

COWI

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Directorate General for Regional Policy

Quick appraisal of “Sistema de suministro desde el embalse del Cenajo a la Mancomunidad de Canales del Taibilla”

2009 ES 161 PR 005

Final Report

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DISCLAIMER: The content of this report is the sole responsibility of the Framework Contractor and can in no way be taken to reflect the views of the European Union.

Acronyms and abbreviations

AF	Application Form
Bulletin	“Boletín Oficial del Estado”
CBA	Cost Benefit Analysis
CBA Guide	EC Guide to Cost Benefit Analysis of Investment Projects, 2008
CF	Cohesion Fund
EIA	Environmental Impact Assessment
ENPV	Economic Net Present Value
ERDF	European Regional Development Fund
EU	European Union
FNPV	Financial Net Present Value
FoI	Field of Interventions
MCT	Mancomunidad de los Canales del Taibilla
NPV	Net Present Value
QA	Quick Appraisal
THM	Trihalomethanes
VAT	Value Added Tax

1 Executive summary

This 'Quick appraisal' report has been prepared by COWI Consortium under a services contract with DG REGIO for the assessment of the EU co-funding application for the major project “*Sistema de suministro desde el embalse del Cenajo a la Mancomunidad de Canales del Taibilla*”.

Project overview

The project under assessment concerns the construction of an aqueduct in order to divert water from Tajo-Segura Channel onto the Cenajo reservoir and to the water purification plants of Sierra de la Espada and of Campotéjar.

The main objective is to improve water quality rather than quantity. The project aims to supply the Canales del Taibilla Community, in Murcia region, with higher quality water by avoiding the current contamination of water supplied by the rivers Mundo and Segura. This contamination is posing a hazard for human health.

The stated objective appears in line with the National Reforms Programme and with the Cohesion Operational Programme-FEDER 2007-2013, within the Priority Axis II – Environment and Sustainable Development (CF).

Proposed technical solution

The overall technical solution consists of two financially independent phases:

1. Construction of the Talave-Cenajo tunnel to carry water from Talave reservoir to Cenajo reservoir (avoiding at upstream level the mix with Mundo and Segura rivers).
2. Construction of a 70 Km pipe from Cenajo reservoir to the water purification plants of Sierra de la Espada and of Campotéjar to supply the Canales del Taibilla Community.

The project for which Community assistance has been requested, illustrated in the Application Form, is the second phase only, consisting of five sub-interventions:

- Intake in the Cenajo reservoir;
- Tunnel of Chopillo;
- Regulating pool;
- Main pipe from the regulating pool to the purification plants of Sierra de la Espada and of Campotéjar;
- Special interventions to cross already existing infrastructures, such as aqueducts, roads, railways and the Segura river.

However, while request for financing is about the second phase only, it is not clear whether the first phase, on which the second one functionally depends on, has been already realized or not.

Also, there are some inconsistencies between the project technical solutions illustrated in the Application Form (AF) and in the attached "Boletín oficial del Estado" (henceforth, the Bulletin). The main inconsistency regards the construction of a new purification plant in Cenajo, which should replace those of Sierra de la Espada and of Campotéjar. It is mentioned in the Bulletin but not in the Application Form.

Also, other inconsistencies exist between the alternative options considered in the Bulletin and in the AF. Indeed, the former provides six alternative options while the latter only three. Moreover, the selected option ("Alternative B") described in the Application Form doesn't seem to be the same of that in the Bulletin and there is no explanation of the methodological approach and criteria adopted to choose this option.

Institutional arrangements

As for implementation, according to the calendar of the Application Form, the project has been conceived in 2007. Currently it is at the stage at which final design is completed, with exception of one section for collection of water from Cenajo to Chopillo tunnel still to be prepared. On top of that, tendering procedure and land acquisition phases, planned to be concluded, respectively, by the 30/12/2011 and 30/01/2011, have not started yet. The Application Form doesn't provide any justification of such delay, although by reading the Bulletin, the delay can be attributed to some environmental issues.

Financial and economic aspects

The CBA analysis presented is that of 2007, which was carried out jointly for the above mentioned phases of the project. This approach is correct, but the CBA needs to be updated to 2012, in order to take into account the actual investment cost for the realisation of the first phase of the project (if occurred) and a new cash flows forecast for the second phase.

In the economic analysis five benefits additional to tariff revenues have been calculated. In general terms, these benefits have been correctly quantified even if the conventional method for this type of projects would be that of estimating the willingness to pay for perceived better quality of water, and purification and other costs savings accrued by stakeholders other than the project promoter. Also, the methodology used to evaluate the benefit "reduction in water losses in the Tajo-Segura Channel" seems not appropriate.

In general, the CBA analysis is well organised and the results achieved seem to be realistic even if some concerns arise. In fact, the reference scenario against which to calculate costs, revenues and benefits has not been properly described. As consequence, one cannot always understand what would happen if the project is not implemented.

A risk analysis is missing and should be implemented to verify the project robustness and its sensitivity to future possible reductions of demand consumption in the beneficiary municipalities, due either to a rationalisation of the urban

water distribution networks or to the hydrological variability of the water natural sources from which the aqueduct is supplied.

Environmental issues

The project does not fully comply with the environmental requirements for this typology of projects. In particular, in F.4.1 of the AF it is stated that it can't be excluded that the project will have no impacts on some NATURA 2000 sites. Despite the fact that the project implementation is considered necessary in order to solve the current situation posing a threat to health, a specific decree has been issued by the relevant National Authority to proceed with the project. In order to minimize the potential environmental damages, it has been estimated that about 7% of the project costs will be devoted to corrective and mitigation measures.

Overall findings and recommendations

The project concept is well-grounded, reasonable and relevant, given the Spanish and the European Laws in matter of "Quality of Surface Water, intended for the abstraction of Drinking Water" and the actual abnormal situation in the quality of water provided to the majority of municipalities in Murcia region. Thus, the worthiness of implementing this investment is confirmed and EU co-financing is justified.

However, since some weaknesses have been detected in the project documents, a clarification of some points is necessary. In detail:

- The implementation status of Phase 1, on which phase 2 depends, is not clear.
- The description of the context is too loose. The current situation in water purification and water supply services within the municipalities touched by the project should be described to show the integration of the investment proposed and of the actors involved, with the systems currently operating at urban level.
- Current baseline values of water pollutant indicators are not presented, as well as target values expected after the intervention.
- The option analysis is not well presented; there is no evidence that the selected alternative is the optimal one. In particular, there is no indication of what selection criteria have been adopted to choose the proposed solution.
- Demand analysis does not consider future trends and possible scenarios. In principle, if the current system of urban distribution networks is not particularly efficient in supplying final users, future efficiency improvements in the networks – which will translate into a decrease of demand from the municipalities – are likely to happen. Reduced demand may put at risk the full achievement of the project objectives. These risks should be fully assessed with a sensitivity and risk analysis.

- The CBA and the implantation plan are not updated. In particular, the CBA does not include the actual investment costs borne for the Talave-Cenajo Tunnel (phase 1) and the new forecasts on cash flows for the construction of the Cenajo-Mancomunidad de los Canales del Taibilla (phase 2). Moreover, the identification of the sources of funding regarding the second phase of the project, and the financing plan to loan reimbursement, cannot be referred anymore to start in 2007. The update of cash flow will have an impact on the project's financial and economic viability, as well as on its financial sustainability.

Bearing in mind these weaknesses, and despite the fact that the Application Form is really concise, the project intends to fight serious health issues and is consistent with the European legislation, this appraisal suggests accepting the project although the Applicant should provide some additional information.

Issue	Findings	Recommendations
Are the project objectives well defined and is the project technically sound?	<p><i>Yes, the objective is well defined and in line with the Spanish and European Legislation in matter of drinking water.</i></p> <p><i>The proposed technical solution is appropriate even if it lacks the description of how the interventions are quantitatively linked to the attainment of the improvement in water quality and elimination of the contamination risks linked to uncontrollable leakages and rain-water.</i></p>	<p><i>The Applicant should:</i></p> <ul style="list-style-type: none"> • <i>Describe the current implementation status of all interventions included in the two phases of the project</i> • <i>Eliminate the inconsistencies between the Application Form and the Bulletin</i> • <i>Provide a quantification of baseline and targets indicators on water pollutants</i> • <i>Give a description of the context</i> • <i>Justify the solution adopted on the basis of a selection of alternatives</i>
Is the project worth co-financing?	<p><i>Yes, the results achieved by the CBA seem to be realistic even if some weak points have been found.</i></p>	<ul style="list-style-type: none"> • <i>Update the CBA and the implementation timetable</i> • <i>Define the without the project scenario and calculate all costs and benefits on an incremental basis</i> • <i>Assess the risks of the project in relation to potential decreases in the volumes of bulk water supplied</i>
Is the public contribution justified?	Yes	
Is the project consistent with <i>other</i> Community policies?	Yes	

2 Introduction

2.1 Framework for quick appraisal

This 'Quick appraisal' report for the major project “*Sistema de suministro desde el embalse del Cenajo a la Mancomunidad de Canales del Taibilla*”, project number 2009ES161PR005 has been prepared by CSIL as a member of the COWI Consortium under a framework contract with DG REGIO No. 2009CE160AT090 in response to order form no. 2012CE16BAT014 signed by the parties on 12 (COWI) and 17 (EC) March 2012. The assignment request note are attached this report as Appendix 2.

The objective of the quick appraisal is to assess whether the contents of the AF documents are in line with current requirements for EU co-funding from the European Regional Development Fund (ERDF) or from the Cohesion Fund (CF) or under the Instrument for Pre-accession Assistance (IPA) programme.

JASPERS has not been involved in the preparation of the application nor the project feasibility studies.

Appendix 1 lists the documents made available for this quick appraisal. The application form has been filled correctly in all its fields and the information received is sufficient for an appropriate quick appraisal.

2.2 Quick appraisal team

The quick appraisal has been performed by the following team:

- Team leader and financial expert: Davide Sartori, CSIL
- Technical expert: Mario Genco, CSIL

Research assistance has been provided by Stefano Lombardi (CSIL) and Chiara Pancotti (CSIL).

3 Project assessment

3.1 Project type and operational programme

- Sector: Environmental and Risk Protection
- Sub-sector: Management and distribution of water, drinking water (Code 45 of the Fields of Interventions – FoI¹).
- The project is requested to be funded under the Cohesion Operational Programme-FEDER 2007-2013, within the Priority Axis II – Environ-

¹ EC Regulation 1828/2006.

ment and Sustainable Development (CF). The Economic activity dimension is Collection, purification and distribution of water.

3.2 Beneficiary and operator

The project promoter and beneficiary is Aguas de las Cuencas Mediterráneas S.A. (Acuamed)² which is responsible for water supply operations in the Autonomous Community of Murcia. Aguas de las Cuencas Mediterráneas absorbed the Sociedad Estatal Aguas de la Cuenca del Segura (AcuaSegura)³, along with the Sociedad Estatal del Júcar.

3.3 Project objectives

Overall and specific objectives

The intervention is aimed to supply the already existing water purification plants of Sierra de la Espada and of Campotéjar, in the Autonomous Community of Murcia, with better quality water obtained from the Cenajo reservoir, fed through the Talave-Cenajo tunnel, in such a way to avoid the contamination of water with Mundo and Segura Rivers⁴.

The implementation of this aqueduct will improve water quality for end users, rather than increase the existing quantity supplied. The beneficiaries of the infrastructure are 15 municipalities located in to the Autonomous Community of Murcia⁵. An analysis of the drinking water supplied to these municipalities has shown that the current situation is critical, with almost all pollutants above the statutory limits.

The specific socio-economic objectives have been qualitatively described mainly in terms of improvement of water quality, by reducing the levels of ion sulphate, magnesium, and the secondary production of Trihalomethanes (THM) in the water distributed to users. Also, thanks to the project, a decrease in water leakages is expected due to the flows passage through pipes instead of rivers, as well as savings in purification and energy costs.

² <http://www.acuamed.es/>

³ Since 1st December 2011 AcuaSegura has been merged with Acuamed which is the main instrument of the Spanish Ministry of Agriculture, Food and Environment for the A.G.U.A. development. It has three main objectives: to increase water resources, to improve water management and to restore the environment.

⁴ The present project has been included as part of the prior and urgent actuation of the Spanish law 10/2001 and of the Spanish National Hydrological Plan (law 10/2001).

⁵ namely: Albanilla, Abaràn, Alcantarilla, Alguazas, Archena Blanca, Ceuti, Cieza, Fortuna, Lorqui, Molina de Segura, Murcia (the capital city of the Autonomous Community), Santomera, Torres de Costillas, Orihuela

It is important that some inconsistencies between the Application Form (AF)⁶ and the attached Bulletin – presenting the analysis of alternatives and the result of the EIA – were clarified:

- According to the AF, the main tunnel connection will be 69.15 Km long, with a maximum capacity of 110 hm³/year and an expected capacity utilisation rate of the infrastructure of 91,8% (101 hm³/year). However, the Bulletin mentions 131 hm³/year of water intake and the main tunnel length of 70.9 Km.
- The Bulletin mentions the construction of a new purification plant next to Cenajo to fully replace the ones of Sierra de la Espada and of Campotéjar currently in operations. The AF, on the contrary, just mentions the construction of a new regulating pool.

Contribution to OP objectives

The project is in line with the National Reforms Programme and with the Priority Axis objective.

The project is expected to be financed under the Priority Axis II – Environment and Sustainable Development of the Cohesion Operational Programme-FEDER 2007-2013.

The Applicant does not provide information about how the project will contribute to socio-economic development in quantitative terms, to be measured through a coherent set of output, result and impact indicators. In particular, no data on baseline and targets indicators on sulphates, magnesium and THM levels in the concerned areas are provided⁷. Hence, it cannot be deduced to which extent (%) the project will contribute to reduce and bring them below the statutory limits.

The only indicators mentioned are:

- 788.342 inhabitants will be supplied with purified water (equal to "835,872 persons equivalent).
- 3 aqueducts and 1 regulating pool will be constructed.

3.4 Institutional arrangements

Land availability and permits

According to the project time schedule - and as it is usual in case of aqueduct projects - land is not a property of the beneficiary and expropriation procedures

⁶ Annex XXI.

⁷ It has been proved that the concentration of the undesired ions is incompatible with the Community Directive 75/440/CEE. Water quality tends to decrease after the Talave reservoir, especially in correspondence to the Camarillas reservoir.

will be necessary. These had been expected to be carried out between July 2011 and January 2012, however, according to D.2.1 they have not started yet.

Project implementation

According to the timetable, the project is currently at the stage of completed design study, with exception of one section for collection of water from Cenajo to Chopillo tunnel still to be prepared. On top of that, the land acquisition phase – planned to be concluded by the 30/01/2011 – has not started yet. The construction phase will extend up to December 2014, however, since the other preliminary activities (preparing of tender documentation and land acquisition) have not been implemented yet, this deadline seems unrealistic.

Project operation

Acuamed is a reliable and well-known operator for water-related services undertaken in the public interest so there are no concerns about the capacity of the operator.

However, since the project will feed with bulk water the water distribution networks of the municipalities located in the catchment area, which represents the "clients" of Acuamed, it would be worth to have some details about these networks – e.g. in terms of length, capacity, reliability of the infrastructure - to have a more comprehensive picture of what happens at downstream level of the water supply chain.

3.5 Technical issues

The current project has been designed to solve a long-standing abnormal situation in the quality of water provided to the Murcia's municipalities. Apart from the current unsustainable ions concentrations, the situation in terms of organic matter is such that the purification process must be carried out adopting a high concentration of chlorine, which in turn generates an excessive level of THM for final users.

In order to address these problems, the applicant states that the proposed system of underground water pipes is the preferred option to increase the water quality.

Project definition

The technical solution plans to divert 101 hm³/year of water (131 hm³/year in the Bulletin) – previously destined to the Tajo-Segura Channel – from the Cenajo reservoir onto the water purification plants of Sierra de la Espada and of Campotéjar. The overall water diversion will take place through underground water pipes with a maximum flow of 6 m³/s.

Two project's phases have been identified to achieve the final objective:

- Phase 1: Construction of the Talave-Cenajo tunnel to carry water from Talave reservoir to Cenajo reservoir (avoiding mixing with Mundo and Segura rivers).

- Phase 2: Construction of a 70 Km pipe from Cenajo reservoir to the water purification plants of Sierra de la Espada and of Campotéjar to supply the Canales del Taibilla Community.

These phases are functionally interrelated and the achievement of objectives depends upon realisation of both. Accordingly, the CBA of the project has been jointly carried out for both phases. On the other hand, since they are financially independent, the intervention objective of the request for funds in the reviewed Application Form is the second phase only. It consists, in turn, of five sub-interventions:

- Intake in the Cenajo reservoir;
- Tunnel of Chopillo;
- Regulating pool;
- Main pipe from the regulating pool to the purification plants of Sierra de la Espada and of Campotéjar;
- Special intervention for the crossing of existing infrastructures, such as aqueducts, roads, railways and the Segura river.

Since section I.1 of the AF specifies that financing sources for the Talave-Cenajo Tunnel have already been obtained from the Cohesion Fund, it seems that Phase 1 has already been initiated or even completed. However this is not clear and since the second phase depends on the completion of the first, this aspect must be clarified by the Applicant.

Overall, the technical definition of the project is satisfactory. However, there are some inconsistencies between the AF and the Bulletin. For instance, it seems that the construction of a new water purification plant has been abandoned in favour of a regulating pool, without explicitly mentioning this fact and explain the reasons for such a decision. In addition, some project features refer to additional documents not included or even cited in the AF. It is preferable to solve these issues in order to provide a more clear-cut description.

Option analysis and selection

According to the AF, the Feasibility Study carried out in mid 2007 has compared three different project alternatives. "Alternative 0" corresponds to the "no project" option, while "Alternative A" differs from "Alternative B" only for hydraulic reasons (with option A, water reaches the regulation pool partly by gravity and partly by impulsion, while option B adopts gravity only).

The Applicant states that Alternative B is the preferable one but lacks in providing information about the methodological approach adopted for taking the decision and the analysis of options is too briefly presented. In particular:

- It is not specified whether a cost-effectiveness analysis has been implemented for taking the final decision upon the two other options (actually, the attached Financial and Economical Analyses have not been carried out adopting the incremental criteria).

- It would have been advisable to take into account also the option of adopting desalination process instead of constructing the new aqueduct infrastructure.
- The Bulletin (section 4) reports additional alternatives that are not even mentioned in the AF. It is not immediate to comprehend which the actual infrastructures characterizing the "Alternative B" are considered.

Conceptual design

The concept of the project is sound and logical, with a convincing overall strategy for reaching the final objectives. However, as mentioned above, it would have been worth to present it with greater consistency between the different information sources to have a more complete overview. Also, some additional information could be added to better place the project into its context, in order to check how it integrates with the already existing water supply networks at downstream level. The inter-relations between the bulk water supply service (provided by Acuamed) and the water distribution service to the end users (provided by the Municipalities) should be described, too. This last feature could also help to carry out a more detailed and realistic Demand and scenario analyses.

Investment and operating costs

Investment costs

According to the CBA annex, grand total investment cost is equal to 261,046,834 € (not actualized), including VAT, which amounts to 33,933,014 € (13% of the investment costs, on average). The two project phases are kept financially separated⁸. Total investment cost of Phase I equals 72,283,619 € – including VAT: 10,611,619 € –, while the one concerning Phase II is equal to 188,763,215 € – VAT: 23,321,395 €.

For both phases, Construction - 57,964,322 € (80.2% of total costs including VAT) and 136,537,976 € (72.3%) respectively – and Machinery and Installation – 1,728,141 € (2.4%) and 11,277,948 € (6.0%) – are the most relevant cost items. With respect to Phase II only, the Land acquisition is also relevant (9,331,006 €, 4.9% of the total).

VAT has been excluded from the financial analysis, being recoverable by the project promoter.

Operating costs

Operating costs include Personnel costs, Equipment costs, Materials and Administration costs, Control and Environment vigilance costs and Energy costs. Operating costs have been separately computed for the two phases and well elaborated by the applicant. However, a full incremental approach has not been adopted.

⁸ (1) construction of the Talve-Cenajo Tunnel, (2) supply of the water through the Canales del Taibilla network.

Implementation and procurement plan

The Timetable included in D.1 of the AF lasts from 2006 (start-date of the feasibility study) to the 1st January 2015 (start of the operational phase) and summarizes the activities scheduled during the planning phase and the stage currently reached. The next steps to be undertaken are:

- design study and tender application with respect to Cenajo collecting water infrastructure and Chopillo tunnel (supposed to be concluded by the end of 2011);
- land acquisition (supposed to be concluded by January 2012);
- contractual phase expected to be carried out between February and December 2012;
- construction work expected to be carried out by December 2014;

The accumulated delays, stated in table D.2.1, makes uncertain the actual date in which the Operative phase could be started (initially scheduled for January 2015).

3.6 Market analysis

Baseline situation and market assessment

According to demographic data, 788,342 inhabitants are currently supplied (equivalent to 835,872 users) in the municipalities of the project catchment area.

Demand projections

The project will allow supplying the same population currently served. According to data from the Spanish Ministry of Environment, the exploited capacity utilisation rate of the infrastructure is equal to 91.8% (101 hm³/year).

Demand analysis has been correctly carried out. Nonetheless, considerations concerning municipalities' future demand could have been included. In principle, if the current distribution system is not particularly efficient in supplying final users (e.g. due to an obsolete infrastructure⁹), future efficiency gains could be prospected, which will translate into a decrease of demand of bulk water from the municipalities to Acuamed.

Moreover, in general terms, the bulk water supply could be affected even by the hydrological variability of the sources of natural water, which the designed aqueduct is supplied from. However, this topic is not covered in the documents submitted by the Applicant.

⁹ The resulting value of water supplied per capita (351 l/inhabitant day) is quite high and seems to indicate high levels of water losses in the urban distribution networks.

3.7 Financial and economic analysis

General methodology

The CBA has been correctly carried out jointly for the two phases, which constitute together a self-sufficient unit of analysis, in line with the methodology presented in the EC Working Document n. 4 (WD4)¹⁰. In particular, the following assumptions have been correctly adopted:

- Time horizon is set at 30 years (ranging from 2015 to 2044) consistently with the reference to the investments in the water sector;
- The Discounted Cash Flow method has been properly applied, only actual inflows and outflows have been included;
- Real discount rates of 5% and 5.5%¹¹ has been applied to financial and economic analyses, respectively.
- A residual value of the investment has been included as inflow in the calculation of the performance indicators.

The results achieved are realistic even if the methodology adopted for evaluation of benefit is not the conventional one (see below). Also, the counterfactual reference scenario against which cost and benefits were calculated is not clearly defined.

Financial CBA

The financial analysis presented in Annex of the AF was carried out in 2007, with both phases still to be realised. In order to make it more truthful, it is needed to update data with actual investment costs borne for the construction of the Tunnel Talave-Cenajo (phase 1) and with new forecasted cash flows for the second phase. The update of cash flow will have an impact on the project's financial and economic viability, as well as on its financial sustainability.

Financial costs and revenues have been properly identified and evaluated. The costs are divided in investment costs and operating costs. The investment will be financed by four sources: national budget, bank loans, European funds and "customers' advances"¹².

The operating costs are properly disaggregated. The financial revenues for the beneficiary come from the application of a tariff (calculated separately for the Tunnel Tavale-Cenajo and the Aqueduct Cenajo-MCT) to the volumes of water

¹⁰ Working Document 4: Guidance on the Methodology for carrying out Cost-Benefit analysis", European Commission, August 2006.

¹¹ Since Spain is a Member States eligible for funding under the Cohesion Fund on a transitional and specific basis during period 2007-2013

¹² For phase I, the municipalities will provide about 5.2 million Euro in advance.

supplied to municipalities. Unit tariffs are properly calculated in order to recover the investment, operational costs and the interests on loans.

The performance indicator Financial Net Present Value (FNPV) has been calculated on the basis of the discounted cash flows for the two alternative cases – with or without the European financing:

- FNPV without the European financing: -129,394,368.60 €
- FNPV with the European financing: -31,489,078.90 €

Economic CBA

The benefits directly attributable to the project are the following:

1. revenues from tariffs
2. increase reliability of drinking water supply
3. gradual increase in consumption of tap water
4. energy savings due to the elimination of water pumping
5. savings in reactivates for purifications
6. reduction in water losses in the Tajo-Segura Channel

These benefits have been evaluated not following the conventional method of estimating the willingness to pay (WTP) for perceived better quality of water, which usually replaces the revenues tariff. However, looking at the single methodologies adopted for each benefit, the overall results and the magnitude of the benefits seem reasonable.

The only weak assumption is related to the reduction in water losses benefit. To evaluate it, the tariff to the final user (0.210786 €/m³) has been used instead of the opportunity cost to use the saved water for the best alternative purpose¹³. If the quantification of this benefit with the above mentioned method proves to be unfeasible, it should be taken into account only from a qualitative point of view.

The economic analysis should have described better the scenario without the project, which could be either a do-nothing or a do-minimum solution. Thus, all benefits identified seem reasonable but there is no counterproof that they are a net gain with reference to what would happen without implementing the project or with implementing an alternative "do minimum" project. For example, it is not clear who is the beneficiary of the savings due to the elimination of pumping and of reactivates. Indeed, if the beneficiary is AcuaMed and not the municipalities, the benefit should be taken into account only in the financial analysis. Also, the increased tariff for the municipalities should be calculated net of what they are currently paying in absence of the project.

Finally, some minor concerns arise in the quantification of the increase in the consumption of tap water since a consumption of one litre per day per inhabi-

¹³ E.g., refer to Pearce D.W., Mourato S. and Atkinson G., 2006, Recent developments in environmental costbenefit analysis, OECD publishing.

tants seems to be too low. Also, additional benefits on health could have been taken into account.

Sensitivity and risk analysis

Sensitivity analysis has been carried out by changing the value of the following variables by arbitrary values:

- Service life of the overall project (+/- 5 years)
- Investments residual value (+/-15%)
- Socio-environmental benefit (+/- 5% and 20%)
- Investments value (+/- 5% and 20%)

The strategy adopted is not in line with the standard methodological approach, as the last three variables are aggregated and not independent as suggested in the Guide of Cost-Benefit Analysis of investments projects (2008). In addition, as suggested in the Demand analysis section, possible *variation in consumers water consumption* (also attributable to an increased efficiency of the urban distribution networks) is a potentially critical variable that should be assessed carefully.

Other standard methodological steps not fully developed are the computation of switching values and the inclusion of scenario analysis.

Consistently with the Sensitivity analysis results, Risk analysis has not been performed, as none of the variables considered has proven to be critical. However, the Risk analysis procedure should be carried out after the implementation of a more correct Sensitivity analysis. In particular, risk analysis should calculate the minimum volume of bulk water to be supplied for the project not to be risky from an economic point of view.

Financing plan

Overall, the Financing plan included in the Annex II has been correctly calculated. In particular, the funding gap computation has been carried out by jointly considering the two functionally dependent project phases.

Applying a funding gap rate of 64.95% to an eligible cost of 134,302,467.28 Euros, and a co-financing rate of 80% to the decision amount, the EU grant is equal to 69,783,562 Euros.

Finally, the Financing plan has been correctly carried out by taking into account also National public contribution, Bank loans and Advance payments. The only issue is related to the fact that the analysis should be updated according to a more realistic time horizon. This, in turns, is likely to affect the scheduled EU subventions.

3.8 Environmental issues

The project does not fully comply with the environmental requirements for this typology of projects. In particular, in F.4.1 of the AF it is stated that the project will have negative impact on some NATURA 2000 sites. Notwithstanding, the project implementation is considered necessary in order to overcome the current abnormal situation.

According to both the preventive action and the damage compensation principles, the Environmental Impact Assessment (EIA) establishes a number of corrective and preventive measures aimed at lowering the infrastructures and operations impact on the environment. In addition, during the exploitation phase the implementation of some specific measures will be subject to the control of the "Dirección General de Calidad y Evaluación Ambiental", under the Spanish Ministry of Environment.

Detailed information about environmental issues is provided both in the AF and in the Bulletin. In particular, it has been estimated that about 7% of the project operating costs will correspond to environmental corrective and preventive measures¹⁴.

Finally, it is likely that the long process for assessing the environmental impact of the project and the environmentalist issues have been the central cause for both the delays occurred in the implementation plan and the changes in the project design found in the AF and the Bulletin.

3.9 Consistency with other EU policies and law

The project is consistent with the other EU policies and law. In particular, it is in line with the policy objectives of the Council Directive on the Quality of Surface Water, intended for the abstraction of Drinking Water (75/440/EEC)¹⁵

¹⁴ Part of these measures is necessary for compensating the affection of "Red Natura 2000" places ("Sierras y Vega Alta del Segura" and the Arabe and Moratella rivers). During the EIA, these environmental damages have been justified for urgent reasons of public interest.

¹⁵ Amended by Council Directive 79/869/EEC (further amended by Council Directive 81/855/EEC and Council Regulation 807/2003/EC) and both amended by Council Directive 91/692/EEC (further amended by Regulation 1882/2003/EC).

4 Conclusions and recommendations

The project concept is overall well-grounded, reasonable and relevant. The application is successful in demonstrating that the project meets a real need in order to accomplish the National and the European Legislation in matter of Quality of Surface Water, intended for the abstraction of Drinking Water. Accordingly, the intervention is justified and the investment is considered worth of financing.

However, the project presents some deficiencies especially linked with the low accuracy of the information presented in the submitted documents.

The first deficiency of the project is, in fact, that information on project is too generic and non quantitative. Above all, it is not clear whether the first phase of the project, outside this request for financing, has been already completed or not. Also, there are some inconsistencies between the technical solution presented in the AF and the Bulletin. For instance, it seems that the construction of a new water purification plant has been abandoned in favour of a regulating pool, without explicitly mentioning this fact and explaining the reasons for such a decision. The Applicant also fails to explain why and in which way the proposed interventions are appropriate to generate the effects. In other words, to what extent (%) levels of pollutants will be reduced. In fact, no data on baseline and targets indicators regarding sulphates, magnesium and THM levels in the concerned areas are provided.

Secondly, there is no analysis of the context in which the project will take place, describing how the project integrates with the already existing system of water distribution to final users.

Thirdly, there is no evidence that the selected project option is the optimal one as there are very poor indications about the selection criteria adopted to choose the proposed solution.

Fourthly, demand analysis does not consider future trend and possible scenarios. In principle, if the current system of urban distribution networks is not particularly efficient in supplying final users, future efficiency improvements in the networks – which will translate into a decrease of demand from the municipalities– are likely to happen. Reduced demand may put at risk the full achievement of the project objectives.

Finally, the CBA and the implementation timetable still refer to 2007 as year zero, reflecting a non realistic financial and implantation plan.

Other specific remarks concern:

- In the CBA, the without-the-project scenario has not been properly defined and as a consequence is not clear if costs, revenues/benefits and performance indicators have been calculated on an incremental basis.

- Some benefits such as savings due to the elimination of pumping and of reactivates" could be financial effects (to be captured in financial analysis) if accrued by the project promoter.

In light of the above, given the good rationale and significance of the project, this QA assesses the project concept as positive. However, before the project being approved, the Applicant is requested to:

1. describe clearly the current implementation status of all interventions included in the two phases of the project: is phase 1 already completed or not?
2. clarify and resolve the inconsistencies found between the technical descriptions provided in the AF and in the Bulletin;
3. provide a quantification of baseline and targets indicators on water pollutants to calculate to what extent the project will impact on reducing hazard to human health;
4. describe the project's context to show the integration of the investments proposed, and of the actors involved, with the water supply systems currently operating in the municipalities concerned;
5. provide evidence showing that the technical solution adopted is the optimal one following the adoption of clear selection criteria;
6. update the CBA analysis (especially the financial plan) and the implementation timetable;
7. adopt a clear incremental approach in the CBA analysis, impute cost savings in financial analysis if accrued by the project promoter, and describe in qualitative terms those benefits which quantification and monetisation proves to be unfeasible, if any;
8. assess the risks of the project, even in relation to potential decreases in the volumes of bulk water supplied, due either to the hydrological variability of the water natural sources, or to potential reductions in the water demand by the Municipalities (after a possible rationalization of the distribution nets).

Appendix 1: Documents Reviewed

- "Application Form". Major project - Request for confirmation of assistance under articles 39 to 41 of Regulation (EC) no 1083/2006. European Regional Development Fund / Cohesion Fund - Infrastructure Investment – *Sistema de suministro desde el embalse del Cenajo a la Mancomunidad de Canales del Taibilla*.
- "Boletín Oficial del Estado", Ministry of the Environment . Appendix 1 of the Application Form – Resolution for the declaration of the project environmental impact, 25 February 2010.
- Appendix 2 of the Application Form – Financial and Economical analysis.

Appendix 2: Request note



EUROPEAN COMMISSION
 DIRECTORATE-GENERAL
 REGIONAL POLICY
 Italy, Malta, Portugal, Spain
Spain

Brussels,
 DG REGIO G1/DV/ij D(2012)

Mr Raphaël Zayat
 Managing Director COWI Belgium,
 Av. de Tervuren, 13-B
 B-1040 Brussels

**Subject: "Quick Appraisal" of major project(s): CCI n. 2009ES161PR005
 "Embalse Cenajo-Canales del Taibilla"**

Reference: Multiple Framework Contract in cascade 2009CE160AT090,

In the context of the multiple framework contract between your company and DG REGIO, Unit REGIO G.1 requests the quick appraisal of the following major project(s):

CCI number	Title	Responsible Desk Officer
2009ES161PR005	Embalse Cenajo-Canales del Taibilla	Diego VILLALBA DE MIGUEL Diego.Villalba-de-Miguel@ec.europa.eu Tf.: 02 2 299 84 30

The documents corresponding to each project will be available in the library of the Interest Group "FWC 2009CE160AT090" on CIRCABC.

Please acknowledge receipt of this request by return e-mail at: Diego.Villalba-de-Miguel@ec.europa.eu

You are also kindly requested, from receipt of this request letter and:

- within 3 calendar days, to confirm your availability and the absence of conflict of interest for these quick appraisals,
- within 7 calendar days, to submit the CVs of the proposed experts and confirm the timetable for the completion of the quick appraisals.

On this basis we will issue an order form signed by authorised Commission representative and sent to you electronically and in original paper copy.

Looking forward to hearing from you.

Yours sincerely

Andrea Mairate
Head of Unit

Copies: Desk Officer(s) responsible for Major Project
 FMB REGIO D3 QUICK APPRAISALS

Commission européenne, B-1049 Bruxelles / Europese Commissie, B-1049 Brussel - Belgium. Telephone: (32-2) 299 11 11. Office: CSM1 6/17. Telephone: direct line (32-2) 2998430. Fax: (32-2) 2963282.

http://ec.europa.eu/regional_policy/

