ONEA

Burkina Faso

Water Losses Reduction

Ouagadougou, Burkina Faso

AFAQ ISO 9001

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Content

- Burkina Faso and ONEA
- Objective of the Case
- Description of the case
- Lessons

BURKINA FASO West Africa, Country area: 274 000 km²

Population: 15 mio with 1,7 mio in the capital Ouagadougou

DEMOGRAPHY DATA

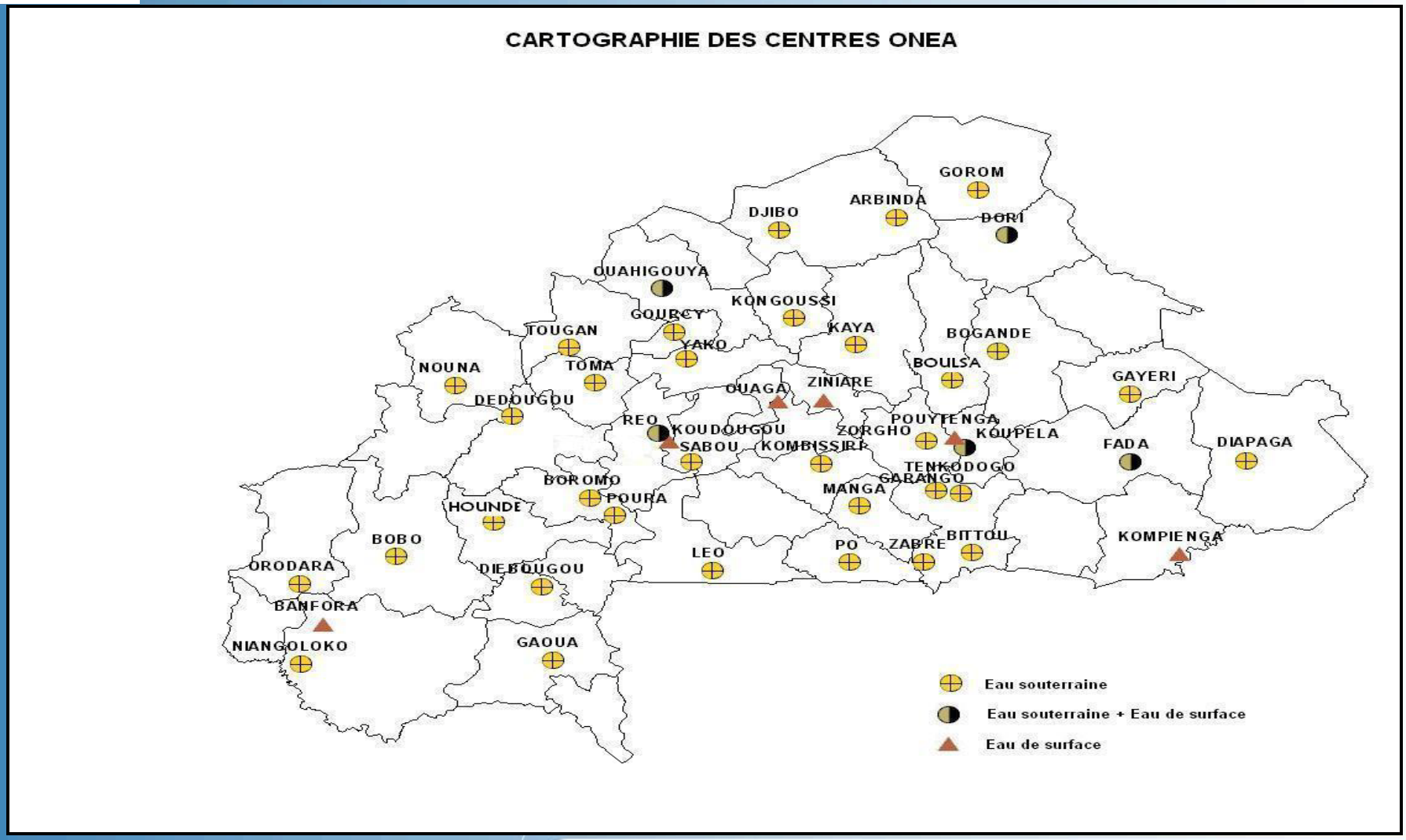
- Urbanisation rate : 23%
- poverty : 165 €/year/inhab for 44% of the population
- Population growth rate: 3%

WATER RESOURCES

- Rainfall: 300 à 1000 mm per year
- Groudwater is limited
- Surface water storage is not easy
- Access to potable water : R= 56% U=75%
- Access to sanitation: U= 21,5%

Office National de l'Eau et de l'Assainissement -ONEA-

state company in charge of water and sanitation in the urban area (46 town served)



Objectives

- Reduction of water losses
- Reduction of pipe break rates
- Implementation of a pressure management system for the areas
- Achieve a more sustainable use of water resources

Current situation

- Water supply guaranteed trough ZIGA Project(2004)
- Shift from intermittent to continuous water supply
- Increase of water losses from 16% to 20%
- ONEA must reduce the water losses to maintain its performance

Current situation

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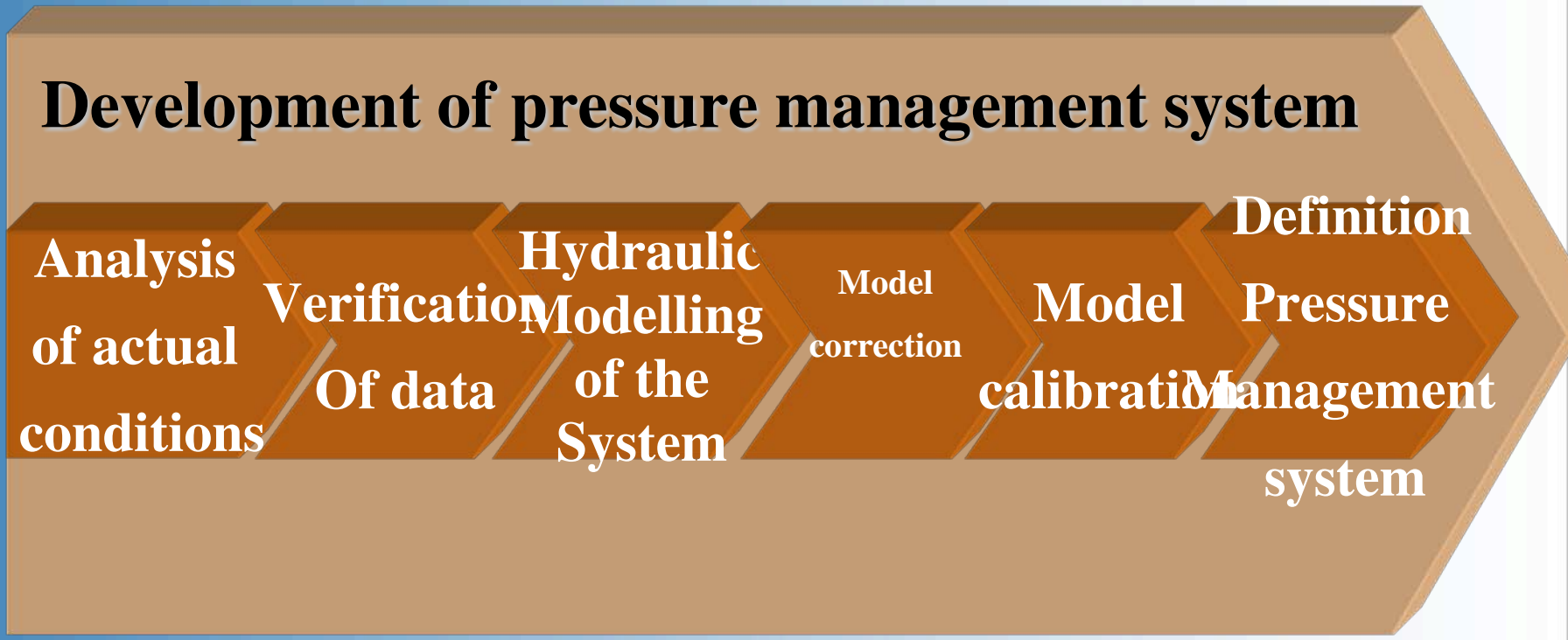
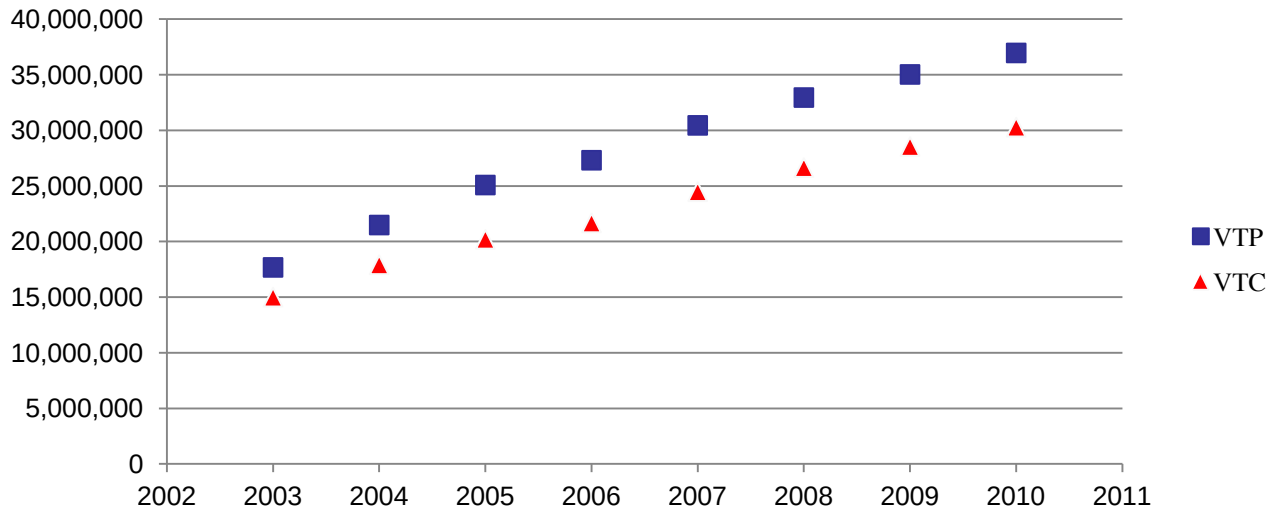
- Solution : pressure management

Procedure

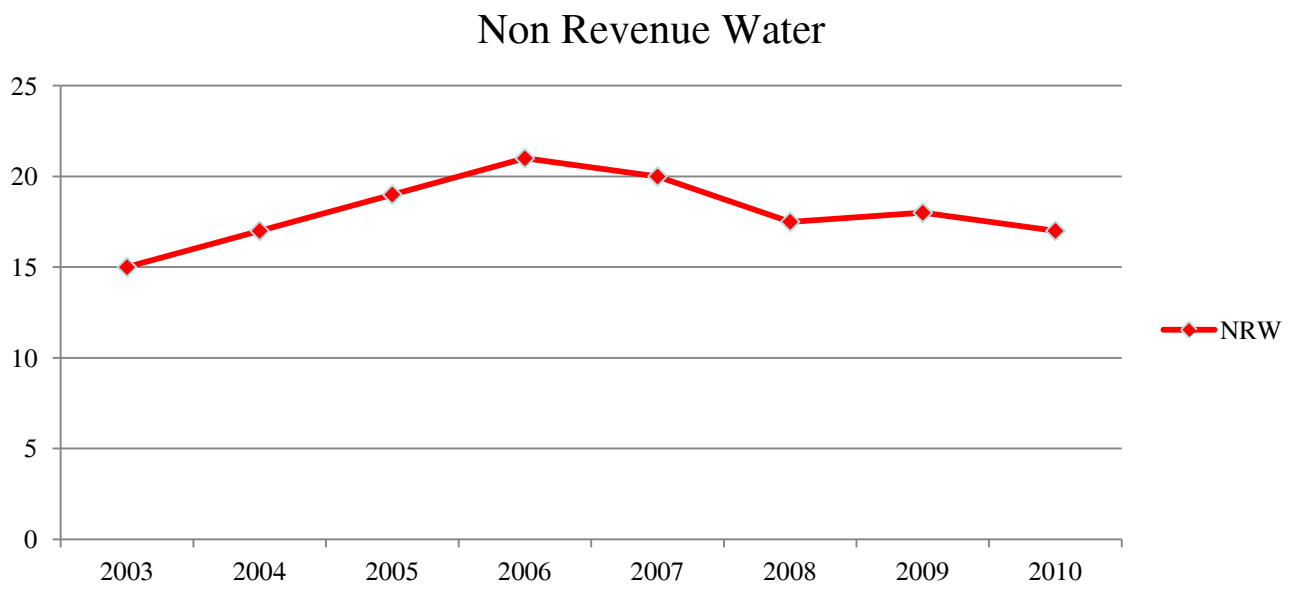

Development of pressure management system
Analysis of actual conditions
Verification Of data
Hydraulic Modelling of the System
Model correction
Model calibration
Definition Pressure Management system

Overall situation

Production [m3]	VTP	17 675 393	21 486 060	25 083 960	27 312 904	30 448 537	32 950 711	35 029 182	36 962 043
Comsumption [m3]	VTC	14 998 556	17 910 666	20 203 196	21 675 027	24 484 968	26 651 595	28 549 104	30 287 262
Length of network [km]	LR	1 048	1 518	1 670	2 903	2 903	3 207	3 350	3 462
Storage capacity [m³]	CS	13 000	13 000	24 400	48 400	48 400	48 400	55 000	55 000
Connections [u]	BP	48 055	52 127	60 461	79 616	111 362	120 833	118 808	121 135
Standpost [BF]	BF	642	689	709	760	1 138	1 153	931	1 025
Continuity of service[h]	H	20	20	24	24	24	24	24	23



Overall situation



Reduction of water losses in 2 Pilot areas:
RE= 389 km, R7= 179 km net length

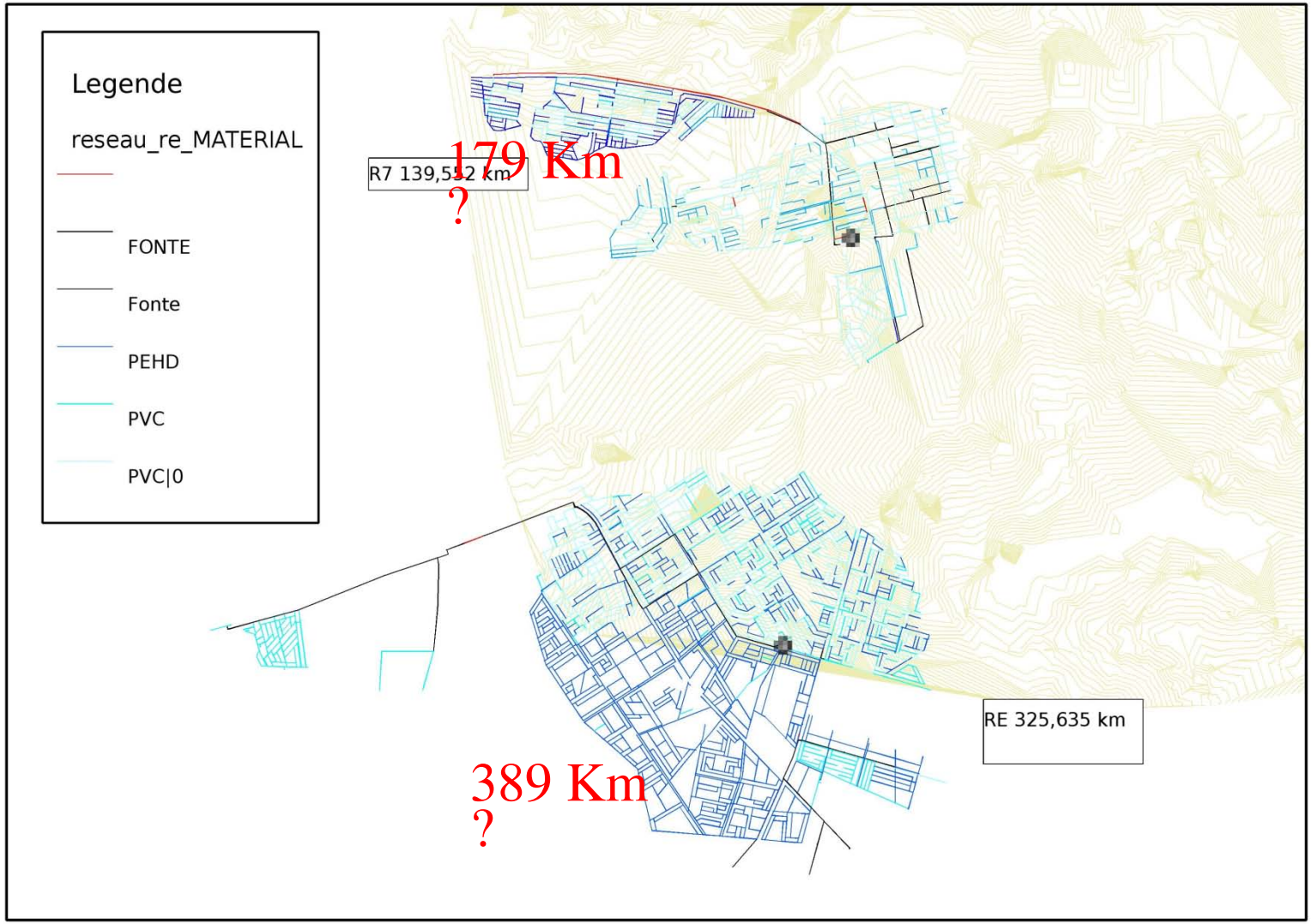
<u>Part 1– Hydraulic design</u>

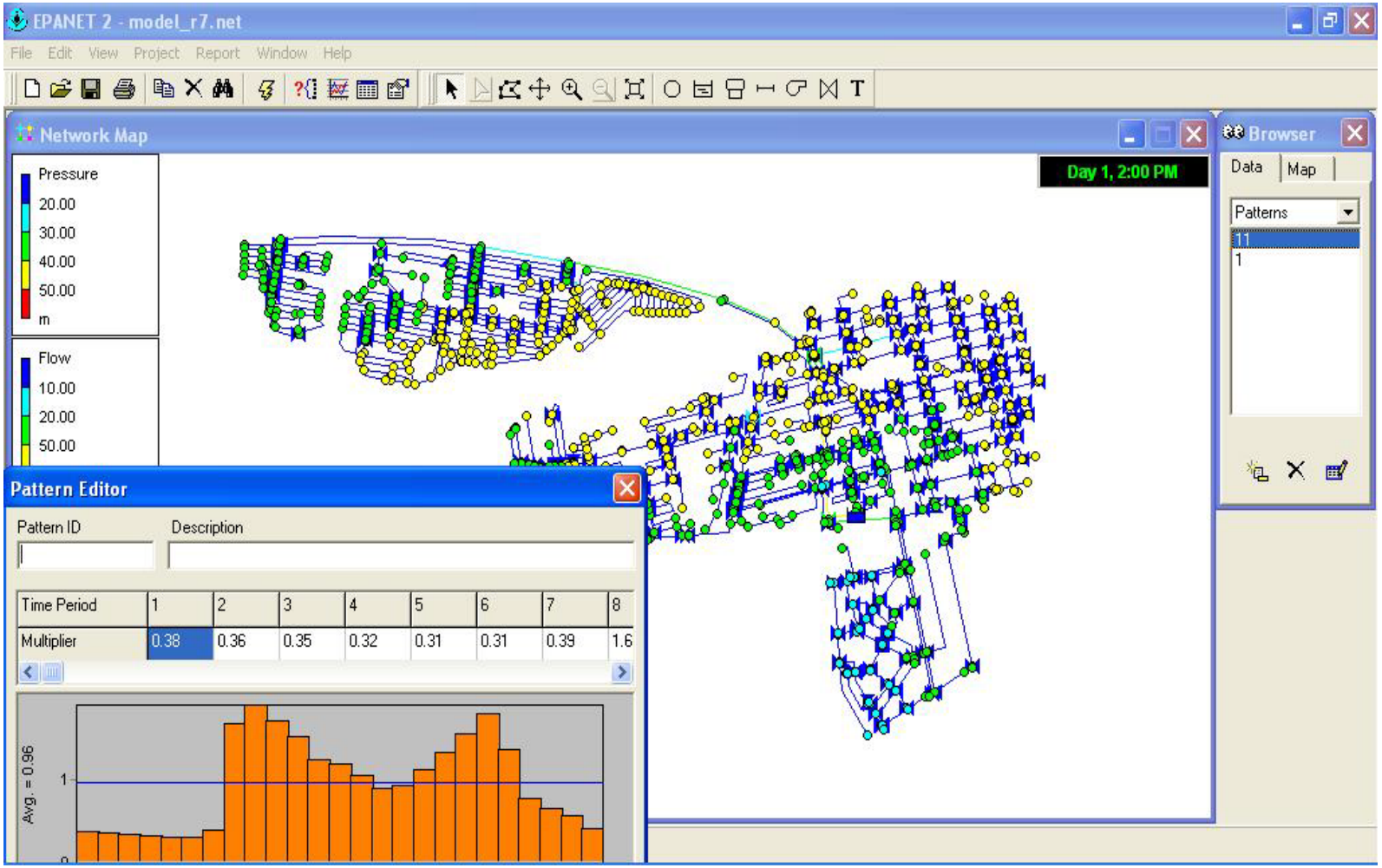
- Verification of supply conditions
  - Hydraulic Modelling
- Determination of optimal solution

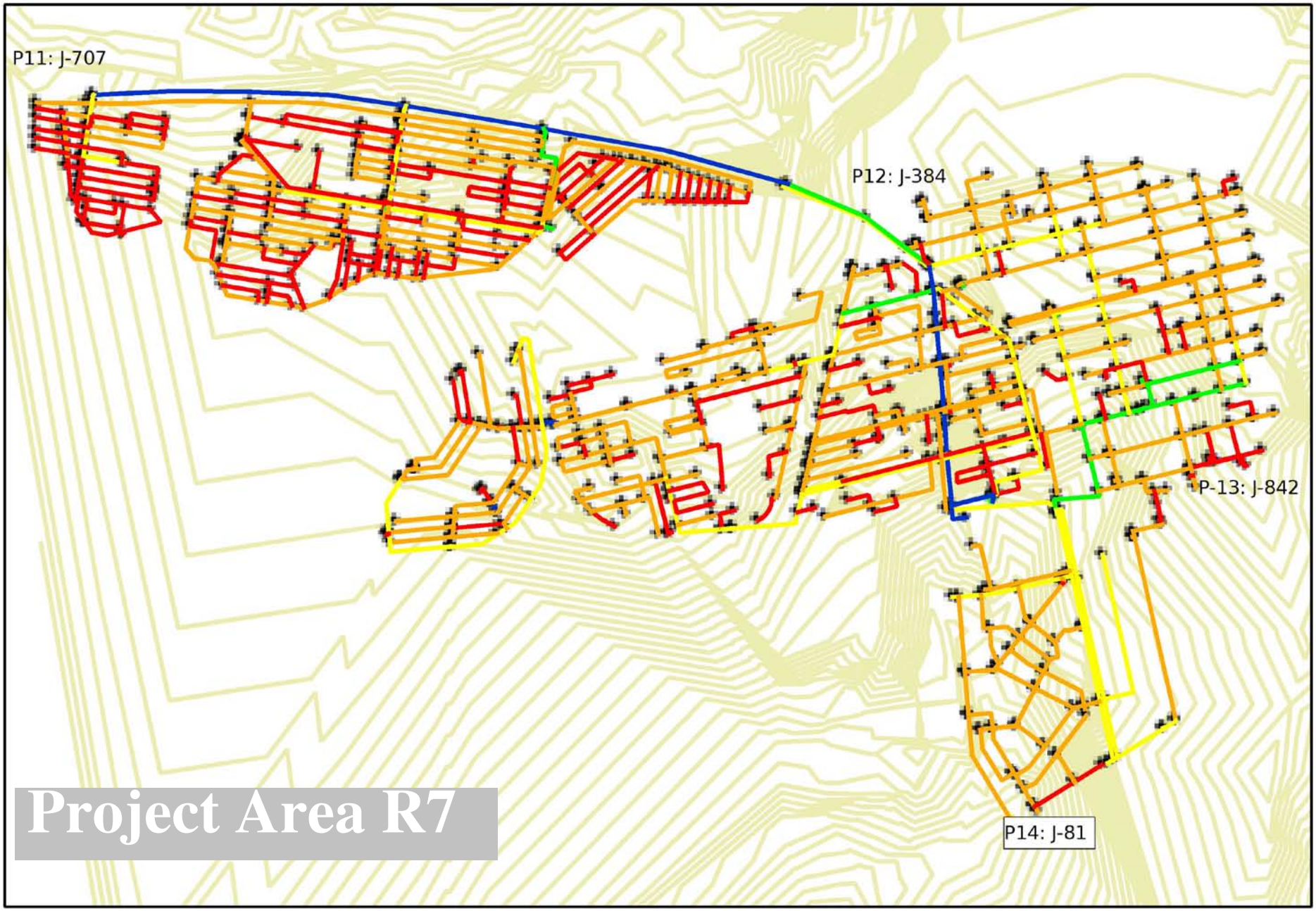
<u>Part 2– Implementation</u>

- Comissioning
- Operation

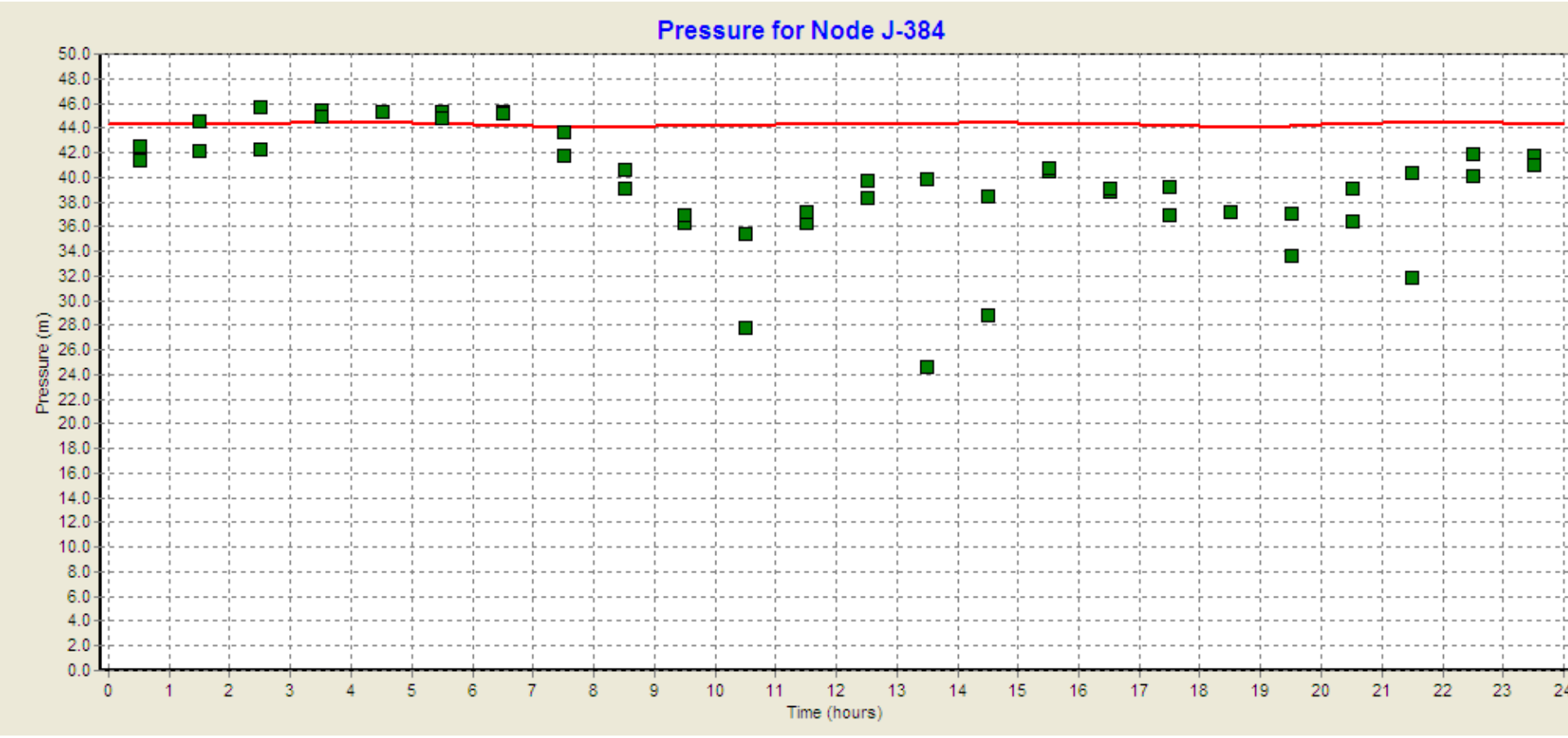
Proofing of supply conditions



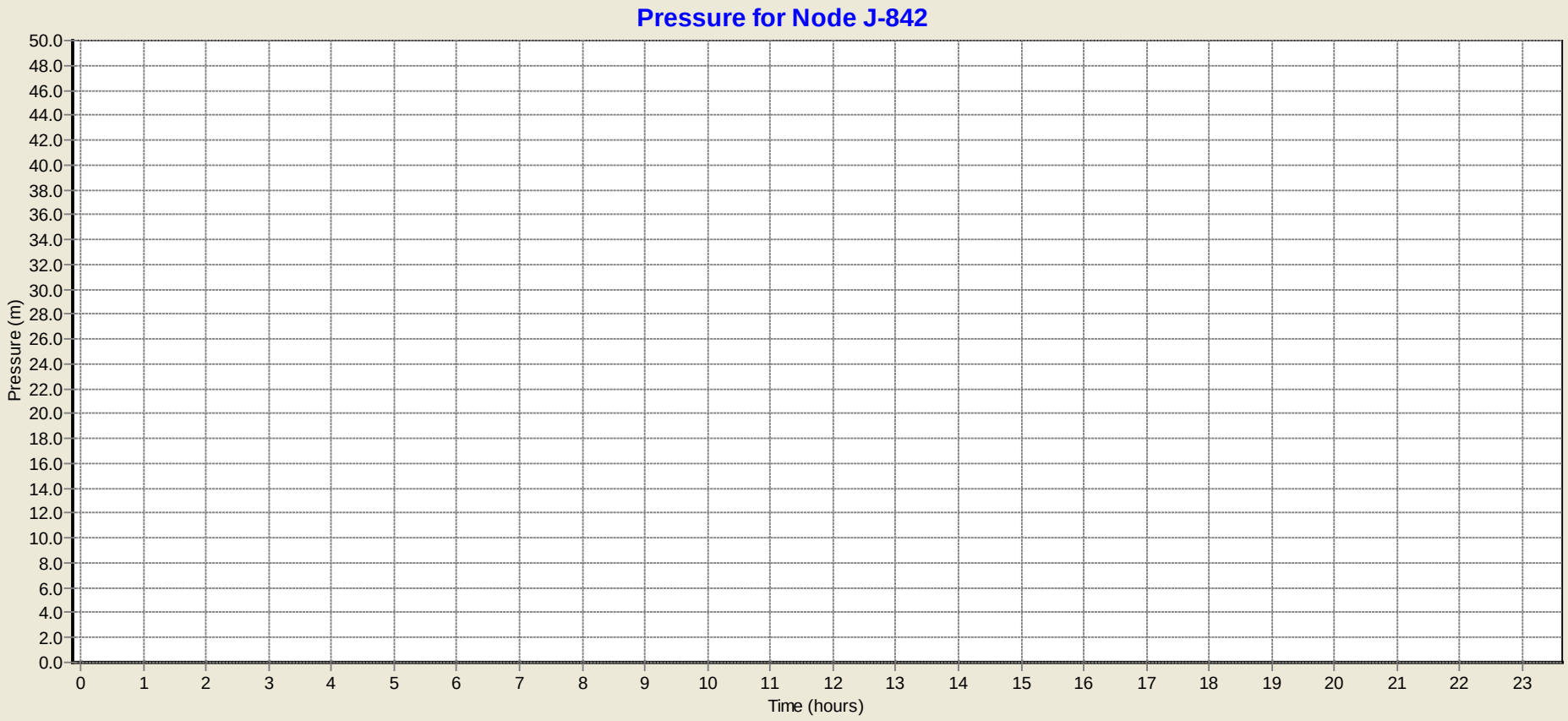

EPANET 2 - model_r7.net
File Edit View Project Report Window Help
Network Map
Pressure
20.00
30.00
40.00
50.00
m
Flow
10.00
20.00
50.00
Day 1, 2:00 PM
Browser
Data
Map
Patterns
1
1
Pattern Editor
Pattern ID
Description
Time Period 1 2 3 4 5 6 7 8
Multiplier 0.38 0.36 0.35 0.32 0.31 0.31 0.39 1.6
Avg. = 0.96
1
0


P11: J-707
P12: J-384
P-13: J-842
P14: J-81
Project Area R7

Before Calibration

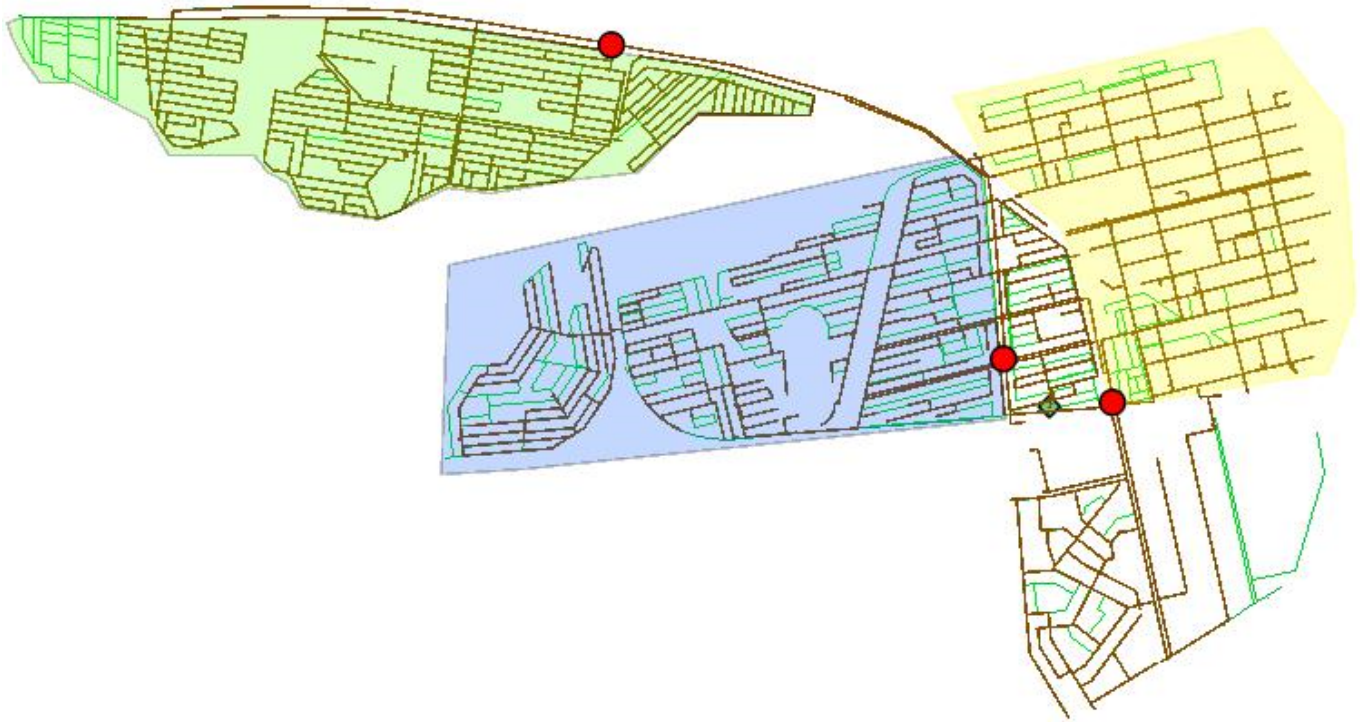


Calibration results



Project Area R7

Alternative R7-2



Recommended Alternative R7-2

Valve V-208									
		Conditions at maximum flow (9 am)				Conditions at minimum flow (5 am)			
Pipe Diameter (mm)	Valve Diameter (mm)	Q (lps)	V (m/s)	Pressure In (m)	Out (m)	Q (LPS)	V (m/s)	In (m)	Out (m)
150	150	17.2	1.0	28	15	2.1	0.02	30	10

Valve V-182									
		Conditions at maximum flow (9 am)				Conditions at minimum flow (5 am)			
Pipe Diameter (mm)	Valve Diameter (mm)	Q (lps)	V (m/s)	Pressure In (m)	Out (m)	Q (LPS)	V (m/s)	In (m)	Out (m)
300	200	18.4	0.59	31	15	2.0	0.06	36	10

Valve on P-1387									
		Conditions at maximum flow (9 am)				Conditions at minimum flow (5 am)			
Pipe Diameter (mm)	Valve Diameter (mm)	Q (lps)	V (m/s)	Pressure In (m)	Out (m)	Q (LPS)	V (m/s)	In (m)	Out (m)
225	200	16.3	0.52	39	15	1.6	0.05	42	10

Recommendations

- Operational conditions of the systems are favourable for installation of PMS as a first step towards NRW reduction
- Proceed with implementation of proposed PMS for R7
- Continue depuration of the models of RE and further zones
- Increase effort for GIS-digitalisation-modelling
- Remember: existing leakages will still be there! Another actions are necessary after having control upon pressure

Valve after installation


01/10/2011 13:02

Change towards green growth

- more efficiency in water resources use
- Capacity building on water losses reduction mainly on holistic approach
- Improvements in infrastructure

Visit of the Valva during the training

Drivers for change

- ONEA-GIZ cooperation
- Public private partnership: ONEA-VAG
- Leadership of ONEA

PATNERSHIP and DETERMINATION

Barriers/obstacles faced

- Difficulties during the installation: language, short presence of experts
- Complexity of parametering: some parts have been sent back to Germany to be parametered again
- Capacity of ONEA staff to hand over the technology for proper O&M

Impact

- Some jobs created along the investments mainly by civil works and O&M operations
- Many other jobs will be created with the improvment of water supply trough WLR
- WLR will also reduce the water production cost and allow ONEA to maintain its tariffs
- WLR will improve the performance of ONEA and increase its capacity and credibility

Evaluation

- Installation of PMS including valves, flow meters, pressure sensors, reote control and sofware has been done by VAG from 14th march to 10th of june 2011
- Performance of the system can be measured after it has been run over a certain period of time
- Because of some dysfunctions noted on the facilities the data collected and sent by ONEA cannot be analysed correctly
- The staff needs supplementary training to be autonomous

ONEA

Burkina Faso

Thank you for your attention

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