

Current selected scheme for Feasibility Design:

- A dam at Smithfield with gross storage capacity 251 million m³ associated with a full supply level of 930 masl (31 % of the Mean Annual Runoff).
- A Langa Dam with gross storage capacity 12.5 million m³ associated with a full supply level of 923 masl.
- A single 3.5 m internal diameter uMkhomazi to uMlaza tunnel and associated pipeline and water treatment plant system to Umlaas Road with design (seasonal) transfer capacity of 8.65 m³/s.
- Water treatment works in the uMlaza River valley.
- Gravity pipeline to the Umgeni Water bulk distribution reservoir system.



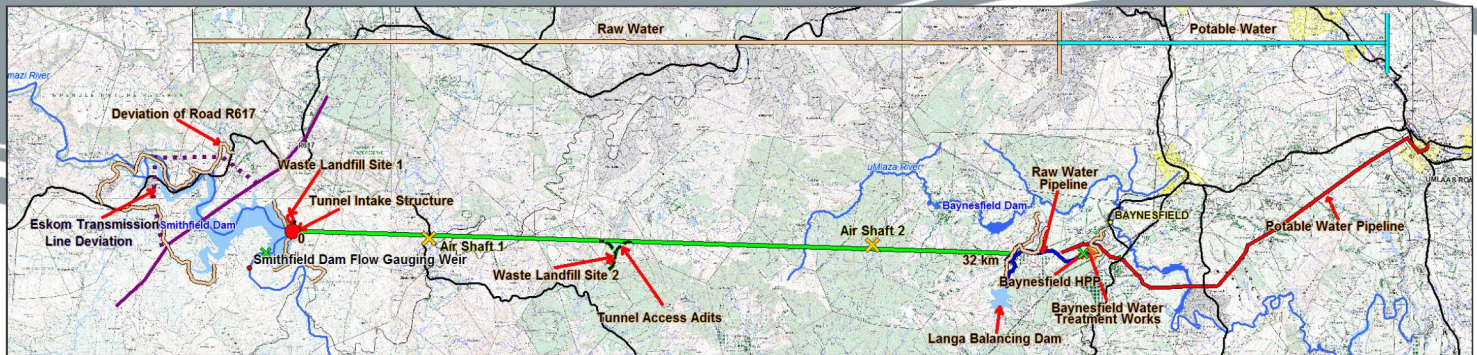
water & sanitation

Department:
Water and Sanitation
REPUBLIC OF SOUTH AFRICA

uMkhomazi Water Project (uMWP)

Fact Sheet

JUNE 2015



Smithfield Dam

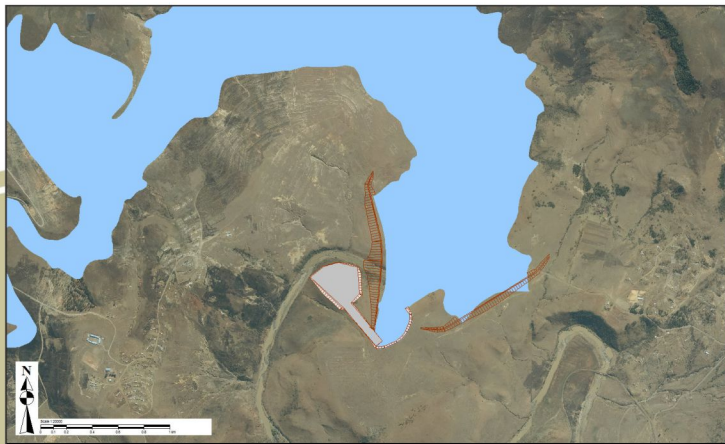


Figure 1: Conceptual layout of the dam at Smithfield

Table 1: Dam characteristics for the selected dam at Smithfield

Parameter	Main dam	Saddle dam
Type of dam	Zoned earth core rockfill dam	Zoned earthfill embankment dam
DWA classification	Category III	
Storage volume as a percentage of Mean Annual Runoff - MAR (%)	31	
Full supply level - FSL (masl)	930	
Minimum operating level - MOL (masl)	887.2	
Gross storage capacity at FSL (million m ³)	251	
Live storage capacity at FSL (million m ³)	226	
Surface area at FSL (km ²)	9.53	
Catchment area (km ²)	2 058	
Crest level (masl)	936	
Maximum wall height (m)	81	26
Crest length of wall (m)	1 200	1 090
Spillway type	Main side channel	Fuse plug
Spillway shape	Ogee	Broad-crested
Spillway length (m)	150	100
1:100 year yield (million m ³ /a) (2012 in-catchment development levels)	220	

Langa Dam

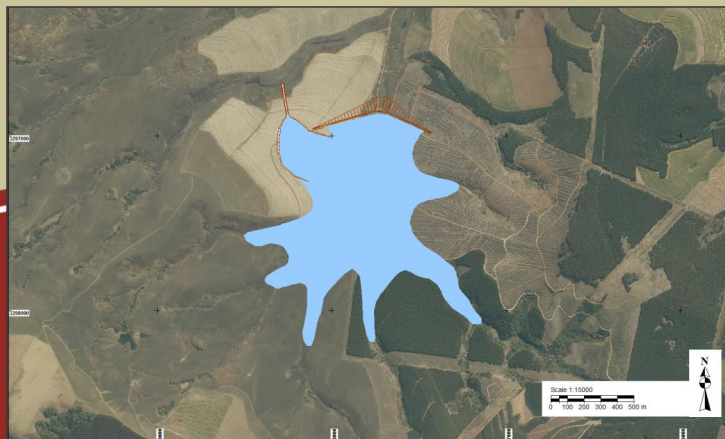


Figure 2: Conceptual layout of the selected Langa Dam

Table 2: Dam characteristics for the selected Langa Dam

Parameter	Main dam
Type of dam	Concrete faced rockfill dam (CFRD)
DWA classification	Category III
Full supply level - FSL (masl)	923
Minimum operating level - MOL (masl)	898
Gross storage capacity at FSL (million m ³)	15.7
Live storage capacity at FSL (million m ³)	14.8
Surface area at FSL (km ²)	0.95
Catchment area (km ²)	5.4
Crest level (masl)	926.6
Maximum wall height (m)	46.6
Crest length of wall (m)	573
Spillway type	On left flank with chute
Spillway shape	Ogee

Tunnel

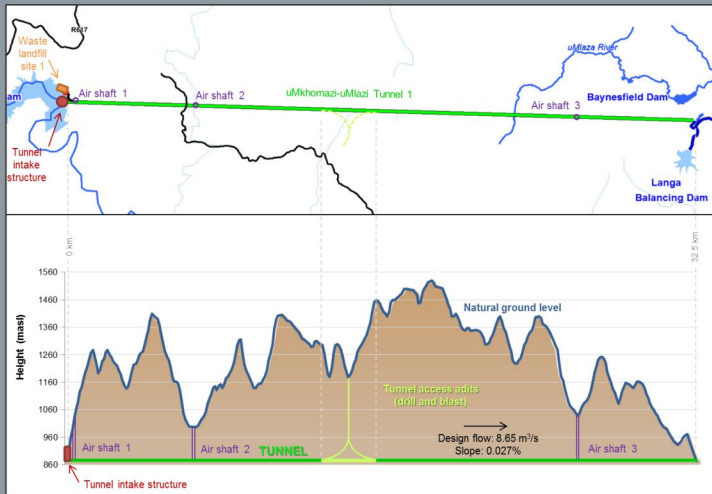


Table 3: Characteristics for the selected tunnel

Aspect	Description
Type	Pressure tunnel
Diameter (m)	3.5
Length (km)	32.0
Maximum tunnel cover depth (m below NGL)	636.4
Transfer capacity (m³/s)	8.65

Gravity pipeline



Table 4: Characteristics of the gravity pipeline

Aspect	Description
Pipeline material	Carbon Steel
Diameter (m)	2.5
Capacity (Mℓ/d)	500
No. of pipelines	2
Length (km)	21.3 km (or 24.5 km on alternate route)
Type of system	Gravity

Water treatment works

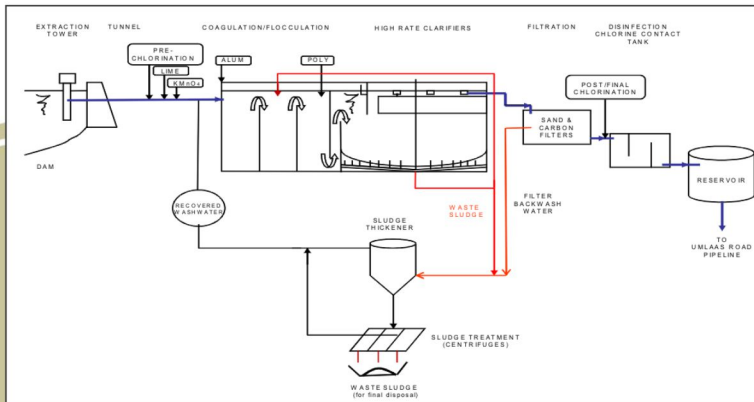


Table 5: Characteristics of the water treatment plant

Aspect	Description
Capacity (overall)	1 250 Mℓ/d in ten trains of 125 Mℓ/d Initially 375 Mℓ/d
Area (footprint)	600 m by 350 m
Unit process employed	<ul style="list-style-type: none"> Flash mixing and coagulation; Flocculation; Sedimentation; Filtration; Disinfection; Sludge dewatering and thickening
Chemicals employed	<ul style="list-style-type: none"> Potassium permanganate for oxidation of iron and manganese; Lime for stabilization; Alum and poly as coagulant/flocculant; Bentonite as ballasting agent; Chlorine for disinfection – pre- and post chlorination required

Artist impression of dams at Smithfield and Langa

