water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Reconciliation Strategy of the KwaZulu-Natal Coastal Metropolitan Area: Phase 2

Strategy Steering Committee (SSC) Meeting No. 11 - Final

02 February 2017

Item 1: Welcome

TEAM INTRODUCTION

- **Chair: Mr Livhuwani Mabuda**
- **DWS:**
  - Study Manager: Mr Niel van Wyk
  - Deputy Study Manager: Mr Kennedy Mandaza
- **PSP: AECOM**
  - Study Director: Mr Gerald de Jager
  - Study Leader: Ms Hermien Pieterse (Supported by Specialists and Technical Team)
  - Stakeholder participation: Ms Bongi Shinga

GENERAL ARRANGEMENTS

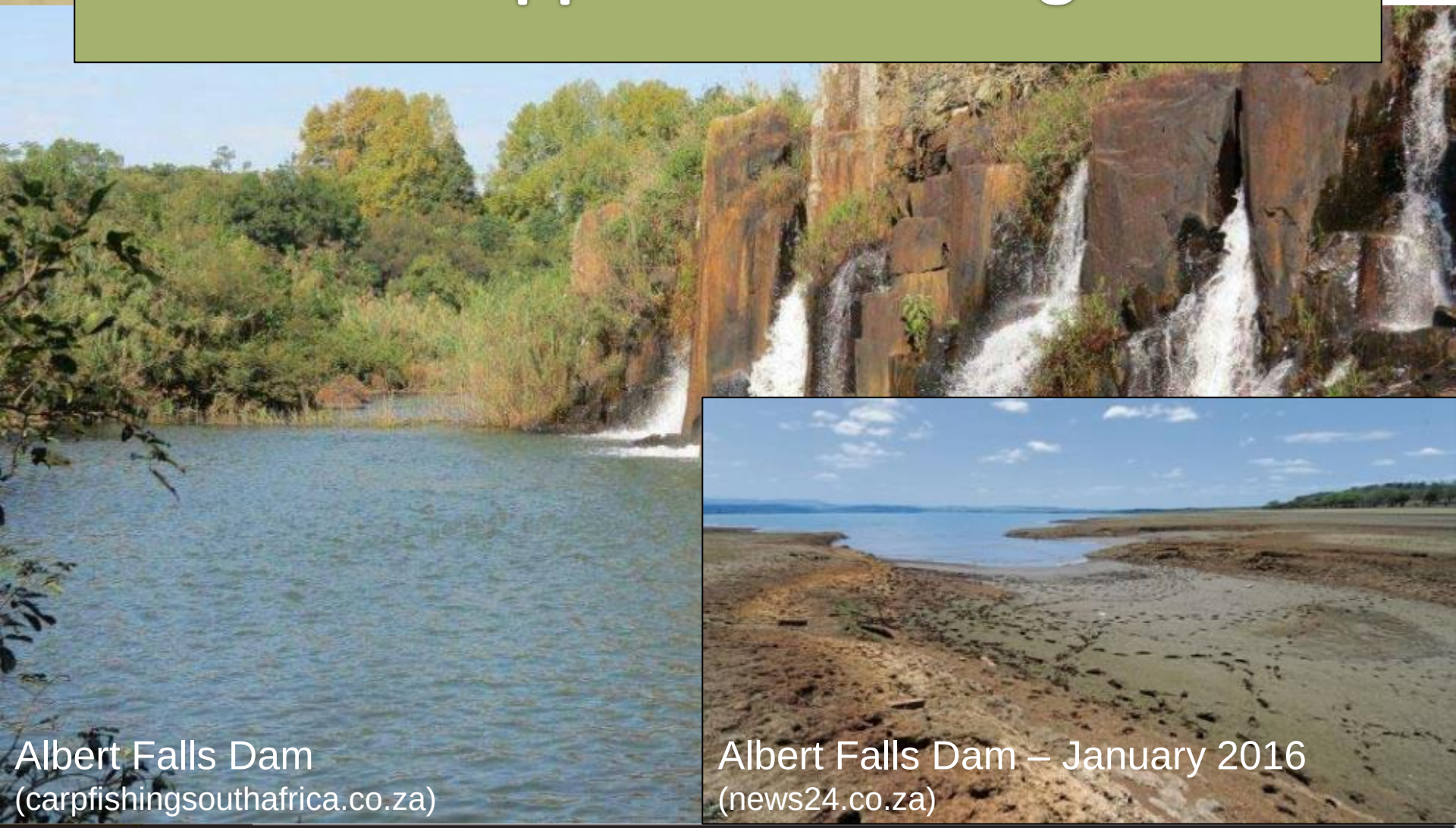
- **Facilities**
- **Tea, coffee and lunch**
- **Meeting arrangements**
  - Introduction of attendees
  - Discussions & Questions times indicated on Agenda

Item 2: Attendance and Apologies

ATTENDANCE REGISTER

- **Attendance register distributed**
  - Please return to Ms Bongi Shinga
- **Apologies**
  - Please provide

Item 3: Approval of the Agenda



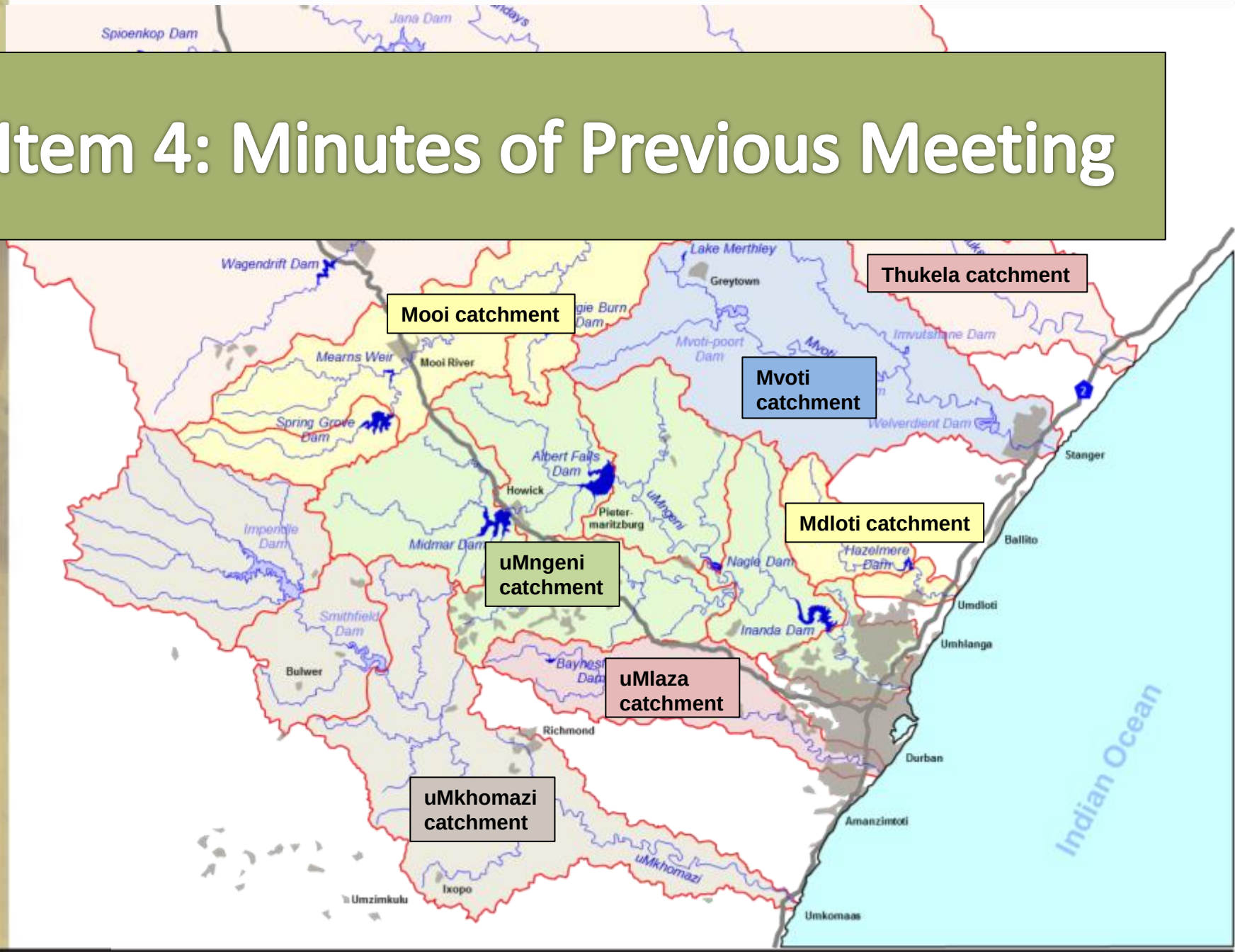
Albert Falls Dam
(carpfishingsouthafrica.co.za)

Albert Falls Dam – January 2016
(news24.co.za)

AGENDA ITEMS

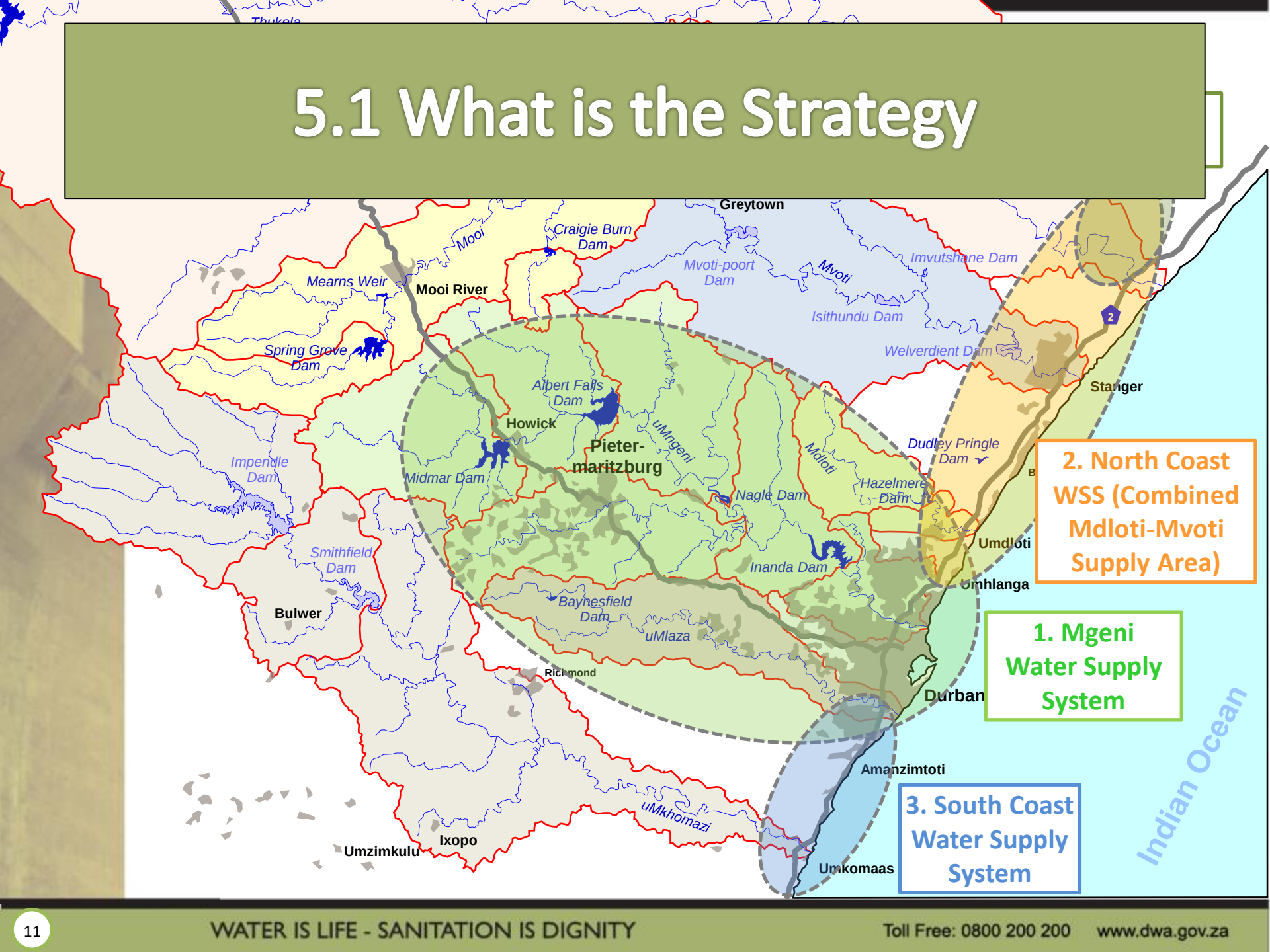
1. Welcome
2. Attendance and Apologies
3. Approval of the Agenda
4. Minutes of SSC Meeting 10
5. Feedback and Summary of Updated Strategy 2016
   - 5.1 What is the Strategy – brief background and history
   - 5.2 Strategy Action Plan
     - Area-wide interventions
     - North Coast WSS
     - Mgeni WSS
     - South Coast WSS
   - 5.3 Deliverables of Updated Strategy
6. Feedback on Progress with Implementation of Already Committed Intervention Options
7. Status and Way Forward with Priority Interventions
8. Way forward with Alternative and Future Interventions
9. Way forward with Implementation and Update of Reconciliation Strategy
10. Communication
11. Closure

Item 4: Minutes of Previous Meeting



Item 5: Feedback and Summary of Updated Strategy

5.1 What is the Strategy



5.1 WHAT IS THE STRATEGY

Background

- Original *Water Reconciliation Strategy Study for the KwaZulu-Natal Coastal Metropolitan Areas* commenced in 2006
- Followed by 3-year continuation study, the Maintenance of the Water Reconciliation Strategy for the KwaZulu-Natal Coast Metropolitan Areas – Phase 1
- In March 2014, Phase 2 of the continuation study commenced – to be completed by February 2017

5.1 WHAT IS THE STRATEGY (CONTINUED)

Why do we have a Reconciliation Strategy?

- "Reconcile water requirements with water availability to secure water supply for now and into the future."
- The implementation of new water resource developments takes time, and if not done proactively, can result in systems in deficit. This can lead to:
  - Systems being vulnerable to drought
  - Water resources stifling growth and development

Why does the Recon Strategy need to be updated?

- To monitor progress of strategy intervention implementation
- To adapt and respond to changes in the volume and location of the requirement for water, and various other factors that can influence a systems water balance
- To incorporate new research and information from other external studies

5.1 WHAT IS THE STRATEGY (CONTINUED)

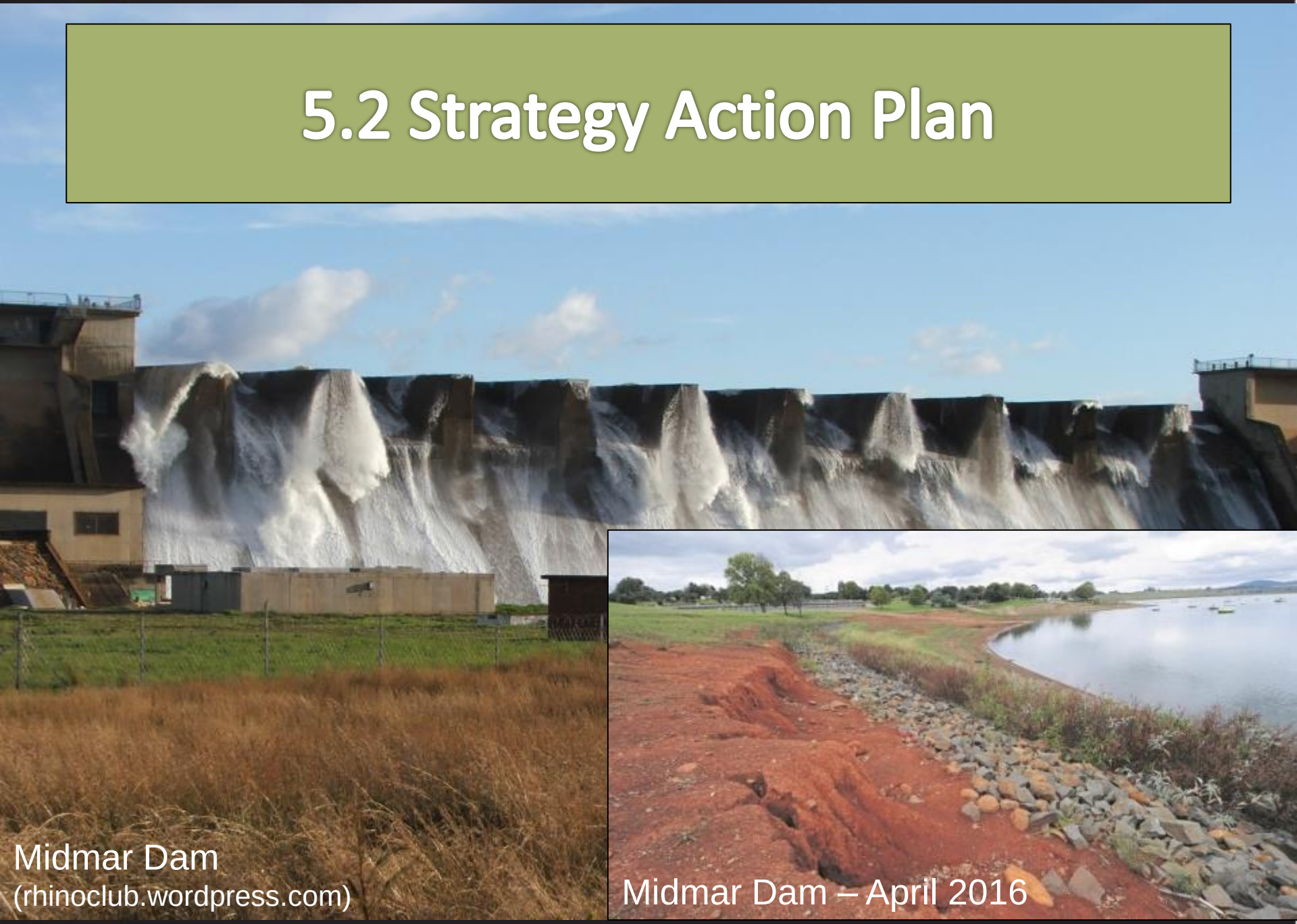
How is the Strategy updated and continued with?

- Input from Strategy Steering Committee (SSC meetings 6th to 11th) - which also form intermediate updates via Status Reports
- Input from Technical Support Group (TSG) meetings to support and direct technical team and integrate planning of key stakeholder initiatives

Process of updating the Strategy includes:

- Delineation of Strategy Area into water supply systems (WSSs – 3 main)
- Update of water requirement projections (based on current actual supply)
- Assessing water availability from current and future interventions
- Prioritisation and timing of intervention options through the development of water balances for various reconciliation scenarios
- Review reconciliation scenarios and update Strategy Action Plan

5.2 Strategy Action Plan



Midmar Dam
(rhinoclub.wordpress.com)

Midmar Dam – April 2016

5.2 STRATEGY ACTION PLAN

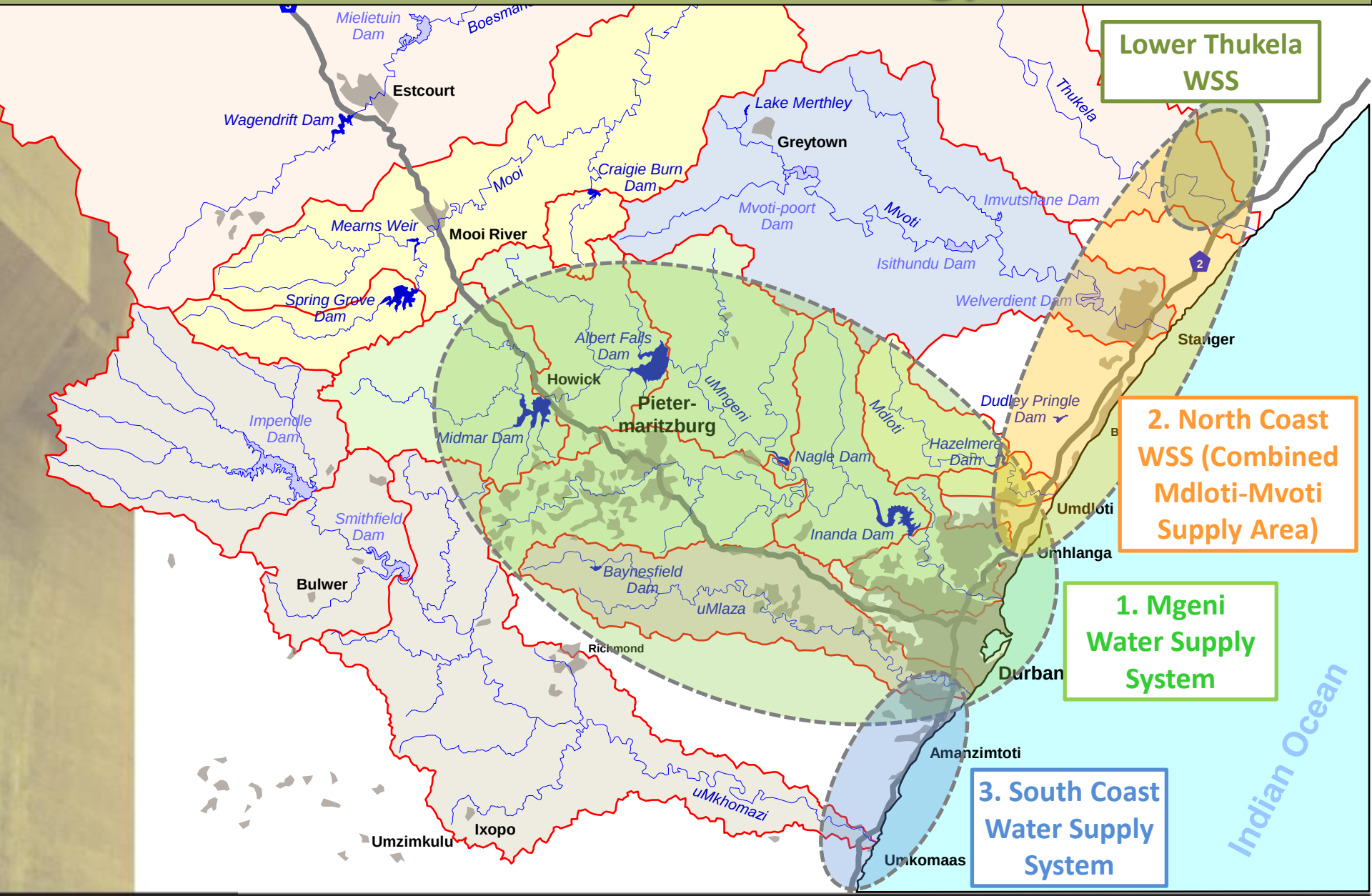
- Growing water requirements need to be met with interventions to increase water availability
  - Reconciliation strategy has annual revisions of projected water requirements.
- Three types of intervention options have been considered as part of the Reconciliation Strategy:
  - Management interventions such WC/WDM and system operations
  - Infrastructure interventions such as dams and water transfer schemes
  - Support interventions such as catchment care and rainwater harvesting
- Updated Strategy presented in 2 parts:
  - Area-wide interventions
  - WSS specific interventions
- Most favourable combination of intervention options have been selected for Strategy Action Plan

5.2 STRATEGY ACTION PLAN (CONTINUED)

Area-wide interventions

- Consists of both management and support interventions
- Intervention options applicable to all supply systems within the Strategy Area
- Significant contribution to the overall Strategy
- Overall impact, whether positive or negative, accounted for in supply system water balances
- Area-wide interventions include:
  - Water Conservation and Water Demand Management (WC/WDM)
  - Water supply and drought operating rules
  - Catchment care and ecological infrastructure
  - Rainwater harvesting

The Reconciliation Strategy Area

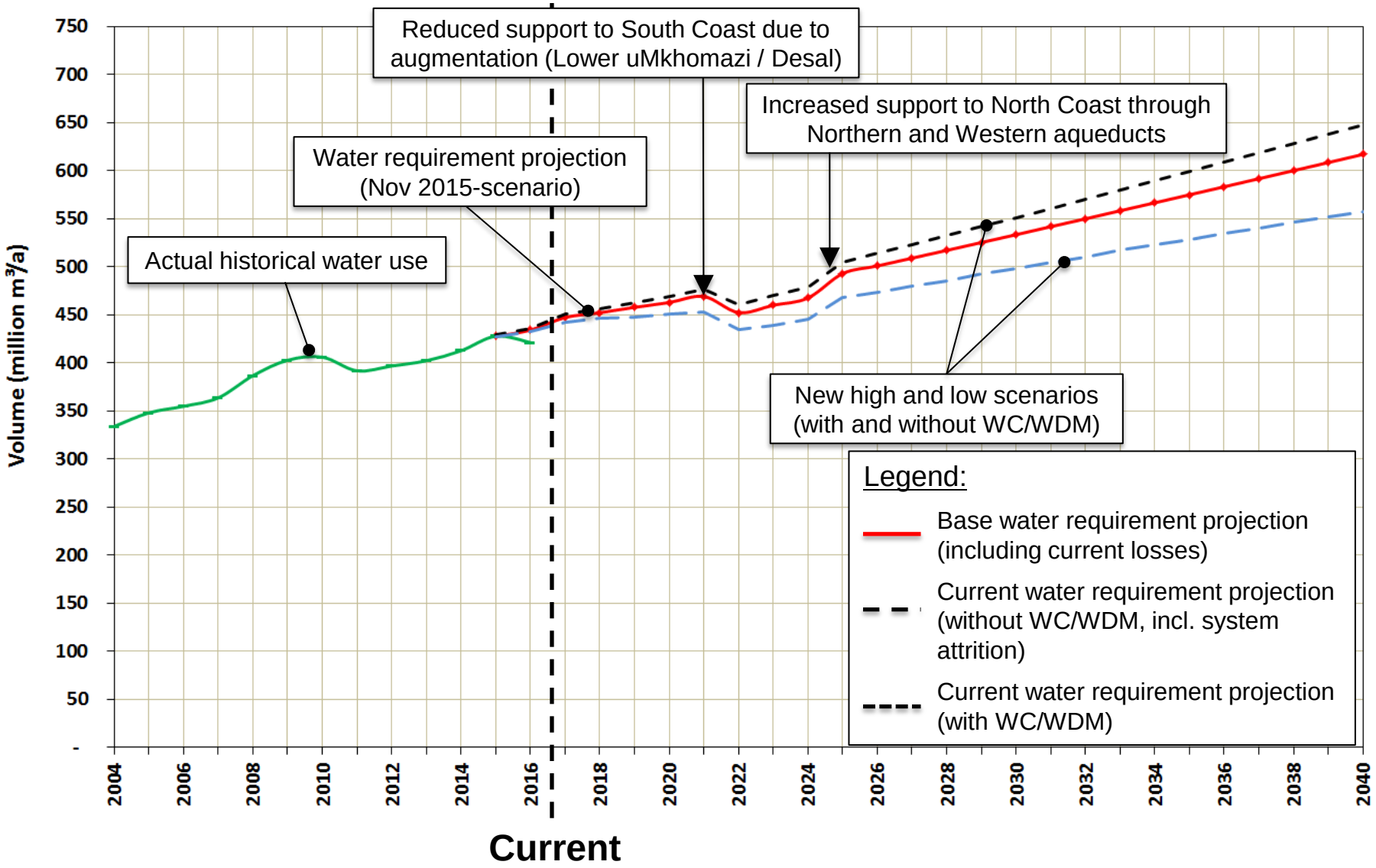


1. Mgeni Water Supply System

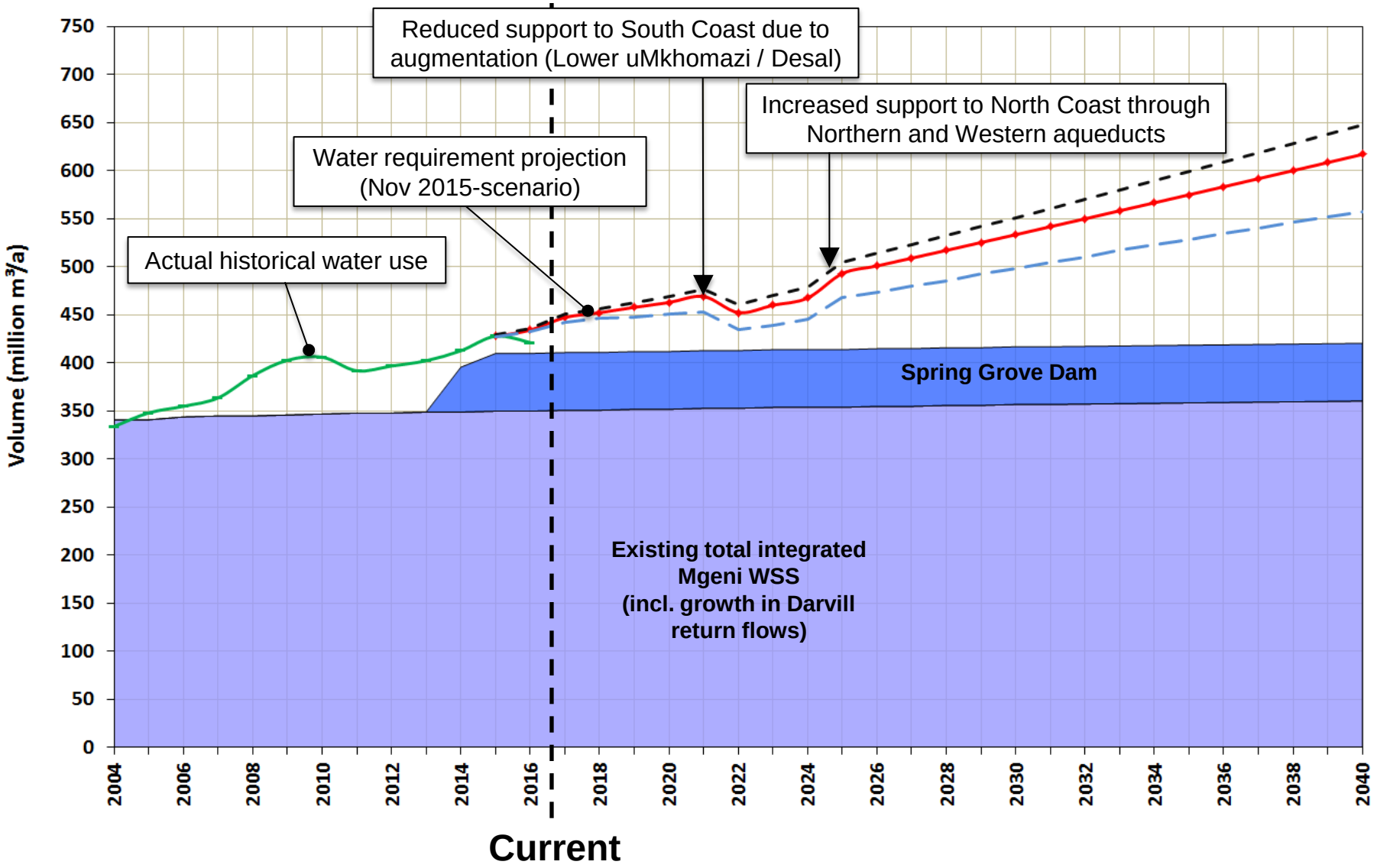
Inanda Dam
(richedwardsimagery.files.wordpress.com)

Cactus Point - Inanda Dam
(http://infrared40.wixsite.com)

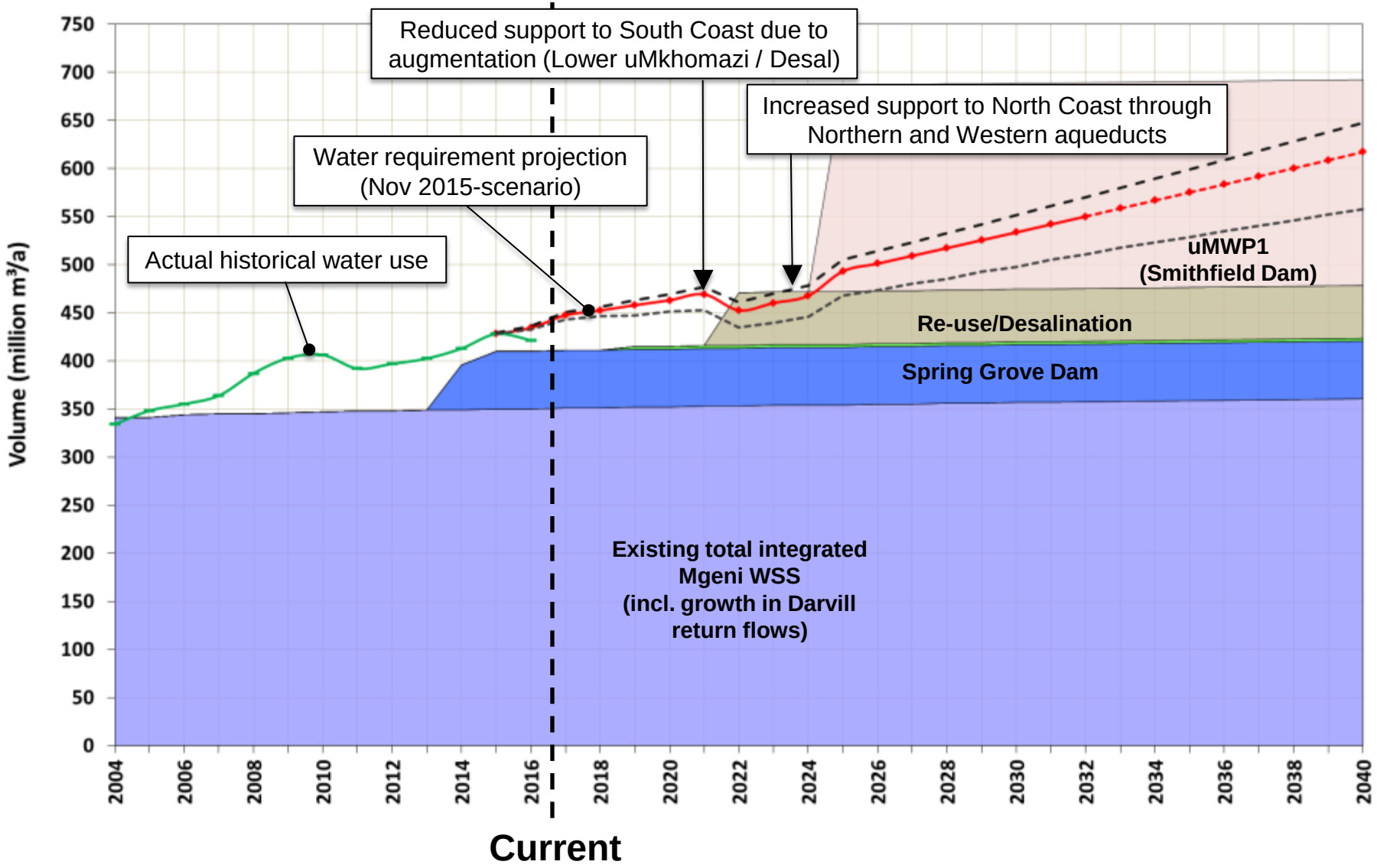
MGENI WSS: WATER REQUIREMENTS



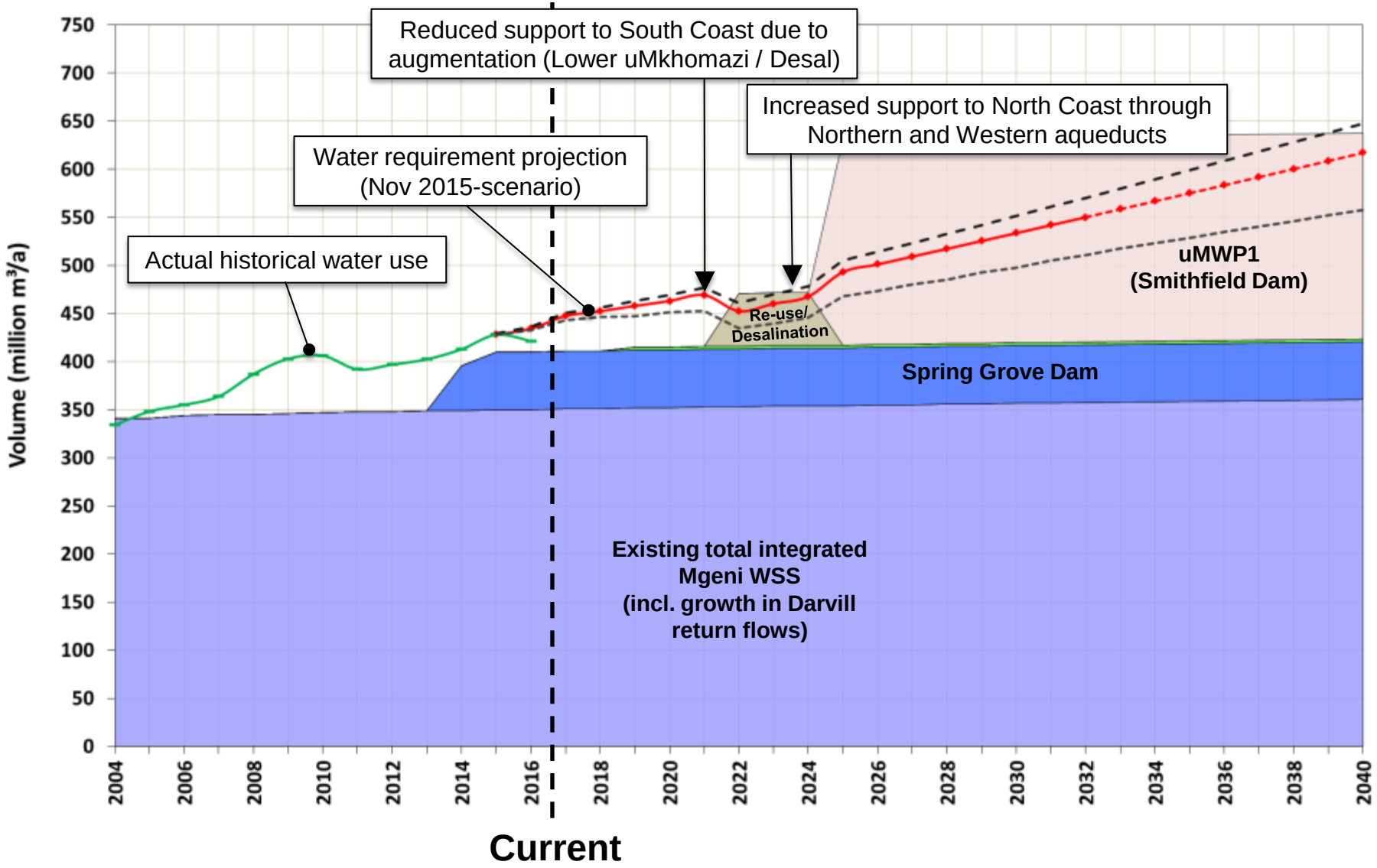
MGENI WSS: EXISTING RESOURCES



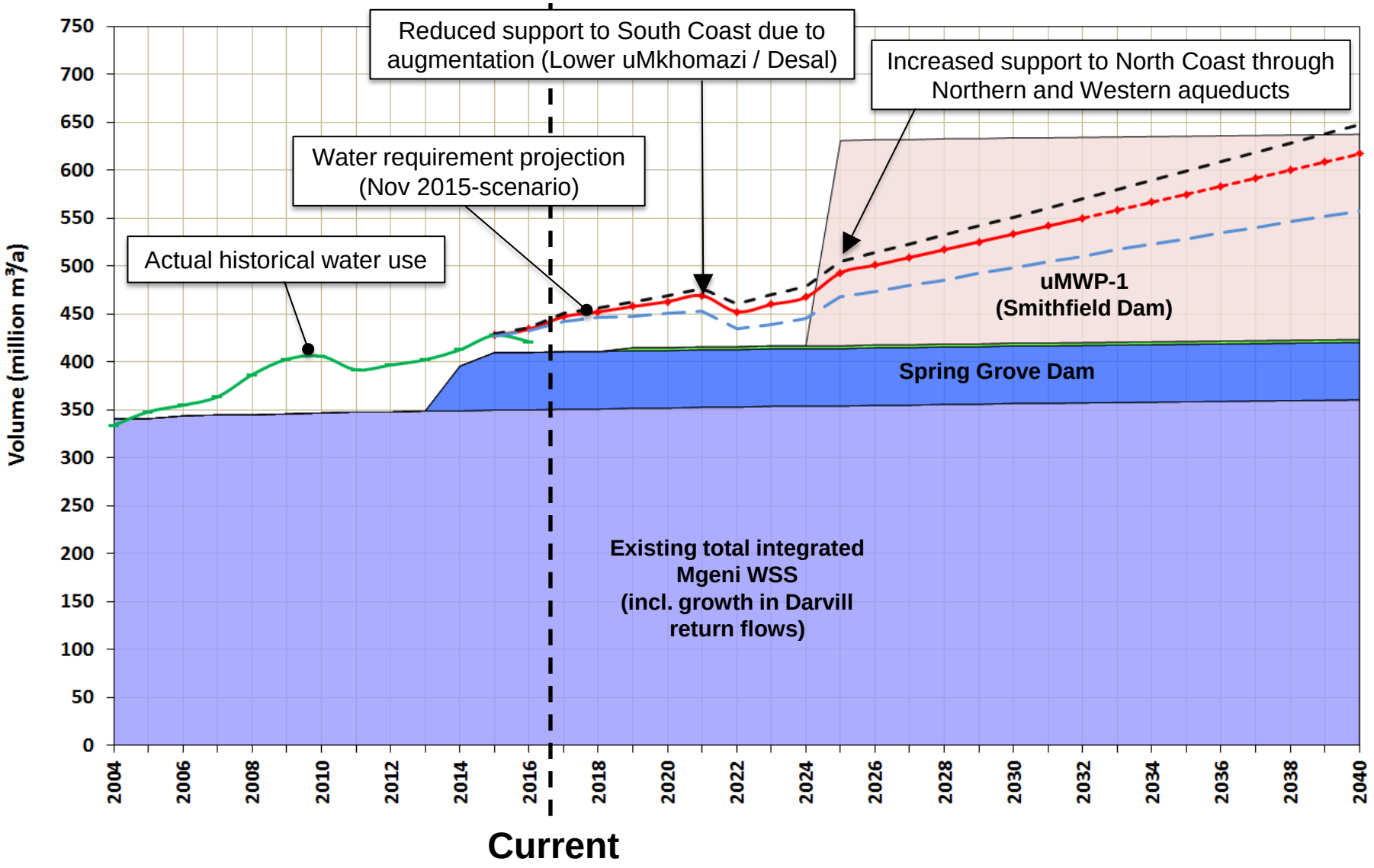
MGENI WSS: INTERVENTION OPTIONS



MGENI WSS: INTERVENTION OPTIONS

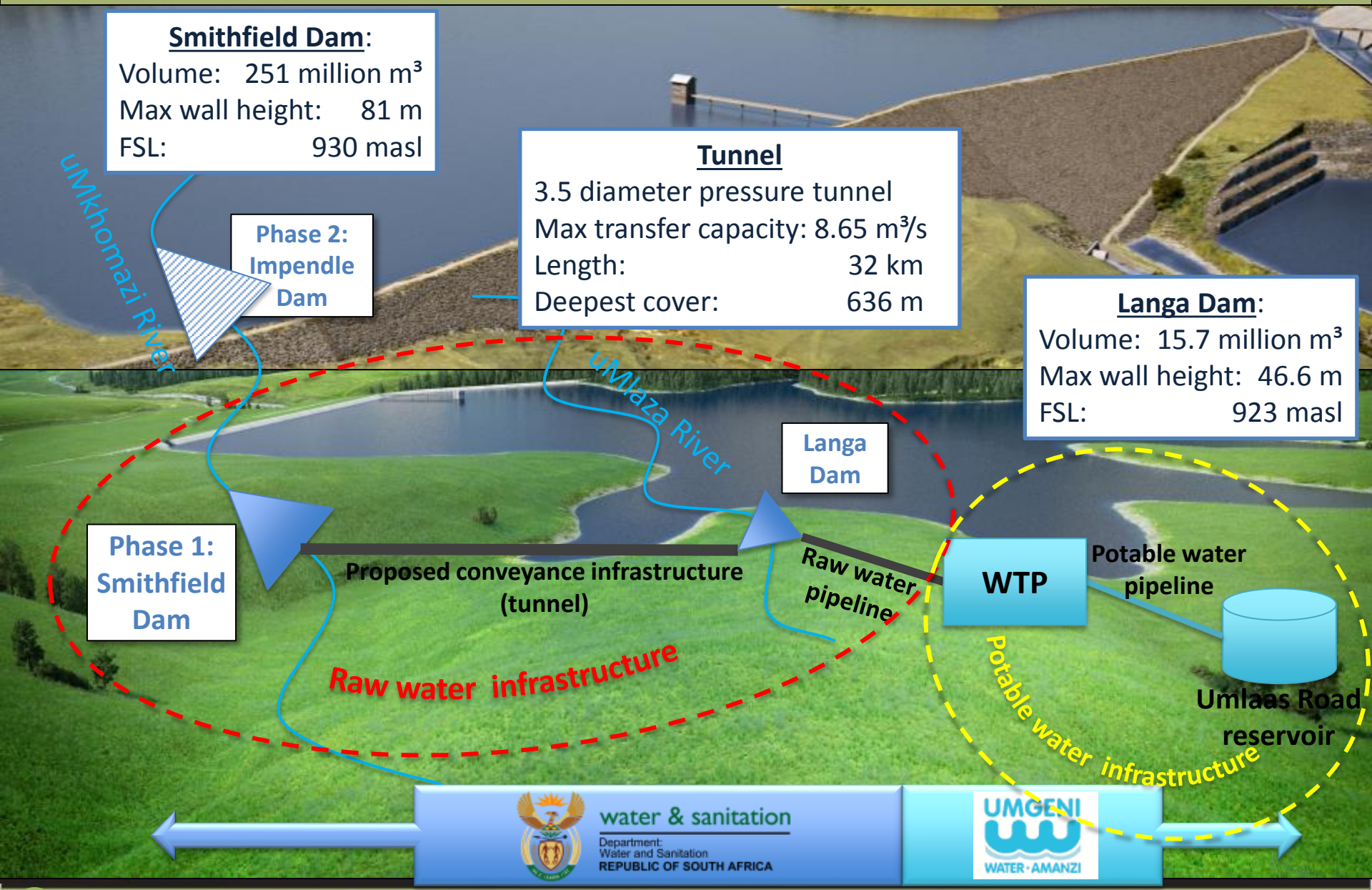


MGENI WSS: INTERVENTION OPTIONS



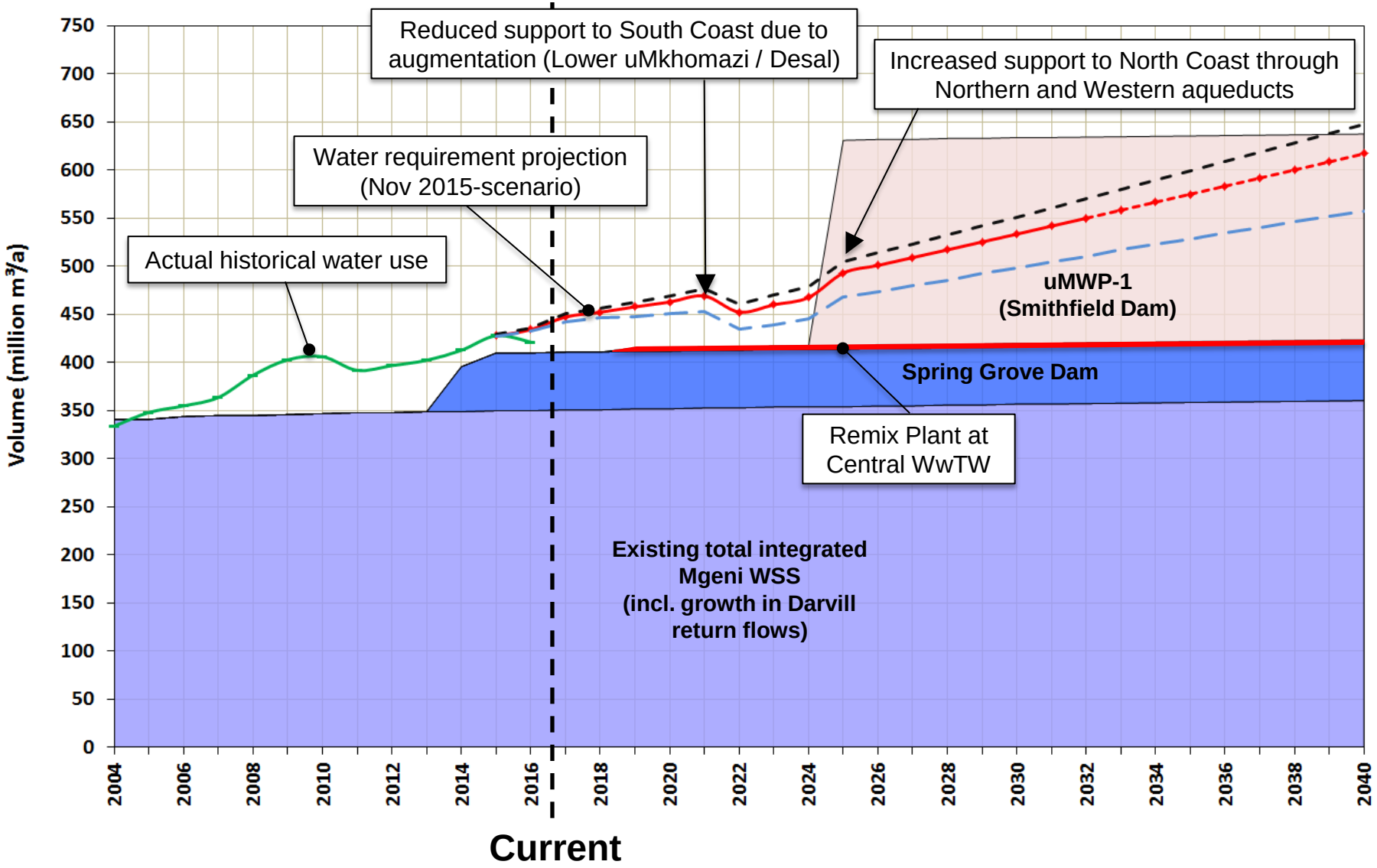

Thukela
Mielietuin Dam
Boesmans
Estcourt
Wagendrift Dam
Lake Merthley
Greytown
Thukela
Mooi
Craigie Burn Dam
Mvoti-poort Dam
Mvoti
Imvutshane Dam
Isithundu Dam
Mearns Weir
Mooi River
MMTS 1 & 2
Spring Grove Dam
Welverdient Dam
Albert Falls Dam
Howick
Pieter-maritzburg
uMngeni
Mdloti
Dudley Pringle Dam
Stanger
Ballito
Impendle Dam
Midmar Dam
Nagle Dam
Hazelmere Dam
Smithfield Dam
Inanda Dam
Umdloti
Umhlanga
Bulwer
uMWP-1
uMlaza
Richmond
Mgeni WSS
Durban
Indian Ocean
Amanzimtoti
uMkhomazi
Umzimkulu
Ixopo
Umkomaas

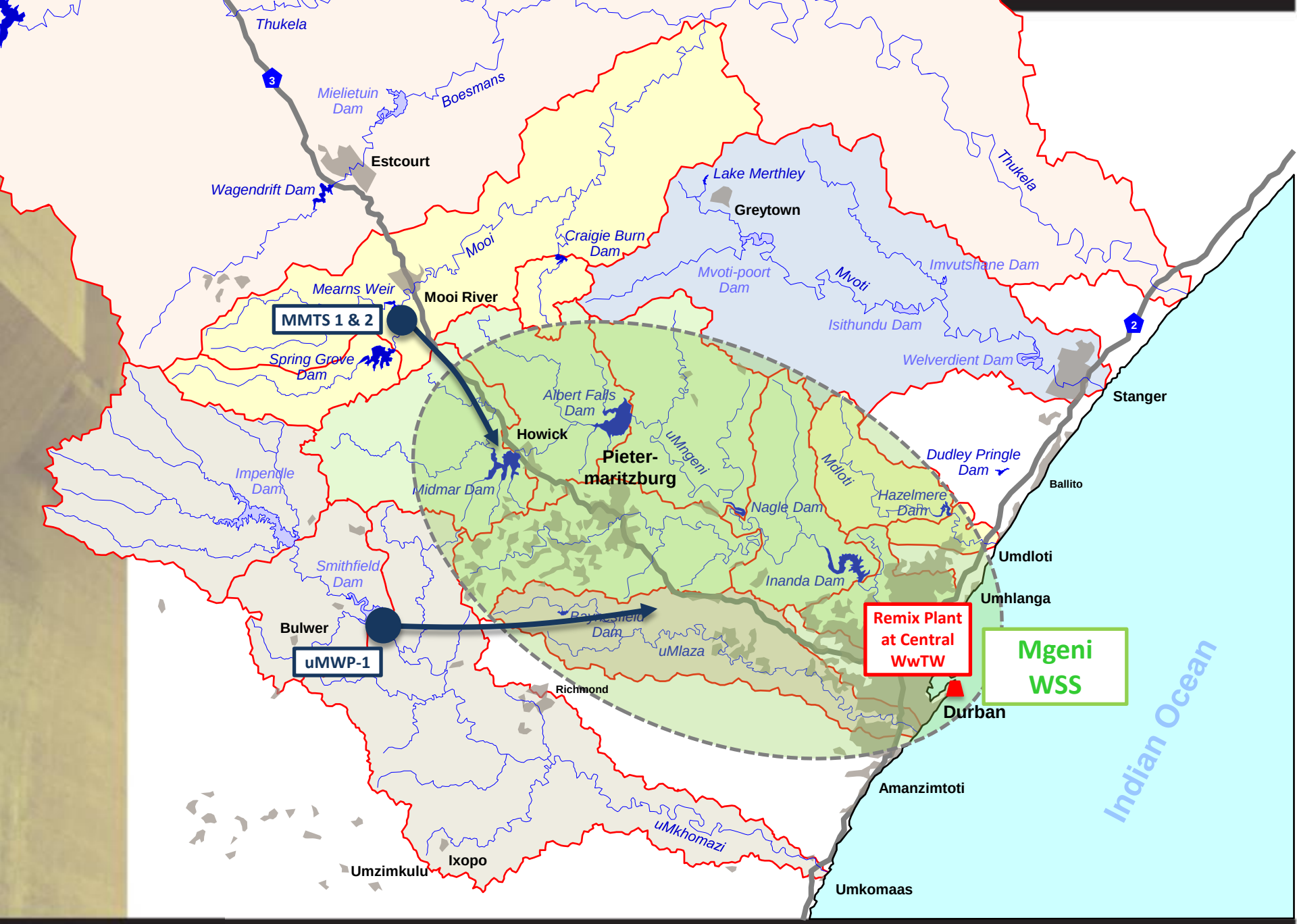
uMkhomazi Water Project – Phase 1



WATER IS LIFE - SANITATION IS DIGNITY

MGENI WSS: INTERVENTION OPTIONS




Thukela
Mielietuin Dam
Boesmans
Estcourt
Wagendrift Dam
Lake Merthley
Greytown
Thukela
Mooi
Craigie Burn Dam
Mvoti-poort Dam
Mvoti
Imvutshane Dam
Isithundu Dam
Mearns Weir
Mooi River
MMTS 1 & 2
Spring Grove Dam
Welverdient Dam
Albert Falls Dam
Howick
Pieter-maritzburg
uMngeni
Mdloti
Dudley Pringle Dam
Stanger
Ballito
Impendle Dam
Midmar Dam
Nagle Dam
Hazelmere Dam
Umdloti
Smithfield Dam
Inanda Dam
Umhlanga
Bulwer
uMWP-1
Payneshield Dam
uMlaza
Remix Plant at Central WwTW
Mgeni WSS
Richmond
Durban
Indian Ocean
Amanzimtoti
uMkhomazi
Umzimkulu
Ixopo
Umkomaas

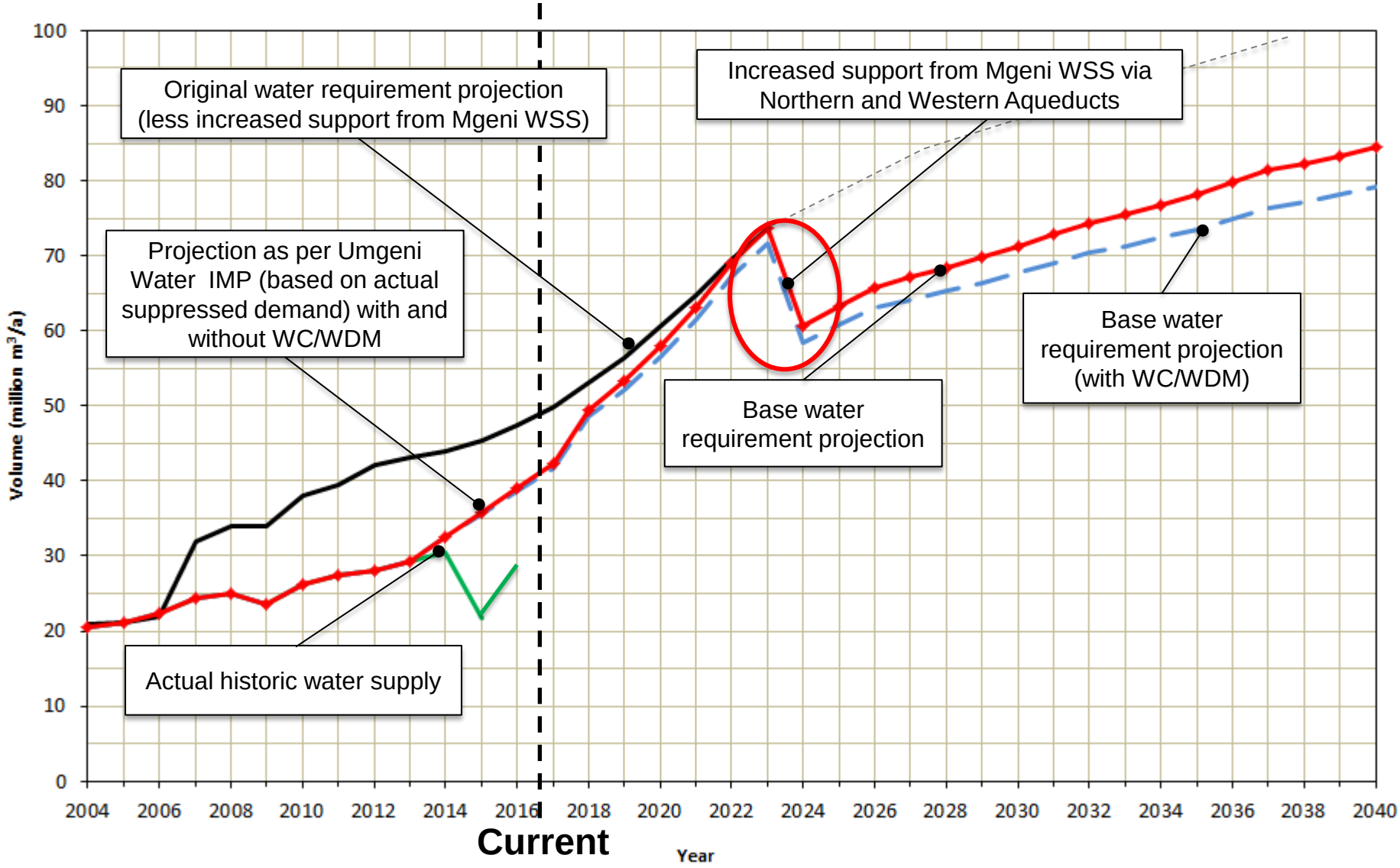
Remix Plant at Central WwTW

- 6.25 Mℓ/day demonstration plant to be installed
- 50% seawater + 50% sewage, electricity consumption less 40 – 50%
- If demonstration plant successful, proposed full scale plant of 100 Mℓ/day - 50 Mℓ/day for Inner City, 50 Mℓ/day for South of Durban

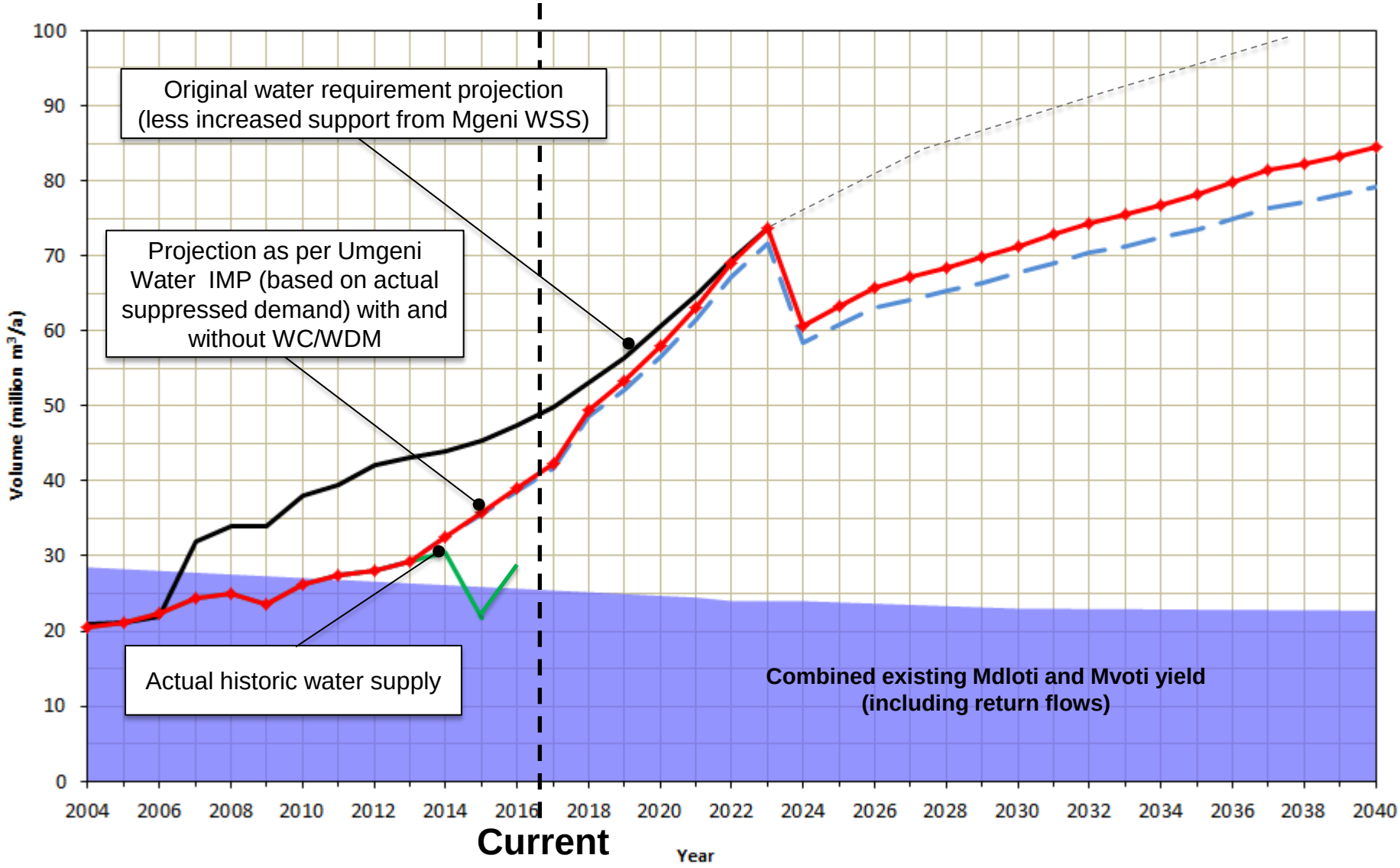
2. North Coast Water Supply System

Lower Thukela Bulk Water Supply Scheme
(Umgeni Water)

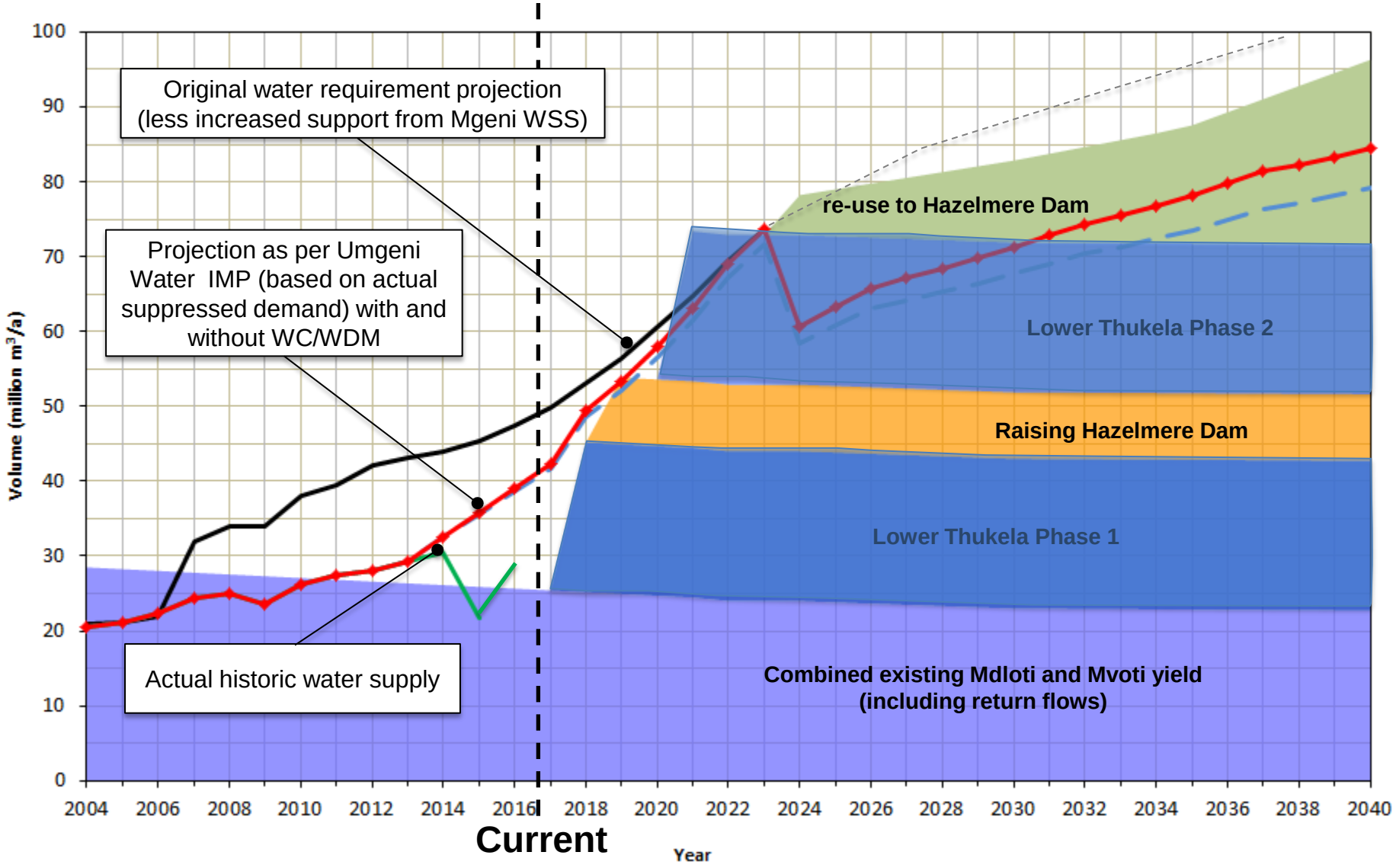
NORTH COAST WSS: WATER REQUIREMENTS

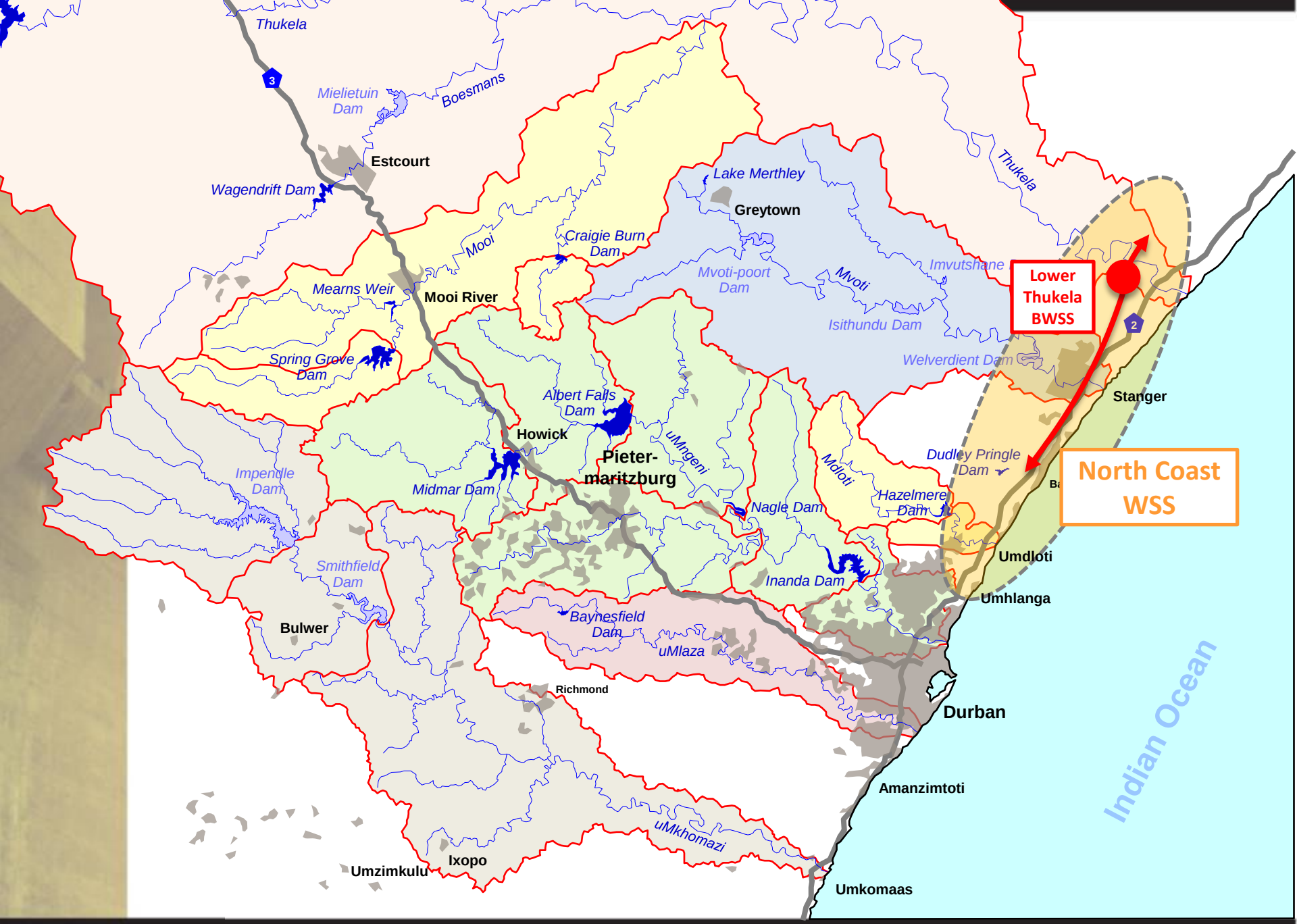


NORTH COAST WSS: EXISTING RESOURCES



NORTH COAST WSS: INTERVENTION OPTIONS




Thukela
Mielietuin Dam
Boesmans
Estcourt
Wagendrift Dam
Lake Merthley
Greytown
Thukela
Mooi
Craigie Burn Dam
Mvoti-poort Dam
Mvoti
Imvutshane
Lower Thukela BWSS
Mearns Weir
Mooi River
Isithundu Dam
Spring Grove Dam
Welverdient Dam
Albert Falls Dam
Stanger
Howick
uMngeni
Pieter-maritzburg
Dudley Pringle Dam
North Coast WSS
Impendle Dam
Midmar Dam
Mdloti
Hazelmere Dam
Nagle Dam
Umdloti
Smithfield Dam
Inanda Dam
Umhlanga
Baynesfield Dam
Bulwer
uMlaza
Richmond
Durban
Indian Ocean
Amanzimtoti
uMkhomazi
Ixopo
Umzimkulu
Umkomaas

Lower Thukela Bulk Water Supply Scheme

Project Details

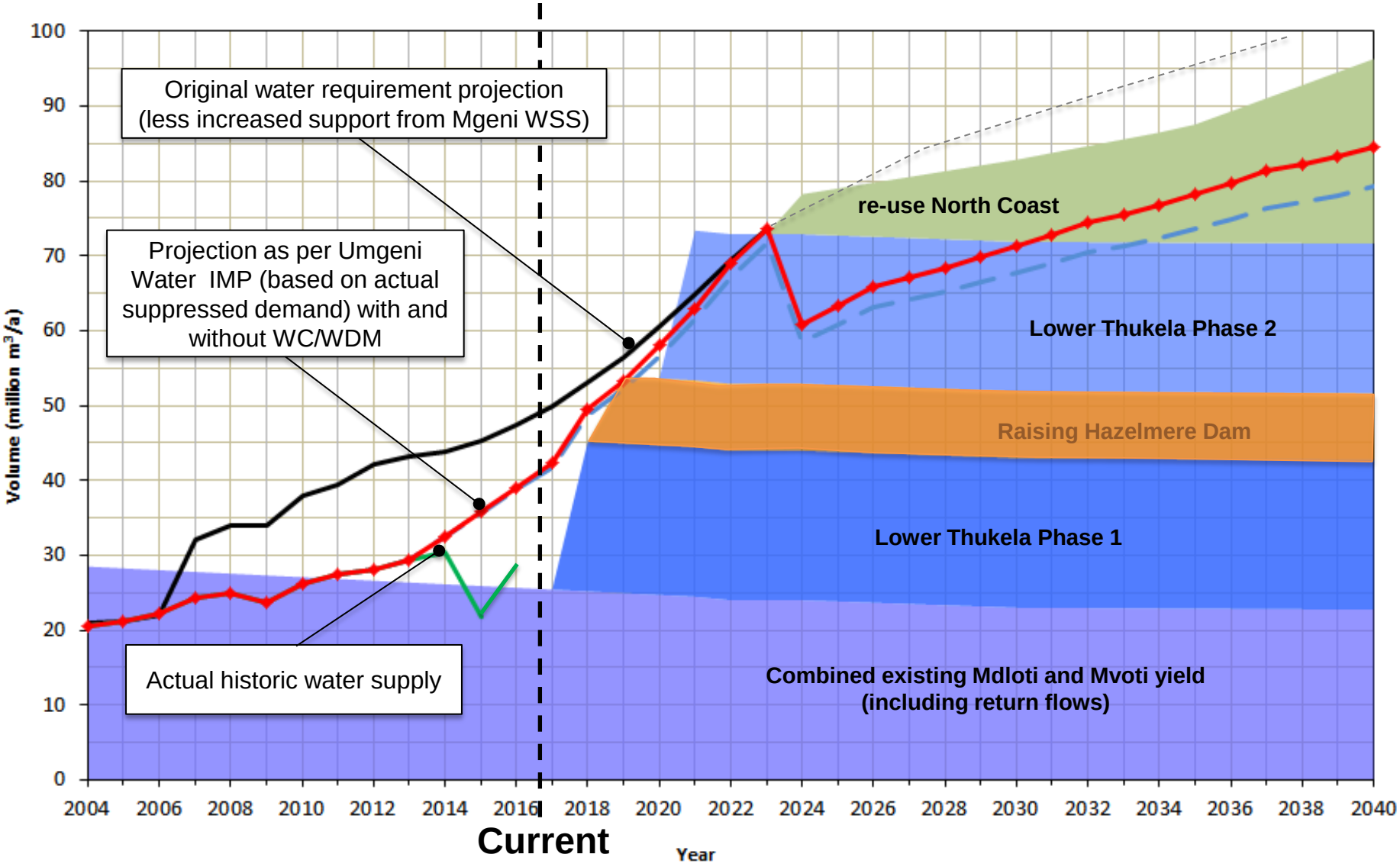
- An abstraction works and low lift pump station located on the banks of the Lower Thukela River with a capacity of 110 Mℓ/day
- A 55 Mℓ/day Water Treatment Works
- A 55 Mℓ/day high-lift pump station at the water treatment works linked to bulk supply pipelines running north and south of the WTW and associated potable water storage reservoirs.

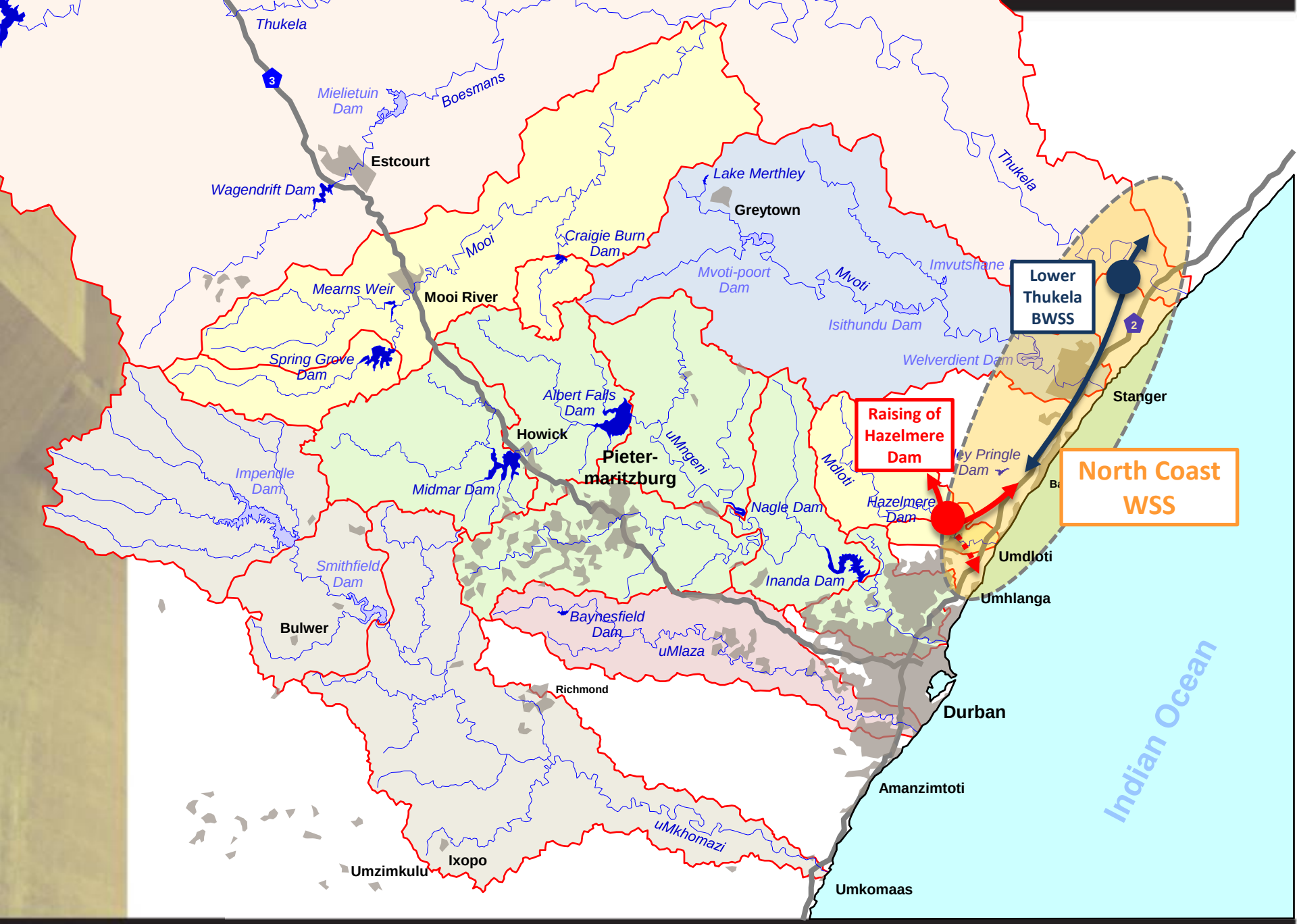
Water Supply Areas

- iLembe DM, including KwaDukuza LM and Mandeni LM

Lower Thukela Bulk Water Supply Scheme
(Umgeni Water)

NORTH COAST WSS: INTERVENTION OPTIONS



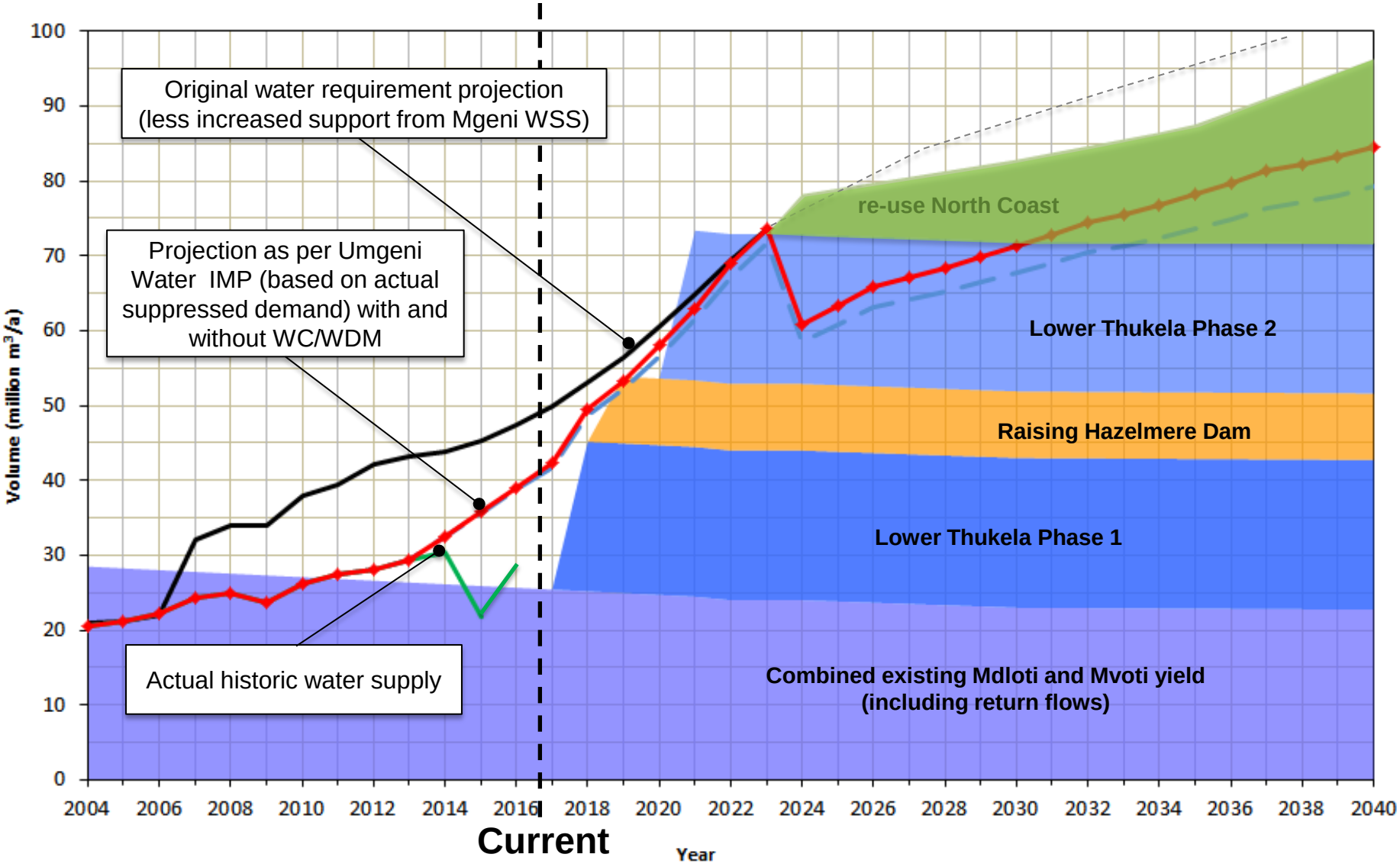

Thukela
Mielietuin Dam
Boesmans
Estcourt
Wagendrift Dam
Lake Merthley
Greytown
Craigie Burn Dam
Mooi
Mearns Weir
Mooi River
Mvoti-poort Dam
Mvoti
Imvutshane
Isithundu Dam
Lower Thukela BWSS
Welverdient Dam
Spring Grove Dam
Albert Falls Dam
Howick
Pieter-maritzburg
uMngeni
Raising of Hazelmere Dam
Stanger
Midmar Dam
Nagle Dam
Hazelmere Dam
North Coast WSS
Impendle Dam
Mdloti
Umdloti
Smithfield Dam
Inanda Dam
Umhlanga
Bulwer
Baynesfield Dam
uMlaza
Richmond
Durban
Indian Ocean
Amanzimtoti
uMkhomazi
Umzimkulu
Ixopo
Umkomaas

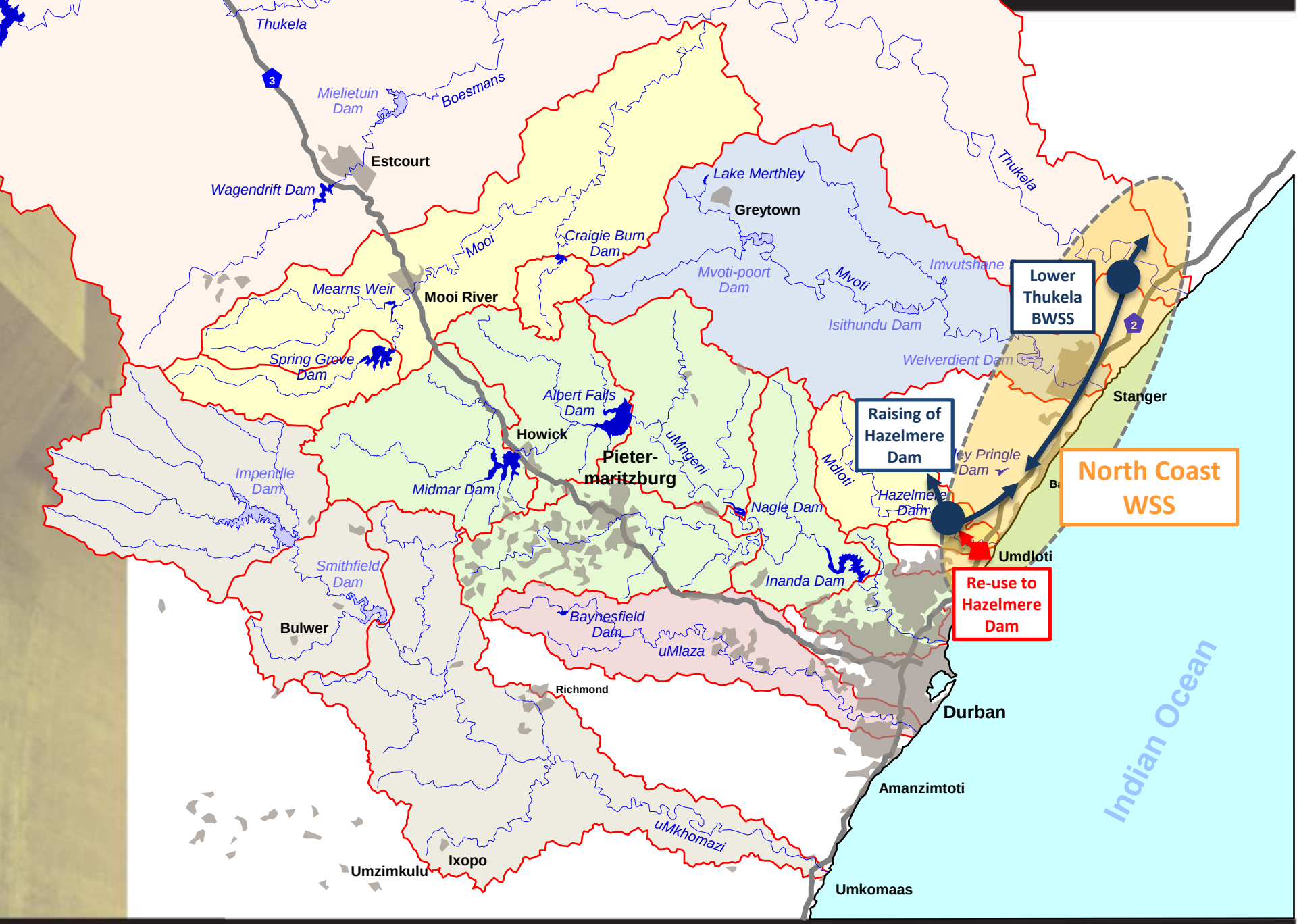
Raising of Hazelmere Dam

Project Details

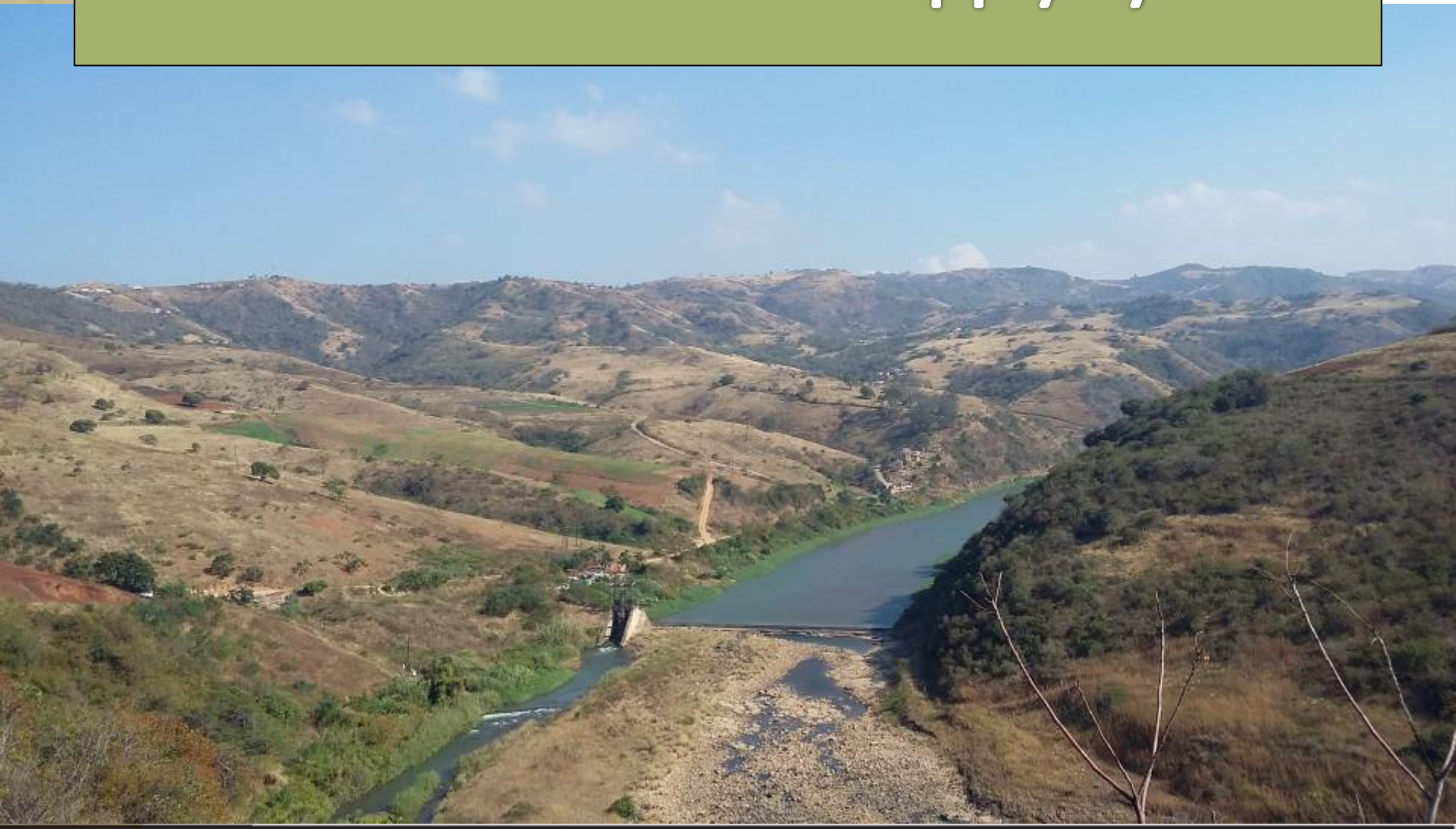
- Raising of Hazelmere Dam by 7 m with piano key weir
- Increase in gross storage capacity from 23.9 to 43.7 million m^3
- Augment the water supply to the North Coast WSS
- Increase water availability by some 10 million $^3/a$

NORTH COAST WSS: INTERVENTION OPTIONS

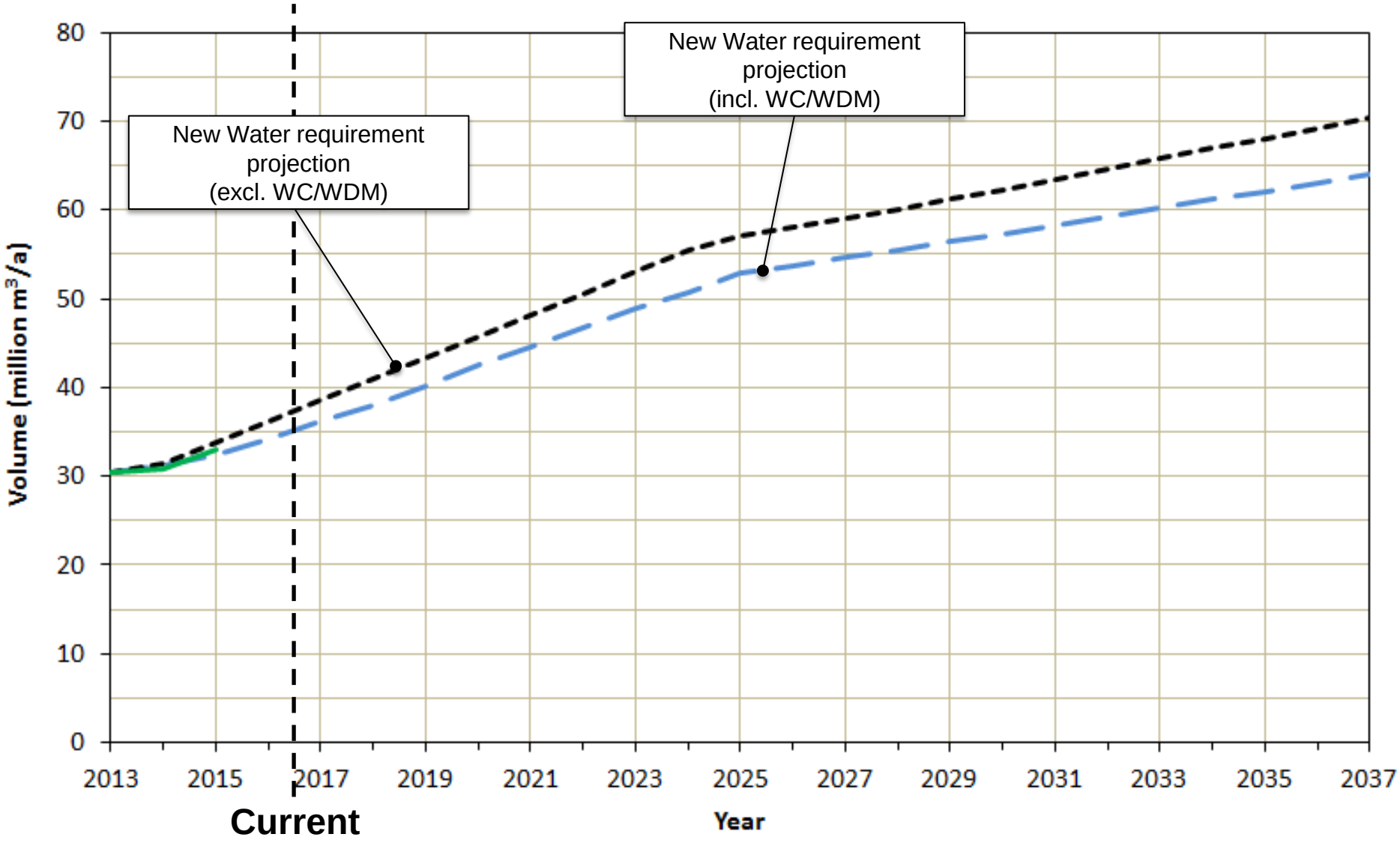



Thukela
Mielietuin Dam
Boesmans
Estcourt
Wagendrift Dam
Lake Merthley
Greytown
Thukela
Mooi
Craigie Burn Dam
Mvoti-poort Dam
Mvoti
Imvutshane
Lower Thukela BWSS
Mearns Weir
Mooi River
Isithundu Dam
Spring Grove Dam
Welverdient Dam
Albert Falls Dam
Stanger
Raising of Hazelmere Dam
Howick
uMngeni
Pieter-maritzburg
Mdloti
North Coast WSS
Impendle Dam
Midmar Dam
Nagle Dam
Hazelmere Dam
Umdloti
Re-use to Hazelmere Dam
Smithfield Dam
Inanda Dam
Bulwer
Baynesfield Dam
uMlaza
Richmond
Durban
Indian Ocean
Amanzimtoti
uMkhomazi
Umzimkulu
Ixopo
Umkomaas

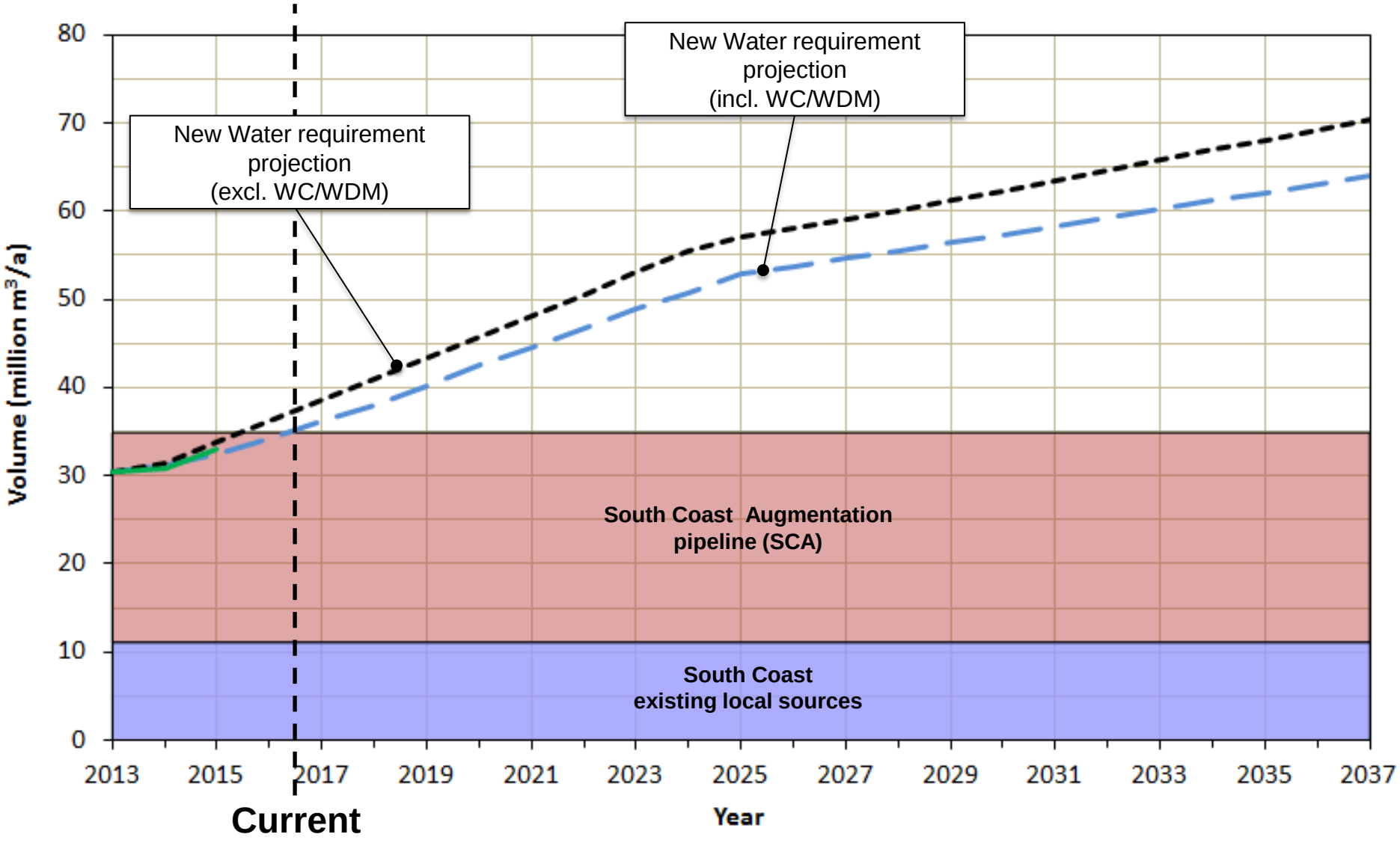
3. South Coast Water Supply System



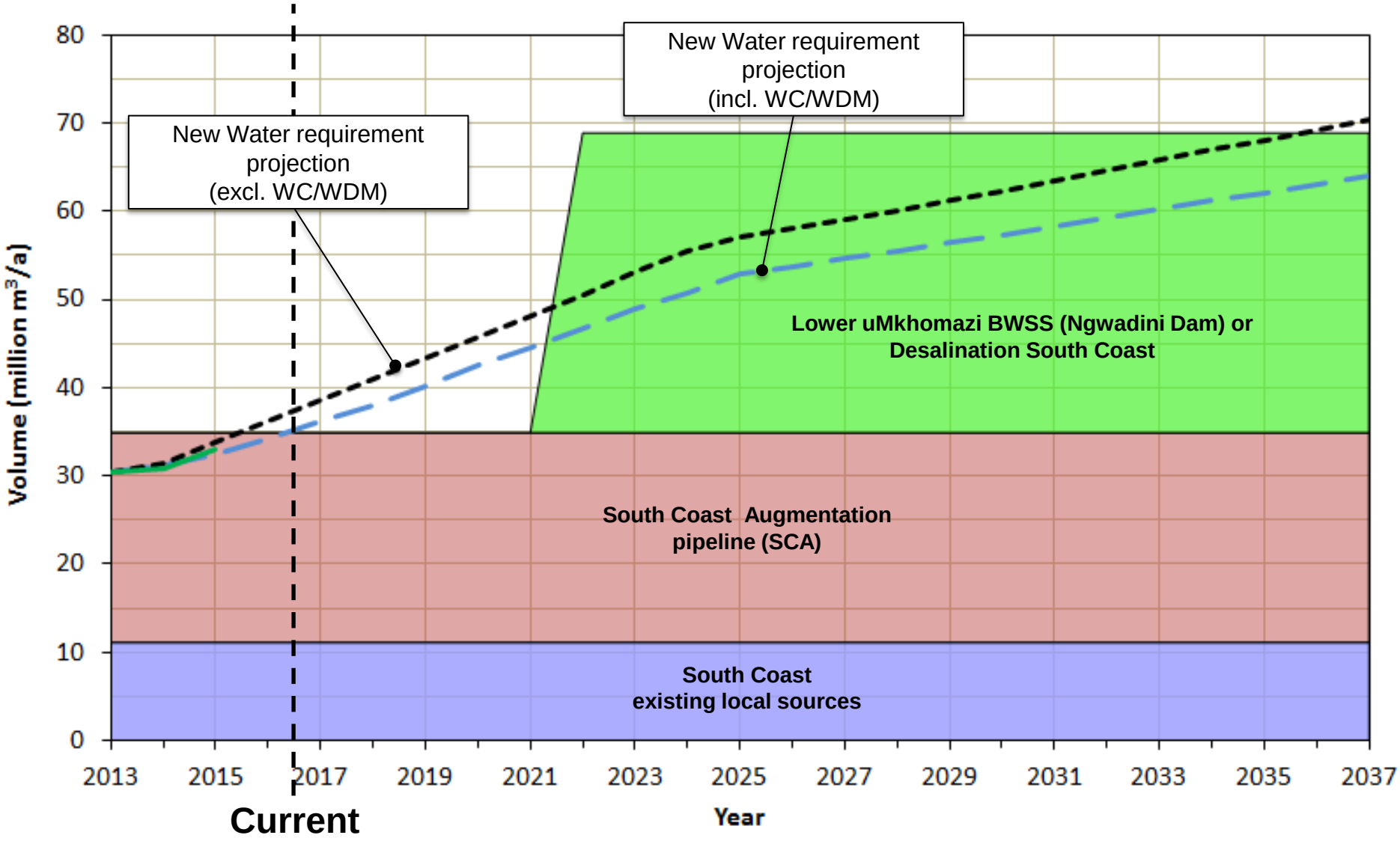
SOUTH COAST WSS: WATER REQUIREMENTS



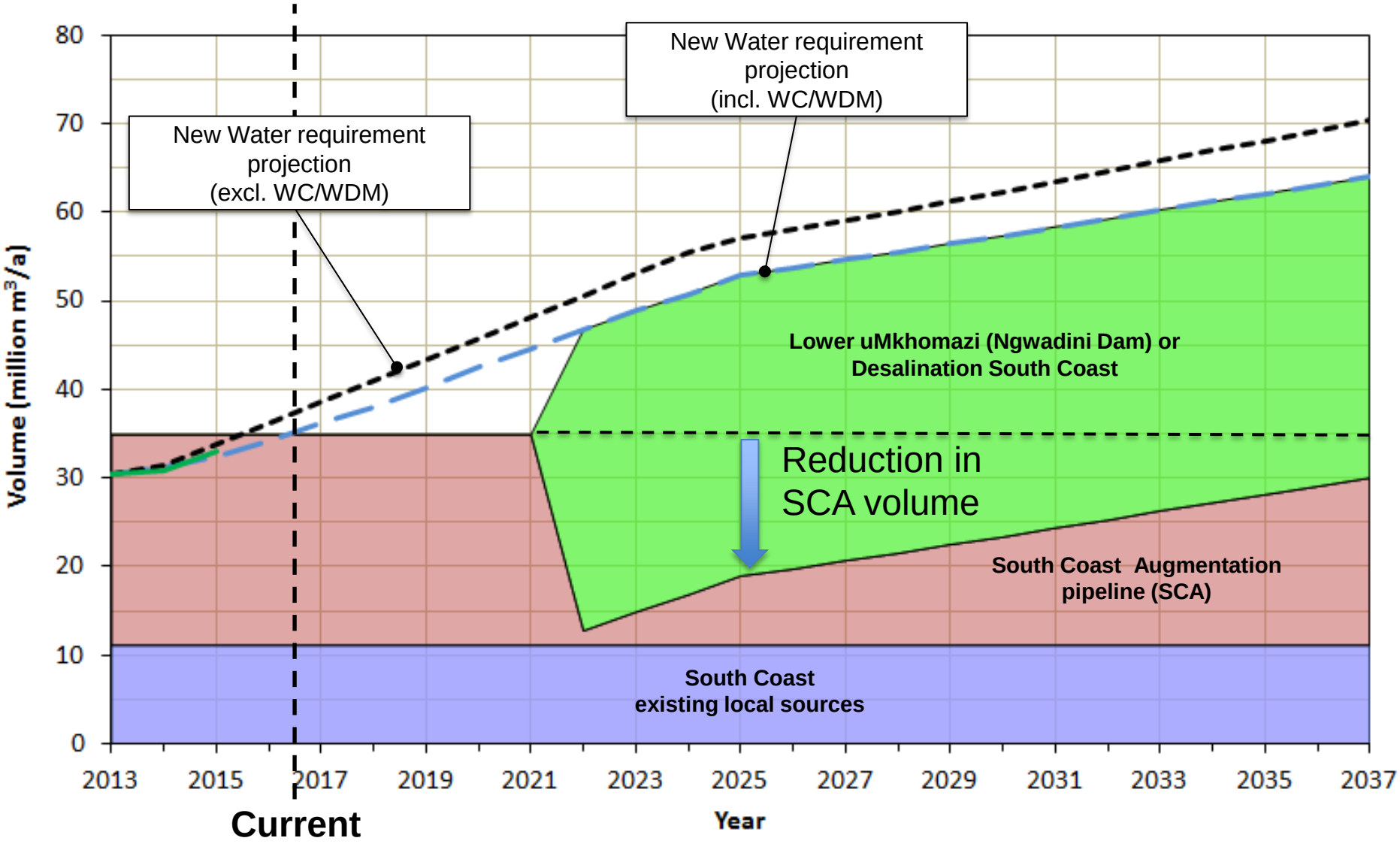
SOUTH COAST WSS: EXISTING RESOURCES



SOUTH COAST WSS: INTERVENTION OPTIONS



SOUTH COAST WSS: INTERVENTION OPTIONS



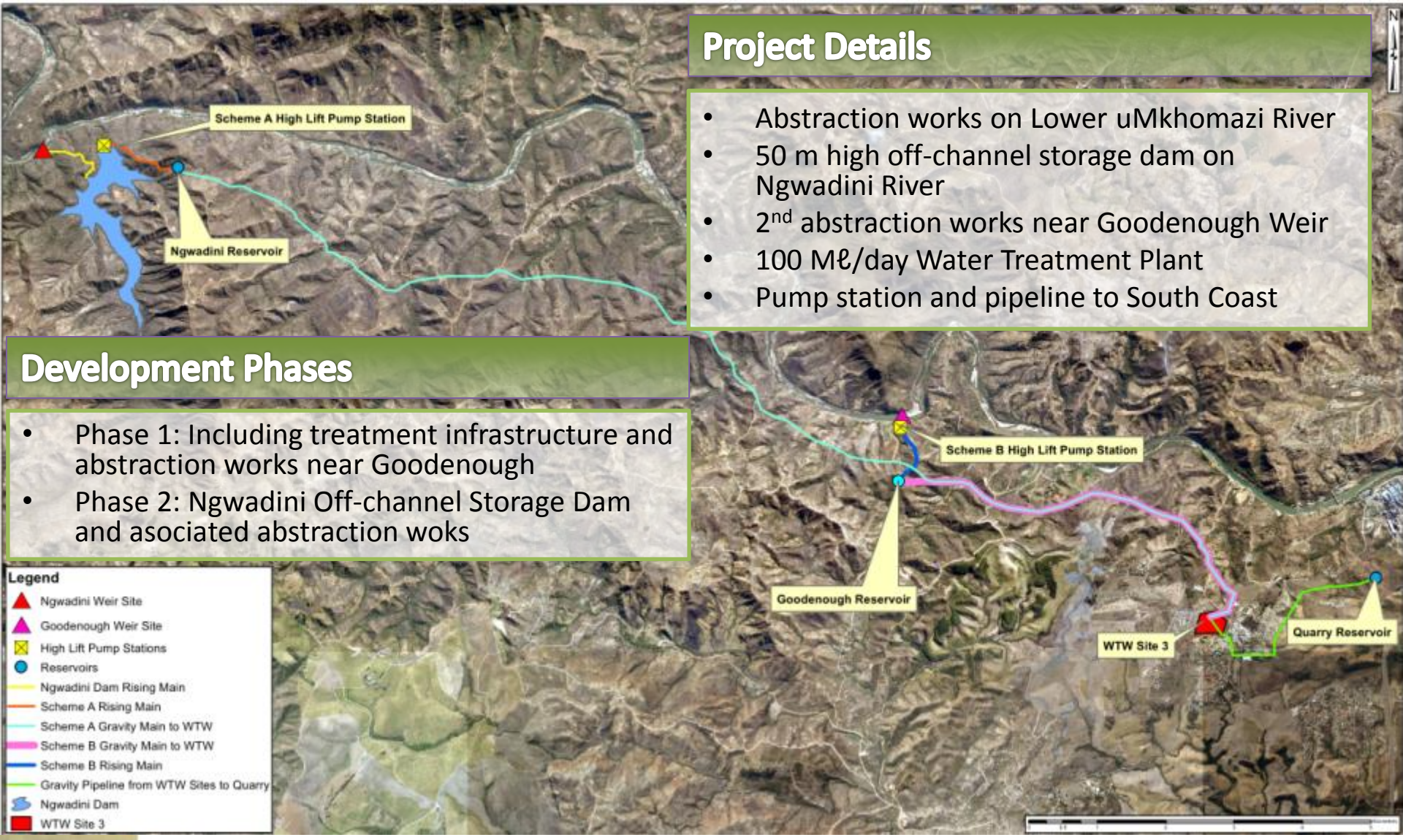
Lower uMkhomazi BWSS

Project Details

- Abstraction works on Lower uMkhomazi River
- 50 m high off-channel storage dam on Ngwadini River
- 2nd abstraction works near Goodenough Weir
- 100 Mℓ/day Water Treatment Plant
- Pump station and pipeline to South Coast

Development Phases

- Phase 1: Including treatment infrastructure and abstraction works near Goodenough
- Phase 2: Ngwadini Off-channel Storage Dam and asociated abstraction woks



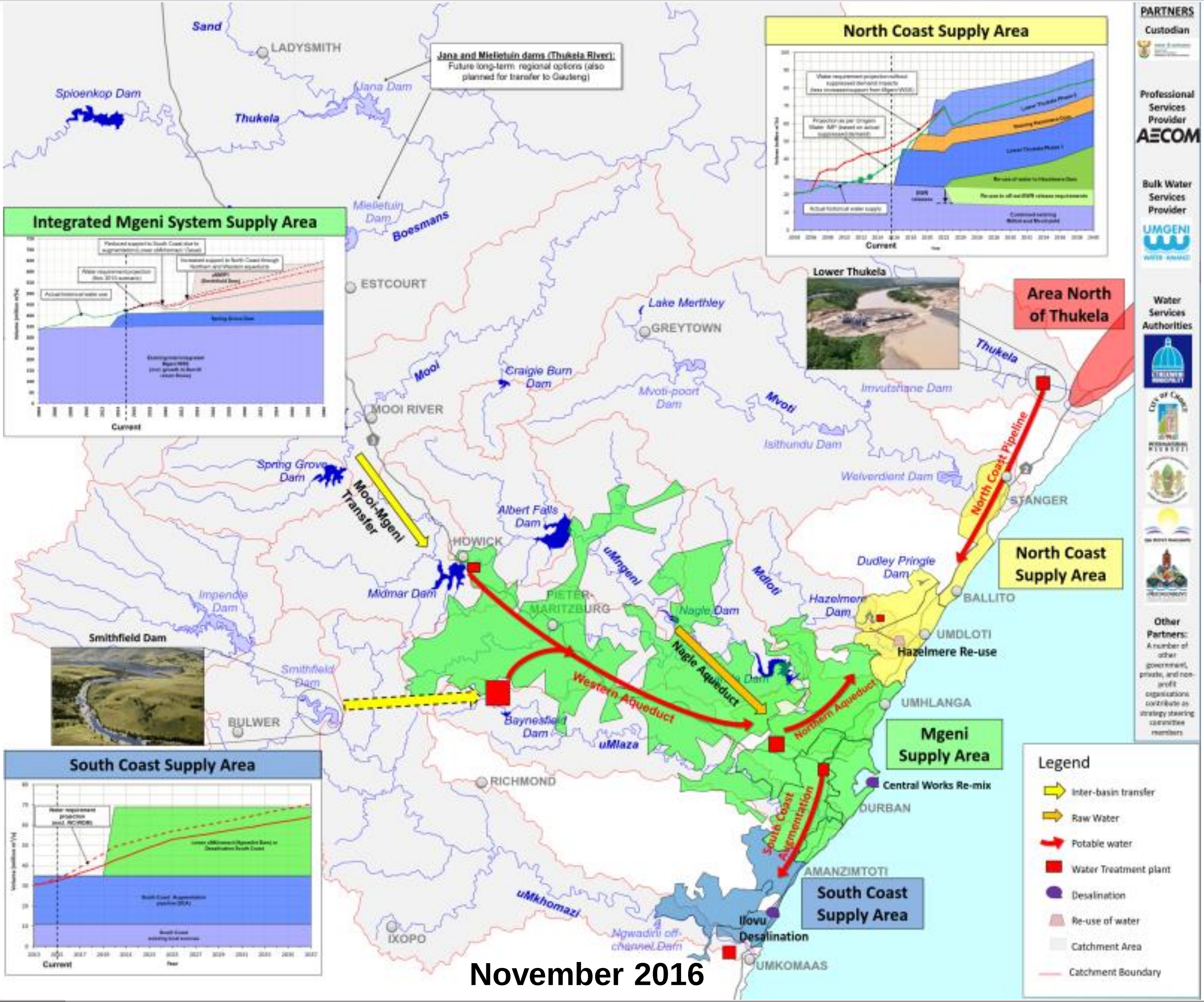
5.3 Deliverables of Updated Strategy

(www.southafrica.net/za)

5.3 DELIVERABLES OF UPDATED STRATEGY

The following three deliverables summarise the updated strategy as per the end of Phase 2 of the Continuation:

- **Updated Reconciliation Strategy Report;**
- **Strategy Poster (Strategy in a Nutshell Map);**
- **Interventions List with actions, dates and responsible institutions.**


North Coast Supply Area
Current
Lower Thukela
Area North of Thukela
PARTNERS
Custodian
Professional Services Provider
AECOM
Bulk Water Services Provider
UMGENI
Water Services Authorities
Other Partners:
A number of other government, private, and non-profit organisations contribute as strategy steering committee members
Sand
LADYSMITH
Jana and Mielietuin dams (Thukela River):
Future long-term regional options (also planned for transfer to Gauteng)
Jana Dam
Spioenkop Dam
Thukela
Mielietuin Dam
Boesmans
Integrated Mgeni System Supply Area
Current
ESTCOURT
Lake Merthley
GREYTOWN
Thukela
Mooi
Craigie Burn Dam
Mvoti-poort Dam
Mvoti
Imvutshane Dam
MOOI RIVER
Isithundu Dam
North Coast Pipeline
Spring Grove Dam
Mooi-Mgeni Transfer
Welverdient Dam
STANGER
Albert Falls Dam
HOWICK
uMngeni
Mdloti
Dudley Pringle Dam
North Coast Supply Area
Midmar Dam
PIETERMARITZBURG
Impendle Dam
Nagle Dam
Hazelmere Dam
BALLITO
Smithfield Dam
UMDLOTI
Hazelmere Re-use
Nagle Aqueduct
Smithfield Dam
Western Aqueduct
Northern Aqueduct
UMHLANGA
BULWER
Baynesfield Dam
uMlaza
Mgeni Supply Area
South Coast Supply Area
Current
RICHMOND
Central Works Re-mix
DURBAN
South Coast Augmentation
AMANZIMTOTI
South Coast Supply Area
uMkhomazi
Ilovu Desalination
IXOPO
Ngwadini off-channel Dam
UMKOMAAS
November 2016
Legend
Inter-basin transfer
Raw Water
Potable water
Water Treatment plant
Desalination
Re-use of water
Catchment Area
Catchment Boundary

Item 6: Feedback on Progress with Implementation of Already Committed Intervention Options

Midmar Dam
(maritzburgsun.co.za)

6.1: Water Conservation and Water Demand Management

(infrastructurenews.co.za)

6.1 Implementation of Water Conservation and Water Demand Management (WC/WDM) Master Plans

Water Conservation and Water Demand Management (WC/WDM)

- Previously identified as key short- and medium-term intervention option
- Success of WC/WDM depends heavily on social perceptions and strong public support
- WC/WDM measures and savings quantified in the 5-year WC/WDM Master Plans for the five Water Services Authorities (WSAs)
- Projected savings incorporated into water requirement projections
- Ageing infrastructure within various municipalities is one of the main causes of water losses in the region

6.1 Implementation of Water Conservation and Water Demand Management (WC/WDM) Master Plans

Water Conservation and Water Demand Management

- Preliminary information from 5-year WC/WDM Master Plans

Water Services Authority	Water supply volume (Mℓ/d)			Saving	
	Baseline value (2013/14)	5-year projection value (2018/19)		Mℓ/d	million m³/a
		Without WC/WDM	With WC/WDM		
eThekwini DM	911	1 014	943	71	25.9
Msunduzi LM	183	206	185	21	7.7
Ugu DM (1)	111	113	102	11	4.0
iLembe DM (1)	63	79	74	5	1.8
uMgungundlovu DM (1)	61	75	62	13	4.7
Total saving:	**40 to 48 million m³/a**				

Note: (1) Partially located within Reconciliation Strategy Area

Water Conservation and Water Demand Management (WC/WDM) beyond 5-Year Master Plans

- WC/WDM savings included in water balances included up to end of planning horizon;
- Ongoing effort – this needs to be achieved by rolling updates of the WSAs WC/WDM Master Plans every 5 years;
- Potential for other WC/WDM efforts (e.g. water use efficiency at household level) to provide further savings - Some uncertainty regarding the extent of implementation, therefore not currently included in water balances;
- Mechanism to incentivise the implementation and monitoring?

6.1 Implementation of Water Conservation and Water Demand Management (WC/WDM) Master Plans

- eThekwini MM
- uMgungundlovu DM
- Msunduzi LM
- Ilembe DM
- Ugu DM

6.2: Implementation of Water Supply and Drought Operating Rules

Hazelmere Dam
(www.timeslive.co.za)

6.2 Water Supply and Drought Operating Rules

- Water supply and drought operating rules need to be implemented and maintained in order to ensure sustainable water supply potential from existing water resources within the Strategy Area;
- Water supply and drought operating rules include the planning and management of water resources under drought conditions by implementing water supply restriction, when required, to protect high priority water use;
- Implementation of these rules is critical to achieving long-term water supply volumes at the assurance levels required by water users in the Strategy Area;
- Water supply and drought operating rules have been developed for all WSSs in the Strategy Area;
- Maintenance and implementation of rules and monitoring of system performance needs to continue through existing System Operations Forums (SOFs) and Joint Operating Committees (JOCs).

Item 6.3: uMngeni Ecological Infrastructure Partnership (UEIP)- Current initiatives

uMngeni River
(midlandsconservanciesforum.wordpress.com)

6.3 UMNGENI ECOLOGICAL INFRASTRUCTURE PARTNERSHIP (UEIP)

Catchment care and ecological infrastructure

What is ecological infrastructure?

- Naturally functioning ecosystems that deliver valuable services to people;
- Ecological infrastructure includes wetlands, riparian areas, coastal dunes.

Why is it important?

- Healthy ecological infrastructure contribute to effective ecosystems;
- Mitigate the damage of flood events;
- Increased adaptive capacity to climate change impacts;
- Supplement built infrastructure solutions; and
- Enhance water security in the uMngeni River catchment.

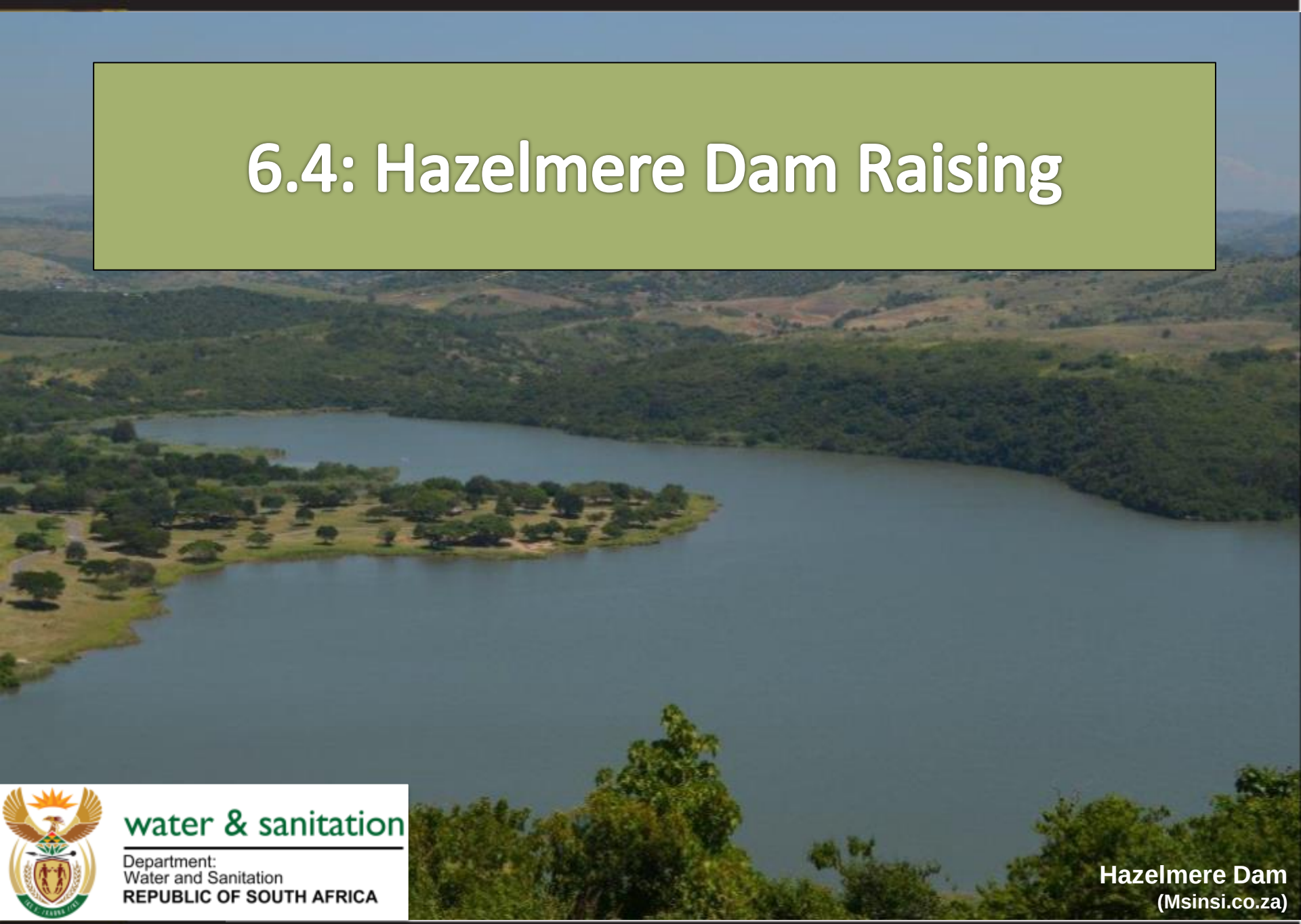
5.2 STRATEGY ACTION PLAN (CONTINUED)

Catchment care and ecological infrastructure

How will it be incorporated into the Strategy?

- Through continued commitment from SSC to collaborate with the uMngeni Ecological Infrastructure Partnership (UEIP) and other partnerships;
- Water system yields are based on a certain catchment status – improvement or degradation of the catchment levels will have a direct impact on the utilizable yield and ultimately water security;
- Supporting investment in ecological infrastructure is required to:
  - Maintain current status of the various catchments, i.e. limit the degradation of water resources and overall impact on water balances, e.g. removal of invasive alien plants, improving water quality in water resources.

6.4: Hazelmere Dam Raising



water & sanitation
Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Hazelmere Dam
(Msinsi.co.za)

Project Status – Raising of Hazelmere Dam

- Project is fast-tracked and can now be filled to about 2m above it's old full supply level (provided there is sufficient inflow).
- Releases stopped in November 2016 to allow some impounding
- Project completion date is November 2017

6.5: Implementation of Lower Thukela BWSS

UMGENI WATER · AMANZI

6.6: eThekwini Remix Project Pilot Plant

Item 7: Status and Way Forward with Priority Interventions

- Water Conservation and Water Demand Management
- uMkhomazi Water Project
- Re-use of wastewater to Hazelmere Dam
- Lower uMkhomazi BWSS

7.1: uMkhomazi Water Project (uMWP)

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Project Status – uMWP-1

- **EIA STATUS**
  - Problems anticipated to obtain authorisation - EDTEA do not support project
    - Blue swallows
    - Biodiversity issues
  - Expect difficult to solve appeals
  - Extension of EIA team VO2:
    - might not be granted or only partially granted
  - DEA authorisation expected by **May 2017** (exclude time required to deal with appeals and if the above issues can be dealt with)

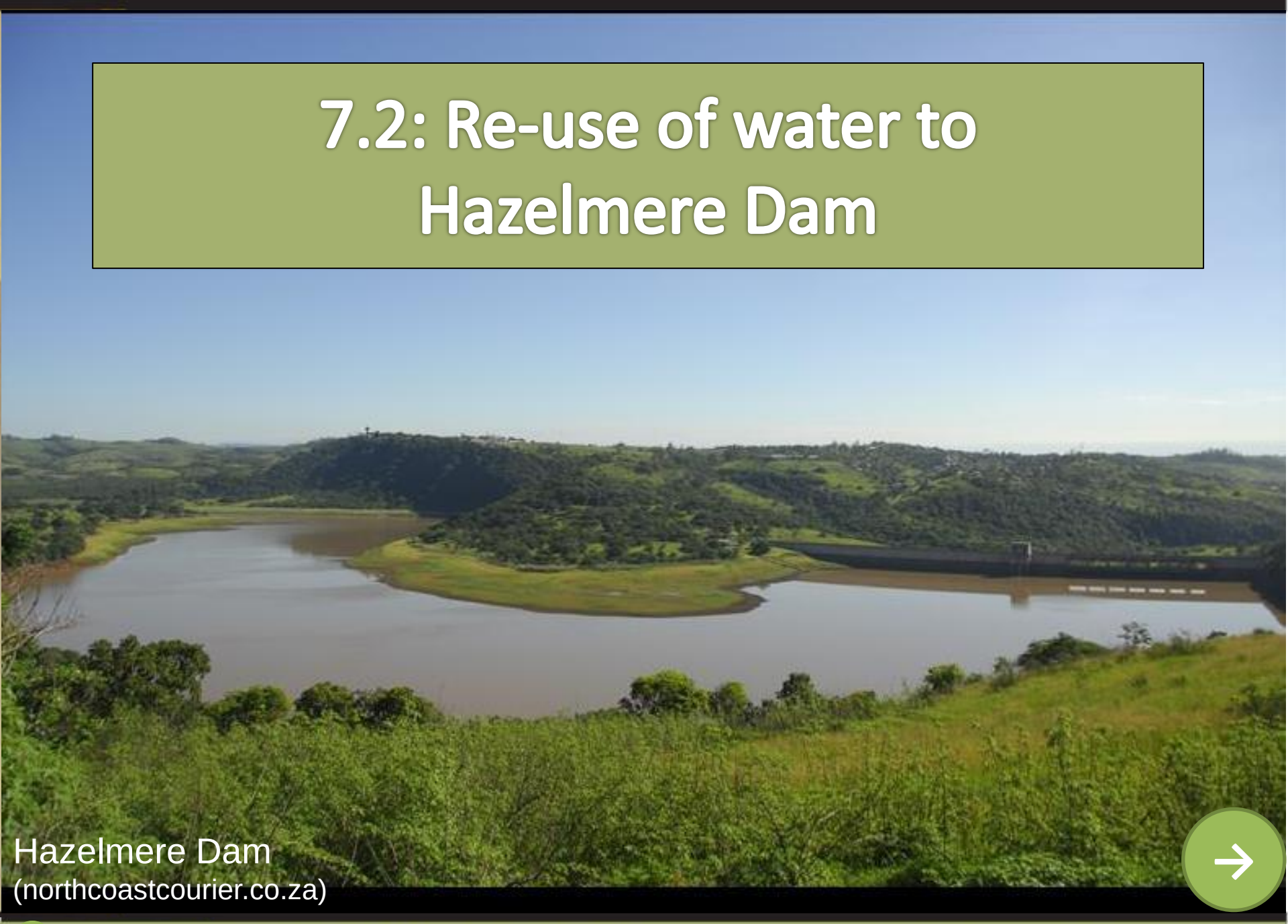
Project Status – uMWP-1

- **DMR PROCESS**
  - Additional work required due to new 2014 NEMA regulation *(EIA approval for quarry material required)*
  - Application number from DMR took months to obtain *(DMR officials needs to find their feet)*
  - Agreement reached with DMR officials to use the current Scoping Report
  - Need to rework NEMA EIA report (1200 pages) into DMR format/requirement
  - Might need to *redo* public participation
  - DMR authorisation expected by **Dec 2017** *(exclude time required to deal with appeals and if the above issues under status can be dealt with)*

Project Status - uMWP-1

- **DWS ACTIONS**
  - Submission to Minister to extend the finalization of the RID from 2016/2017 to 2017/2018 (water delivery 2024/2025)
  - Approval of EIA team VO2 and most probably VO3
  - Compiling a submission for the appointment of TCTA to do preparatory work and implement scheme (critical for recovering/fast tracking)
  - Review current programme required to confirm anticipated scenario
  - **Possible scenarios if one or more of the above does not happen or happens:**
    - Design period: 2019 – 2023 (incl additional geotech)
    - Construction to start by end 2023
    - Water delivery by end 2028

7.2: Re-use of water to Hazelmere Dam



Hazelmere Dam
(northcoastcourier.co.za)

Actions List

Main scheme	Start date	End date	Comment/s
Upgrade of North Coast WwTWs and planning of re-use			
Regional Umdloti WwTW & Tongaat WwTW upgrade site selection	Late 2015	Mar 2017	Currently done by Ethekwini (includes basic re-use assess.)
EIA for Regional WwTW	Mar 2017	Oct 2018	To commence after feasibility.
Feasibility for WwTW and re-use (include. institutional arrangements)	Mar 2017	Aug 2017	Roles & funds by Ethekwini, DWS & Umgeni Water?
PPP for Design & construct of phase 1 WwTWs (Umdloti 40-50 ML/d; Tongaat 20 ML/d)	Sept 2017	Mar 2019	Ethekwini can return these to estuaries. Contribute /off-set Mdloti EWR
Re-use of water – Tongaat and uMdloti			
Confirm re-use for next WwTW upgrade phases (dates and volumes)	Require monitoring after phase 1 complete		Current basic projections: Tongaat - 20 ML/d cap 2020 uMdloti - 55 ML/d cap 2035
Design & construct additional WwTW phases & re-use infrastructure (including WTP upgrades if required)	2018	2020	WwTW By Ethekwini. Re-use by selected implement agent. Timing based on discharge cap and water resource need
Delivery of Tongaat re-use (in-direct via Tongaat and/or Hazelmere WTP)	2020	Beyond 2065	Ultimate potential: Tongaat - 120 ML/d
Deliver uMdlotire-use water (in-direct via Hazelmere WTP)	2035	Beyond 2065	Ultimate potential: uMdloti - 85 ML/d

7.3: Lower uMkhomazi BWSS

Actions List

Main scheme	Start date	End date	Comment/s
Lower uMkhomazi Bulk Water Supply Scheme (Umgeni Water)			
Feasibility Study	Jul 2014	Nov 2016	**Completed**
EIA Approval	Mid 2016	April 2018	**Commenced**
Detailed design	Mar 2017	Mar 2018	**Tender for design underway**
Construction (Delivery 100 Mℓ/d)	Aug 2018	End 2022	Yield available before & after uMWP-1 with releases. ROD for dam expires Aug 2018
First delivery of water		Early 2021	A partial volume of water can be delivered before completion of the dam (with associated risk)

Item 8: Way forward with Alternative and Future Interventions

Bridge at headwaters of Inanda Dam
(gameplanmedia.co.za)

8.1 ALTERNATIVE INTERVENTIONS

Rainwater harvesting

- Rainwater harvesting has been an identified intervention since the beginning of the Reconciliation Strategy;
- Currently, unknown number of installations with no existing formal implementation programme;
- Due to the drought, rainwater harvesting is gaining popularity and momentum.
- Current levels of ad-hoc implementation of RWH are already accounted for in actual supply volumes (in part compensating and/or lumped with drought restriction impacts);
- Reasonable amount of research is available at household level;
- Impact and volumetric benefit, at a catchment scale, for inclusion in water balances still needs to be better quantified;

8.1 ALTERNATIVE INTERVENTIONS – RWH continued

Rainwater harvesting (RWH) was investigated during initial phases of Recon. Estimates of household level potential and yield obtained from specialist input and assumptions on roof and tank size.

Different types of rainwater harvesting considered:

Sole supply option:

- For conservative drawdown, i.e. managing system to minimise "dry tank days", rainwater yield for RDP house is 28.7 kℓ/a per unit, which is equal to 40% of the Free Basic Water.

Conjunctive use option:

- Use of rainwater is prioritised over municipal supply;
- For a suburban house with average roof size of 200 m² and a storage tank with a capacity of 5 000 ℓ, the rainwater yield is 117.1 kℓ/a per unit
- For a RDP house with an average roof of 40 m² and a 5 000 ℓ storage tank, the rainwater yield is 30.6 kℓ/a, which is 43% Free Basic Water per unit.

➢ More yield obtained from conjunctive use i.e. use when available.

8.1 ALTERNATIVE INTERVENTIONS – RWH continued

- What are the potential yields from a system perspective?

2nd phase of Reconciliation Strategy estimated maximum yield potential by assuming all formal housing in Ethekwini fitted with rainwater harvesting tanks:

Sole source:

- The indicative total firm yield for 5 000 ℓ and 10 000 ℓ capacity tanks was 7.6 million m³/a and 13.5 million m³/a respectively.

Conjunctive use:

- Maximum total rainwater yield for full conjunctive use (assuming point-of-use treatment to potable level) is 42 million m³/a;
- Maximum total rainwater yield for secondary use (water for laundry, flushing of toilets, gardening and filling of swimming pools) is 32 million m³/a;

- These yields are max potential if all houses in Ethekwini implemented RWH (hence somewhat unrealistic and over-inflated). Realistic number – 10%?
- The extent to which we approach this potential will be based on public desire to off-set costs and extent of government programs and incentive schemes.

8.1 ALTERNATIVE INTERVENTIONS – RWH continued

Though starters on the way forward with RWH:

- Institutional arrangements and roles/responsibilities around RWH need to be clarified. Is it going to be left to the public, or is a formal program needed?
- Municipalities should consider incentivising RWH systems through subsidies or as part of poverty alleviation funds to either supplement water supply at standpipe level or tankering of water;
- Due to temporal and spatial variability of rainfall, optimum size for rainwater storage tanks should be determined for various areas and roof sizes;
- Proper training programmes should be developed to ensure the successful implementation and maintenance of RWH systems.
- Industry is learning as we go and RWH requires good management …….. Best practices should be documented and shared.

8.2 ALTERNATIVE INTERVENTIONS (CONTINUED)

Main scheme	Start date	End date	Comment/s
Direct re-use of treated wastewater (eThekwini MM)			**STOP-GAP UNTIL UMWP-1**
Council Resolution		July 2017	Public buy-in likely improved due to north coast initiative
Tender preparation and adjudication	Jan 2018	Jun 2018	- Requires council resolution and public buy-in
Tender award, financing and site establishment	Jun 2018	Jun 2019	-
Construction and commissioning	Jul 2019	Dec 2021	-
Delivery (41 million m^3/a)	-	Jan 2022	-
Desalination of seawater (Umgeni Water)			**STOP-GAP UNTIL UMWP-1**
Development of EPC contract	July 2017	July 2018	1 year assumed
Funding procurement, design and tender phase	July 2018	July 2019	1 year assumed
Construction	July 2019	Dec 2021	2 and a half years assumed
Delivery (150 Mℓ/d)	-	Jan 2022	Tongaat (long term option, due to other feasible options)
			lovu site an alternative to LUBWSS

8.2 POSSIBLE FUTURE INTERVENTIONS

Main scheme	Start date	End date	Comment/s
Mvoti River Scheme - iSithundu Dam (DWS)			ALTERNATIVE TO HAZELMERE RE-USE
Feasibility Study	Apr 2021	Apr 2024	Estimated start date (timeline moved for water resources need)
EIA (including estuary)	Jun 2021	Apr 2024	-
Detailed design	Aug 2024	Jul 2026	-
Construction	Oct 2026	Oct 2030	-
Delivery	-	Apr 2030	-
uMkhomazi Water Project: Phase 2 – Impendle Dam			LONG TERM
Feasibility Design	Requires feasibility design study for phase 2		
EIA	Required together with feasibility design study		
Design and construction	2039	2044	
Delivery	-	2045	

8.2 POSSIBLE FUTURE INTERVENTIONS

Main scheme	Start date	End date	Comment/s
Thukela Water Project (Mielietuin or Jana dams) (DWS)			**LONG TERM**
Feasibility study	Completed Would require bridging study		
EIA	Needed together with bridging study		
Mzimkhulu River Development (DWS)			**LONG TERM**
Feasibility study	Mzimkhulu River Catchment Water Resource Study completed (2011) Would require bridging study for transfer option		
EIA	Needed together with bridging study		

Item 9: Way forward for implementation and Update of Reconciliation Strategy

WAY FORWARD FOR IMPLEMENTATION AND UPDATE OF RECONCILIATION STRATEGY (1 OF)

Drive key initiatives by core stakeholders:

- WSAs to continue with implementation of WC/WDM initiatives. This is the most cost-effective - we cannot afford not to.
- Operating rules need to be carefully implemented (or else we risk supply to basic human needs and economic activities.
- Issues around uMWP1 – Smithfield Dam need to be addressed. If this project is delayed the risks are significant.
- Re-use of water on North Coast (uMdloti & Tongaat) requires institutional arrangements & monitoring of effluent growth.
- Design of construction of Lower uMkhomazi BWSS according to program, to augment South Coast and reduce load on Mgeni WSS.

WAY FORWARD FOR IMPLEMENTATION AND UPDATE OF RECONCILIATION STRATEGY (1 OF)

Drive the initiatives requiring greater community participation:

- Protection from further degradation and rehabilitation of catchments to maintain water quantity and water quality. Currently spearheaded by UEIP, but needs to spread to other areas and institutions.
- Rainwater harvesting has gained momentum through the drought. The need and potential benefit of formal programs to support ad-hoc installations by the private sector to be better quantified.
- The more the general public buy-in to and become involved in the above two activities, the greater the impact.

➢ The same can be said to apply for awareness and buy-in to the Strategy as a whole. Water is becoming everyone's responsibility!

Item 10: Communication

10.1 COMMUNICATION

- Confirmation of SSC members
- DWS project website:

  https://www.dws.gov.za/projects.aspx

10.2 WAY FORWARD AND COMMUNICATION OF THE UPDATED STRATEGY

Methods of Communication

- Publishing of Updated Strategy on DWS Project Website;
- Press Release/ News Letter;
- Distribution of Updated Strategy by SSC members representing various spheres of the community.
- Other methods of communication?

Item 11: Closure

water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

Thank you