NORTH GAZA EMERGENCY SEWAGE TREATMENT PROJECT NGEST

RECOVERY AND REUSE SCHEME

PALESTINIAN WATER AUTHORITY PROJECTS MANAGEMENT UNIT

PROJECT BACKGROUND

BLWWTP was designed in 1970s to handle 5,000 m^3 daily

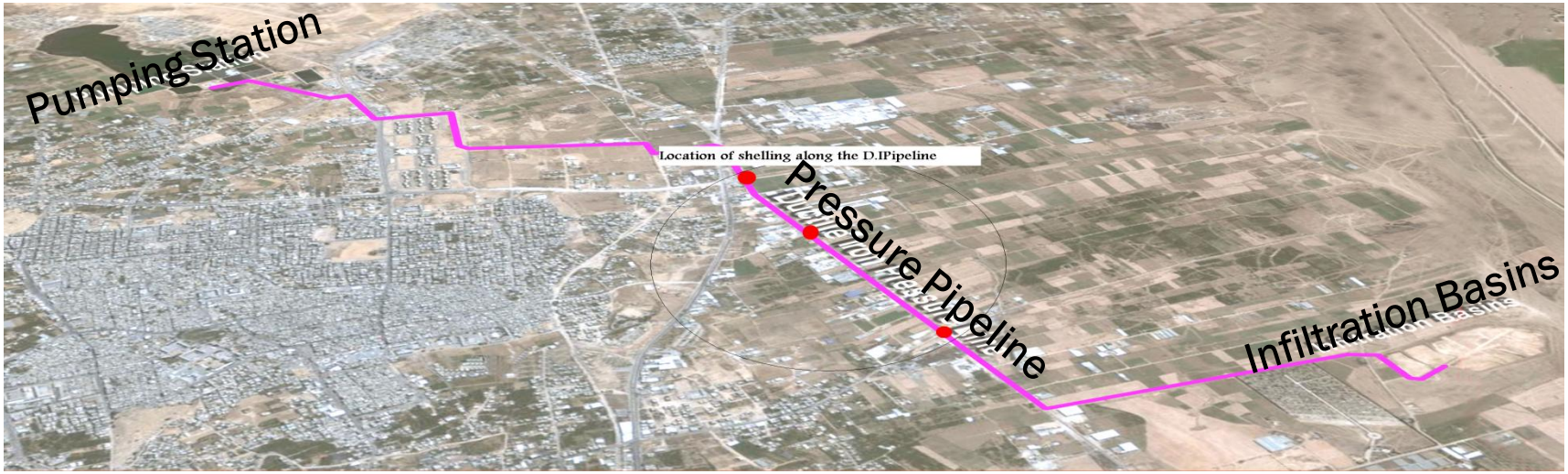
Through years the population increased resulted in the following:

- In 2004, huge lake (**2.5-3 MCM of sewage, 30 hectares**) formed
- In March 2007, **5 casualties died** due to collapse of a temporary pond.
- The World Bank (WB), AFD, EU, Sida, Belgium responded with financing NGEST Project.

NGEST Project consists of Part A, Part B & Risk Management :

Part A includes: (Total US$ 15 m of US$ 5.4 m Financed by EIB)

- Terminal Pumping Station
- Pressure Line (7 Km)
- 9 Infiltration Basins (8.1 hectares)
- **Started operation in 4/2009**



According to NGEST design a 2 year lag was proposed between part 'A' and part 'B' of NGEST. The time lag is now more than 4 years.

- The bad effluent quality affected the operation of the basins (BOD 90 mg/L)
- As a results the average infiltration rate for the basins is now below 0.5 m/day
- Currently the basins can only handle **8,000 m^3 daily**
- The accumulated infiltrated wastewater up to date is **19.6 MCM**

Part B includes:

1. Constructing a WWTP with capacity of **35,600 m^3** daily

- The plant comprises of 3 treatment modules for treatment:
  - Primary treatment; Secondary treatment and Sludge treatment combined with Electricity Generation (60% of Plant Demand)
- The effluent of the NGWWTP: Fit to Aquifer Recharge and Unrestricted Reuse
  - BOD_5 10-20 mg/L
  - SS 15-20 mg/L
  - N-tot 10-15 mg/L
  - Helminthes <1 No/L
  - Fecal Coliform <200 MPN/100 ml/L

2. Remediation of the land at BLWWTP

3. O&M support

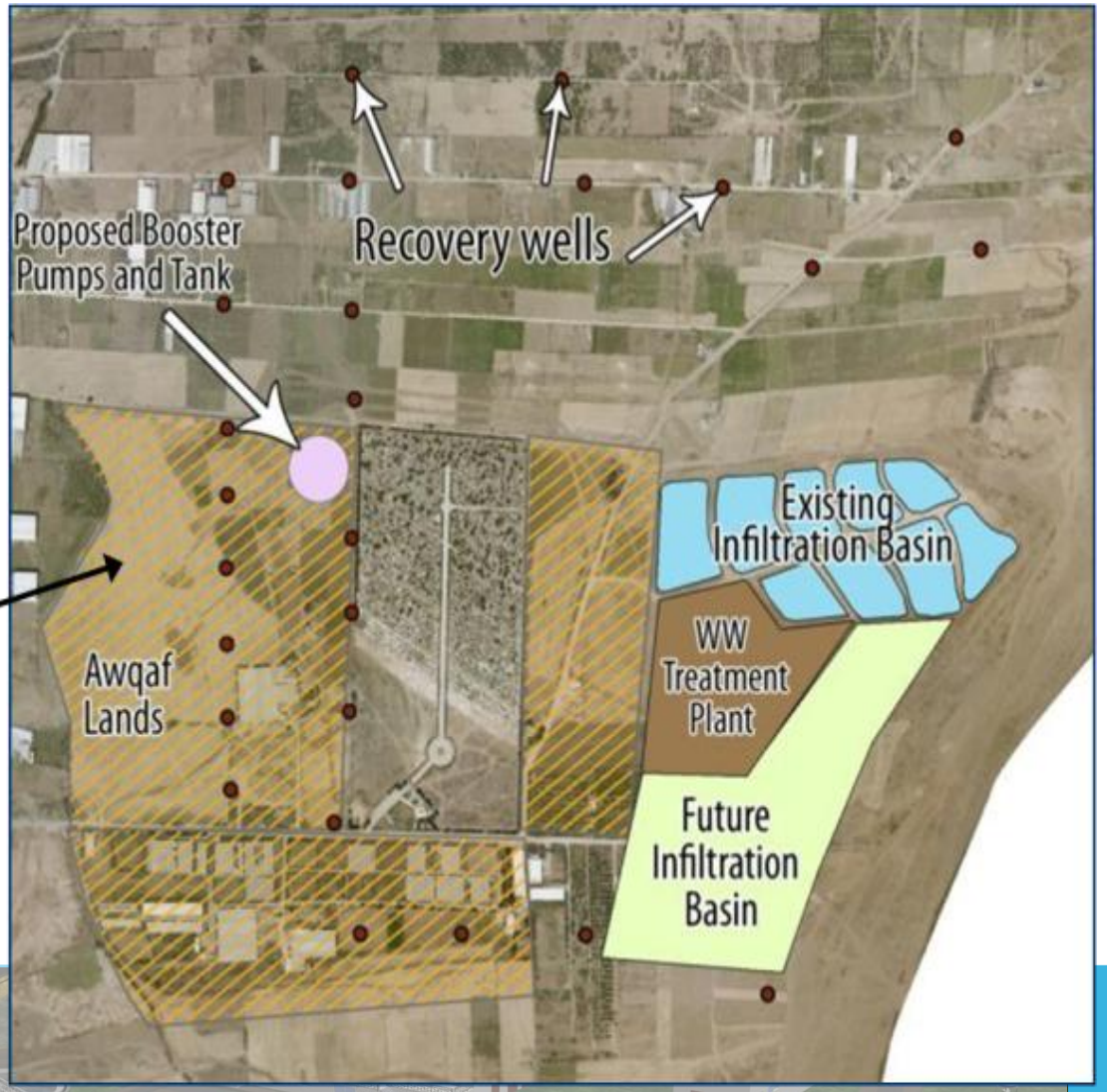
NGWWTP contract :

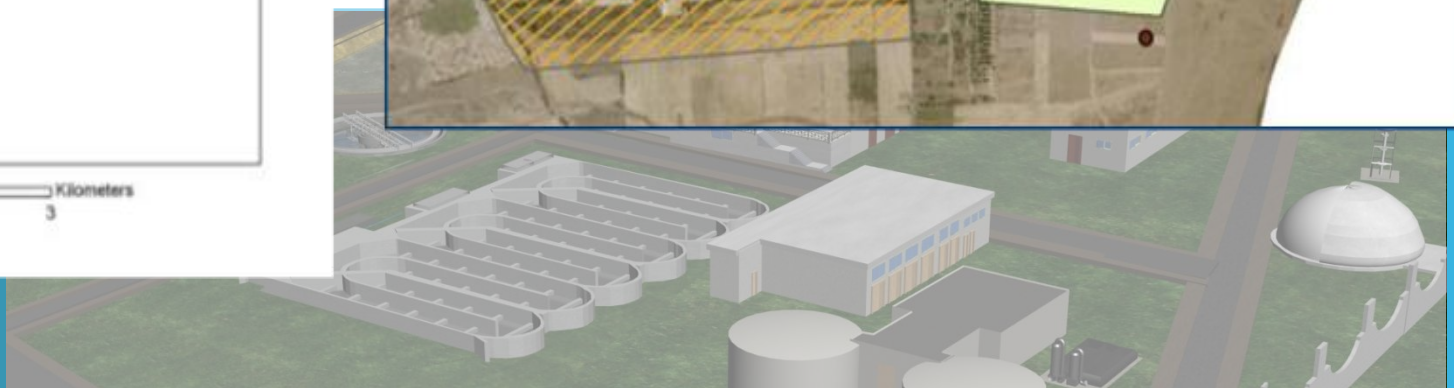
- Commenced in 2/9/2010 (original contract duration **30 months**)
- Contractor: SPA+MACC (German-Palestinian JV) (**$ 42 million**)
- Consultant: Artelia Group + MVV + UG + Decon
- Amended completion date 10/1/2014

Risk Management: Effluent Recovery and Reuse Scheme includes:

- To mitigate the expected impact of the infiltrated waste water on the aquifer a Recovery and Reuse Scheme is intended to be implemented.
- The concept of the Recovery Scheme is to capture pollution plume via 27 pumping wells by extracting 110% of the infiltrated quantities).
- The Recovery Scheme is surrounding the Basins from the North, South and the West (according to the expected flow of the stream).

Potential Lands for irrigation





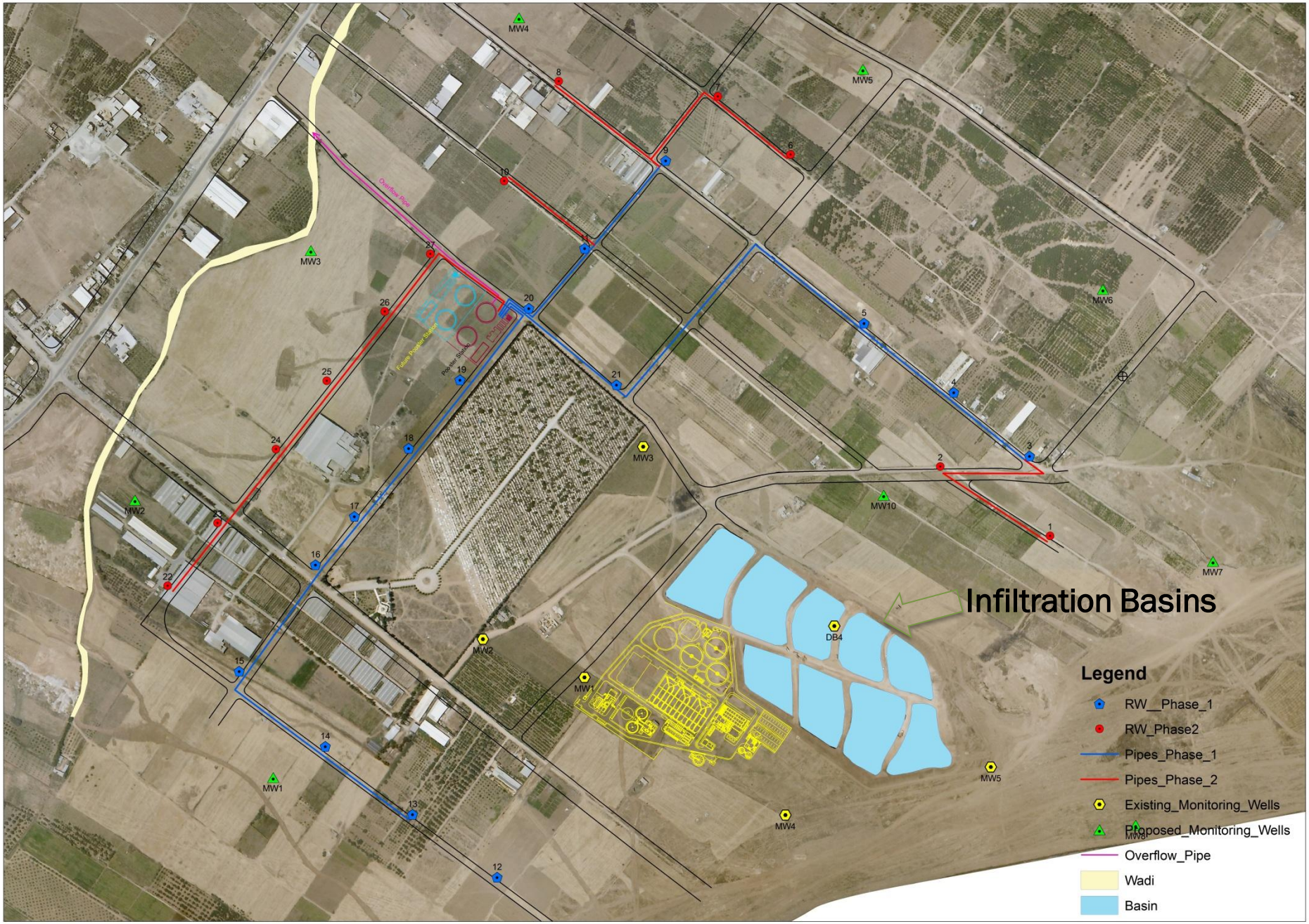
Components of Effluent Recovery and Reuse Scheme includes:

- **27 recovery wells** around the infiltration basins.
- Two water reservoirs of **4,000 m^3**
- Booster pump station with **6,000 m^3/hr**.
- Collection pipelines from the wells to the reservoirs.
- Trunk line & Distribution system to pump water up to the farm gate **(~103 km)**.
- Irrigation of **1,500 hectares** in Eastern-North of Gaza and Gaza City
- The Bidding documents are ready for tendering stage(I), and work expected to start **Mid Sep, 2013**.

Effluent Recovery and Reuse Scheme Phases:

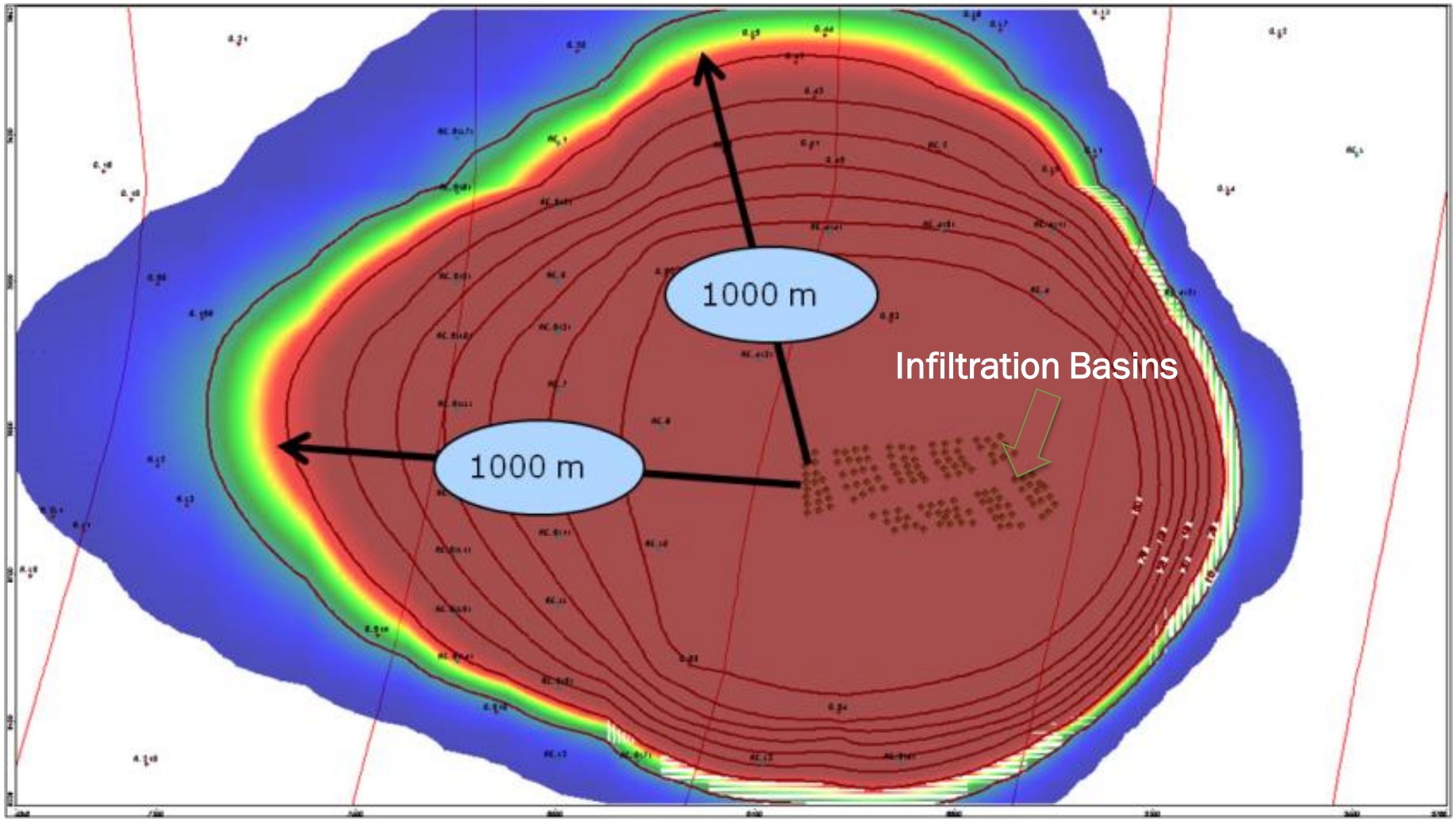
- **Phase 1:** (15 recovery wells, one water tank, 5 booster pumps, irrigation network for **500 hectares** and 5 monitoring wells). **$12 m**

- **Phase 2:** (12 recovery wells, one water tank, booster pumps, irrigation network for **1,000 hectares** and 5 monitoring wells). **$17 m**


Infiltration Basins
Legend
RW__Phase_1
RW_Phase2
Pipes_Phase_1
Pipes_Phase_2
Existing_Monitoring_Wells
Proposed_Monitoring_Wells
Overflow_Pipe
Wadi
Basin
MW1
MW2
MW3
MW4
MW5
MW6
MW7
MW10
DB4

Risks of delaying the implementing of the recovery scheme:

- The first row of recovery wells is located 500 m to the West of the Infiltration Basins.
- According to the GW model the plume currently reached 350 m away from the IB.
- If phase 1 of the recovery scheme did not started to function by 2014 the plume will cross the first row of the Recovery Wells.
- By 2015 the plume will exceed 1000 m and the plume will not be recovered and may reach the municipality wells even the treatment plant is functioning.



Pollution Extension if project was not implemented by 2015

PROJECT FINANCING

Component	Revised Budget	Committed
Part A - Transfer of Effluent	15,864,785	15,864,785
Part B - Construction of WWTP	52,226,792	47,065,787
Risk Management - Effluent Recovery & Reuse	30,233,000	9,531,025
Total Project Cost	98,324,577	72,461,597
Deficit in Budget (excluding US$ 7.0 for O&M Support)	25,862,980	

World Bank ($26.8 M)

Belgium Government (€ 3.92 M)

EU (€ 5.88 M)

Sida (SEK 44.1M)

AFD (Co-finance) (€ 16 M)

ADDITIONAL FINANCING IN PROCESSING

Donors	Additional Finance	
	Euro	US$
Belgium additional TF	2	
AFD 2nd additional Financing	5	
Parnership for infrastructure Multi Donors TF		4.5
World Bank 3rd TF		3
Total	7	7.5
Total US$ Equv.		17

COVERAGE OF ADDITIONAL FINANCING

1. Bridging in funding of the ongoing construction contract
2. O&M Support for running costs and TA Contract for NGEST WWTP
3. Complete the financing required for first phase of Recovery and Reuse Scheme

NGEST FINANCING MANAGEMENT

1. Donors Trust Funds Administrated by World Bank (EU, Belgium , Sida and Partnership Multi TF)
2. World Bank TF Grant Agreements
3. AFD Parallel Co-Financing

- For Financing under 1 and 2 PWA manages the Designated Accounts and disbursement maintained according to the Bank policies and procedures.
- For AFD direct payments are made directly to the implementers

MAIN CHALLENGES

1. Sustainable O&M, specifically the NGWWTP.
2. Recovery and Reuse Scheme Intuitional Future Arrangements
3. Coverage the O&M cost for recovery and reuse scheme to maintain its sustainability.
4. Enhance the private role in managing the reuse scheme to ensure public acceptance and affordability.

OPPORTUNITIES

1. Contribute positively to Agriculture Economy, more that 3000 farmers families will benefit directly.
2. Increase the agriculture productivity through converting more than 1000 hectares rain field cultivation to irrigated field which will result in better food security.
3. Reallocating the Ground water for supplying drinking water to population.
4. Potential involvement of private participation, most likely in operating the first phase and financing the infrastructure for the 2nd phase and operating the entire scheme.

THANK YOU FOR YOUR CONTINUOUS SUPPORT AND FOR YOUR ATTENDANCE TODAY