Barrydale Interventions Map

Legend

Project 1: Sanitise the Sewers

- 1.1 Fence the Wastewater Treatment Works (WWTW)
- 1.2 Improve WWTW operation and effluent quality
- 1.3 Address the Smitsville Sewers

Project 2: Monitoring & Operation

- 2.1 Improve monitoring and real time operation of the system
- 2.2 Detailed Yield Analysis
- 2.3 Water System Operating Rules

Project 3: Clear IAPs

- 3.1 Clear Invasive Alien Plants (IAPs) in riparian zone
- 3.2 Clear upper Huis River Catchment IAPs

Project 4: River Management & Accountability

- 4.1 River Maintenance and Management Plan
- 4.2 Stewardship Agreement

Project 5: System Improvements

- 5.1 Pipe across the river to the commercial farmers
- 5.2 Supply water to the Gwarry for community vegetable gardening
- 5.3 Install solar pump to improve irrigation for the Kleinboere
- 5.4 Improve existing water supply system infrastructure
- 5.5 Address unaccounted for water in potable distribution system
- 5.6 Additional storage tank for potable water

Project 6: Guardians of the Huis

- 6.1 Friends of the Huis River
- 6.2 Education campaign about the water system
- 6.3 Raise awareness and provide support for water friendly gardens

Legend Continued

Project 7: Landowner Ownership

- 7.1 Rainwater harvesting
- 7.2 Register boreholes and monitor use
- 7.3 New operating rules and system for Privatised Leiwater

Project 8: Major Infrastructure Investment

- 8.1 Expand and upgrade WWTW
- 8.2 Design and install stormwater management system

Project 9: Riverine Green Corridor

- 9.1 Create a public open green space in old caravan park
- 9.2 Construct and plant biofiltration zones along the Huis River

Project 10: Redfin Champion

- 10 Investigate potential for moving the Redfin upstream of Donkergat

Project 11: Expanding Supply

- 11.1 Ecological Infrastructure Management Plan
- 11.2 Increase storage capacity of Swartdam
- 11.3 Investigate groundwater as a source

R62
Van Riebeeck Street
Tinley Street
Barrydale
Distribution Reservoirs
DWS Monitoring Weir
Huis River
Leiw...
Commercial Farmers
Smitsville
Gwarry
Overflow Dam
Irrigation Fields
Wastewater Treatment Works
Kleinboere Dam West
Kleinboere Dam East
Rooidam
Pumpstation
Water Treatment Works
Verdeelstruktuur
Witdam
Reservoirs
Canal to Small-scale Farmers
Swartdam
Donkergat
R324
Tradouw River

0 200 400 600 800 1,000 m

Barrydale Interventions Description

No.	Project Name	Description	Activities	Outcome
1.1	Sanitise the Sewers	Fence the Wastewater Treatment Works (WWTW)	► Install fencing around ponds and improve access control. ► Ensure community buy-in to ensure fencing is maintained.	► Reduce risk to residents and smale-scale farmers. ► Prevent livestock from grazing at the ponds and making it possible to sell livestock produce within Barrydale
1.2		Improve WWTW operation and effluent quality and re-use.	► Ensure irrigation water is taken from last pond, at the right timing intervals and reducing livestock exposure to freshly irrigated fields (i.e., operating as designed). Consider an additional polishing wetland before irrigation (as WWTW is currently overcapacity).	► Reduce exposure of grazing livestock to disease. ► Improve effluent and irrigation run off quality and health of receiving environment.
1.3		Address the Smitsville Sewers	► Investigate and address the cause of the overflowing sewers in Smitsville.Fixing leaking pipes and overflowing manholes, including the pipe crossing the flow path into the Kleinboere West Dam. ► Include an education campaign of what can be flushed.	► Reduce raw sewage running into the human and natural environments. Small scale farmers on western side of Smitsville will be able to use the small dam for irrigation and livestock.
2.1	Monitoring & Operation	Improve monitoring and real time operation	► Install flow monitoring devices at Donkergat, and at the split in the canals. ► Establish an "eco-club" to implement citizen science monitornig of the water quality of the river.	► Establish the seasonal water usage by the municipality and the commercial farmers. ► In time this will also help distribute water fairly among water users. ► Establish and maintain a comprehensive record for water quality in the Huis River.
2.2		Detailed Yield Analysis	► Update the yield analysis of the water supply system. ► Update allocations based on assurance of supply calculations and actual water availability. ► Include a Reserve Determination to establish the ecological flow requirements.	► Understand available water. ► Update allocations and licensing with protection of the ecological flow requirements in account.
2.3		Water System Operating Rules	► Create water system operating rules that adapt with times of flood and drought.	► Better managed water system that ensures fair and equitable distribution of water throughout the hydrological life cycle.
3.1	Clear IAPs	Clear Invasive Alien Plants (IAPs) in riparian zone and plan for sustained follow up	► Clear the reeds and other IAPs from the riparian area and catchment and mapping the habitat quality.	► Increase water quantity. ► Improve visual connection to the river and safety. ► Improve the habitat of the Barrydale Redfin and reduce parasite load.
3.2		Clear upper Huis River Catchment IAPs and include biocontrol agent on Hakea and plan for sustained follow up	► Clear the IAPs from the upper catchment and mapping the habitat quality.	► Increase water quantity. ► Control IAP spread and reduce wildfire risk. ► Improve biodiversity.
4.1	River Management & Accountability	River Maintenance and Management Plan	► Draw up a River Maintenance and Management Plan with collaboration between the Department of Agriculture and river-front property owners	► Establish best practices and accountability for the management and protection of the river and riparian zone. ► Authorise maintenance activities in the river and riparian zone. ► Remove concerns related to clearing riparian zone and causing erosion and/or moving sediment or if indigenous plants are becoming invasive.
4.2		Stewardship Agreement	► Draw up a formal agreement between landowners, government agencies and other stakeholders to manage and protect the Huis River and its catchment	► Ensure long-term health of the river-system, promote sustainable land use practices and protect biodiversity. ► Promotes a community sense of ownership for the management and protection of the Huis River.
5.1	System Improvements	Pipe across the river to the commercial farmers	► Design and install pipe to convey allocated water to the commercial farmers canal. ► Design should include the opportunity to divert water in times of flood to allow farmers to fill their dams. ► Must be operated with the newly defined Operating Rules.	► Protect the environmental flow of the river and therefore the Redfin habitat. ► Ensure farmer allocations are conveyed without losses in dry season. ► Ensure farmers can fill dams in wet season.
5.2		Supply water to the Gwarry for community vegetable gardening.	► Design and install a system to convey water to the Gwarry for irrigation of the community garden. ► Must be operated with the newly defined Operating Rules.	► Reduce food insecurity.
5.3		Install solar powered pump to improve irrigation for the Kleinboere (both East and West Dams)	► Size and install a solar pump system to facilitate irrigation of the Kleinboere agricultural fields. ► Must be operated with the newly defined Operating Rules.	► Allows for irrigation on Kleinboere lands and growing crops. ► Improves Kleinboere productivity and scalability. ► Avoids reliance on electricity or diesel.
5.4		Improve existing water supply system	► Fix broken sluice gate at Municipal offtake. ► Extend the concrete HDPE lined canal to Swart, Wit, Rooi, and Kleinboere East Dams. ► Install sluice gate valves at offtakes.	► Reduce losses due to infiltration along the canal. ► Improve monitoring and operation.
5.5		Address unaccounted for water in potable distribution system	► Reduce unaccounted for water. ► Find and fix leaks in the potable distribution network. ► Install metering devices for accurate billing information.	► Water is used more efficiently. ► Municipality recovers more operational costs. ► Water users get charged based on actual water used.
5.6		Additional storage tank for potable water	► Build an additional storage tank at the water treatment works (WTW). ► The feasibility and system impact must be investigated under the Detailed Yield Analysis intervention (Project 2.2).	► Increase storage capacity of municipal water supply. ► Allow the municipality to take an existing reservoir offline for cleaning and maintenance without disrupting supply.

Barrydale Interventions Description

No.	Project Name	Description	Activities	Outcome
6.1	Guardians of the Huis	Friends of the Huis River	► Formulate a Friends of group to continue the Framework Plan efforts.	► Sustain the momentum and engagement of the Framework Project. ► Follow up with the Framework Plan projects and initiatives.
6.2		Education campaign about the water system	► Focus on the education of children regarding water stewardship and responsible use of sewers.	► Spread awareness about water and sanitation issues. ► Begin behavioural change in the use of the sewers.
6.3		Raise awareness and provide support for water friendly gardens	► Education campaign on the benefits of locally indigenous planting.	► Create more town buy-in to the process and collective action. ► Water saving and reducing pumping from the river.
7.1	Landowner Ownership	Rainwater harvesting	► Encourage and potentially incentivise homeowners to install rainwater harvesting tanks.	► Reduce reliance on municipal water (both potable and leiwater) for domestic irrigation.
7.2		Register boreholes and monitoring use	► Encourage and facilitate land owners to register and monitor their boreholes.	► Understand the groundwater availability. ► Understand impact on ground water levels and stream flow in the Huis River. ► Understand what contitutes Schedule 1 water use.
7.3		New operating rules and system for Privatised Leiwater	► Privatise leiwater and develop an operational model and contractual agreement for use.	► Improve leiwater operation. ► Reduce losses in the canal system.
8.1	Major Infrastructure Investment	Upgrade Wastewater Treatment Works (WWTW)	► Increase and upgrade to accommodate both Barrydale and Smitsville wastewater. ► The upgrade must consider nature-based solutions treatment technology, e.g., extension or expansion of the oxidation pond system with a biofiltration zone for polishing.	► Increase treatment capacity of WWTW to cope with increasing population ► Improve the quality of the effluent leaving the WWTW. ► Improve the water quality of the Tradouw River.
8.2		Design and build a stormwater management system throughout Barrydale using WSD principles	► Design a stormwater management system using WSD principles. ► Focus on sustainable urban drainage systems, e.g. swales, bioretention areas, rain gardens, infiltration trenches, etc.	► Improved road drainage and erosion control due to mitigated surface water runoff damage. ► Protect properties and river from uncontrolled runoff. ► Mitigate the risk of polluted runoff entering the river. ► Reduced flooding from stormwater runoff entering leiwater system.
9.1	Riverine Green Corridor	Create public open green space in old caravan park with water friendly demonstration garden	► Create a community green space and connection to the river. ► Establish showcase and agroecology garden. ► Establish a nursery for locally indigenous plants.	► Improve community buy-in to the Huis River water stewardship. ► Expand knowledge of water friendly gardens and agroecology for residents and subsistence gardeners.
9.2		Construct and plant biofiltration zones along the Huis River (throughout the town and surrounding farms)	► Planting biofiltration zones or constructed wetlands along the riverbanks throughout the town and river fronting properties.	► Improve water quality and ddress concerns regarding fertilisers polluting the water. ► Protect against reeds reestablishing along the riverbanks. ► Establish riparian buffer zone.
10	Redfin Champion	Investigate potential for moving the Redfin upstream of Donkergat	► Investigate through a specialist study the potential to expand habitat for Redfin to include a safe haven upstream.	► Expanded and secure population of Redfin.
11.1	Expanding Supply	Ecological Infrastructure Management Plan	► Draw up a Ecological Infrastructure Management Plan that accounts for the natural environment and the ecosystem services of the Huis River catchment.	► New infrastructure will account for climate changes that will occur within its design life. ► Improved green infrastructure; prioritisation of green stormwater management systems. ► Protection of natural resources is inherent in infrastructure planning. ► Promotion of sustainable and climate resilient development including water use practices and food security.
11.2		Increase storage capacity of Swart Dam	► Raise Swart Dam wall. ► The feasibility and system impact must be investigated under the Detailed Yield Analysis intervention (Project 2.2).	► More storage volume for use by the municipality.
11.3		Investigate groundwater as a source	► Investigate the potential for groundwater as a source. ► Investigate the geology and siting of the borehole. ► Determine the short- and long-term consequences during the installation and subsequent abstraction.	► Additional water resource separate to the Huis River.