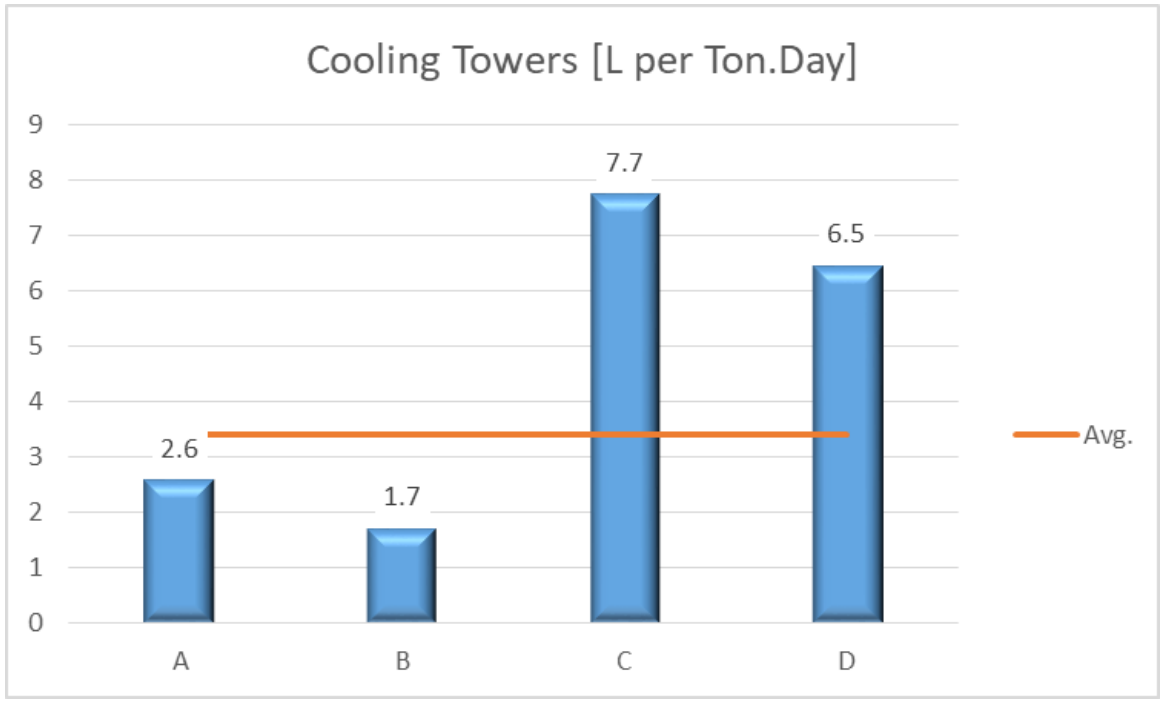
- This benchmark includes all packing line water consumption of which flume water use make up the majority.
- Unit of Measure: Litres per Ton of Fruit Packed
- Notes: The ablution water use for Packhouse D was included in the packing line figures.



PACKHOUSE ACTION GROUP

Industry Benchmark – Cold Storage

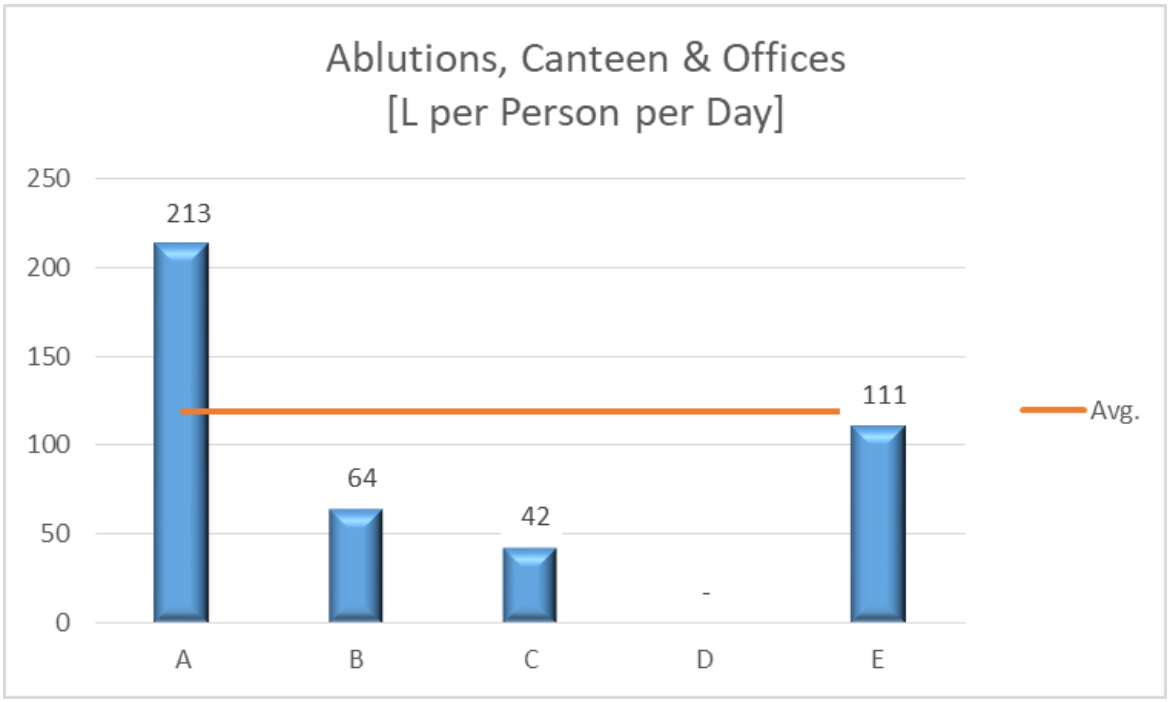
- This benchmark includes all cold storage water consumption of which cooling towers make up the majority.
- Unit of Measure: L per Ton.Day
- Notes: Packhouse C used “cooling towers” as a balancing item for their water use.



PACKHOUSE ACTION GROUP

Industry Benchmark – Ablutions, Canteen & Offices

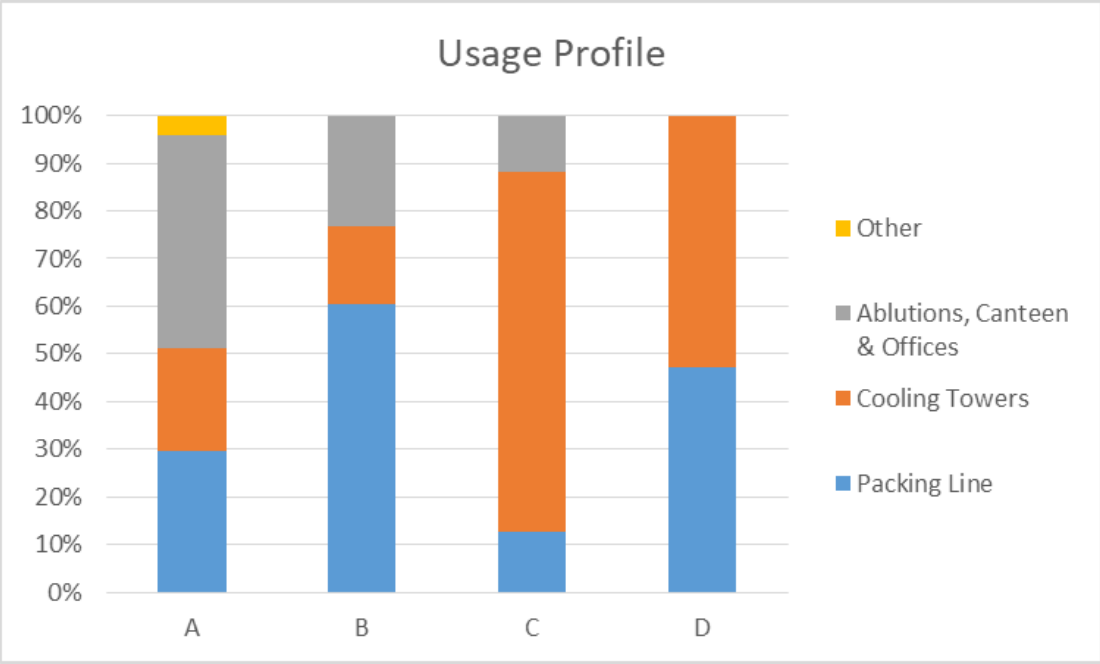
- This benchmark includes water consumption from Ablutions, Canteen & Offices.
- Unit of Measure: L per Person per Day
- Notes: The ablution water use for Packhouse D was included in the packing line figures.



PACKHOUSE ACTION GROUP

Industry Benchmark – Water Usage Profiles

- This benchmark displays the % water use profiles of packhouses.
- Unit of Measure: %
- Notes:
  - Packhouse C used “cooling towers” as a balancing item for their water use.
  - The ablution water use for Packhouse D was included in the packing line figures.



PACKHOUSE ACTION GROUP

Industry Benchmark Learnings

- Some packhouses have areas that are not metered and therefore do not have an accurate picture of how and where water is consumed.
- In some instances water meters are not read regularly.
- In some instances water readings are not recorded regularly.
- Where meters are in place and records are accurately kept, there are still large variation between packhouses. This points to easy opportunities for improvement.

PACKHOUSE
ACTION GROUP

Thank You

Eddie Vienings

Blue North Sustainability
eddie@bluenorth.co.za
082 502 7004
www.bluenorth.co.za

@BlueNorthSA

PACKHOUSE
ACTION GROUP