FORM FOR THE DRAINAGE TUNNELS CLASSIFICATION

1. GENERAL DATA

1. **NAME;**
2. **LOCATION;**
   - 2.1 Country;
   - 2.2 Region;
   - 2.3 Province;
   - 2.4 Localisation on topographic map to scale 1:25.000;
   - 2.5 Cadastral parcel;
   - 2.6 Geographical UTM coordinates;
   - 2.7 Medium altitude;
   - 2.8 Ownership;
   - 2.9 Others;
3. **DATE AND AUTHORS OF THE SURVEY**

2. GRAPHICAL AND PHOTOGRAPHICAL DOCUMENTATION

1 **HORIZONTAL TUNNEL(S);**
   - 1.1 Topographical development;
   - 1.2 General development compared to orography;
   - 1.3 Typology;
   - 1.4 Sections;
   - 1.5 Run-off plane;

2 **VERTICAL SHAFTS;**
   - 2.1 Function;
   - 2.2 Distance;
   - 2.3 Depth;

3 **COLLATERAL WORKS;**
   - 3.1 Basins of accumulation;
   - 3.2 Tanks of decantation;
   - 3.3 Ventilation systems;

4. **ECOSYSTEM;**
   - 4.1 General framework compared to:
     - 4.1.1 Other drainage tunnels (distribution, distance and route)
     - 4.1.2 Distribution network
     - 4.1.3 Agriculture
     - 4.1.4 Human settlements

3. SPECIFIC DATA

1. **PLANIMETRIC DEVELOPMENT;**
2. **GENERAL MORPHOLOGY OF THE TUNNEL: SINGLE, DOUBLE, MULTIPLE OR SUPERIMPOSED TUNNEL, ETC.; ROUTE: LINEAR, SINUOUS AND BRANCHED OUT;**
3. **DISTANCE FROM THE OUTLET (MOUTH AND WATER SHARING SYSTEMS) AS FAR AS THE ORIGIN (UMM EL MA, THE MOTHER OF WATER, MOMM' D'ACQU);**
4. **ACTUAL LENGTH OF THE MAIN TUNNEL FROM THE ORIGIN AS FAR AS THE OUTLET;**
5. **ACTUAL LENGTH OF THE MINOR TUNNELS AND/OR BRANCHES;**
6. **SEPARATION BETWEEN DEAD AND LIVE TUNNELS;**
7. **LOCALISATION OF THE DRAINING AND TRANSPORTING PARTS;**
8. **ORTHOGONAL PASSAGEWAYS, BRANCHES AND SUPERIMPOSED TUNNELS;**
9. **OUTLET OF THE MAIN TUNNEL;**
10. **ROOM OF THE OUTLET (WATER SHARING SYSTEM OR OTHER);**
11. **ALTITUDE OF THE ORIGIN;**
12. **ALTITUDE OF THE WATER SHARING SYSTEM;**
13. **SLOPE;**
    - 13.1 Medium slope in percentage terms;
    - 13.2 Medium depth of the tunnels compared to the surface;
      - 13.2.1 From the surface altitude to the keystone (intrados);
      - 13.2.2 From the surface altitude to the run-off plane;
14. **DIMENSIONS OF THE TUNNEL OF THE MAIN PASSAGEWAY;**
    - 14.1 Medium width;
    - 14.2 Minimum width;
    - 14.3 Maximum width;
    - 14.4 Minimum width of the branches;
    - 14.5 Medium height of the dome of the main tunnel;
      - 14.5.1 From the run-off plane to the keystone;
      - 14.5.2 From the run-off plane to the impost;
    - 14.6 Maximum height of the dome;
    - 14.7 Absolute maximum height;
    - 14.8 Minimum height;
    - 14.9 Vertical shafts;
      - 14.9.1 Localised on the surface;
      - 14.9.2 Total;
      - 14.9.3 Distance among the surface shafts;
15. **MORPHOLOGY OF THE SURFACE VERTICAL SHAFTS (WASTE MATERIALS, STONE AND LOCKS);**
16. **GEOLOGIC, STONE, MORPHOLOGIC AND ARCHITECTURAL MATERIALS;**
17. **DESCRIPTION OF THE UNDERGROUND NETWORK;**
    - 17.1 Horizontal entrances;
    - 17.2 Vertical entrances;
    - 17.3 Sectors;
    - 17.4 Dome;
    - 17.5 Walls;

17.6 Branches;
17.7 Channels;
17.8 Shafts (openings for ventilation and evaporation);
17.9 Tanks of decantation (lost shafts);
17.10 Little stairs carved out of the rock useful to the survey;
17.11 Niches for placing lamps;
17.12 Joints for orientation;
17.13 Material of the surfaces;

18. DISTRIBUTION AREA;

18.1 Distribution channels;
18.1.1 Surface channelling;
18.1.2 Water sharing system;
18.2 Methods for calculating and allocating the shares of water;
18.2.1 Hydraulic law;
18.2.2 Ownership system;
18.3 Water uses;

19. COMPLEMENTARY WORKS;

19.1 Branches;
19.2 Other channelling;
19.3 Other complementary works;

20. OTHERS

4. ARCHITECTURAL ANALYSIS

1. DESCRIPTION;
2. HYDRAULIC ARCHITECTURE;
3. MORPHOLOGIC, TECHNICAL AND BUILDING ELEMENTS;

3.1 Typology;
3.2 Sections;
3.3 Surfacing run-off plane;
3.3.1 Run-off plane with a single channel;
3.3.2 Run-off plane with double channel;
3.3.3 Run-off plane with hanging channel;
3.3.4 Mixed run-off planes;
3.4 Use of the shafts;
3.4.1 Shafts for inspection;
3.4.2 Technical shafts;
3.4.3 Shafts for ventilation;
3.4.4 Secondary shafts;
3.4.5 Multifunctional shafts;
3.5 Covers;
3.6 Basins;
3.6.1 Basins of sedimentation;
3.6.2 Basins of deviation;
3.6.3 Basins of collection;
3.7 Techniques of building of the main tunnel;
3.7.1 Masonry building;
3.7.2 Excavation and material drawing up techniques;

3.7.3 Methods and tools used;
3.7.4 Marks of the excavation work over the inner surfaces;
3.7.5 Possible dates;
3.7.6 Following maintenance works and restoration;

3.8 Pipes;

4. **CURRENT STATE OF CONSERVATION;**
5. **OTHERS;**

5. GENESIS AND STRUCTURAL ANALYSIS

1. **ORIGINS AND HISTORY;**
2. **DESCRIPTION AND ORAL TRADITION;**
3. **PLANE OF THE WORK;**
4. **MODIFICATIONS AND MAINTENCANCE;**
5. **LOCAL LAW SYSTEM;**
6. **TRADITIONAL JOB CORPORATIONS;**
7. **SOCIO-ECONOMIC ROLE;**
8. **OTHERS;**

6. WATER

1. **GEOLOGICAL STATE ;**
2. **HYDROGEOLOGICAL STATE;**
3. **MECHANICAL FEATURES OF THE ROCKS AND LANDS;**
4. **PRECIPITATIONS;**
5. **GROUNDWATERS;**
6. **HIDDEN PRECIPITATIONS;**
7. **POTENTIAL EVAPOTRANSPIRATION;**
8. **WATER FLOW;**
9. **TEMPERATURE AND QUALITY;**
10. **TEMPERATURE, PRESSURE AND HUMIDITY INSIDE THE TUNNEL AND THE VENTILATION SHAFTS (ANNUAL MEDIA AND SEASONAL SITUATION);**
11. **OTHERS;**

7. HISTORICAL AND BIBLIOGRAPHICAL SOURCES

1. **BIBLIOGRAPHICAL SOURCES;**
2. **OTHERS;**

8. GENERAL MATTERS

1. **MAIN CONSIDERATIONS ON THE STATE OF THE WORKS;**
   - 1.1 Functions (hydrical, environmental and socio-economic);
   - 1.2 Historical, aesthetic and monumental values;
   - 1.3 State of the works and risks;
   - 1.4 Maintenance and restoration;
   - 1.5 Re-use and dissemination;
2. **EVALUATION OF THE SOCIO-ECONOMIC PHENOMENA;**
3. **EVALUATION OF THE EFFECTS ON TOURISM;**
4. **FUTURE WORKS;**
5. **OTHERS;**