

Groundwater Pollution in Afghan Urban Areas and Proposed Protection Measures

NATIONAL GROUNDWATER CONFERENCE

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Eng. M. Fayez Fayez, GIZ-WSIP

Objectives of Groundwater Protection in Catchment Areas for Drinking-Water Wells



Some Qualitative Objectives for Sources of Drinking Water Supply

- Neutral taste
- Clear
- Odourless
- Free from pathogens
- Free from chemical pollutants
- Little content of solutes (apart from Mg, Ca)

No or little treatment required before use as Drinking Water

Groundwater Protection Basic Legal Requirements

Environmental Law

Article 35. Preventing and remedying effects of pollution of water resources

An owner of land, a person in control of land or a person who occupies or uses the land on which any activity or process is performed or undertaken which causes or is likely to cause significant pollution of a water resource, must take the following measures to prevent any such pollution from occurring:

Water Law

Article 30 - Non- Contamination of Water Resources

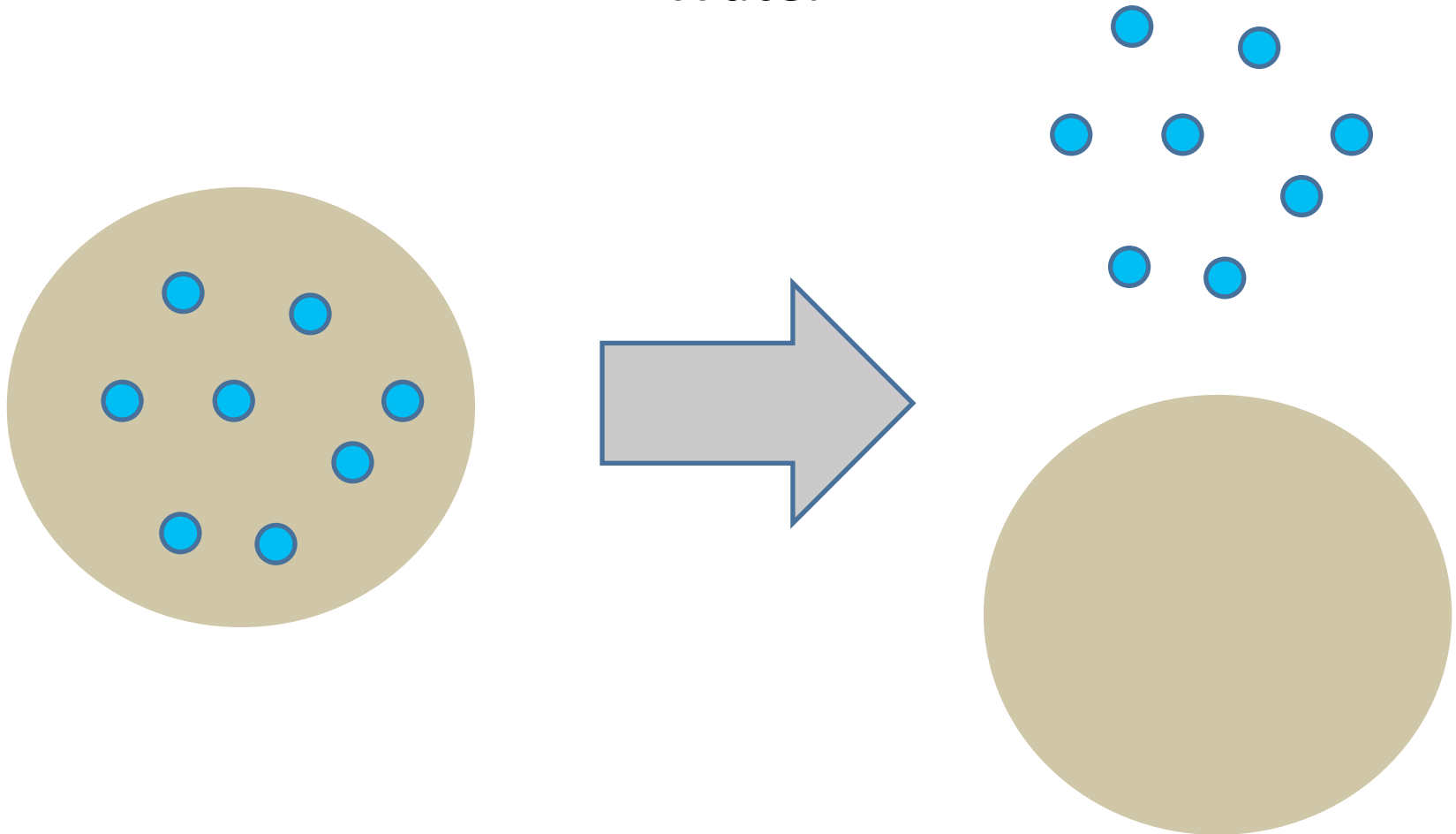
1. No ordinary and legal persons shall contaminate water resources by way of using or putting any pollution, industrial waste, poison, chemical or toxicant which could result in exceeding the pollution tolerance limit of the water resources.
2. The offender based on this law is responsible for the cost recovery

Various Possible Pollution Sources in Urban Areas



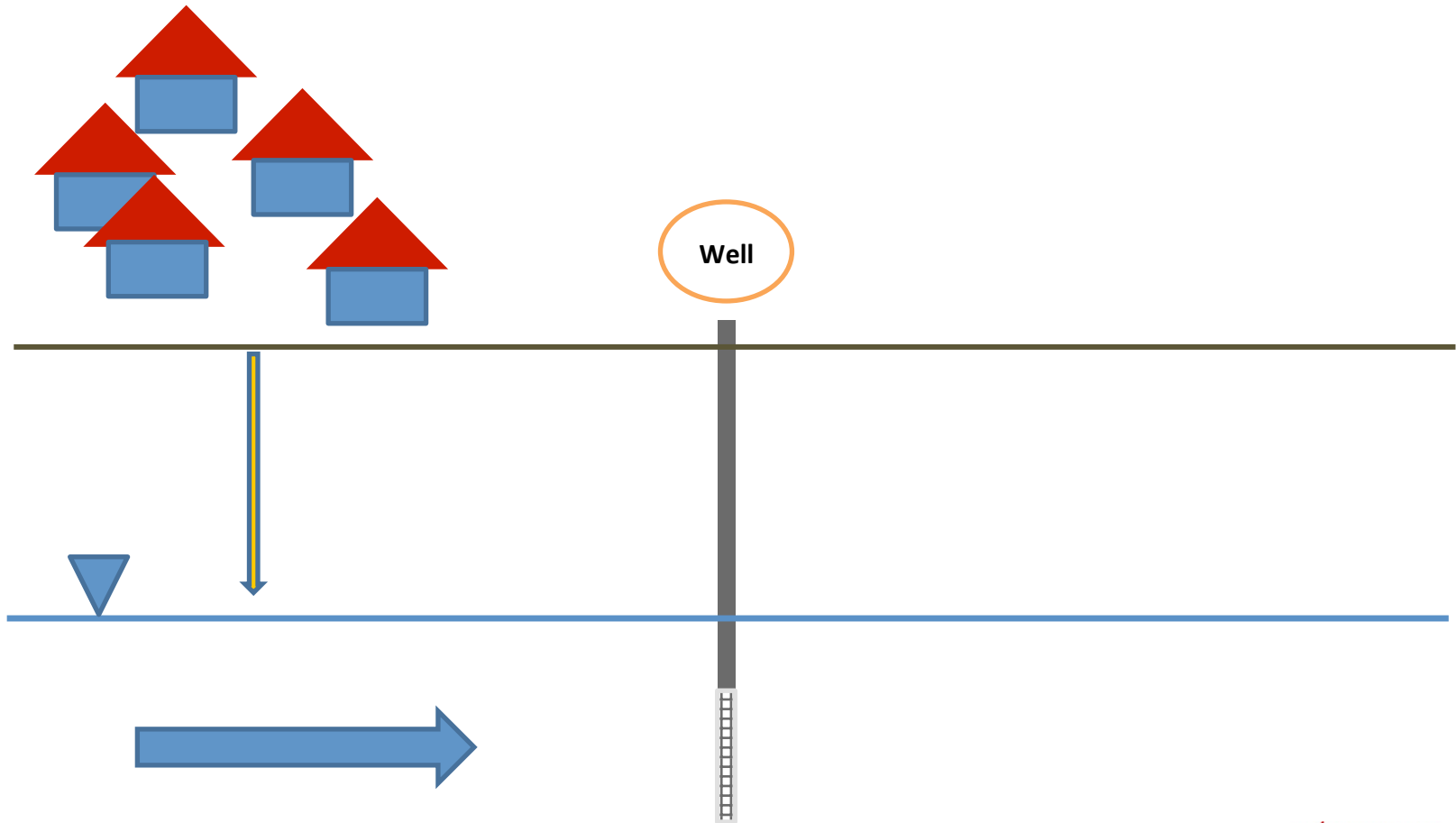
Additional Protection Measures

Separation of Supply Area and Source of Drinking Water



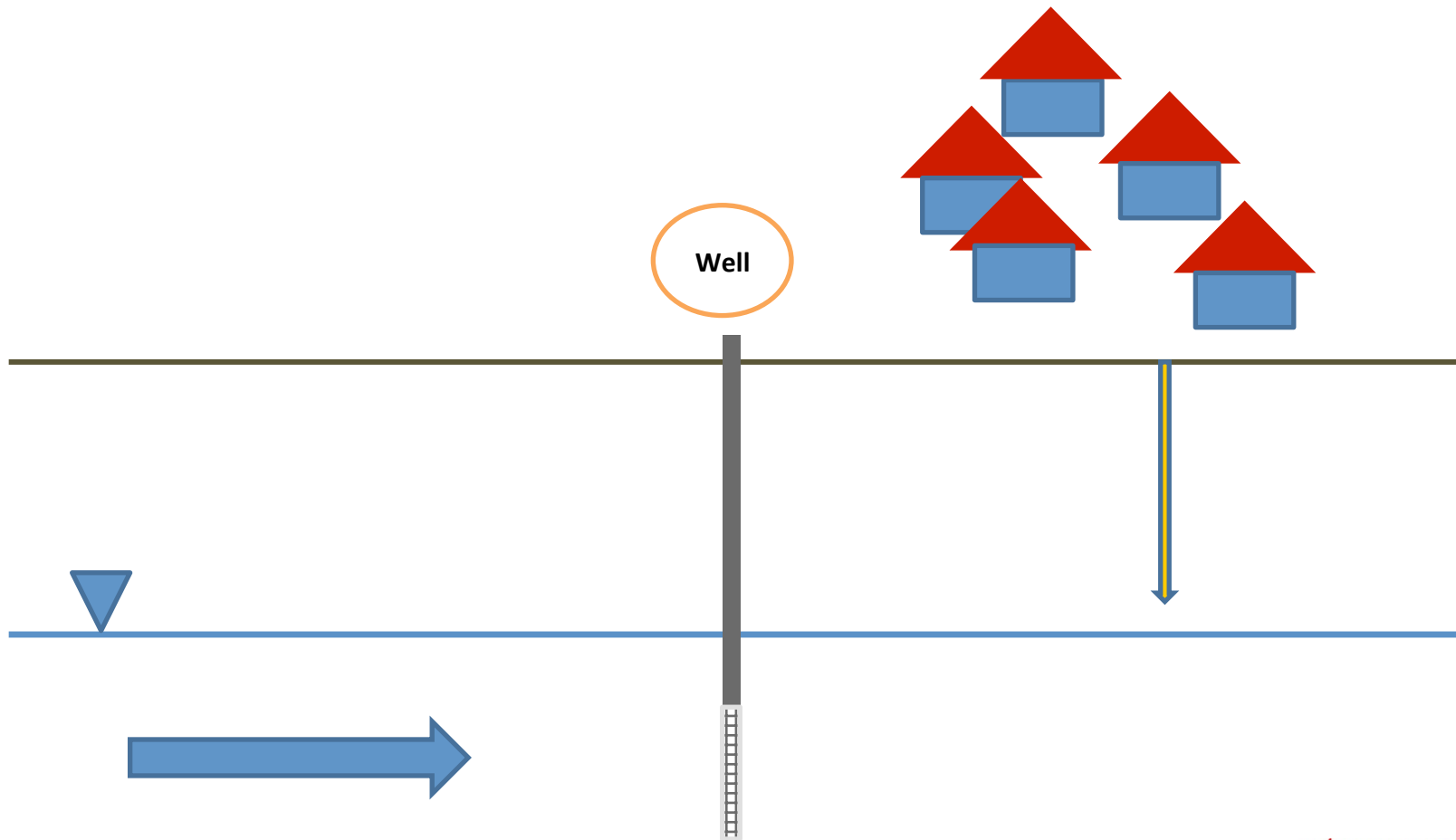
Additional Protection Measures

Use of Upstream / Downstream Situation (1)

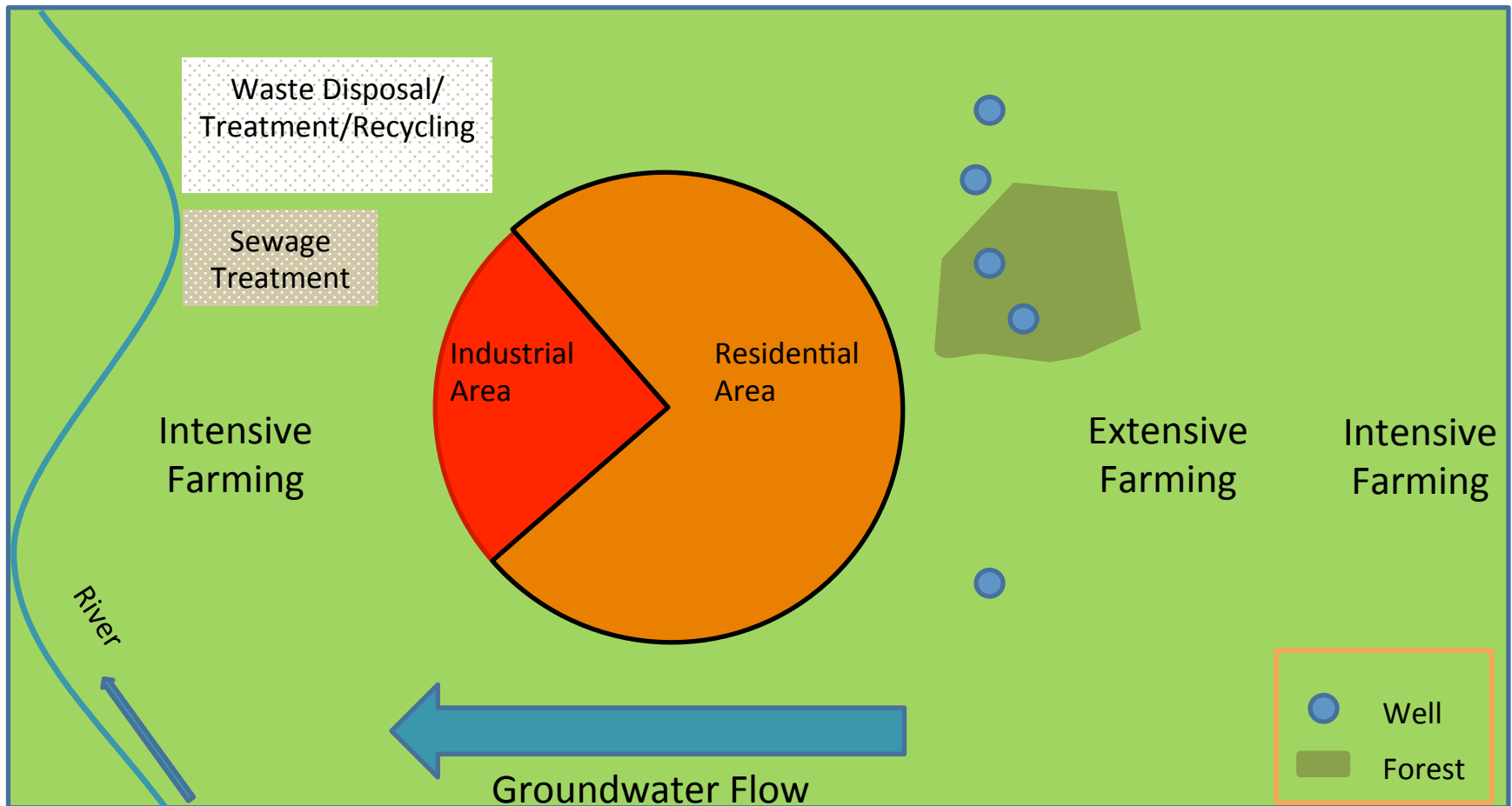


Additional Protection Measures

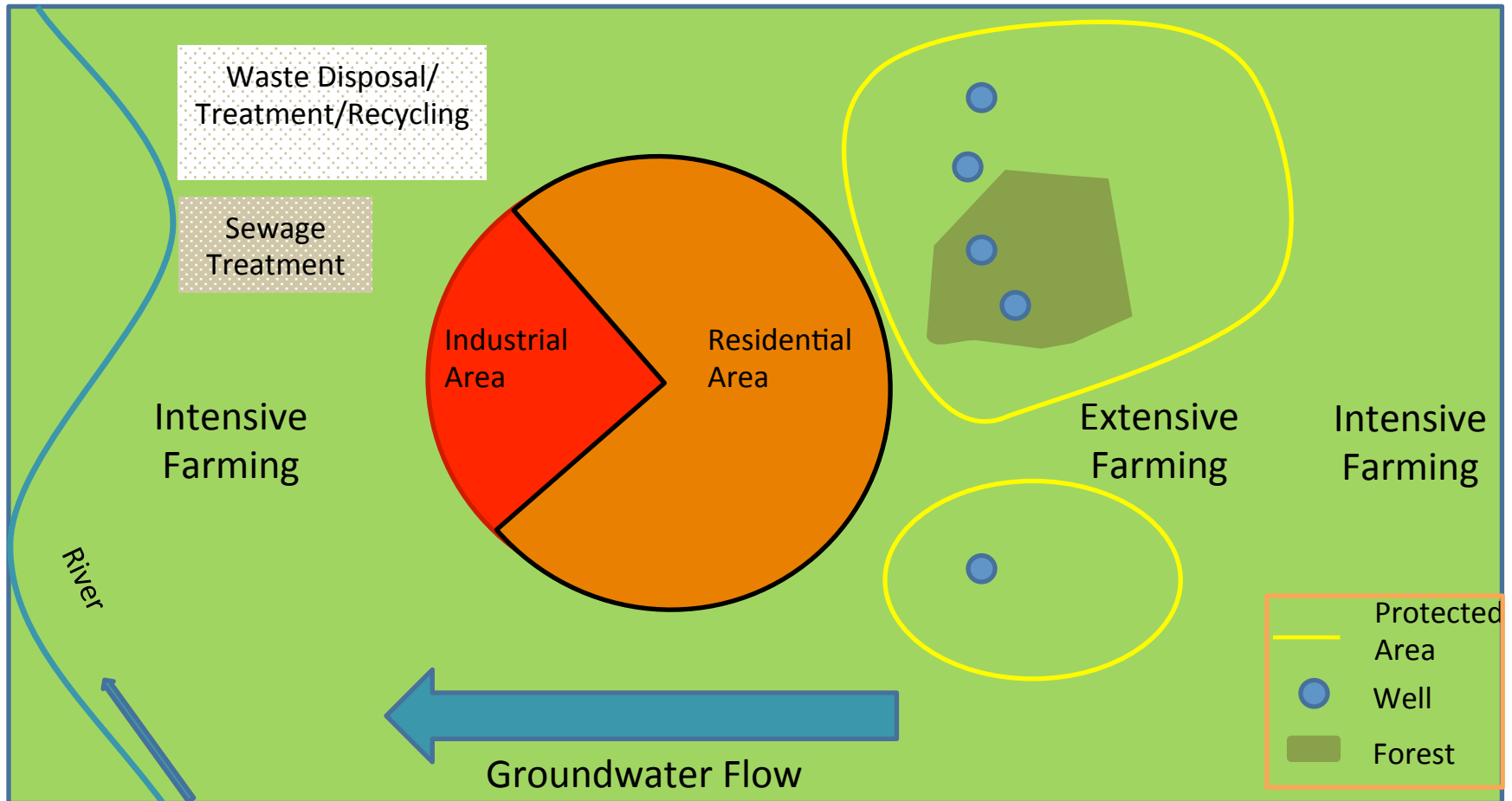
Use of Upstream / Downstream Situation (2)



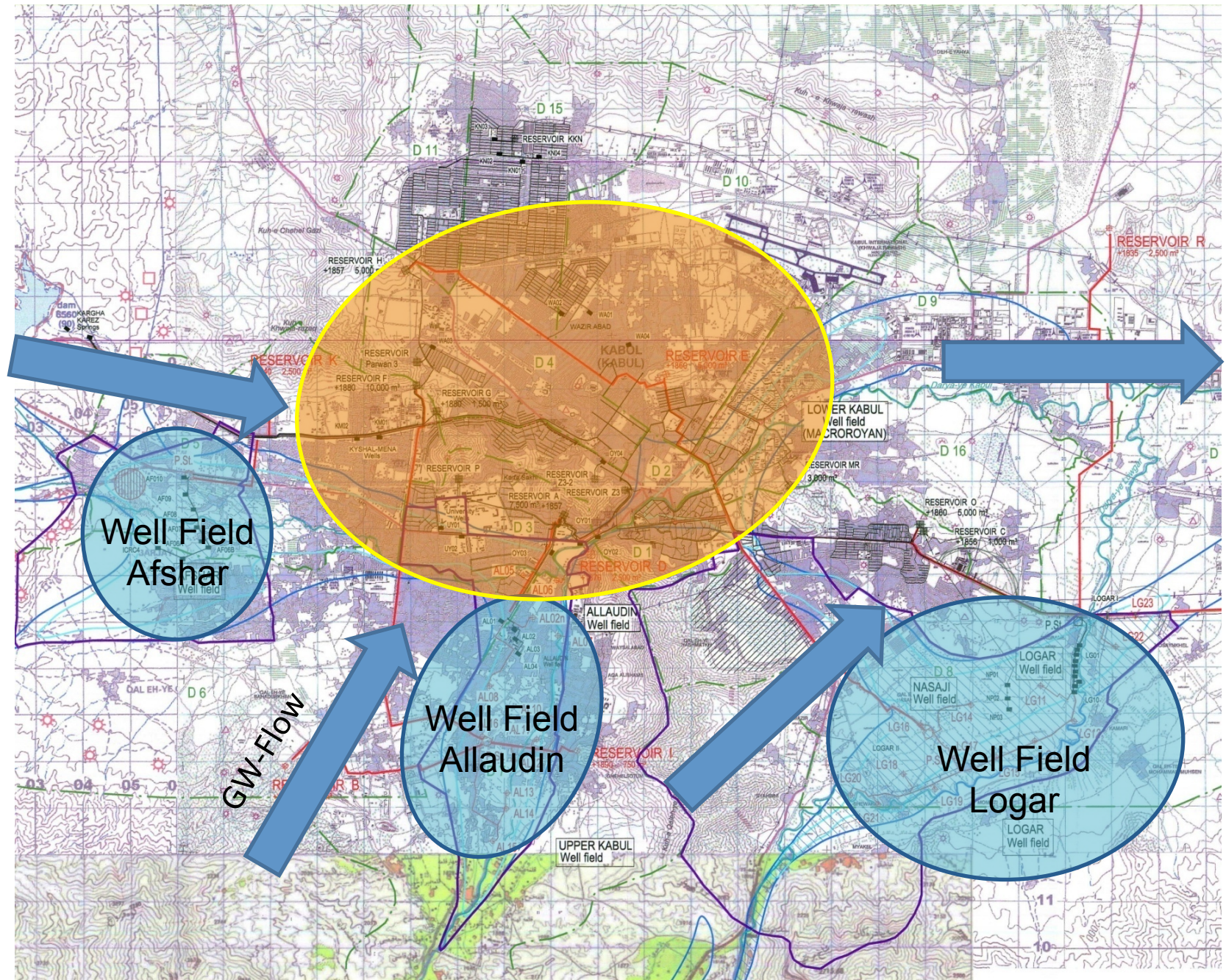
Additional Protection Measures Coordinated Land Use



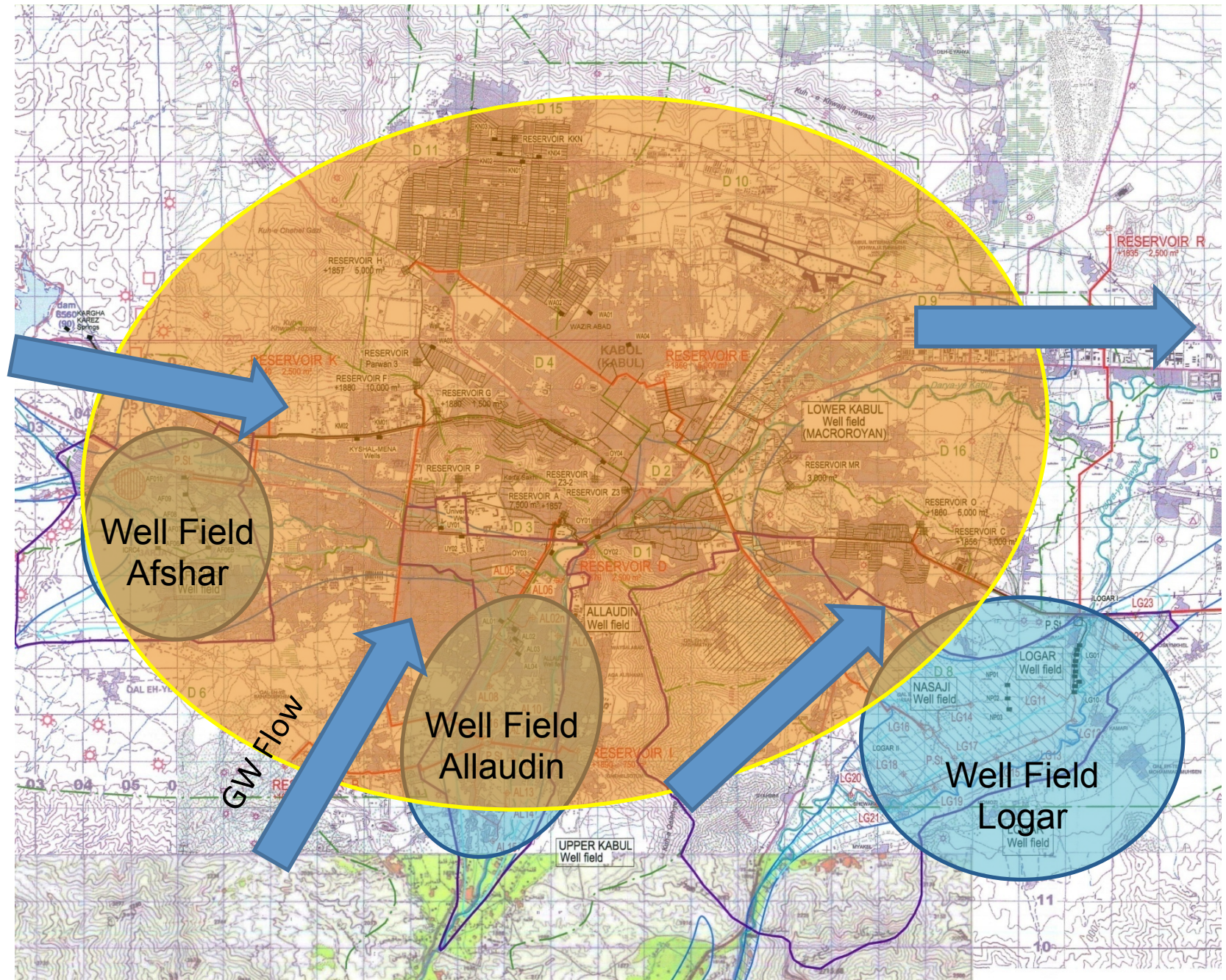
Additional Protection Measures Coordinated Land Use and Protection Areas



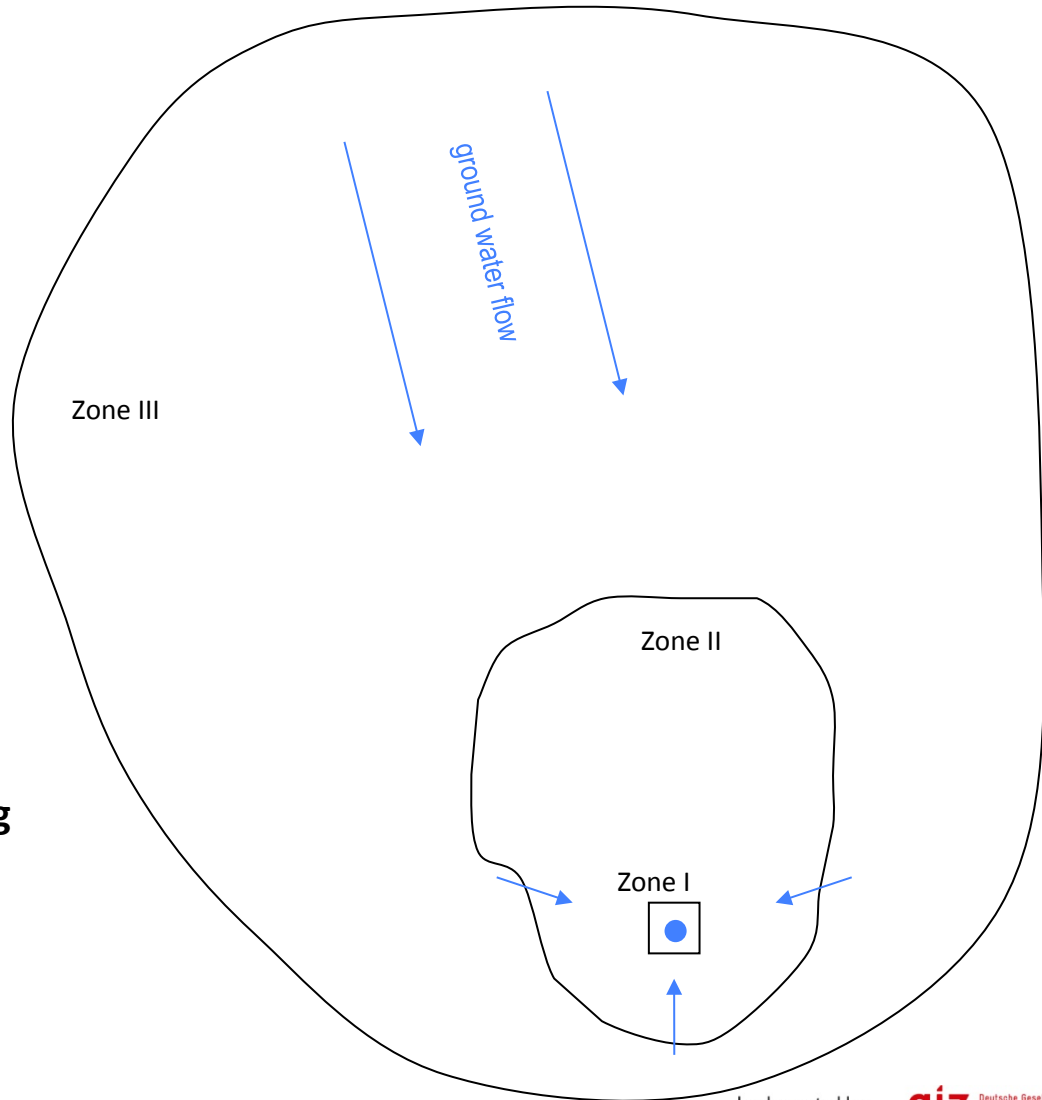
Kabul Water Supply in the Past



Kabul Water Supply Today



Groundwater Protection Area



Well

Zone I immediate surrounding
of the well

Zone II 50-Day-Line

Zone III = Catchment Area

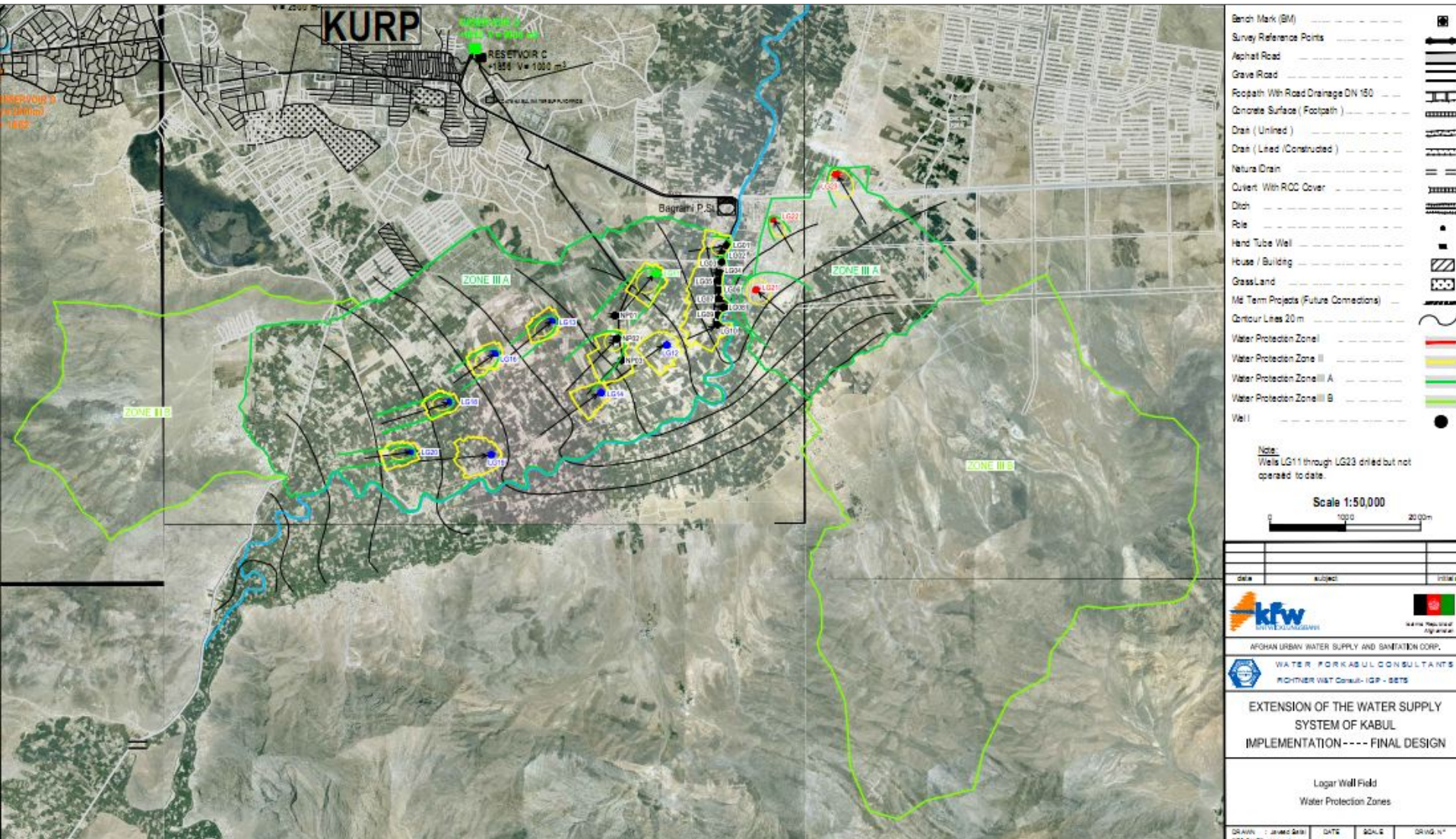
Model of a Water Protection Area



Suggested Limitations in Water Protection Areas

- Zone III:** Limitations for the use of pesticides and fertilizer and business activities. Handling with harmful chemicals is prohibited or limited. Discharge of waste material is prohibited
- Zone II:** Limitations similar to those in Zone III but more stringent. The use of organic fertilizers is strongly limited. Development of settlements is not possible
- Zone I:** All activities are prohibited with the exception of work related to the water supply facilities.
The area is usually fenced.

Suggested Water Protection Area Logar Well Field

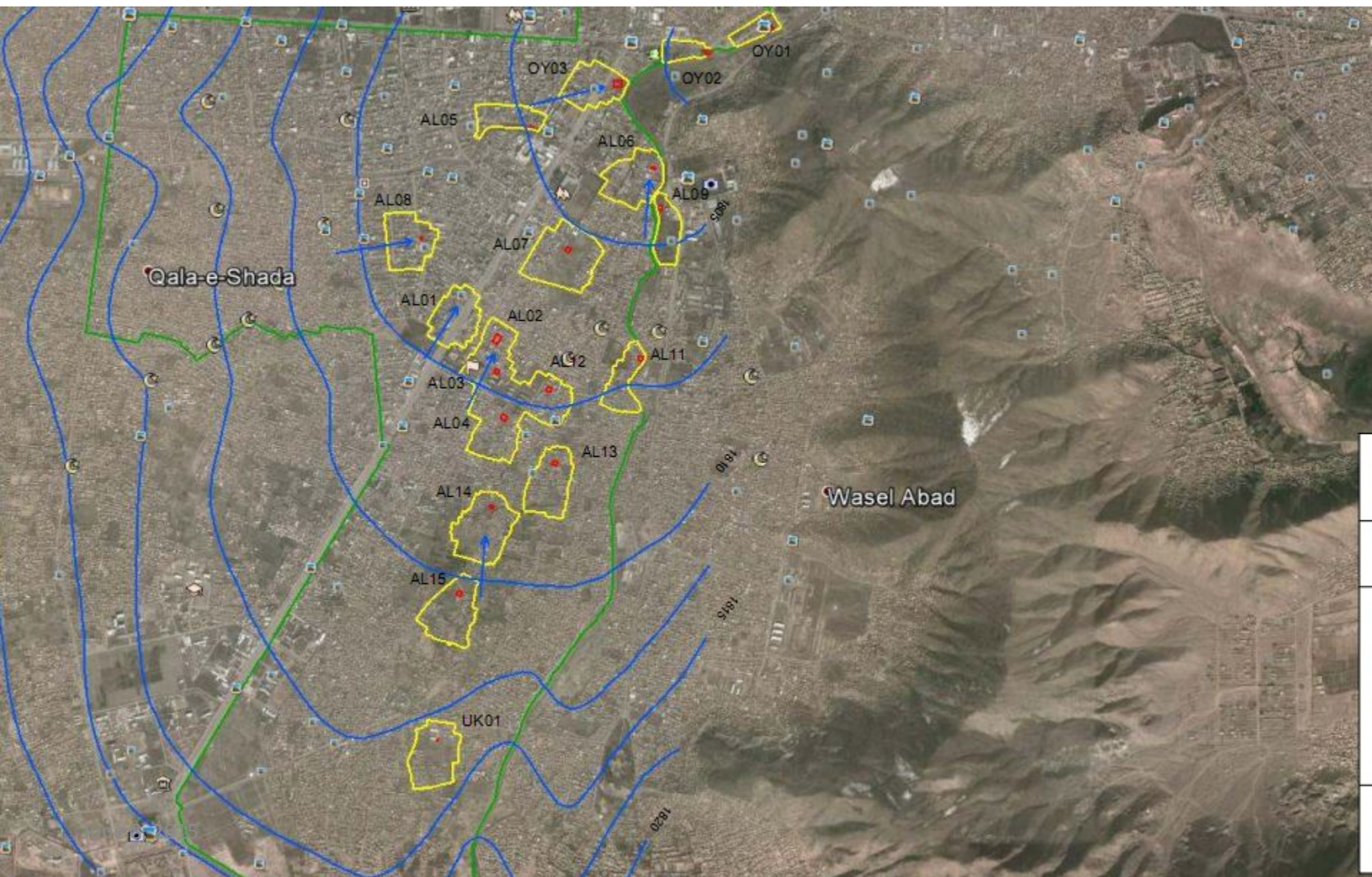


June 8, 2015

Suggested Zone 2 for Well LG 20 in Logar Well Field



Suggested Water Protection Area Allaudin Well Field



Suggested Zone 2 for Well AL 01 and AL 02



Suggested Zone 2 for Well AL 09



Assessment of Potential Polluters in Kabul and Herat Well Fields in 2013

Goal:

- Identification of potential polluters in the delineated protection areas
- Assessment of the current risks for the groundwater resources
- Identification of possible protection measures
- Development of base for implementation of similar monitoring procedure in responsible Afghan Institutions

Results of Polluter Assessment in Catchment Areas of Well Fields in Kabul and Herat

Identified major pollution risks:

- Septic tanks / Local latrines
- Waste water canals
- Excavation areas, some used for dumping garbage
- Solid waste dumping
- Small scale commercial activities
- Open market places (solid waste)
- Agricultural activities
- Irrigation wells
- Petrol stations
- Major roads (risk of accidents with trucks loaded with polluting materials)

Water Quality Monitoring System of KSBU

- Standard monitoring system is newly established

Results of previous quality tests

- Raw water from KSBU production wells seems to be influenced by pollutants in densely settled areas*
- Fecal coliforms in less than 5% of analyzed samples*

Conclusion of Recent Monitoring Measures in Catchment Areas of Drinking Water Wells *Assessment of Potential Polluters and Chemical Quality Test*

- Some critical activities are ongoing
- Raw water used by KSBU has still a better quality than groundwater analyzed in researches in Kabul in recent years
- **Existing risks must be considered and urgently managed**



Thanks for Your
Attention!