

**ΑΝΑΡΤΗΤΕΑ ΣΤΟ ΔΙΑΥΓΕΙΑ
ΚΑΤΑΧΩΡΗΣΤΕΑ ΣΤΟ ΚΗΜΔΗΣ**



**ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ
ΠΕΡΙΦΕΡΕΙΑ ΑΤΤΙΚΗΣ
ΕΙΔΙΚΗ ΥΠΗΡΕΣΙΑ ΔΙΑΧΕΙΡΙΣΗΣ
ΕΠΙΧΕΙΡΗΣΙΑΚΟΥ ΠΡΟΓΡΑΜΜΑΤΟΣ**

Αθήνα 27-07-2017
Αρ. Πρωτ.: Οικ.2604

Προς: Ως Πίνακας Αποδεκτών

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ΤΚ: 11741
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ΘΕΜΑ: Πρόσκληση εκδήλωσης ενδιαφέροντος, με τη διαδικασία μέσω καταλόγου, για την επιλογή αναδόχου υλοποίησης του Υποέργου 23 «Σύμβουλος υποστήριξης κατά την τεκμηρίωση σκοπιμότητας για τα έργα αποχέτευσης της Περ. Ενότητας Ανατ. Αττικής» της Πράξης «Σύμβουλοι Υποστήριξης στο πλαίσιο της προγραμματικής περιόδου 2014-2020 / ΕΤΠΑ» (MIS: 5000415), με κριτήριο την πιο συμφέρουσα προσφορά (αποκλειστικά βάσει της χαμηλότερης τιμής).

Η ΠΕΡΙΦΕΡΕΙΑΡΧΗΣ ΑΤΤΙΚΗΣ

Έχοντας υπόψη:

1. Το άρθρο 90 του «Κώδικα Νομοθεσίας για την Κυβέρνηση και Κυβερνητικά Όργανα» που κυρώθηκε με το άρθρο 1 του Π.Δ. 63/2005 (ΦΕΚ 98/Α/22-4-2005)
2. Τις διατάξεις του Ν 3852/2010 (ΦΕΚ87/07-06-2010 Τ.Α) «Νέα Αρχιτεκτονική της Αυτοδιοίκησης και της Αποκεντρωμένης Διοίκησης – Πρόγραμμα Καλλικράτης», όπως τροποποιήθηκε και ισχύει
3. Την υπ. αριθμ. 109290/39629 (ΦΕΚ 4251/τ.Β'/29-12-2016) Απόφαση του Γεν. Γραμματέα Αποκεντρωμένης Διοίκησης Αττικής «Έγκριση της υπ' αριθμ. 438/2016 απόφασης του Περιφερειακού Συμβουλίου Περιφέρειας Αττικής με την οποία τροποποιείται ο Οργανισμός Εσωτερικής Υπηρεσίας της Περιφέρειας Αττικής»
4. Την με αριθμ. 919/2014 απόφαση του Πολυμελούς Πρωτοδικείου Αθηνών
5. Το Ν.4314/2014 (ΦΕΚ 265Α/23-12-2014) «Α) Για τη διαχείριση, τον έλεγχο και την εφαρμογή αναπτυξιακών παρεμβάσεων για την προγραμματική περίοδο 2014-2020, Β) Ενσωμάτωση της Οδηγίας 2012/17 του Ευρωπαϊκού Κοινοβουλίου και του Συμβουλίου της 13ης Ιουνίου 2012 (ΕΕ L 156/16.6.2012) στο ελληνικό δίκαιο, τροποποίηση του ν. 3419/2005 (Α 297) και άλλες διατάξεις», όπως τροποποιήθηκε και ισχύει.
6. Την υπ. αριθμ. C(2014) 3542final/23-05-2014 απόφαση της Επιτροπής των Ε.Κ. για την έγκριση του Εταιρικού Συμφώνου για το Πλαίσιο Ανάπτυξης 2014-2020
7. Την Απόφαση της Επιτροπής των ΕΚ με αριθμό C (2014) 10170 final/18-12-2014, που αφορά την έγκριση του Ε.Π. «Αττικής 2014-2020»
8. Την με αριθμ. 32670/ΕΥΘΥ327 (ΦΕΚ 715/Β'/24-04-2015) Υπουργική Απόφαση «Αναδιάρθρωση της Ειδικής Υπηρεσίας Διαχείρισης του ΕΠ Περιφέρειας Αττικής, σύμφωνα με το άρθρο 7 του Ν. 4314/2014 και αντικατάσταση της αριθμ. 1310/Γ'ΚΠΣ 310/17-01-2001 (ΦΕΚ 33/Β) ΚΥΑ, όπως έχει τροποποιηθεί και ισχύει»

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9. Την με αρ.πρωτ. 110427/ΕΥΘΥ/1020 (ΦΕΚ 3521/Β'/01-11-2016) Υπουργική Απόφαση «Τροποποίηση και αντικατάσταση της υπ' αριθ.81986/ΕΥΘΥ712/31.07.2015 (ΦΕΚ Β' 1822) Υπουργικής Απόφασης «Εθνικοί κανόνες επιλεξιμότητας δαπανών για τα προγράμματα του ΕΣΠΑ 2014 – 2020 – Έλεγχος νομιμότητας δημοσίων συμβάσεων συγχρηματοδοτούμενων πράξεων ΕΣΠΑ 2014-2020 από Αρχές Διαχείρισης και Ενδιάμεσους Φορείς – Διαδικασία ενστάσεων επί των αποτελεσμάτων αξιολόγησης πράξεων»
10. Την υπ' αριθμ. 23451/ΕΥΣΣΑ493 (ΦΕΚ 677/Β'/03-03-2017) Υπουργική Απόφαση «Διαδικασίες κατάρτισης, έγκρισης και υλοποίησης προγραμμάτων τεχνικής βοήθειας, διαδικασίες δημιουργίας και διατήρησης καταλόγων προμηθευτών για την ανάθεση και υλοποίηση ενεργειών Τεχνικής Βοήθειας».
11. Το Ν. 4270/2014 (ΦΕΚ 143/Α'/28-06-2014) «Αρχές δημοσιονομικής διαχείρισης και εποπτείας (ενσωμάτωση της Οδηγίας 2011/85/ΕΕ) – δημόσιο λογιστικό και άλλες διατάξεις», όπως τροποποιήθηκε και ισχύει.
12. Το Ν.4013/2011 (ΦΕΚ 204/Α'/15-09-2011) «Σύσταση ενιαίας Ανεξάρτητης Αρχής Δημοσίων Συμβάσεων και Κεντρικού Ηλεκτρονικού Μητρώου Δημοσίων Συμβάσεων – Αντικατάσταση του έκτου κεφαλαίου του Ν. 3588/2007 (πτωχευτικός κώδικας) – Προπτωχευτική διαδικασία εξυγίανσης και άλλες διατάξεις», όπως τροποποιήθηκε και ισχύει
13. Την αριθμ. 57654/2017 (ΦΕΚ 1781/Β'/23-05-2017) Υπουργική Απόφαση «Ρύθμιση ειδικότερων θεμάτων λειτουργίας και διαχείρισης του Κεντρικού Ηλεκτρονικού Μητρώου Δημοσίων Συμβάσεων (ΚΗΜΔΗΣ) του Υπουργείου Οικονομίας και Ανάπτυξης».
14. Το Ν.2690/1999 (ΦΕΚ 45/Α'/09-03-1999) «Κύρωση του Κώδικα Διοικητικής Διαδικασίας και άλλες διατάξεις» όπως τροποποιήθηκε ισχύει
15. Το Ν.3861/2010 (ΦΕΚ 112/Α/13-07-2010) «Ενίσχυση της διαφάνειας με την υποχρεωτική ανάρτηση νόμων και πράξεων των κυβερνητικών, διοικητικών και αυτοδιοικητικών οργανισμών στο διαδίκτυο «Πρόγραμμα Διαύγεια» και άλλες διατάξεις, όπως τροποποιήθηκε και ισχύει
16. Το Ν.2286/1995 (ΦΕΚ 19/Α'/01-02-1995), «Προμήθειες του δημοσίου τομέα και ρυθμίσεις σχετικών θεμάτων».
17. Το Ν. 4412/2016 (ΦΕΚ 147/Α/8-8-2016) «Δημόσιες Συμβάσεις Έργων, Προμηθειών και Υπηρεσιών (προσαρμογή στις Οδηγίες 2014/24/ΕΕ και 2014/25/ΕΕ)», όπως τροποποιήθηκε και ισχύει
18. Την με αρ. πρωτ. 326/08-02-2016 απόφαση ένταξης της Πράξης «Σύμβουλοι Υποστήριξης στο πλαίσιο της προγραμματικής περιόδου 2014-2020 / ΕΤΠΑ» στο ΠΕΠ Αττικής 2014-2020, όπως τροποποιήθηκε και ισχύει
19. Ότι με την παρούσα προκαλείται συνολική δαπάνη ύψους σαράντα τριών χιλιάδων επτακοσίων σαράντα ενός ευρώ και πενήντα λεπτών (43.741,50€), μη συμπεριλαμβανομένου του αναλογούντος ΦΠΑ, η οποία θα βαρύνει τον προϋπολογισμό των συγχρηματοδοτούμενων ενεργειών (Υποπρόγραμμα Α') του προγράμματος της Τεχνικής Υποστήριξης Εφαρμογής του Περιφερειακού Επιχειρησιακού Προγράμματος Αττικής 2014-2020, ΣΑΕΠ 0851, Κωδικός 2016ΕΠ08510001.
20. Τις ανάγκες της ΕΥΔΕΠ Περιφέρειας Αττικής και την υλοποίηση του Ε.Π. ΑΤΤΙΚΗ 2014-2020 και του εγκεκριμένου ΠΕΣΔΑ εν γένει.
21. Την με αρ. πρωτ. Οικ. 361/10-02-2016 πρόσκληση εκδήλωσης ενδιαφέροντος για εγγραφή στον κατάλογο προμηθευτών/παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περιφέρειας Αττικής.
22. Το με αρ. πρωτ. 2104/22-06-2017 έγγραφο της ΕΥΔΕΠ Περιφέρειας Αττικής «Συμπληρωματικά στοιχεία για την επικαιροποίηση εγγραφής στον κατάλογο προμηθευτών / παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περ. Αττικής».
23. Την με αρ. πρωτ. 2133/14-07-2017 βεβαίωση εγγραφής στον κατάλογο προμηθευτών /παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περιφέρειας Αττικής της εταιρείας «ΠΑΝΑΓΙΩΤΗΣ ΚΑΨΑΛΗΣ».
24. Την με αρ. πρωτ. 2126/14-07-2017 βεβαίωση εγγραφής στον κατάλογο προμηθευτών /παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περιφέρειας Αττικής της εταιρείας «ΕΝVI ΣΥΣΤΗΜΑΤΑ ΠΡΟΣΤΑΣΙΑΣ ΠΕΡΙΒΑΛΛΟΝΤΟΣ Ε.Π.Ε.».

25. Την με αρ. πρωτ. 2116/14-07-2017 βεβαίωση εγγραφής στον κατάλογο προμηθευτών /παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περιφέρειας Αττικής της εταιρείας «Α.Τ. ΣΥΜΒΟΥΛΟΙ ΔΙΟΙΚΗΣΗΣ ΧΡΗΜΑΤΟΔΟΤΗΣΗΣ ΚΑΙ ΑΝΑΠΤΥΞΗΣ Ε.Π.Ε.».

26. Την με αρ. πρωτ. 2131/14-07-2017 βεβαίωση εγγραφής στον κατάλογο προμηθευτών /παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περιφέρειας Αττικής της εταιρείας «ΚΥΡΙΑΚΟΣ ΣΤΑΜΕΛΟΣ».

ΚΑΛΕΙ

Τις εταιρείες:

- 1) «ΠΑΝΑΓΙΩΤΗΣ ΚΑΨΑΛΗΣ»
- 2) «ENVI ΣΥΣΤΗΜΑΤΑ ΠΡΟΣΤΑΣΙΑΣ ΠΕΡΙΒΑΛΛΟΝΤΟΣ Ε.Π.Ε.».
- 3) «Α.Τ. ΣΥΜΒΟΥΛΟΙ ΔΙΟΙΚΗΣΗΣ ΧΡΗΜΑΤΟΔΟΤΗΣΗΣ ΚΑΙ ΑΝΑΠΤΥΞΗΣ Ε.Π.Ε.»
- 4) «ΚΥΡΙΑΚΟΣ ΣΤΑΜΕΛΟΣ»

να υποβάλλουν προσφορά, με ισχύ εκατόν ογδόντα (180) ημερολογιακών ημερών προσμετρούμενων από την επομένη της καταληκτικής ημερομηνίας υποβολής προσφορών, στο πλαίσιο της επιλογής αναδόχου, με τη διαδικασία της ανάθεσης μέσω επιλογής από τον κατάλογο προμηθευτών/παρεχόντων υπηρεσιών βάσει των άρθρων 9, 10, 11, 12, 13 της με αρ. πρωτ. 23451/ΕΥΣΣΑ493 (ΦΕΚ 677/Β'/03-03-2017) Υπουργικής Απόφασης «Διαδικασίες κατάρτισης, έγκρισης και υλοποίησης προγραμμάτων τεχνικής βοήθειας, διαδικασίες δημιουργίας και διατήρησης καταλόγων προμηθευτών για την ανάθεση και υλοποίηση ενεργειών Τεχνικής Βοήθειας», για την υλοποίηση του Υποέργου 12 «Σύμβουλος υποστήριξης του ΕΔΣΝΑ στην υλοποίηση του ΠΕΣΔΑ Αττικής» της Πράξης «Σύμβουλοι Υποστήριξης στο πλαίσιο της προγραμματικής περιόδου 2014-2020 / ΕΤΠΑ» (MIS: 5000415), με κριτήριο την πλέον συμφέρουσα προσφορά (αποκλειστικά βάσει της χαμηλότερης τιμής).

Οι προσφορές θα υποβάλλονται σε έντυπη μορφή, στην Ελληνική Γλώσσα.

Οι υποψήφιοι Ανάδοχοι πρέπει να υποβάλουν τις Προσφορές τους, σύμφωνα με τα οριζόμενα στην παρούσα απόφαση το αργότερο μέχρι τις 18/08/2017, ημέρα Παρασκευή και ώρα 15:30 στο πρωτόκολλο της Ειδικής Υπηρεσίας Διαχείρισης Επιχειρησιακού Προγράμματος Περιφέρειας Αττικής, Λ. Συγγρού 98-100, 5ος όροφος.

Οι προσφορές μπορεί να αποστέλλονται στην Αναθέτουσα Αρχή με οποιοδήποτε τρόπο και θα παραλαμβάνονται από το εν λόγω γραφείο, όπου και θα πρωτοκολλούνται, με την απαραίτητη όμως προϋπόθεση, ότι θα περιέρχονται στην Αναθέτουσα Αρχή μέχρι και την ανωτέρω καταληκτική ημερομηνία υποβολής προσφορών.

Ο σφραγισμένος φάκελος με την προσφορά θα συνοδεύεται εξωτερικά με επιστολή ώστε να μπορεί σε αυτή να αναγράφεται ο αριθμός πρωτοκόλλου, έτσι ώστε να μην ανοιχθεί από το πρωτόκολλο ο φάκελος.

Προσφορές που υποβάλλονται ή περιέρχονται στην Υπηρεσία μετά την καθοριζόμενη από τη παρούσα απόφαση ημερομηνία και ώρα, θεωρούνται εκπρόθεσμες και επιστρέφονται χωρίς να αποσφραγιστούν.

Οι Γενικοί και Ειδικό Όροι της παρούσας Πρόσκλησης περιγράφονται αναλυτικά στα επισυναπτόμενα Παραρτήματα, τα οποία αποτελούν αναπόσπαστο μέρος της παρούσας.

Η παρούσα Απόφαση και τα συνημμένα Παραρτήματα αυτής, μπορούν να παραλαμβάνονται από τους ενδιαφερόμενους από το πρωτόκολλο της ΕΥΔΕΠ Περιφέρειας Αττικής, Λ. Συγγρού 98-100, 5ος όροφος. Το κείμενο της παρούσης διατίθεται και σε ηλεκτρονική μορφή μέσω διαδικτύου, στην ιστοσελίδα της ΕΥΔΕΠ Περιφέρειας Αττικής (www.peppattikis.gr).

Η τελική επιλογή του Αναδόχου θα πραγματοποιηθεί με απόφαση της Αναθέτουσας Αρχής μετά την γνωμοδότηση της Επιτροπής Αξιολόγησης της ΕΥΔΕΠ Περιφέρειας Αττικής στο πλαίσιο του

υποπρογράμματος Α΄ της Τεχνικής Υποστήριξης της εφαρμογής του ΠΕΠ Αττικής, βασιζόμενη στο κριτήριο αξιολόγησης που αναφέρεται στην παρούσα απόφαση.

Μεταξύ του Αναδόχου και της ΕΥΔΕΠ Περιφέρειας Αττικής εκπροσωπούμενης από την Περιφερειάρχη Αττικής θα υπογραφεί σχετική σύμβαση, στην οποία θα αναφέρονται λεπτομερώς οι υποχρεώσεις τους. Η κατακύρωση του διαγωνισμού θα γίνει στον υποψήφιο που θα προσφέρει την πλέον συμφέρουσα προσφορά, αποκλειστικά βάσει της χαμηλότερης τιμής, και η προσφορά της καλύπτει τους όρους της παρούσας απόφασης. Σε περίπτωση που ο μειοδότης δεν προσέλθει μέσα στην προθεσμία που θα του οριστεί να υπογράψει τη σχετική σύμβαση ή αρνηθεί να εκτελέσει ή εκτελέσει αυτή μερικώς ή πλημμελώς, κατά παράβαση των όρων της παρούσης, κηρύσσεται έκπτωτος και επιλέγεται ο μειοδότης με την αμέσως χαμηλότερη τιμή κ.ο.κ..

Οι πληρωμές γίνονται έπειτα από την παραλαβή από την αρμόδια επιτροπή και αφού υποβληθούν στην Υπηρεσία μας, τα νόμιμα δικαιολογητικά.

Οι επιβαρύνσεις επί των κρατήσεων και οι προβλεπόμενοι φόροι βαρύνουν τον Ανάδοχο.

Η παρούσα να δημοσιευθεί για δέκα (10) ημέρες, στην ιστοσελίδα της ΕΥΔΕΠ Περιφέρειας Αττικής (www.peppattikis.gr).

Η Περιφερειάρχη Αττικής

Ρένα Δούρου

Πίνακας Αποδεκτών

1) «ΠΑΝΑΓΙΩΤΗΣ ΚΑΨΑΛΗΣ»

Δ. Σωτηρίου 11, Τ.Κ. 190 03, Μαρκόπουλο

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2) «ΕΝVI ΣΥΣΤΗΜΑΤΑ ΠΡΟΣΤΑΣΙΑΣ ΠΕΡΙΒΑΛΛΟΝΤΟΣ Ε.Π.Ε.»

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e-mail: envi@otenet.gr

3) «Α.Τ. ΣΥΜΒΟΥΛΟΙ ΔΙΟΙΚΗΣΗΣ ΧΡΗΜΑΤΟΔΟΤΗΣΗΣ ΚΑΙ ΑΝΑΠΤΥΞΗΣ Ε.Π.Ε.»

Πατρ. Ιωακείμ 45, Τ.Κ. 106 76, Αθήνα

e-mail: atmanage@otenet.gr

4) «ΚΥΡΙΑΚΟΣ ΣΤΑΜΕΛΟΣ»

Όθωνος 22, Τ.Κ. 152 31, Χαλάνδρι

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Εσωτερική Διανομή

Μονάδα Γ΄

Συνημμένα:

Παραρτήματα Α - Γ

ΠΑΡΑΡΤΗΜΑ Α**1. Αντικείμενο του έργου**

Σκοπός του έργου είναι η υποστήριξη για την τεκμηρίωση σκοπιμότητας για τα μεγάλα έργα αποχέτευσης τα οποία θα πραγματοποιηθούν στην Αν. Αττική. Οι προδιαγραφές ορίζονται από την ομάδα Jaspers της Ευρωπαϊκής Τράπεζας Επενδύσεων και παρατίθενται στο παράρτημα Δ', το οποίο αποτελεί αναπόσπαστο τμήμα της παρούσας πρόσκλησης.

2. Διάρκεια υλοποίησης του έργου

Η διάρκεια της σύμβασης ορίζεται σε πέντε (5) μήνες από την ημερομηνία υπογραφής της.

3. Παραδοτέα του έργου – Χρονοδιάγραμμα παράδοσης

Ο Ανάδοχος έχει την υποχρέωση υποβολής ενός (1) παραδοτέου, το οποίο περιλαμβάνει δύο (2) Μελέτες Σκοπιμότητας για τα δύο (2) Μεγάλα Έργα Αποχέτευσης της Ανατολικής Αττικής (Ραφήνα-Αρτέμιδα & Ν. Μάκρη-Μαραθώνα).

4. Προϋπολογισμός – Προεκτιμώμενη αμοιβή

Ο προϋπολογισμός ανέρχεται στο συνολικό ποσό των σαράντα τριών χιλιάδων επτακοσίων σαράντα ενός ευρώ και πενήντα λεπτών (43.741,50€), μη συμπεριλαμβανομένου του αναλογούντος ΦΠΑ

Η εν λόγω δαπάνη θα βαρύνει το Πρόγραμμα συγχρηματοδοτούμενων ενεργειών (Υποπρόγραμμα Α') του προγράμματος της Τεχνικής Υποστήριξης Εφαρμογής του Περιφερειακού Επιχειρησιακού Προγράμματος Αττικής 2014-2020, ΣΑΕΠ 0851, Κωδικός 2016ΕΠ08510001.

Στο ανωτέρω τίμημα περιλαμβάνονται όλες οι απαραίτητες αμοιβές και δαπάνες για την εκτέλεση του έργου, χωρίς καμία περαιτέρω επιβάρυνση της Αναθέτουσας Αρχής έστω και εξ επιγενόμενης αιτίας και ενδεικτικά:

- η αμοιβή του προσωπικού που διαθέτει ο Ανάδοχος.
- κάθε δαπάνη που αφορά οποιονδήποτε τρίτο σχετικό με τις υπηρεσίες αυτές, συμπεριλαμβανομένων των εισφορών σε Ασφαλιστικά Ταμεία οποιασδήποτε φύσης, της ασφάλισης έναντι όλων των ατυχημάτων (προσώπων, περιουσιών κλπ.) ή υποχρεώσεων έναντι τρίτων κατά την εκτέλεση των υπηρεσιών της παρούσας ή εξ αφορμής αυτών.
- Δεν προβλέπεται αναπροσαρμογή της αμοιβής του Αναδόχου κατά τη διάρκεια εκτέλεσης των Υπηρεσιών που θα αναλάβει, σύμφωνα με την σχετική σύμβαση.

Ο Ανάδοχος επιβαρύνεται με κάθε νόμιμη ασφαλιστική εισφορά και κράτηση υπέρ νομικών προσώπων ή άλλων οργανισμών, η οποία, κατά νόμο, βαρύνει τον Ανάδοχο.

ΠΑΡΑΡΤΗΜΑ Β**1. Νομοθετικό Πλαίσιο**

Η όλη διαδικασία θα γίνει με βάση τα προβλεπόμενα:

- α) του Ν.4412/2016 (ΦΕΚ 147/Α'/2016) «Δημόσιες Συμβάσεις Έργων, Προμηθειών και Υπηρεσιών (προσαρμογή στις οδηγίες 2014/24/ΕΕ και 2014/25/ΕΕ)», όπως τροποποιήθηκε και ισχύει
 β) την με αρ.πρωτ. 110427/ΕΥΘΥ/1020 (ΦΕΚ 3521/Β'/01-11-2016) Υπουργική Απόφαση «Τροποποίηση και αντικατάσταση της υπ' αριθ.81986/ΕΥΘΥ712/31.07.2015 (ΦΕΚ Β' 1822) Υπουργικής Απόφασης «Εθνικοί κανόνες επιλεξιμότητας δαπανών για τα προγράμματα του ΕΣΠΑ 2014 – 2020 – Έλεγχοι νομιμότητας δημοσίων συμβάσεων συγχρηματοδοτούμενων πράξεων ΕΣΠΑ 2014-2020 από Αρχές Διαχείρισης και Ενδιάμεσους Φορείς – Διαδικασία ενστάσεων επί των αποτελεσμάτων αξιολόγησης πράξεων»
 γ) την υπ' αριθμ. 23451/ΕΥΣΣΑ493 (ΦΕΚ 677/Β'/03-03-2017) Υπουργική Απόφαση «Διαδικασίες κατάρτισης, έγκρισης και υλοποίησης προγραμμάτων τεχνικής βοήθειας, διαδικασίες δημιουργίας και διατήρησης καταλόγων προμηθευτών για την ανάθεση και υλοποίηση ενεργειών Τεχνικής Βοήθειας»

2. Δικαιώματα και Προϋποθέσεις Συμμετοχής

Η παρούσα πρόσκληση αποστέλλεται στους υποψηφίους που προεπιλέχθηκαν από την ΕΥΔΕΠ Περιφέρειας Αττικής από τον κατάλογο προμηθευτών για την συμμετοχή στην πρόσκληση ενδιαφέροντος.

Οι συγκεκριμένοι υποψήφιοι και μόνο έχουν δικαίωμα υποβολής πρότασης.

3. Προθεσμία - Τόπος Υποβολής Προσφορών

Οι προσφορές θα κατατίθενται στα γραφεία της ΕΥΔΕΠ Περιφέρειας Αττικής Περιφέρειας Αττικής, (Συγγρού 98-100 στο Γραφείο Πρωτοκόλλου, 5ος όροφος), μέχρι τις 18/08/2017, ημέρα Παρασκευή και ώρα 15:30.

Οι προσφορές μπορούν να υποβληθούν και ταχυδρομικά στην προαναφερθείσα διεύθυνση ως συστημένες.

Οι προσφορές θα παραλαμβάνονται από το εν λόγω γραφείο, όπου και θα πρωτοκολλούνται, με την απαραίτητη όμως προϋπόθεση, ότι αυτές θα περιέρχονται στην Αναθέτουσα Αρχή μέχρι και την ανωτέρω καταληκτική ημερομηνία υποβολής προσφορών. Ο σφραγισμένος φάκελος με την προσφορά θα συνοδεύεται εξωτερικά με επιστολή ώστε να μπορεί σε αυτή να αναγράφεται ο αριθμός πρωτοκόλλου, έτσι ώστε να μην ανοιχθεί από το πρωτόκολλο ο φάκελος. Η προσφορά θα έχει ισχύ εκατόν ογδόντα (180) ημερολογιακών ημερών προσμετρούμενων από την επομένη της καταληκτικής ημερομηνίας υποβολής προσφορών.

Προσφορές που υποβάλλονται ή περιέρχονται στην Υπηρεσία μετά την καθοριζόμενη από τη παρούσα απόφαση ημερομηνία και ώρα, θεωρούνται εκπρόθεσμες και επιστρέφονται χωρίς να αποσφραγιστούν. Η ημερομηνία σφραγίδας ταχυδρομείου δεν λαμβάνεται υπόψη.

4. Τρόπος Υποβολής Εγγράφων

Ο σφραγισμένος φάκελος της Προσφοράς θα συνοδεύεται από συνοδευτική επιστολή/αίτηση συμμετοχής, προς την Αναθέτουσα Αρχή, στην οποία πρέπει να αναφέρονται τα στοιχεία του υποψηφίου και του σχετικού διαγωνισμού. Στον φάκελο της Προσφοράς θα αναγράφονται ευκρινώς τα εξής:

*Ονοματεπώνυμο προσφέροντος φυσικού προσώπου
ή Επωνυμία νομικού προσώπου, ένωσης ή κοινοπραξίας οικονομικών φορέων
Ταχυδρομική διεύθυνση, Τηλέφωνο, Αριθμός τηλεομοιοτυπίας
Διεύθυνση ηλεκτρονικού ταχυδρομείου*

ΠΡΟΣ:

ΕΥΔΕΠ Περιφέρειας Αττικής
Λ. Συγγρού 98-100, 5ος όροφος
«ΦΑΚΕΛΟΣ ΠΡΟΣΦΟΡΑΣ»

ΓΙΑ ΤΗΝ ΕΠΙΛΟΓΗ ΑΝΑΔΟΧΟΥ ΥΛΟΠΟΙΗΣΗΣ ΤΟΥ ΥΠΟΕΡΓΟΥ

«Σύμβουλος υποστήριξης κατά την τεκμηρίωση σκοπιμότητας για τα έργα αποχέτευσης της Περ.
Ενότητας Ανατ. Αττικής»

Ημερομηνία: (ημερομηνία)

«Να ΜΗΝ αποσφραγισθεί από την ταχυδρομική υπηρεσία ή το πρωτόκολλο»

Δεν πρέπει να χρησιμοποιηθούν αυτοκόλλητοι φάκελοι, οι οποίοι είναι δυνατόν να αποσφραγισθούν και να επανασφραγισθούν χωρίς να αφήσουν ίχνη.

Ο φάκελος συνοδεύεται από επιστολή, στην οποία θα πρέπει να αναφέρεται ο Προσφέρων που υποβάλλει την προσφορά.

Ο φάκελος μπορεί να υποβληθεί και ταχυδρομικά στην προαναφερθείσα διεύθυνση ως συστημένος.

Ο φάκελος θα παραλαμβάνεται από το εν λόγω γραφείο, όπου και θα πρωτοκολλάται, με την απαραίτητη όμως προϋπόθεση, ότι θα περιέχεται στην Αναθέτουσα Αρχή μέχρι και την ανωτέρω καταληκτική ημερομηνία υποβολής προσφορών. Ο σφραγισμένος φάκελος θα συνοδεύεται εξωτερικά με επιστολή ώστε να μπορεί σε αυτή να αναγράφεται ο αριθμός πρωτοκόλλου, έτσι ώστε να μην ανοιχθεί από το πρωτόκολλο ο φάκελος.

Φάκελοι που υποβάλλονται ή περιέρχονται στην Υπηρεσία μετά την καθοριζόμενη από τη παρούσα απόφαση ημερομηνία και ώρα, θεωρούνται εκπρόθεσμοι και επιστρέφονται χωρίς να αποσφραγιστούν.

Η ημερομηνία σφραγίδας ταχυδρομείου δεν λαμβάνεται υπόψη.

Εντός του σφραγισμένου φακέλου επιβάλλεται να περιλαμβάνονται δύο διακριτοί, σφραγισμένοι φάκελοι, ως εξής:

α) «ΦΑΚΕΛΟΣ ΔΙΚΑΙΟΛΟΓΗΤΙΚΩΝ», στον οποίο θα αναγράφονται ευκρινώς τα εξής:

*Ονοματεπώνυμο προσφέροντος φυσικού προσώπου
ή Επωνυμία νομικού προσώπου, ένωσης ή κοινοπραξίας οικονομικών φορέων
Ταχυδρομική διεύθυνση, Τηλέφωνο, Αριθμός τηλεμοιοτυπίας
Διεύθυνση ηλεκτρονικού ταχυδρομείου*

ΠΡΟΣ:

ΕΥΔΕΠ Περιφέρειας Αττικής
Λ. Συγγρού 98-100, 5ος όροφος
«ΦΑΚΕΛΟΣ ΠΡΟΣΦΟΡΑΣ»

ΓΙΑ ΤΗΝ ΕΠΙΛΟΓΗ ΑΝΑΔΟΧΟΥ ΥΛΟΠΟΙΗΣΗΣ ΤΟΥ ΥΠΟΕΡΓΟΥ
«Σύμβουλος υποστήριξης κατά την τεκμηρίωση σκοπιμότητας για τα έργα αποχέτευσης της Περ.
Ενότητας Ανατ. Αττικής»

Ημερομηνία: (ημερομηνία)

«Να ΜΗΝ αποσφραγισθεί από την ταχυδρομική υπηρεσία ή το πρωτόκολλο»

Δεν πρέπει να χρησιμοποιηθούν αυτοκόλλητοι φάκελοι, οι οποίοι είναι δυνατόν να αποσφραγισθούν και να επανασφραγισθούν χωρίς να αφήσουν ίχνη.

Ο Φάκελος Δικαιολογητικών επιβάλλεται, επί ποινή αποκλεισμού, να περιέχει τα παρακάτω:

1. Υπεύθυνη Δήλωση του συμμετέχοντα ότι δεν έχει επέλθει καμία μεταβολή στα στοιχεία που έχουν υποβληθεί και συμπεριλαμβάνονται στον κατάλογο προμηθευτών /παρεχόντων υπηρεσιών της ΕΥΔΕΠ Περιφέρειας Αττικής

2. Υπεύθυνη Δήλωση του συμμετέχοντα ότι:

- Αποδέχεται ανεπιφύλακτα τους όρους της παρούσας Διακήρυξης.
- Η προσφορά συντάχθηκε σύμφωνα με τους όρους της παρούσας Διακήρυξης, των οποίων ο Προσφέρων έλαβε πλήρη και ανεπιφύλακτο γνώση.
- Η υποβαλλόμενη προσφορά καλύπτει το σύνολο του προκηρυσσόμενου έργου.
- Τα στοιχεία που αναφέρονται στην προσφορά είναι αληθή και ακριβή.
- Πληρεί τις προϋποθέσεις συμμετοχής που τίθενται στην παρούσα Πρόσκληση
- Στην περίπτωση, που αναδειχθεί ως ο Ανάδοχος, θα εκπληρώσει στο ακέραιο το αντικείμενο, σύμφωνα με τα οριζόμενα στην παρούσα Πρόσκληση

3. Για τα νομικά πρόσωπα Πρακτικό Απόφασης του Διοικητικού Συμβουλίου ή του Διοικούντος Οργάνου του Προσφέροντος με το οποίο:

- Εγκρίνεται η συμμετοχή του στην παρούσα πρόσκληση.
- Εγκρίνεται και παρέχεται σε συγκεκριμένο άτομο ή άτομα (νόμιμος εκπρόσωπος) εξουσιοδότηση να υπογράψει όλα τα απαιτούμενα δικαιολογητικά (της προσφοράς συμπεριλαμβανομένης) να καταθέσει την προσφορά – τα έγγραφα, καθώς και να υπογράψει οποιοδήποτε σχετικό έγγραφο απαιτηθεί.

β) «ΦΑΚΕΛΟΣ ΟΙΚΟΝΟΜΙΚΗΣ ΠΡΟΣΦΟΡΑΣ», στον οποίο θα αναγράφονται ευκρινώς τα εξής:

Όνοματεπώνυμο προσφέροντος φυσικού προσώπου
ή Επωνυμία νομικού προσώπου, ένωσης ή κοινοπραξίας οικονομικών φορέων
Ταχυδρομική διεύθυνση, Τηλέφωνο, Αριθμός τηλεμοιαιότητας
Διεύθυνση ηλεκτρονικού ταχυδρομείου

ΠΡΟΣ:

ΕΥΔΕΠ Περιφέρειας Αττικής
Λ. Συγγρού 98-100, 5ος όροφος
«ΦΑΚΕΛΟΣ ΠΡΟΣΦΟΡΑΣ»

ΓΙΑ ΤΗΝ ΕΠΙΛΟΓΗ ΑΝΑΔΟΧΟΥ ΥΛΟΠΟΙΗΣΗΣ ΤΟΥ ΥΠΟΕΡΓΟΥ

«Σύμβουλος υποστήριξης κατά την τεκμηρίωση σκοπιμότητας για τα έργα αποχέτευσης της Περ.
Ενότητας Ανατ. Αττικής»

Ημερομηνία: (ημερομηνία)

«Να ΜΗΝ αποσφραγισθεί από την ταχυδρομική υπηρεσία ή το πρωτόκολλο»

Δεν πρέπει να χρησιμοποιηθούν αυτοκόλλητοι φάκελοι, οι οποίοι είναι δυνατόν να αποσφραγισθούν και να επανασφραγισθούν χωρίς να αφήσουν ίχνη.

Ο Φάκελος Οικονομικής Προσφοράς, επιβάλλεται να περιέχει το κατ' αποκοπή τίμημα για την παροχή των υπηρεσιών του Έργου, το οποίο αναγράφεται αριθμητικώς και ολογράφως και εκφράζεται σε ΕΥΡΩ, το οποίο δεν μπορεί να υπερβεί το ποσό του προϋπολογισμού.

Διευκρινίζεται ότι:

α. Στο ποσό αυτό θα περιλαμβάνονται οι τυχόν κρατήσεις υπέρ τρίτων καθώς και κάθε άλλη δαπάνη που σχετίζεται με το έργο (αμοιβές προσωπικού, έξοδα μετακινήσεων κλπ). Επισημαίνεται ότι εφόσον δεν προκύπτει με σαφήνεια η προσφερόμενη τιμή, η προσφορά θα απορρίπτεται ως απαράδεκτη. Οι προσφερόμενες τιμές θα πρέπει να περιλαμβάνουν το σύνολο των προβλεπόμενων επιβαρύνσεων και δαπανών του αναδόχου για την πλήρη εκτέλεση του Έργου.

β. Οι τιμές της προσφοράς δεν υπόκεινται σε μεταβολή κατά την διάρκεια ισχύος της προσφοράς και εκτέλεσης της σύμβασης. Ο υποψήφιος ανάδοχος έχει μελετήσει και εκτιμήσει τις απαιτήσεις του έργου και τα οικονομικά μεγέθη που θα απαιτηθούν για την καλή εκτέλεση των εργασιών και εγγυάται για την ακρίβεια των επί μέρους στοιχείων του κόστους. Κατά συνέπεια ρητά συμφωνείται ότι καμία αξίωση για πρόσθετη χρηματοδότηση δεν θα μπορεί να προβληθεί από τον ανάδοχο, ο οποίος δηλώνει ότι παραιτείται απ' όλα τα δικαιώματα που προκύπτουν από τα άρθρα 388, 696 και 697 του Αστικού Κώδικα.

γ. Τα τιμολόγια του αναδόχου θα είναι σε Ευρώ. Η καταβολή των αμοιβών του θα γίνεται στην Ελλάδα σε Ευρώ σύμφωνα με την ισχύουσα νομοθεσία.

δ. Ο Ανάδοχος επιβαρύνεται με κάθε άλλη νόμιμη ασφαλιστική εισφορά και κράτηση υπέρ Νομικών Προσώπων ή άλλων Οργανισμών, η οποία κατά νόμο βαρύνει τον Παρέχοντα τις υπηρεσίες (Ανάδοχο).

ε. Η Αναθέτουσα Αρχή διατηρεί το δικαίωμα να ζητήσει από τους συμμετέχοντες πρόσθετα στοιχεία για την τεκμηρίωση του εύλογου ή μη των προσφερόμενων τιμών, οι δε συμμετέχοντες υποχρεούνται να παρέχουν αυτά.

Σημειώνεται ότι ο προσφέρων οφείλει επί ποινή αποκλεισμού να συμπεριλάβει συμπληρωμένο τον Πίνακα 1 (ΠΑΡΑΡΤΗΜΑ Γ), ο οποίος περιλαμβάνει την οικονομική προσφορά του για το σύνολο του έργου, η οποία αναγράφεται αριθμητικώς και ολογράφως και εκφράζεται σε ΕΥΡΩ.

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Διευκρινίζεται ότι:

- α) Η συμπλήρωση του Πίνακα 1 (ΠΑΡΑΡΤΗΜΑ Γ), θα πραγματοποιηθεί εισάγοντας μία μόνο τιμή (αριθμητικώς και ολογράφως).
- β) Στοιχεία ή ενδείξεις που καθιστούν την ΟΙΚΟΝΟΜΙΚΗ ΠΡΟΣΦΟΡΑ (Πίνακας 1, ΠΑΡΑΡΤΗΜΑ Γ) αόριστη, συνεπάγονται την απόρριψη της.
- γ) Η μη συμπλήρωση τιμής (αριθμητικώς και ολογράφως) του Πίνακα 1 (ΠΑΡΑΡΤΗΜΑ Γ), συνεπάγεται την απόρριψη της προσφοράς.
- δ) στην περίπτωση ασυμφωνίας μεταξύ της αναγραφόμενης τιμής ολογράφως και της αναγραφόμενης τιμής αριθμητικώς, υπερισχύει η αναγραφόμενη τιμή ολογράφως

5. Χρονική Ισχύς Προσφορών

Η προσφορά θα έχει ισχύ εκατόν ογδόντα (180) ημερολογιακών ημερών προσμετρούμενων από την επομένη της καταληκτικής ημερομηνίας υποβολής προσφορών. Προσφορές που αναφέρουν χρόνο ισχύος μικρότερο των εκατόν ογδόντα (180) ημερολογιακές απορρίπτονται ως απαράδεκτες.

6. Αξιολόγηση Προσφορών

Η Επιτροπή Αξιολόγησης του διαγωνισμού θα ελέγξει τα υποβαλλόμενα στοιχεία, με βάση τα ως άνω αναφερόμενα, και την προσφορά του υποψηφίου. Εφόσον η προσφορά του υποψηφίου πληροί τα ως άνω αναφερόμενα, θα γίνει κατακύρωση του έργου στον Ανάδοχο με απόφαση της Αναθέτουσας Αρχής.

Ο υποψήφιος θα κληθεί να υπογράψει σύμβαση με την Αναθέτουσα Αρχή, που θα βασίζεται στους όρους της παρούσας πρόσκλησης. Η σύμβαση δύναται να τροποποιηθεί όταν τούτο προβλέπεται από συμβατικό όρο ή όταν συμφωνήσουν προς τούτο και τα δύο συμβαλλόμενα μέρη, ύστερα από γνωμοδότηση του αρμόδιου οργάνου.

Σημειώνεται ότι η Αναθέτουσα Αρχή διατηρεί το δικαίωμα να ματαιώσει ή να επαναλάβει το διαγωνισμό, σταθμίζοντας τα συμφέροντα και τις ανάγκες της Αναθέτουσας Αρχής.

7. Δικαιολογητικά Κατακύρωσης

Ο προσωρινός Ανάδοχος καλείται, εντός προθεσμίας είκοσι (20) εργάσιμων ημερών από τη σχετική ειδοποίηση, να υποβάλλει σε σφραγισμένο φάκελο με σήμανση «Δικαιολογητικά Κατακύρωσης», τα παρακάτω δικαιολογητικά κατακύρωσης τα οποία αποκλείουν ότι ο προσωρινός Ανάδοχος:

- Βρίσκεται σε πτώχευση, εκκαθάριση, παύση δραστηριοτήτων, αναγκαστική διαχείριση ή πτωχευτικό συμβιβασμό ή σε οποιαδήποτε ανάλογη κατάσταση που προκύπτει από παρόμοια διαδικασία προβλεπόμενη από τις κατά περίπτωση εφαρμοζόμενες νομοθετικές και κανονιστικές διατάξεις.
- Έχει κινηθεί εναντίον του διαδικασία κήρυξης σε πτώχευση, εκκαθάριση, ή έκδοσης απόφασης αναγκαστικής διαχείρισης, πτωχευτικού συμβιβασμού, ή οποιαδήποτε άλλη ανάλογη διαδικασία προβλεπόμενη από τις κατά περίπτωση εφαρμοζόμενες νομοθετικές και κανονιστικές διατάξεις.
- Έχει καταδικασθεί με δικαστική απόφαση με ισχύ δεδικασμένου για αδίκημα που αφορά την επαγγελματική διαγωγή του.

Έχει διαπράξει επαγγελματικό παράπτωμα, που μπορεί να διαπιστωθεί με οποιοδήποτε μέσο από τις αναθέτουσες αρχές.

Είναι ένοχος υποβολής ψευδούς δηλώσεως ή παραλείψεως υποβολής των πληροφοριών που απαιτούνται κατ' εφαρμογή του παρόντος κεφαλαίου.

Επιπρόσθετα ο προσωρινός Ανάδοχος υποχρεούται να υποβάλει τα ακόλουθα:

Σελ. 10 από 79

- Πιστοποιητικό του οικείου Επιμελητηρίου,
- Πιστοποιητικό Φορολογικής Ενημερότητας,
- Πιστοποιητικό Ασφαλιστικής Ενημερότητας.

Ο σφραγισμένος φάκελος των δικαιολογητικών κατακύρωσης θα συνοδεύεται από συνοδευτική επιστολή/αίτηση συμμετοχής, προς την Αναθέτουσα Αρχή, στην οποία πρέπει να αναφέρονται τα στοιχεία του υποψηφίου και της σχετικής πρόκλησης. Στον φάκελο των δικαιολογητικών κατακύρωσης θα αναγράφονται ευκρινώς τα εξής:

*Ονοματεπώνυμο προσφέροντος φυσικού προσώπου
ή Επωνυμία νομικού προσώπου, ένωσης ή κοινοπραξίας οικονομικών φορέων
Ταχυδρομική διεύθυνση, Τηλέφωνο, Αριθμός τηλεομοιοτυπίας, Διεύθυνση ηλεκτρονικού ταχυδρομείου*

ΠΡΟΣ:

ΕΥΔΕΠ Περιφέρειας Αττικής

Λ. Συγγρού 98-100, 5ος όροφος

«ΦΑΚΕΛΟΣ ΔΙΚΑΙΟΛΟΓΗΤΙΚΩΝ ΚΑΤΑΚΥΡΩΣΗΣ»

ΓΙΑ ΤΗΝ ΕΠΙΛΟΓΗ ΑΝΑΔΟΧΟΥ ΥΛΟΠΟΙΗΣΗΣ ΤΗΣ ΥΠΟΕΡΓΟΥ

«Σύμβουλος υποστήριξης κατά την τεκμηρίωση σκοπιμότητας για τα έργα αποχέτευσης της Περ.
Ενότητας Ανατ. Αττικής»

Ημερομηνία: (ημερομηνία)

«Να ΜΗΝ αποσφραγισθεί από την ταχυδρομική υπηρεσία ή το πρωτόκολλο»

Δεν πρέπει να χρησιμοποιηθούν αυτοκόλλητοι φάκελοι, οι οποίοι είναι δυνατόν να αποσφραγισθούν και να επανασφραγισθούν χωρίς να αφήσουν ίχνη.

Ο φάκελος συνοδεύεται από επιστολή, στην οποία θα πρέπει να αναφέρεται ο Υποψήφιος Ανάδοχος που υποβάλλει τα Δικαιολογητικά Κατακύρωσης.

Ο φάκελος μπορεί να υποβληθεί και ταχυδρομικά στην προαναφερθείσα διεύθυνση ως συστημένος.

Ο φάκελος θα παραλαμβάνεται από το εν λόγω γραφείο, όπου και θα πρωτοκολλάται, με την απαραίτητη όμως προϋπόθεση, ότι θα περιέχεται στην Αναθέτουσα Αρχή μέχρι και την καταληκτική ημερομηνία υποβολής. Ο σφραγισμένος φάκελος θα συνοδεύεται εξωτερικά με επιστολή ώστε να μπορεί σε αυτή να αναγράφεται ο αριθμός πρωτοκόλλου, έτσι ώστε να μην ανοιχθεί από το πρωτόκολλο ο φάκελος.

Φάκελοι που υποβάλλονται ή περιέρχονται στην Υπηρεσία μετά την καθοριζόμενη ημερομηνία και ώρα, θεωρούνται εκπρόθεσμοι και επιστρέφονται χωρίς να αποσφραγιστούν.

Η ημερομηνία σφραγίδας ταχυδρομείου δεν λαμβάνεται υπόψη.

Σημειώνεται ότι η μη έγκαιρη και προσήκουσα υποβολή των Δικαιολογητικών κατακύρωσης συνιστά λόγο αποκλεισμού του υποψηφίου Αναδόχου. Σε αυτή την περίπτωση η Αναθέτουσα Αρχή καλεί τον επόμενο σε σειρά στον Πίνακα Κατάταξης των διαγωνιζομένων υποψήφιο Ανάδοχο να υποβάλλει τα Δικαιολογητικά Κατακύρωσης και συνεχίζεται η διαδικασία ως ανωτέρω.

8. Τρόπος Πληρωμής του Αναδόχου

Το ποσό θα καταβληθεί στον Ανάδοχο σε μία (1) δόση και θα έπεται της παραλαβής του Παραδοτέου.

Η αμοιβή του Αναδόχου θα καθοριστεί με βάση την οικονομική προσφορά που θα υποβάλει για την εκτέλεση του έργου. Οι προσφερόμενες τιμές αναφέρονται στη συνολική αμοιβή για τις υπηρεσίες που θα προσφέρει ο Ανάδοχος και είναι σταθερές καθ' όλη τη διάρκεια του έργου.

Σε κάθε περίπτωση, η αμοιβή δεν μπορεί να υπερβαίνει το ποσό του προϋπολογισμού.

Κάθε πληρωμή του αναδόχου θα υπόκειται σε όλες τις προβλεπόμενες από τον νόμο παρακρατήσεις.

9. Εγγυητική Επιστολή Καλής Εκτέλεσης

Ο Ανάδοχος στον οποίο θα ανατεθεί το έργο είναι υποχρεωμένος για την υπογραφή της σύμβασης να καταθέσει Εγγυητική Επιστολή Καλής Εκτέλεσης η οποία θα καλύπτει ποσοστό 5% της συνολικής τιμής κατακύρωσης του έργου. Ο χρόνος ισχύος της εγγύησης καλής εκτέλεσης πρέπει να είναι μεγαλύτερος κατά δύο (2) μήνες από τον συμβατικό χρόνο ολοκλήρωσης του έργου. Η Εγγυητική Καλής Εκτέλεσης της σύμβασης επιστρέφεται μετά την οριστική παραλαβή του έργου.

10. Παρακολούθηση - Παραλαβή του Έργου του Αναδόχου

Η επίβλεψη και η παραλαβή του έργου θα πραγματοποιείται από τριμελή Επιτροπή Παρακολούθησης και Παραλαβής (ΕΠΠΕ). Κατά τη διάρκεια υλοποίησης του έργου ο Ανάδοχος υποχρεούται να συμμορφώνεται με τις υποδείξεις της Επιτροπής, το έργο της οποίας είναι:

- η συνεργασία με τον Ανάδοχο
- η συμβατική επίβλεψη, η διατύπωση παρατηρήσεων και διορθώσεων
- ο έλεγχος της πορείας του έργου με κάθε πρόσφορο μέσο
- η προσωρινή και οριστική παραλαβή των παραδοτέων από τον Ανάδοχο, προκειμένου να εκκαθαριστεί και να καταβληθεί στον Ανάδοχο το συμφωνηθέν τίμημα

11. Ενστάσεις

Επιτρέπεται η έγγραφη υποβολή ένστασης, σύμφωνα με τα οριζόμενα του αρθ. 13 της υπ' αριθμ. 23451/ΕΥΣΣΑ493 (ΦΕΚ 677/Β'/03-03-2017) Υπουργικής Απόφασης «Διαδικασίες κατάρτισης, έγκρισης και υλοποίησης προγραμμάτων τεχνικής βοήθειας, διαδικασίες δημιουργίας και διατήρησης καταλόγων προμηθευτών για την ανάθεση και υλοποίηση ενεργειών Τεχνικής Βοήθειας». Ενστάσεις που υποβάλλονται για οποιουσδήποτε άλλους λόγους, εκτός από τους προαναφερόμενους, δεν γίνονται δεκτές

ΠΑΡΑΡΤΗΜΑ Γ**Πίνακας 1**

<p>ΟΙΚΟΝΟΜΙΚΗ ΠΡΟΣΦΟΡΑ</p> <p>.....</p> <p>.....</p> <p>(Επωνυμία)</p> <p>Έργο: <u>«Σύμβουλος υποστήριξης κατά την τεκμηρίωση σκοπιμότητας για τα έργα αποχέτευσης της Περ. Ενότητας Ανατ. Αττικής»</u></p> <p>Το Συνολικό Τίμημα του προτεινόμενου έργου ανέρχεται σε:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 5px;">ΠΙΝΑΚΑΣ ΣΥΝΟΛΙΚΟΥ ΚΟΣΤΟΥΣ</td> <td></td> </tr> <tr> <td style="text-align: center; padding: 5px;">ΣΥΝΟΛΙΚΟ ΠΟΣΟ</td> <td style="text-align: right; padding: 5px;">*</td> </tr> <tr> <td style="text-align: center; padding: 5px;"></td> <td style="text-align: right; padding: 5px;">**</td> </tr> </table> <p>* αριθμητικώς <u>ΜΗ</u> συμπεριλαμβανομένου του αναλογούντος ΦΠΑ ** ολογράφως <u>ΜΗ</u> συμπεριλαμβανομένου του αναλογούντος ΦΠΑ</p>	ΠΙΝΑΚΑΣ ΣΥΝΟΛΙΚΟΥ ΚΟΣΤΟΥΣ		ΣΥΝΟΛΙΚΟ ΠΟΣΟ	*		**
ΠΙΝΑΚΑΣ ΣΥΝΟΛΙΚΟΥ ΚΟΣΤΟΥΣ						
ΣΥΝΟΛΙΚΟ ΠΟΣΟ	*					
	**					

Διευκρινίζεται ότι:

- α) Η συμπλήρωση του ανωτέρω Πίνακα 1, θα πραγματοποιηθεί εισάγοντας μία μόνο τιμή (αριθμητικώς και ολογράφως).
- β) Στοιχεία ή ενδείξεις που καθιστούν την ΟΙΚΟΝΟΜΙΚΗ ΠΡΟΣΦΟΡΑ (Πίνακας 1) αόριστη, συνεπάγονται την απόρριψη της.
- γ) Η μη συμπλήρωση τιμής (αριθμητικώς και ολογράφως) του ανωτέρω Πίνακα 1, συνεπάγεται την απόρριψη της προσφοράς.
- δ) στην περίπτωση ασυμφωνίας μεταξύ της αναγραφόμενης τιμής ολογράφως και της αναγραφόμενης τιμής αριθμητικώς, υπερισχύει η αναγραφόμενη τιμή ολογράφως

ΠΑΡΑΡΤΗΜΑ Δ

EXAMPLE ON HOW TO PREPARE TECHNICAL REPORT FOR PROJECT APPLICATIONS FOR WATER AND WASTEWATER PROJECTS

Introduction

This document presents an example of a Technical Report (Feasibility Study as per definition below) for project applications in the water and wastewater services sector aiming at funding from Structural funds in the financial perspective 2014-2020. The document produced should be primarily based on the European legal framework and the commitments made by the Member State in its membership accession and negotiation of the funding. Furthermore, and in line with the Procurement Directive, it is expected that National adaptation of European Norms (ENs) are followed where these exist. Only in cases where these do not, that other national standards are followed. In addition, it is expected that best industry practice is followed in areas which might not be sufficiently covered by European Standards or National legislation (e.g. the recommendations and methodology of the International Water Association).

Notwithstanding the Cohesion Funding requirements, there might be additional requirements under by national legislation to comply with planning and permitting processes. In line with the Accession Treaty these should be complementary and not contradictory to the EU framework The consultants undertaking the studies are expected to apply the current national requirements and extend the documentation to be compliant.

Readers of this document should always have in mind that legislation and standards (and their interpretations) can change over time as a result of high-end policy changes or court cases at European and/or National level. Sufficient flexibility should be applied to adapt methods to suit the specific project.

Definitions

The term “Feasibility Study” is used exclusively in the sense that is meant in the EC Regulations on CF for the programming period 2014-2020 and best European practice. National legislation may also use the term “Feasibility Study” for a different purpose, and the consultant should be aware of the differences if they exist.

Terminology used in the documentation should be in line with European legislation and the relevant EN standards for water supply and wastewater.

Structure of Documentation

VOLUME I: FEASIBILITY STUDY REPORT

VOLUME II: ANNEXES TO TECHNICAL REPORT

**ANNEX A: GENERAL DOCUMENTATION RELATING TO
IMPLEMENTATION OF STUDY**

**ANNEX B: SOURCES OF INFORMATION, AVAILABLE DATA AND
DOCUMENTS CONSULTED**

ANNEX C: DATA COLLECTION AND SURVEYING REPORTS

ANNEX D: CALCULATIONS

VOLUME III: DRAWINGS AND MAPS

VOLUME IV: FINANCIAL AND ECONOMIC ASSESSMENT (CBA)

VOLUME V: ENVIRONMENTAL IMPACT ASSESSMENT

VOLUME VI RISK AND CLIMATE CHANGE ASSESSMENT

VOLUME VII INSTITUTIONAL ASSESSMENT

**VOLUME VIII: ADDITIONAL DOCUMENTATION REQUIRED TO COMPLY WITH
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¹ The term Feasibility Study as used in this document is in no way related to its use in local legislation. The use and meaning behind the term "Feasibility Study" is used exclusively in the sense that it is meant in the EC Regulations on CF for the programming period 2014-2020.

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1. EXECUTIVE SUMMARY

The Executive Summary should include the conclusions of all key data and the conclusions of the following chapters. It should give a good summary over maximum 10 pages of the work undertaken by the Consultant.

2. INTRODUCTION

2.1 General Framework

1. Background and History of the Project
2. Award of Contract
3. Information provided by Stakeholders
4. Previous studies and relevant documents
5. Other relevant references

2.2 Stakeholders

Describe all stakeholders involved in project development:

- Final Beneficiary
- Contracting Authority
- Other key stakeholders

2.3 Project Objectives

- Describe the overall objectives of the Regional Feasibility Study. In most cases this is expected to relate to compliance with EU Directives in the field of water.
- Describe the specific objectives of the RFS. Here it would be expected to list the specific compliance and operational objectives (such as sustainability of investment). Below is a list of probable specific objectives, which would need to be elaborated:

(1) Legal

- a. Water Framework Directive-oriented especially considering the objectives of the River Basin Management Plan and the implications on the Surface and Groundwater Directives.
- b. DWD-oriented ensuring adequate water quality and service coverage;
- c. UWWTD-oriented ensuring:
 - i. link with Implementation Programme (Art.17 - UWWTD)
 - ii. which article of the UWWTD will be entirely complied with at end of project
- d. Bathing Water Directive-oriented.
- e. EIA Directives

- (2) System Operational objectives: technical, legal, institutional, financial, focusing around overall water operating system sustainability on the regional principle.

2.4 Scope of Services

- Summarise the Scope of Service as defined in the ToR
- Project deliverables
- Briefly present the work programme for the FS

2.5 Other relevant programmes

- Describe ongoing programmes and projects relevant for the project

2.6 Structure of Report

- Present the overall structure of the documentation incl. Volumes and Annexes.
- Regarding the Feasibility Study Report (Volume I) briefly present the table of contents with chapters and a description of the content of each chapter
- Project deliverables and their distribution
- Present the contents to the Volumes and Annexes including a link between the chapters of the document and them.

3. GENERAL DATA

Present all general data necessary to understand the project context. In particular describe briefly the project title, project area, and the natural features relevant as background for the document. Thematic maps and photography should be inserted to simplify the understanding of the area.

3.1 Title of Project

Present the title of the project and the involved agglomerations and water supply areas.

3.2 Description of the River Basin Management Plan

Summarise the latest River Basin Management Plan(s) (RBMP) with regard to the aspects which have a relation with the area of the Regional Feasibility Study. Describe the key specific recommendations/actions which are needed in this project area to ensure that the aimed water quality criteria are met.

3.3 Natural Features

Briefly describe the natural features in the project area (region, localities) with the assistance of thematic maps and photography. This may need to expand on the description provided in the MP and should cover the following:

- Climate plus assessment of extreme weather events
- Landscape and topography
- Geology and hydrogeology
- Ground Stability
- Flood Risk (based on flood risk maps)
- Ecology, sensitive areas and potential archaeological areas
- Expected Climate Change Considerations based on National Climate Change Documents

3.4 Region (Project Area)

- Describe the location of the concerned localities and agglomerations as per MP(s)
- Provide overview maps (A4 or A3 at an appropriate scale) in the main text of the water supply areas and wastewater agglomerations. The map should clearly indicate:
 - Administrative borders and general features (rivers, main roads, etc.)
 - Boundary of water supply areas
 - Boundary of wastewater agglomerations (as reviewed by this project in line with MRDPW's methodology)
 - Existing/proposed DWTP/WWTPs (as defined in the Master Plan)
 - Current and future Locality area (from urban development plan or other investigations)

3.5 Water Pollution

Provide an overview of current status and trends for development of water in the Region by summarizing findings of the MP and data available from other Ministries and NGOs.

- Major pollution sources
- Impact of wastewater discharge

Provide more specific information on pollution load for each locality concerned. In the case of industrial sources based on discharge permits and where these are not available or accessible undertake 24h composite wastewater sampling survey (focusing on COD and other required parameters based on the nature of the industrial activity) over 7 days.

3.6 Relevant Risks and Climate Change Considerations

In this section the risks related to the area (e.g. potential water conflicts, climate change, EIA, archaeological, buildability of investment measures due to site specific conditions) should be highlighted. The key Results from the Risk and Climate Change Assessment as per DG Clima Non-Paper (Volume VI) should be included

4. PROJECT BACKGROUND

Present in a concise manner the background of the project considering:

- The results of the Master Plan;
- Objectives and targets defined in the accession treaty, national development plans and sector plans (OP ENV) as well as regional targets defined in the MP;
- A short summary of the socio-economic and institutional framework.

4.1 Reference to Agreements between the Member State and the EU

Summarize the water related commitments of the Member State from the relevant chapters of Accession Treaty and outline compliance dates.

Summarise the Partnership Agreement and relevant Operational Programmes in relation water and the implications on the Regional Feasibility Study.

4.2 Results of Master Plan and other Development Plans

Summarise the results of the MP and other Development Plans focusing on:

- Key identified deficiencies of the Region and Conclusion
- General Development Strategy for the Region
- Priority Infrastructure Investment Programme for the current project
- Localities/Agglomerations defined in the MP (present map with water supply/wastewater systems/Localities/agglomerations selected for priority investments)
- Comment on the validity of the individual components of the MP. Especially with regards to considering global measures to address current deficiencies
- Assess the quality of the MP especially in relation to strength of data and strategic option analysis.
- Indicate areas where the FS needs to revise work done in the MP
- Comment on any considered changes to the investment measures, costs and underlying assumptions of the MP in this FS.

4.3 National Policy Objectives and Targets

Summarize:

- National policy objectives and objectives defined in the OP ENV (including attached implementation plan), special focus should be placed on the adopted Water and Sanitation Strategy and Action Plan
- Regional targets as defined in the MP.

4.4 Socio-economic Assessment

Summarise the socio-economic assessment prepared in the MP and update figures for last on record from the same sources with focus on:

- Current and future development of population
- Current and future development of economic and main industrial activities (non-domestic water consumers and pollutants)

4.5 Institutional and Legal Framework

Present the general legal and administrative framework as well as the institutional set-up of the local water sector.

4.5.1 General Legislative Framework

- Summarize European legislation in water and wastewater sector.
- List relevant water and wastewater European Norms
Describe relevant national laws for water supply and wastewater incl. those relating to asset ownership and operations.

4.5.2 General Administrative Framework

Briefly describe the administrative framework at the national, regional, and municipal levels relevant for the water sector and their functions to each other.

- Environmental and public health institutions
- Water and wastewater institutions

4.5.3 Institutional Setup of the National Water Sector

- Briefly describe the Regionalization Strategy in the Water Sector

4.5.4 State Aid

- Briefly describe the water sector set up vis-à-vis State Aid regulations, a more thorough description will be provided in the Institutional and State Aid Assessment further on.

5. ANALYSIS OF CURRENT WATER SUPPLY SYSTEM AND PROJECTIONS

The analysis of the current situation and projection of future development should focus on the following key elements:

- Present the current situation and projections of water resources and water demand in order to assess the current water scarcity and future availability (water balance);
- Assess current and possible future quality of water resources as key constraint to sustain water resources development;
- Assess the existing water supply infrastructure in order to define the main deficiencies as a justification for the investment project;

The assessment should be based on sufficient and reliable data. Field investigations and measurements (i.e. field surveys) are key elements of the assessment and are of the utmost importance in the document. Field measurements will in particular be important to assess and verify actual water quality, water losses, and for any other field in which the data provided are insufficient or deemed unreliable or inconsistent. These surveys should be done according to European Norms where available and if not other best international practice (WRc, IWA etc.). Relevant surveys are discussed in the relevant section. For site visits and meetings with operatives Site Visit Reports and Minutes of Meeting respectively should be prepared and included in the respective Annex.

5.1 General

Provide an overview of current water resources in the Region by summarizing the findings of the MP. Also summarise any constraints (e.g. water stresses or conflicts) identified by the River Basin Management Plan.

5.2 Water Supply System X

5.2.1 Water Resources

5.2.1.1 General

A list of Localities served by this water supply system should be clearly indicated and should be presented on an A4 or A3 map.

5.2.1.2 Water Quantity

Briefly describe current water resources sustainably available for water supply from each source. Regarding the current water abstraction for drinking water it is necessary to quantify for each water source:

- Development of yearly water production for the past five years
- Monthly variation of water production
- Replenishment of natural resources and maximum sustainable water production from that source;
- Non-drinking water supply abstractions;
- Tendency for availability of water resources (i.e., lowering water table, water stress, sea water intrusion).

- Indicate if water deficit and constraints (water shortages) exist.

5.2.1.3 Water Quality

Briefly describe current water quality of existing:

- Briefly describe current water quality monitoring system and comment on reliability of data below
- Summarise statistics on water quality analysis (development in the past years if available) in a table
- For each raw water source (indicator, unit, concentration measured, max. admissible value), provide table with water quality analysis. The complete analysis should be included in the relevant Annex.
- Provide table with water quality analysis after treating raw water (indicator, unit, concentration measured, max. admissible value)
- Provide table with statistics on water quality analysis measured in the distribution system (i.e. consumer tap)
- Particularly focus on water quality parameters in the accession treaty and other parameters with high risk for non-compliance (pesticides, nitrates, ammonia, etc.)
- Describe current protection zones (deficiencies)
- Assess reason for inadequate water quality (geogenic, anthropogenic – industry, agriculture, sewer system, etc.)
- Describe the drinking water quality at the tap. Use the measurements of the local public health office and if there are reasons to doubt these undertake own measurements for all DWD parameters. Identify localities which are not compliant with the DWD standards.
- Conclude on compliance with Drinking Water Standards (EC DWD and National Legislation) and clearly indicate in a table the respective compliance dates to be respected for the non-compliant parameters

5.2.1.4 Summary of Water Resources

Table: Summary of Water Resources in Water Supply System X

Name of Abstraction Points*	Water Course Code	Ground or Surface water source [G/S]	Chemical Quality of Water Source	Exceedance Parameters and Actual Range	Name of Localities served	Volume Extracted [m ³ /a]

* Individual wells should be listed here, as wells in one abstraction area may tap into different water sources.

5.2.1.5 Relevant Risks and Climate Change Considerations

The risks and climate change considerations resulting from the water resource assessment should be assessed.

5.2.1.6 Other potential Water Sources

In cases where there are the abstracted water is either insufficient to meet the demand or the source quality does not meet the required parameters, potential additional water resources for future development should be identified and quantified. For this, water samples should be taken and the same data as described above for existing water sources presented. Measurements and calculations should be included in the relevant Annex.

5.2.2 Current Water Consumption and Water Demand Projection

5.2.2.1 Current water consumption

Provide an overview of current water consumption for all water supply system concerned by summarizing findings of the MP and consider the following:

- Quantify current water consumption and development in the past 3-5 years for each locality by using existing data and own measurements
- Carry out measurements (with portable ultrasonic flow meter) at representative consumer types (metered/un-metered, apartment blocks, individual households, major industrial consumers etc.) and verify actual consumer readings with measurements
- Break down consumption by category of consumers (domestic, non-domestic).

Table: Current water consumption

Water Demand	Units	locality x	locality y
Domestic Water Consumption	10 ³ *m ³ /a		
Non-Domestic Water Consumption	10 ³ *m ³ /a		
Total Water Consumption (Domestic + Non-Domestic)	10 ³ *m ³ /a		
Specific Domestic Consumption	lcd		
Specific Total Water Consumption	lcd		

5.2.2.2 Water Quality at Tap

Analyse data of water quality measurements at the end user point (i.e. tap) provided by the local or national Public Health Authority. If the data is deemed insufficient or of questionable quality, the Consultant should undertake additional measurements for all the parameters contained in the Drinking Water Directive.

A discussion on the findings and the quality of the data should be presented here, elaborating on systems and localities where the parameters are not met.

5.2.2.3 Water Losses

(1) Estimate current water losses as follows:

- Apply IWA methodology² to determine the current water balance (see example below) and indicate data accuracy (error margin)
- Estimate components of the water balance based on existing data, field measurements, and expert's estimates for each locality
- If no loss measurements are available, estimate real (physical) water losses by (i) night flow measurements and/or (ii) physical condition of the network/pipe failures (iii) estimate of apparent losses
- Calculate/estimate technological losses in the treatment plant
- Calculate Infrastructure leakage indexes (ILI) and losses in litres/connection/day (or m³/km of pipe per day)
- Conclude on the current losses indicating the importance for network rehabilitation (classification as per IWA) – correlation with national plans, where available
- Calculate applicable Economic Leakage Level (ELL)
- Undertake measurements with portable ultrasonic flow meter at the system input bulk water meters to confirm the actual water production values
- Measure pressure in the water supply network.

Table: Example for Water Balance (IWA standard)

<div style="background-color: #FF0000; color: white; padding: 2px; text-align: center; font-weight: bold;">Home</div> Annual System Input Volume 435,742 m ³ /year Error Margin [+/-]: 5.0%	Authorised Consumption 181,051 m ³ /year Error Margin [+/-]: 0.0%	Billed Authorised Consumption 181,051 m ³ /year	Billed Metered Consumption 181,051 m ³ /year Billed Unmetered Consumption 0 m ³ /year	Revenue Water 181,051 m ³ /year
	Unbilled Authorised Consumption 0 m ³ /year Error Margin [+/-]: 0.0%	Unbilled Metered Consumption 0 m ³ /year Unbilled Unmetered Consumption 0 m ³ /year Error Margin [+/-]: 0.0%	Non-Revenue Water 254,691 m ³ /year Error Margin [+/-]: 8.6%	
	Water Losses 254,691 m ³ /year Error Margin [+/-]: 8.6%	Apparent Losses 36,356 m ³ /year Error Margin [+/-]: 5.7%	Unauthorised Consumption 9,198 m ³ /year Error Margin [+/-]: 10.0% Customer Meter Inaccuracies and Data Handling Errors 27,158 m ³ /year Error Margin [+/-]: 6.9%	
		Real Losses 218,335 m ³ /year Error Margin [+/-]: 10.0%		

(2) Set realistic targets for development of future water losses considering:

- Future investment measures (priority measures and long term investments)
- Improvement of water loss reduction practices of the REGIONAL OPERATOR

(3) Provide data for the water loss indicator table given below:

² Farley M. and Trow S., *Losses in Water Distribution Networks – A Practitioner's Guide to Assessment, Monitoring and Control* (IWA Publishing 2007) provides a good description.

Note: setting water loss targets will be necessary to calculate design water flows. As the proposed investment measures (network rehabilitation) will determine the future water losses, setting water loss targets is an iterative process.

Table: Water Losses Indicators

Item	Indicator	Unit	Current Losses	Target Losses
2.2.1	Total system input (raw water input)	m ³ /a		
2.5.1	Total non-revenue water (IWA standard: Total system input - total water sold)	m ³ /a		
2.5.2	Percent of non-revenue water (2.5.1/2.2.1)	% of 2.2.1		
2.5.3	Real water losses (physical losses) in the network (excluding technical losses in the WTP)	m ³ /a		
2.5.4	Percent of real water losses (physical losses) in the network (excluding technical losses in the WTP)	%		
2.5.5	Real water losses per number of connections (at average system pressure of 30 -40 m)	Litres/conn./day		
2.5.8	Infrastructure Leakage Index (ILI as defined by IWA)*	-		

* Assumption: pressure 35 m; $L_p=0$

5.2.3 Water Demand Projection

- (1) The water demand calculation should be done in accordance with EN805. Provide a summary table with projection of future water demand components for all localities as given in the table below:

Table: Summary of future water demand for the target year as defined by MA and CBA Guidelines

Water Demand	Units	Locality x	Locality Y
Population	Number		
Specific Water Demand – Domestic	lcd		
Domestic Water Demand	m ³ /a		
Non Domestic Water Demand	m ³ /a		
Total Water Demand (Domestic + Non-Domestic)	m³/a		
Real Water Losses	m ³ /a		
Total Water Demand incl. Water Losses	m³/a		

- (2) Prepare for each locality a summary table with projection of future water demand components as given in the table below:

Table: Example of Projection of future water demand for locality x

Water Demand	Units	2018	2023	2028	2033	2038	2048
Population	10 ³ *Number						
Specific Water Demand – Domestic	lcd						
Domestic Water Demand	10 ³ *m ³ /a						
Non Domestic Water Demand	10 ³ *m ³ /a						
Total Water Demand	10³*m³/a						
Real Water Losses	10 ³ *m ³ /a						
Total Water Demand incl. Water Losses	10³*m³/a						

(3) Prepare a summary table for design water demand/flow as given in the table below:

Table: Summary of the design³ water demand:

Water Demand	Units	Locality x	Locality y
Average daily flow	m ³ /d		
Maximum daily flow: Q _{max} , day	m ³ /d		
Maximum hourly flow Q _{max} , hour	m ³ /h		
Average yearly flow	m ³ /a		
Design year	Year		

More detailed tables for calculating design demand for each locality are to be attached to the relevant Annex of the FS.

5.2.4 Summary of Localities Served by Water Supply System X

Provide a list of localities (incl. population figures) served by this Water Supply System.

5.2.5 Existing Water Supply Infrastructure in Locality X

For each locality, assess the existing water supply infrastructure and present the results as follows:

- Give an overview of water and wastewater infrastructure for each locality (i.e. maps with infrastructure)
- Describe and quantify the current water supply and wastewater system components
- Conclude on the key deficiencies for each system component and provide a summary for all localities
- Briefly describe and quantify operation and maintenance efficiency for all system components

³ design horizon target year as defined by MA and CBA Guidelines (maximum demand during the planning horizon; note: for decreasing demand the design year is the year after completion date)

- (1) Briefly describe and quantify current water supply system (from intake to consumers):
 - Water Abstraction
 - Pumping Stations
 - Water Treatment Plants
 - Water Transmission Mains
 - Water Distribution Network
- (2) Present an overview map (A4) showing location and key data of the current water infrastructure for the locality. Additionally, indicate the location of the WWTP and other relevant elements (rivers, main roads, if possible topography, etc.).

5.2.5.1 Location of Existing Infrastructure

- Describe the location of the concerned locality
- Describe changes in agglomeration boundaries since preparing the Master Plan (if any)
- Provide an overview map (A4 or max. A3) of the water supply agglomeration indicating the existing infrastructure:
 - Detailed boundary of the locality
 - Current and future Locality area (urban development plan or other investigations)
 - Administrative borders and general features (rivers, main roads, etc.)
 - Existing water intake / well fields
 - Existing pipe mains and important pumping stations
 - Existing water supply network
 - Existing treatment plants

Additionally: wastewater discharge point(s) of municipal wastewater treatment plants or industrial polluters.

5.2.5.2 Water Abstraction

- (1) Briefly describe and quantify current endowment for raw water abstraction (from intake to treatment) indicating location/altitude, main parameters, current condition, for:
 - Water protection zones (zone 1 and zone 2)
 - Water reservoirs and dams
 - Surface water intakes
 - Wells and raw water pumping stations
 - Others endowments
- (2) Conclude on key deficiencies

5.2.5.3 Pumping Stations

(1) Briefly describe and quantify current endowment for pumping stations (for freshwater pumping stations) indicating location, main parameters, current physical condition and efficiency:

- Civil structures
- Electromechanical equipment (efficiency, risk for failures, etc.)
- Automation system (SCADA system)

(2) Conclude on key deficiencies

An example is given below:

- *Costs for repair of pumps increased substantially (x % during past y years) as pumps are highly depreciated*
- *Access to spare parts is not anymore assured (supply security)*
- *High costs for operation of the system due to over-dimensioning of the existing pumps and outworn pumps*
- *Civil structures are outworn and need capital renovation*
- *The existing SCADA system is old and does not provide comprehensive information to operate the system efficiently.*

5.2.5.4 Water Treatment Plants

(1) Briefly describe and quantify current endowment for treatment plants (for all steps of the treatment process) indicating location, main parameters, current physical condition and efficiency, for:

- Civil structures
- Electromechanical equipment (efficiency, risk for failures, etc.)
- Automation system (SCADA system)

Describe efficiency of current treatment system by presenting input water quality and output water quality for critical parameters.

Describe the current sludge discharge (backwash water from Drinking Water Treatment Plant).

(2) Conclude on key deficiencies

5.2.5.5 Water Transmission Mains

(1) Briefly describe and quantify current endowment for transmission mains indicating location, main parameters (length, diameter, material), current physical condition, for:

- Armatures (gate valves, etc.)

Quantify as much as possible the water losses in the transmission main and the development of pipe failures during the past e.g. five years (supply security).

(2) Conclude on key deficiencies

5.2.5.6 Water Distribution Network and Reservoirs

(1) Briefly describe and quantify current endowment for the distribution system indicating location, main parameters (length, diameter, material), current physical condition, for the following elements:

- Pipe network and armatures (see example below)
- Reservoirs
- House connections and metering

Example Table: Material and length of pipes in the Water Supply Network

Material	Diameter [mm]		Length [km]	Length [%]
	from	to		
Asbestos Cement	60	150	72.0	48%
	200	300	36.0	24%
	400	546	12.0	8%
Sub-total AC			120.0	80%
Steel	60	277	3.2	2%
	325	426	6.7	4%
	530	720	9.1	6%
Sub-total Steel			19.0	13%
Cast Iron	125		2.0	1%
Polyethylene (PE)	110	200	4.7	3%
	225	250	4.3	3%
Sub-total PE			9.0	6%
TOTAL Length			150.0	100%

Describe efficiency of the current distribution system by assessing the main reasons for the water losses quantified above. Describe the data used and measurements done to estimate the water losses. Comment on the quality of data (data provided by operator, consultants' estimate, consultants' own measurements, etc.).

Prioritise necessity for network renovation for different network zones and/or pipe materials (based on information provided by the operator, water loss data and data on pipe failures). For this reason, try to allocate water losses to zones and/or pipe materials (see table below).

Example Table: Distribution of water losses in network

Material of Pipes	L [km]	Before rehabilitation		
		[m ³ /year]	%	[m ³ /km ³ *year]
"New" PE pipes				
AC old	120	14 536 606	95%	121 138
- High zone	65	10 075 000	66%	155 000
- Middle zone	55	4 956 282	32%	90 114
Other material	30	270 408	2%	9 014
- High zone	2	30 000	0.2%	15 000
- Middle zone	28	240 408	2%	8 586
Total	150	15 301 690	100%	102 011

(2) Conclude on key deficiencies

Example:

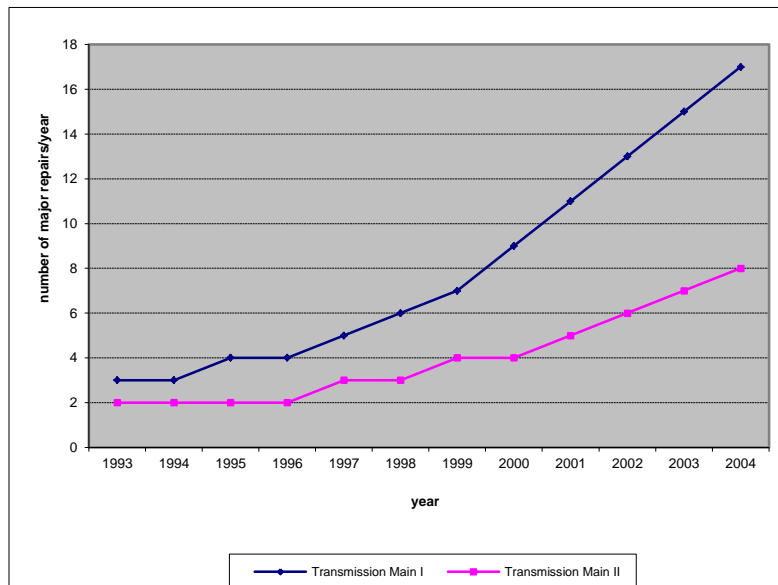
- *Outworn rubber gaskets of AC pipes causing frequent pipe breaks and high water losses.*
- *Low network pressure due to insufficient pipe diameters*
- *Galvanized steel pipes with small diameters (3/4" to 1 1/2") are heavily corroded and cause frequent failures and deteriorating water quality.*

5.2.5.7 Operation and Maintenance

(1) Briefly describe and quantify operation and maintenance efficiency for all of the above mentioned components of the water supply system as follows:

- Water quality monitoring and preventions for accidental pollution
- Monitoring and maintenance of protection zones
- Operation & Maintenance costs (energy, chemicals, staff, material) for all components
- Pipe failures (development during past i.e. 5 years) and supply security
- Water loss reduction practices and operating efficiency

Example Figure: Development of pipe breaks in the Transmission main I+II (1993-2004)



Example Table: Energy Consumption and Energy Efficiency in year x

Pumping Station	Production	Energy consumption	Energy Coefficient	
			Energy Costs	Energy Coefficient
	[m ³ *1000/year]	kWh*1000/year	€/1000/year	kWh/m ³ €/m ³
1				
N				
TOTAL				

(2) Conclude on key deficiencies with regard to Operation & Maintenance

5.2.5.8 Main Deficiencies in Water Supply System

Summarise conclusions of Chapter given above (Description of existing infrastructure and Operation and Maintenance) in the following tables:

Table: Summary of main deficiencies in water supply system

Item	Components	Main deficiency*
1	Water abstraction	-
2	Pumping stations	-
3	Water treatment	-
4	Transmission main	-
5	Distribution network	-

*Describe the deficiencies as specifically as possible and quantify as far as possible.

Summarise compliance with DWD 98/83/EC and other relevant directives.

5.3 Water Supply System Y

Repeat the above exercise for all other water supply systems.

5.4 Summary of Relevant Risks and Climate Change Considerations

The risks and climate change considerations resulting from the assessment of the water supply system and mitigation measures should be described.

5.5 Conclusions and Recommendations

5.5.1 Water Supply System X

Summarise for each Water Supply System the conclusions and recommendations from the assessment.

6. ANALYSIS OF CURRENT WASTEWATER SYSTEM AND PROJECTIONS

The analysis of the current situation and projection of future development should focus on the following key elements:

- Present the current situation and projections of wastewater generation to assess the current wastewater system capacity and efficiency;
- Assess the existing wastewater infrastructure in order to define the main deficiencies as a justification for investments;

The assessment should be based on sufficient and reliable data. Field investigations and measurements (i.e. field surveys) are key elements of the assessment and are of the utmost importance in the document. Field measurements will in particular be important to assess and verify actual water quality, water losses, infiltration/exfiltration water, sewer capacity, wastewater load and hydraulic wastewater flow, and for any other field in which the data provided are insufficient or deemed unreliable or inconsistent. These surveys should be done according to European Norms where available and if not other best international practice (WRc, IWA etc.). Relevant surveys are discussed in the relevant section. For site visits and meetings with operatives Site Visit Reports and Minutes of Meeting respectively should be prepared and included in the respective Annex.

6.1 General

Provide a summary list and map of the agglomerations covered in this Chapter.

6.2 Agglomeration X

6.2.1 Review of the Agglomeration

Based on the list of agglomerations included in the MP and the relevant national Guidelines for Assessment of Agglomerations, plus site visits review the area of the agglomerations and prepare revised maps to be included an Annex. This section should describe the findings of this project activity.

6.2.2 Wastewater Flow and Load

- A detailed assessment of the actual load generated in the agglomeration should be assessed based on actual data. It should consider variations in load throughout the year and assess the maximum weekly average. This assessment of the load should be done based on the national methodology.
- The quality of the population data should be assessed through an assessment of the agglomeration and if strong variations are likely the design will need to consider that it will have to operate under the likely extreme load scenarios.
- Present detailed methodology for calculation in the annexes
- Present summary of results in the chapters below.
- All data required by the relevant section of EN752:2008 should be presented

6.2.2.1 Domestic Wastewater

Wastewater Flow and Load:

- Calculate current average and maximum wastewater flow for domestic customers in m³/day (m³/hour) and P.E.
- Prepare scenario for development of domestic wastewater flow until the end of the planning horizon.
- Present results of wastewater flow measurements (detailed presentation in annex) in both dry weather period and wet weather (including peak flows).
- For (partially) combined wastewater networks, indicate measures foreseen to buffer rainwater inflow (i.e. rainwater overflow basins); the measure should be supported by an option analysis, taking into account the environmental impact of subsequent discharges. As far as necessary and applicable, use dynamic sewer modelling for calculating rainwater overflow basins and indicate clearly overflow discharge quantity and frequency of overflow. Ensure that there is no overflow into the recipient water during dry weather flow.
- Clearly indicate instances of sewer flooding giving location, frequency and extent. Include detailed records in the Annex.

6.2.2.2 Non-domestic Wastewater

- Provide a table with all non-domestic (commercial/industrial) customers currently discharging wastewater into the sewerage network indicating wastewater flow in m³/day
- Prepare scenario for industrial development until the end of the planning horizon
- Prepare table with projected wastewater flow for non-domestic wastewater
- Present results of wastewater flow measurements (details in annex).

6.2.2.3 Infiltration/exfiltration

- Assess level of infiltration/exfiltration using the methods suggested by EN standards
- Describe measurements to identify current infiltration rate into the sewer network
- Present results of wastewater flow measurements (detailed presentation in annex).
 - Carry out the measurement campaign for infiltration water during the dry and wet weather periods. Carry out also peak flow measurements during storm water periods.
 - Define infiltration rates based on appropriate assessment methods (i.e. day-night fluctuations, dilution of parameters such as TSS, BOD₅, P or N, etc.).
 - The result of the measurement campaign should provide data on the current volume of infiltration water (average volume per year) and the infiltration rate, the yearly fluctuation, the location of the highest/lowest infiltration rates in the network, the main reasons for high infiltration rates. The measurement campaign should include: assessment of age of sewer; history of interventions; localisation of the water table (piezometers), multiannual database of inflows measures at the WWTP, functioning of pumping stations. Detailed measurements should be undertaken at the entrance of the WWTP and at selected points on the network comparing: actual average flow with expected flow connected to the sewage; average diurnal and nocturnal flow; actual and theoretical concentrations.
 - Conditions for measurements: during the day and night time; when water table is high; during longer period (one month to track the impact of rain events); measuring flows, main parameters and conductivity. The results of the surveys need to be included in the Annex and the results presented in the FS report.
- Develop a projection of infiltration volume and infiltration rate for scenarios (i) without project and (ii) with project, considering the length of sewer network replaced by the project measure and the reduction of water losses in the distribution network (indirect effect on infiltration).
- Infiltration rates for new or renovated sewer sections should be close to 0% during dry weather flow (after commissioning of works water tightness should be certified). However, a certain (small) percentage for infiltration water might still be reasonable in the assumption on wastewater flow.
- Provide indicators on the efficiency of the proposed rehabilitation measures (investment costs per quantity of infiltration water reduced => see unit cost table below).

6.2.2.4 Summary Hydraulic Wastewater Flow and Load

Present the current and projected hydraulic wastewater flow (supported by measurement campaign to be annexed to the FS) in line with EN standards.

Note: setting water flow targets will be necessary to calculate design wastewater flows. As the proposed investment measures (sewer network rehabilitation) will influence the future quantity of water infiltrating into the sewer network, setting wastewater flow targets is an iterative process.

- (1) Provide a summary table with projection of future wastewater flow components for all agglomerations as in the table below:

Table: Summary of future wastewater flow for the year [e.g.2048]

Category of Wastewater Flow	Units	Agglomeration x
Domestic Consumers	m ³ /a	
Industry	m ³ /a	
Commerce and Public Service	m ³ /a	
Total Wastewater Flow (Domestic + Non-Domestic)	m³/a	
Infiltration in the Sewer Network	m ³ /a	
Total Wastewater Flow including infiltration	m³/a	

- (2) Prepare a summary table for design wastewater flow as in the table below:

Table: Summary of the design⁴ wastewater flow:

Wastewater Flow Design Parameter	Units	Agglomeration x
Average daily flow	m ³ /d	
Maximum daily flow: Qmax, day	m ³ /d	
Maximum hourly flow Qmax, hour	m ³ /h	
Average yearly flow	m ³ /a	
Design year	Year	

More detailed tables for calculating design wastewater flow for each agglomeration are to be attached to the FS.

- (3) Use the following indicators to summarise wastewater flow data (before and target after project implementation)

Table: Summary indicators – Hydraulic Wastewater Flow

Item	Indicator	Unit	Agglomeration x	
			Before Project	Target
3.2.1	Total wastewater volume collected (average wastewater flow)	m ³ /d		
3.2.1.1	Wastewater volume collected from domestic customers	m ³ /d		
3.2.1.2	Wastewater volume collected from industry	m ³ /d		
3.2.1.3	Wastewater volume collected from commerce and public service entities	m ³ /d		
3.2.1.4	Wastewater volume from infiltration into the wastewater network	m ³ /d		
3.2.1.5	Percent of wastewater volume collected from domestic customers	% of 3.2.1		

⁴ design horizon target year as defined by MA and CBA Guidelines (maximum demand during the planning horizon; note: for decreasing demand the design year is the year after completion date)

3.2.1.6	Percent of wastewater volume collected from industry	% of 3.2.1		
3.2.1.7	Percent of wastewater volume collected from commerce and public service entities	% of 3.2.1		
3.2.1.8	Sewer Infiltration rate: Volume of infiltration water into the wastewater network / total wastewater volume collected	% of 3.2.1		

- (4) For storm water flow from separated sewer systems, present data according to the following table and add other relevant data (before and target after project implementation):

Table: Summary indicators – Storm water Flow

Item	Indicator	Unit	Agglomeration x	
			Before Project	Target
3.3.1	Total volume of storm water (from separated sewer system)	m ³ /d		
3.3.1.3	Percent of storm water discharging to WWTP	% of 3.3.1		
3.3.1.4	Percent of storm water discharging to receiving waters without treatment	% of 3.3.1		
3.3.2	Peak factor for storm drainage flow (Q24 max)	-		

Table: Current and projected Wastewater Load

Item	Indicator	Unit	Agglomeration x	
			Before Project	Target
3.4.1	Total Biological load (BOD5)	kg BOD/d		
3.4.1.4	Percent from domestic customers	% of 3.4.1		
3.4.1.5	Percent from industry	% of 3.4.1		
3.4.1.6	Percent from commerce and public service entities	% of 3.4.1		
3.4.2.1	BOD5 concentration	mg/l		
3.4.2.2	COD concentration	mg/l		
3.4.2.3	Suspended solids	mg/l		
3.4.2.4	Total Nitrogen concentration	mg/l		
3.4.2.5	Total Phosphorus concentration	mg/l		

6.2.2.5 Water Cycle Balance

Prepare a water balance for the entire water cycle (water and wastewater) including:

- Water production (surface water and groundwater)
- Water distribution (consumption + losses)
 - Water consumption (domestic and non-domestic)
 - Water losses (apparent losses and real losses)
- Wastewater collection
 - Domestic
 - Non-domestic (commercial, industrial)

- Percolation (infiltration/exfiltration from/to groundwater + infiltration from water losses in the water supply network)

➤ Inflow to WWTP

Example of Water Balance (target year as defined by MA and CBA Guidelines)

Water Balance Components	2018		2023		2048	
	[m ³ /d]	%	[m ³ /d]	%	[m ³ /d]	%
Water Production						
- Ground water	25 693	38%	28 389	74%	17 409	70%
- Surface Water	41 140	62%	10 192	26%	7 617	30%
Sub-total Production	66 833	100%	38 581	100%	25 025	100%
Water Distribution						
Water Losses***	53 717	80%	22 219	58%	4 900	20%
Water Supply						
- Domestic	8 480	13%	11 460	30%	14 121	56%
- Industrial	4 636	7%	4 902	13%	6 004	24%
Sub-total Water Supply	13 116	20%	16 362	42%	20 125	80%
Sub-total Distribution	66 833	100%	38 581	100%	25 025	100%
Wastewater Collection						
- Domestic	7 632	15%	10 314	41%	12 709	43%
- Commercial	1 800	4%	1 900	8%	1 900	7%
- Industrial	2 179	4%	2 304	9%	2 700	9%
- Infiltration*	38 760	77%	10 497	42%	11 911	41%
Inflow WWTP:	50 371	100%	25 015	100%	29 220	100%

from water losses in the water distribution network and infiltration from groundwater into the sewer network

6.2.3 Recipient Water

Present for all agglomerations (or separate for each agglomeration) the following information:

- General description of the recipient and its drainage area (name, location, river course, etc.)
- Provide a map showing up-stream and downstream (i) abstraction locations for water users (municipal and industrial or agricultural water users) as well as (ii) discharge points of other polluters (industrial, non-treated wastewater directly discharging from sewer network, etc.)
- Current water quality data (classification of river water quality “status of river”)
- Discharge volume of recipient water (seasonal flow variation)
- Dilution of wastewater (ratio of wastewater discharge / recipient water flow)
- Identification of designated bathing areas if they exist

6.2.4 Impact of Wastewater Discharge on Downstream Users

Based on the results of the “Recipient Water” chapter, assess:

- Risk for downstream water quality degradation (i.e. eutrophication). In case of high risk for degradation (i.e., retention lake with reduced flow and high risk for eutrophication), assess alternative solutions for discharge points (see option analysis)
- Projected impact of wastewater measures on water quality of recipient (improvement of water quality status)
- Possible more stringent effluent requirements (as per UWWTD Annex I.B.4)) need to be identified.

6.2.5 Land occupation and legal status

Describe status of land availability for the proposed infrastructure (current property of land; constraints for construction and future extension, acquisition of additional land (if any), risks for implementation.

6.2.6 Summary of Geotechnical Studies

Briefly summarise geotechnical investigations carried out in the past and those carried out as part of the project, including:

- Underground condition along construction areas
- Seismic zones
- Assessment of risks due to unfavourable geotechnical conditions
- Soil permeability in agglomerations

6.2.7 Summary of [Other Studies undertaken]

Briefly summarise other studies and investigations undertaken as part of the FS including:

- Hydrological data for assessment of flood risk
- Etc.

Detailed studies are to be presented in the Annex.

6.2.8 Existing Wastewater Infrastructure

Assess for each agglomeration the existing wastewater infrastructure and present the results as described above.

6.2.8.1 Overview of Location of Current Infrastructure

- Describe the location of the concerned agglomeration
- Describe changes in agglomeration boundaries since preparing the master plan
- Provide an overview map (A4 or max. A3) of the agglomeration showing the existing wastewater infrastructure. The map should clearly show:
 - Detailed boundaries of the agglomerations (defined as per MRDPW's methodology)
 - Current and future Locality areas (from urban development plan or other investigations)

- Administrative borders and general features (rivers, main roads, etc.)
 - Existing mains collectors and important pumping stations
 - Existing wastewater network
 - Existing wastewater treatment plants
- Additionally: location of water intake or well-field

6.2.8.2 Wastewater Network and CSOs

- Where it is necessary to assess the quality of the sewerage network the steps outlined in EN standards should be followed.
- Describe wastewater main collectors, secondary wastewater network, and storm water network including rainwater overflow structures (length, capacities, location, combined system/separate system, etc.)
- Provide detailed table with current sewerage network lengths, materials, and diameters

Table: Material used in wastewater network (current situation)

N°	Diameter	Length of Network			
		Concrete	Asbestos Cement	PVC/PE/PP	Total Length

- Assess physical condition of infrastructure (as far as possible apply CCTV inspection to identify critical sections).
- Summarize wastewater network system parameters using the following indicators table:

Table: Current wastewater network system parameter

Item*	Indicator	Unit
3.6.1	Total length of wastewater network (incl. storm water & main collectors)	km
3.6.1.1	Percent of length of combined system	% of 3.6.1
3.6.1.2	Percent of length of separated system	% of 3.6.1
3.6.1.3	Percent of length of partially combined/separated system	% of 3.6.1
3.6.2	Length of main collectors	km
3.6.2.2	Percent of main collectors rehabilitated (related to existing main collectors)	% of 3.6.2
3.6.3	Number of wastewater pumping stations	number
3.6.4	Capacity wastewater pumping stations	1000 m ³ /d
3.6.5	Length of wastewater network (without storm water and main collectors)	km
3.6.5.1	Length wastewater network rehabilitated	km
3.6.5.2	Percent of wastewater network rehabilitated (related to existing network)	% of 3.6.6
3.6.7	Population served per length of wastewater network	capita/km
3.6.9	Capacity of storm water retention basins	1000*m ³

6.2.8.3 Wastewater Pumping Stations

Describe existing pumping stations:

- Table showing electro-mechanical equipment (capacity of pumps; Q, H,P)
- Assess current physical condition of electro-mechanical equipment of pumping stations (indicators for energy efficiency – kWh/m³)
- Assess physical condition of civil structures of pumping stations

Table: Assessment of existing pumping stations in Agglomeration xx

N°	Name of Pumping station	Number of pumps	Q ⁵	Hp	P	Energy efficiency	Year of installation	Rating of physical condition of E&M equipment	Rating of physical condition of Civil Structures
			m ³ /h	M	kW	kWh/m ³	year		

6.2.8.4 Wastewater Treatment Plants

Describe main components of existing wastewater treatment plant(s)

- Inlet pumping station
- Pre-treatment
- Primary sedimentation
- Biological Treatment
- Secondary clarifier
- Sludge treatment
- Other components (discharger, etc,)

Table: Assessment of physical condition of electro-mechanical equipment and civil structures in Agglomeration x

N°	Component	Description ⁶	Year of installation	Rating of physical condition of E&M-equipment	Rating of physical condition of Civil Structures	Need for renovation ⁷

Evaluate treatment performance using the following table:

Table: Assessment of current treatment efficiency in Agglomeration xx

N°	Parameter	Unit	Influent WWTP	Effluent WWTP	Treatment Performance

Summarise performance of WWTP with the following indicators (before and after project implementation):

Table: Performance Indicators for Wastewater Treatment

⁵ Sum of nominal capacity of pumps in the pumping station (more details might be provided in the annex)

⁶ Main deficiency of component (i.e. insufficient capacity, outworn, etc.)

⁷ Short comment on extend of renovation (i.e. full renovation, partly - %, no renovation necessary)

Item*	Indicator	Unit	Before Project	Target
3.2.1	Total wastewater volume collected (average wastewater flow)	m ³ /d		
3.7.2	Hydraulic design capacity of WWTPs	m ³ /d		
3.7.3	Biological design capacity	kg BOD/d		
3.7.5	Percent of biologic design capacity used (3.4.1 / 3.7.3)	%		
3.7.7	Capacity of WWTPs in Population equivalent	p.e.		
3.7.8	Total volume of wastewater treated in WWTPs (yearly average at the outlet of WWTP)	m ³ /d		
3.7.8.10	<i>Volume of wastewater treated with effluent quality in compliance with EC UWWTD 91/271/EEC</i>	<i>m³/d</i>		
3.7.8.11	<i>Percent of volume of wastewater treated with effluent quality in compliance with EC UWWTD 91/271/EEC Article 4 (5)</i>	<i>% of 3.2.1</i>		
3.7.8.12	<i>Total BOD treated / removed</i>	<i>kg BOD/d</i>		
3.7.8.13	<i>Total COD treated / removed</i>	<i>kg COD/d</i>		
3.7.8.14	<i>Total N treated / removed</i>	<i>kg N/d</i>		
3.7.8.15	<i>Total P treated / removed</i>	<i>kg P/d</i>		

6.2.8.5 Operation and Maintenance

(1) Briefly describe and quantify operation and maintenance efficiency for all of the above mentioned components of the wastewater system as follows:

- Wastewater effluent quality monitoring
- Monitoring of industrial wastewater polluters (reason and frequency of operating problems in the WWTP due to infringement of legal requirements regarding industrial discharge)
- Describe current procedures with regard to maintenance of equipment, civil structures and network and main consequences on the existing infrastructure (degradation of infrastructure due to inadequate maintenance)
- Network failures such as sewer overflows, sewer clogging (development during past i.e. 5 years, reasons for failures i.e. incorrect design, construction, damages or insufficient operation)
- Current treatment performance (reasons for inefficient performance i.e. insufficient operation of air-blowers, etc.)
- Current procedures in place to improve operating efficiency (i.e. measurement campaigns for sewer infiltration or treatment process optimisation)

(2) Assess current operation & maintenance costs (energy, chemicals, staff, material) for all components (see table below):

Table: Current Operation & Maintenance Costs Wastewater

Cost Item	Amount [€/year]	% of Total
Energy costs		
Chemicals costs		
Staff costs		
Material costs		
Others ⁸ costs		
TOTAL		100%

(3) Conclude on key deficiencies with regard to Operation & Maintenance

- Briefly summarise the key deficiencies identified
- Summarise current operation performance using the following indicator table for efficiency of sewer system

Table: Efficiency of sewerage system

Item*	Indicator	Unit
3.9.1	Number of sewer blockages per year	number/year
3.9.2	Number of sewer blockages per km of sewer network per year (3.9.1 / 3.6.1)	number/km/a
3.9.3	Number of days with flooding caused by sewerage system	number
3.9.4	Number of days with flooding caused by sewerage system per km per year (3.9.3 / 3.6.1)	days/km/a
3.9.5	Average electricity consumption per year	kWh/a
3.9.6	Average electricity consumption per volume of wastewater treated (3.9.5./3.7.8)	kWh/m ³

- Make sure that the proposed action plan for the OPERATOR includes measures (sufficient training) to improve operation & maintenance of the assets
- Additionally, consider in the procurement strategy outsourcing of operational tasks (including intensive training) as an option (i.e. Design-Built-Operate - DBO contract)

6.2.8.6 Main Deficiencies in Wastewater System

(1) Summarise conclusions in as follows:

Table: Main Deficiencies in Wastewater System

Item	Components	Main Deficiencies*
1	Wastewater network	-
2	Wastewater Pumping stations	-
3	Wastewater treatment Plant	-

⁸ ie. costs External Services (excavation, construction, etc.)

**Describe the deficiencies as specific as possible and quantify as far as possible.*

(2) Summarise compliance of current situation with UWWT Directive 91/271 EEC and other relevant environmental directives (i.e. Water Framework Directive, DWD, and Bathing Water Directive).

6.3 Summary of Relevant Risks and Climate Change Considerations

Summarise the risk and climate change considerations resulting from the assessment of the whole wastewater system plus the recommended mitigation measures.

6.4 Conclusions and Recommendations

Present the Conclusions and Recommendations of the assessment of the wastewater system.

7. INDUSTRIAL WASTEWATER DISCHARGE

- Investigate quantity and type, extent of pre-treatment, institutional and legal framework (e.g. what kind of arrangements exists between industries and the city/regional water company concerning discharge and treatment of industrial wastewater).
- Assess existing wastewater treatment facilities, including sludge handling and disposal: type of process, capacity, flow, technological appropriateness, treatment effectiveness, condition, maintenance practices, suitability, bottlenecks, and quality of materials and equipment.
- Quality standards: analyse compliance with applicable effluent standards and applicable regulations
- Sustainability: what investigations and investments are recommended to ensure the sustainability of the measure in reducing operational costs?
- The Consultant's review of industrial loads and characteristics should include a review of current mechanisms for licensing and enforcing discharge to the sewer network, with a view to managing the risk that future pollution incident damages the new plant, or substances harmful or toxic to the process might be discharged. Consider compliance with the Integrated Pollution and Prevention Control (IPPC) Directive (96/61/EC) covering pollution from large industrial installations.
- Prepare a report on industrial wastewater discharge and draft an action plan. Acceptable/indicative templates for the **report** and the **action plan** are available at MRDPW, if requested.

The following structure of the report is recommended:

7.1 Introduction and reference to RBMP

Summarise any aspects of the RBMP, which related to industrial wastewater production and pollution in the area in the region.

7.2 Objectives

Prepare a report on industrial wastewater discharge and draft an action plan with the following objectives:

- Adequately pre-treat industrial wastewaters in compliance with EC Directives and national legislation and/or recycled as appropriate;
- Pre-treatment to be monitored and enforced by competent environmental authorities;
- Industrial effluent loads not to hamper the designed technology of the WWTPs;
- Introduce appropriate wastewater charges for industries, based on quantity and quality of effluent produced and on cost of treatment.

7.3 Legal regulation on Industrial Wastewater

- EU Directives and national laws
- Prevention and control of accidental pollution
- Polluters pays principle
- Restrictions Concerning Wastewater Discharge into Municipal Sewerage Systems

7.4 Approach and Methodology

Briefly describe the approach and methodology to carry out the study:

- Inventory of industrial activities (data base with specific data on production and pollution)
- Current performance of regional operators
- Impact of industrial discharge

7.5 Investigations of Wastewater Discharges

7.5.1 Inventory of Industries

Table: Existing industrial companies in agglomeration x discharging wastewater into the municipal sewer network

Item	Economic unit/industry	Field of activity

7.5.2 Wastewater Volume and Load

Table: Pollution Load and wastewater characteristic for selected industries

Item	Parameter	Value industry x	Value industry y etc	Value industry z etc

7.5.3 Industrial Wastewater Pre-treatment Plants

Prepare list of industries currently endowed with a pre-treatment plant (see table below):

Table: Pre-treatment facilities of the industrial agents

Item	Economic unit/industry	Status	Technical information	Efficiency
1	Industry x	functional	mechanical treatment clarifying tanks	Satisfactory
2	Industry y.	-	Clarifying tanks	Unsatisfactory

7.6 **Current Performance of Service Operators with regard to Control of Industrial Wastewater Discharge**

- Describe performance of service operators with regard to monitoring industrial polluters (monitoring programme in place)
- Monitoring frequency and quality analysis facilities (laboratory, etc.)
- Contracting and billing of industrial agents
- indicate what has been done to identify industrial discharges: agreement signed to buffer the quantity and quality of discharges, monitoring regime in place, paying particular attention to heavy metals

7.7 **Impact of Industrial Wastewater Discharges on WWTP Influent and Downstream Users**

- Impact of industrial pollution on sewer network and WWTP (impact of missing pre-treatment)
- Impact on downstream users (agricultural users, water intake for DWTP, etc.)
- Impact of industries not yet connected to the sewer system

7.8 **Proposal for Managing and Monitoring Wastewater discharges**

Describe briefly roles of:

- REGIONAL OPERATOR to monitor industrial discharge
- controlling body for WWTP effluents discharge
- Responsible body for controlling and inspection.

7.9 Action Plan to Control Industrial Wastewater Discharges

Elaborate an action plan to reduce/control wastewater discharges, with short and medium term actions and responsibilities. The Short-term Action Plan defines the Goals and Activities to be undertaken, addresses the responsibilities, and sets out the deadlines for its execution during this period.

- Data base elaboration
- Defining the polluting substances and potential
- Initiating the monitoring programme
- Elaborating and implementing a plan for unforeseen (accident) situations

In conclusion, the Short-term Action Plan will focus on creating an effective data collection system and implementing appropriate monitoring programmes. The complexity of the measures needs strong cooperation among all involved authorities.

7.10 Relevant Risk and Climate Change Considerations

Similarly to the previous chapter, summarise the risks and climate change considerations resulting from the assessment of industrial wastewater and mitigation measures proposed.

7.11 Conclusions and Recommendations

Conclusions and recommendations with particular focus on:

- Potential impact on downstream users
- Potential impact on WWTPs
- Pre-treatment facilities (existing and required)
- Polluters pay principles

Use the following table to summarise the data for industrial pollution for all⁹ agglomerations (current and future¹⁰):

Table: Performance Indicators Industrial Pollution

Item*	Indicator	Unit	Current	Future
3.5.1	Total number of industrial units in agglomeration	Number		
3.5.2	Percent of industrial units NOT connected to the wastewater system	% of 3.5.1		
3.5.3.1	Number of connected industrial units with pre-treatment facilities	Number		
3.5.3.2	Percent of connected industrial units with pre-treatment (compliant with EC regulations)	% of 3.5.3		
3.5.4.1	Percent of industrial pollution load reduced by pre-treatment (3.5.4./3.4.1.2)	% of 3.4.1.2		

⁹ Detailed tables for each agglomerations are to be presented in the annex of the FS

¹⁰ Indicate year and assumptions for projected future development of industrial pollution

Item*	Indicator	Unit	Current	Future
3.5.5	Number of industrial units discharging dangerous substances into the aquatic environment	number		

8. SLUDGE MANAGEMENT

8.1 Introduction

8.2 Objectives

8.3 Legislative Framework

- Legislative transition process (national Laws)
- EU Directive 86/278 EEC and national Legislation
- Parameters subject to the provisions of the Directive
- Revision of EU Directive 86/278 EEC and future aspects (recent research development with regard to dangerous substances in the sludge and measures for prevention)

8.4 Approach and Methodology

- Existing sludge management
- Approach and methodology
 - economic, technical, and ecological parameters
 - specific criteria (practicability, flexibility, environmental acceptability, safety and viability, cost efficiency)

8.5 Current Sludge Disposal

- Describe current sludge disposal and quantify as far as possible
- Current problems regarding sludge disposal (environment, etc.)

8.6 Sludge Volume and Sludge Quality

- Prepare a table with current and projected sludge volume (yearly development) based on generated load for each agglomeration and DS content
- Assess current sludge quality for each WWTP (sludge quality analysis at WWTP as far as possible a series of at least three analyses)
- Assess source of pollution (type of industry discharging particular hazardous substances to the sewer network)
- Comment on development of sludge quality (development of sludge quality if measures proposed in the action plan will be implemented – i.e. disconnection of/pre-treatment for critical industries). Assess the risk for degradation (or non-

improvement) of sludge quality (i.e. socio-economic consequences if polluter pays principle will be applied for some important industries). For planned WWTPs, assess the potential risk of sludge quality degradation and prepare reasonable assumptions for projection (i.e., classify according to degree of industrialization and if possible type of industries).

8.7 Available Capacities for Sludge Disposal

Assess current and future capacities for:

- Municipal landfills:
 - Assess the current and future capacity of landfills taking into consideration the projects for regional landfills currently under preparation (CF-Applications). In particular, pay attention to the requirements of the landfill directive (max. admissible volume of biological waste per year) which will limit the capacity for sludge disposal in the future.
- Re-use in agriculture:
 - Assess current and potential application of sludge on agricultural land depending on surface area of agricultural land suitable for sludge reuse (criteria: types of crops, type of soil, inclination of fields, soil texture, etc.).
 - Assess current willingness of farmers to use sludge (of quality compliant with standards) and make assumption for future development of willingness; include in the TA-measures a campaign to improve the willingness of farmers to apply sludge;
 - Assess current (and foreseen) agreements between REGIONAL OPERATOR and farmers (farmers associations) or landfill operators to receive sludge;
 - Based on maximum potential sludge use and assumptions on willingness of farmers, prepare a sound projection for demand of sludge in the future;
- Thermal reduction (incineration/co-incineration):
 - Consider co-incineration (i.e., cement industry) as a potential short-term alternative; a long-term development of sludge incinerators might cover the deficit between total projected sludge volume and projected use for landfills and agriculture.
- Re-use in reforestation (surface of forest suitable for sludge re-use)
- Composting
- Other types of reuse (i.e., use of sludge for land re-cultivation or specific products)

8.8 Strategic Sludge Disposal Alternatives

- Assess sludge disposal alternatives above and compare current and future capacities for sludge disposal with the sludge volume and quality produced (current and future development);
- Describe legal constraints for each option and assess environmental and health impact (advantage, disadvantage);

- Options such as recycling and agricultural re-use are encouraged by EC Directive 86/278/EEC, but others will need to be studied. The disposal costs define and limit the treatment options that might be developed;
- Foresee sufficient storage capacity (in case of agricultural use for 6 months storage period). Indicate the estimated dewatering performance;
- Make sure that there is no odour nuisance due to sludge disposal (sufficient distance to Locality);
- Compare option analysis considering the following methodology:
 - Compare NPV for different options retained (i.e. landfill and agricultural reuse)
 - Select the most cost effective solution (least cost option)
 - Prepare action plan to assure viability of selected measure (i.e. if agricultural reuse is the most cost effective solution, measures such as (i) disconnect/pre-treat industrial polluters (ii) campaign to increase willingness of farmers to receive sludge, etc.)
 - Full justification is necessary if another option (not the least-cost option) is selected (i.e. socio-economic and political constraints are too high to implement stringent measures – i.e. disconnect).

8.9 Sludge Disposal Costs

Assess current and future costs (yearly development of costs for each agglomeration) for sludge dumping and sludge transport for the selected sludge disposal alternatives and relevant combinations of it (sludge scenarios).

8.10 Proposed Sludge Disposal Strategy

Evaluate sludge disposal alternatives based on the following criteria (or similar ones):

- Practicability
- Environmental impact acceptable
- Clear regulations and control mechanisms implemented?
- Acceptable from potential users
- Costs
- Tendency in other European countries

8.11 Conclusions and Recommendations

Conclusions and recommendations based on the results of the Chapters above. Based on the assessment of the chosen sludge disposal route, recommendation should be made regarding the appropriate sludge treatment options to be considered as part of the option analysis. The summary should briefly present the proposed sludge management concept and should focus on:

- Sludge disposal alternatives
- Quantities and ratios for each of the proposed alternatives

➤ Costs for sludge disposal

Summarise the result of the sludge disposal strategy (present details for each agglomeration in the annex) based on the following indicators¹¹ (current and projection of future development¹²):

Table: Performance Indicators Sludge Management

Item *	Indicator	Unit	Current	Future
3.8.2	Sludge volume	tons/a		
3.8.3.1	<i>Dry solids content</i>	%		
3.8.3.2	<i>Total number of parameters NOT-compliant with RO/EC regulations</i>	<i>number</i>		
3.8.4	Sludge disposal and reuse			
3.8.4.1	Sludge reuse in Agriculture	tons/a		
3.8.4.2	Sludge reuse in Reforestation	tons/a		
3.8.4.3	Sludge composting	tons/a		
3.8.4.4	Sludge disposal at sanitary landfill	tons/a		
3.8.4.5	Sludge Incineration	tons/a		
3.8.4.6	<i>Others (please specify)</i>	tons/a		
3.8.4.7	Sludge reuse in Agriculture	% of 3.8.2		
3.8.4.8	Sludge reuse in Reforestation	% of 3.8.2		
3.8.4.9	Sludge composting	% of 3.8.2		
3.8.4.10	Sludge disposal at sanitary landfill	% of 3.8.2		
3.8.4.11	Sludge Incineration	% of 3.8.2		
3.8.4.12	<i>Others (please specify)</i>	% of 3.8.2		
3.8.6	Sludge storage capacity in months (i.p. for agricultural reuse)	months		
3.8.7	Total volume of sludge end-disposed in compliance with EU directives	m ³ /day		

9. DESIGN PARAMETERS AND DEMAND ANALYSIS

Prepare the design parameters for preparing the FS for the following sub-sections:

Note: Justify any deviation from the assumptions and standards above, by providing sufficient data and agreeing with MRDPW prior to developing further steps of the FS.

¹¹ And/or graphs based on these data

¹² Iterative estimation of situation after project implementation based on estimated wastewater flow and design of WWTP

As a minimum the design parameters stated in EN752:2008 and EN12255-11:2001 should be included for each system.

9.1 Population growth

Data base: National statistical institute. Potential variations that can be observed should be noted and if there is a likely difference this should be discussed.

Where significant increases in population are envisaged in future years, the option of phasing project requirements should be considered.

9.1.1 Level of Service

Present the current level of service for water supply applying the following indicators and draw conclusions:

Table: Level of Service Indicators for Water Supply and Wastewater

Item	Indicator	Unit	Locality / Agglomeration ¹³
Water Supply			
2.1	Level of water supply service coverage		
2.1.1	Total population in service area concerned (water supply zone)	capita	1
2.1.2	Service Coverage: Percent of population connected to water supply system (2.1.3/2.1.1)	% of 2.1.1	2
2.1.3	Population served (population connected to/served by a central water supply system through house/yard connections, public tap)	capita	3
2.3	Water consumption/demand*		
2.3.6	Specific domestic water consumptions	lcd	4
2.3.9	Depressed consumption (insufficient quantity available)	yes/no	5
2.6	Supply security and system failures		
2.6.2	Supply interruptions due to system failures per length of network per year	number/km/year	6
2.6.5	Hours of water supply per day	Number of hours	7
2.9	Water Quality		
2.9.2	Population supplied with drinking water quality compliance with EC Drinking Water Directive 98/83/EC and transition treaty	number	8
2.9.3	Percent of population supplied with drinking water quality compliance with EC Drinking Water Directive 98/83/EC and transition treaty	% of 2.1.1	9
Wastewater			

¹³ Add column for each agglomeration

Item	Indicator	Unit	Locality / Agglomeration x ¹³
3.1.1	Total population in agglomeration concerned	Capita	10
3.1.2	Service coverage: Percent of population connected to wastewater network	% of 3.1.1	11
3.1.3	Population connected to a wastewater network	Capita	12
3.1.12	Percent of population connected to a WWTP compliant with EU UWWTD 91/271/EEC Article 4 (5)	% of 3.1.1	13

9.2 Water Supply and Design Parameters

Prepare basic design parameters for the planning horizon, taking into account the transition periods agreed for compliance with the relevant EU Directives and the population size of the concerned localities.

9.2.1 Domestic Water Demand

Where there is a lack of reasonable data to allow for assessment of the demand, the relevant EN standards can be used to estimate the requirements.

Assumption:

- Current specific consumptions of domestic water will be reduced / increased to the levels above after introducing water metering and cost covering tariffs
- Consumption elasticity rate is to be considered

9.2.2 Non-domestic Water Demand

Determine specific flow and variation coefficient based on specific data on type of industry/commercial/institutional entity:

- Specific flow – according to the specific type of industry;
- Daily variation coefficient – according to the working days per week;
- Hourly variation coefficient – according to the working hours per day.

Assumption:

- Reduce demand for small scale livestock and garden irrigation to a minimum (replaced by local water sources if available) after introducing water metering and cost covering tariffs.

Present in a table the proposed values for the target years with sound justifications. Pay particular attention to the robustness of the assumptions for water demand (current and future levels, both domestic and non-domestic).

9.2.3 Hydro-geological Data:

When there are available geological surveys, use them to determine the main parameters of the ground water intakes. If surveys are not available, collect data related to existing wells in the area or carry out measurements and investigations.

9.2.4 Water Quality and Treatment:

Collect sufficient water quality data to conclude on current compliance with the EC DWD 98/83/EC and the respective national laws. If there are insufficient data, carry out a quality analysis campaign. In particular, compliance with the parameters in the Accession Treaty should be ensured.

Present in the annex the design parameters for each treatment step (pre-oxidation, coagulation and flocculation, sedimentation, filtration, post-oxidation adsorption, and final disinfection). When designing a Treatment Plant, consider:

- Precautions for sludge from Treatment Process (environmental impact)
- For the sustainability of the plant, ensure that the regional operator has enough capacity and know-how for operating the plants (avoid complex treatment plants for small localities, ensure that the OPERATOR is sufficiently supported in the first years of operation of the system (i.e. DBO contracts, sufficient technical assistance, contractor's training)).

9.2.5 Transmission Mains:

Present the design criteria used for dimensioning the transmission main:

- Optimise the pipe diameter with regard to investment and operation costs.
- Design flow is the maximum daily flow.

9.2.6 Pumping stations and Reservoirs:

Present the key design criteria used for dimensioning the pumping stations:

- Foresee enough standby capacity
- Automatic steering of pumps in the SCADA system should allow for continuous monitoring of water quantity data and energy data
- Give high priority to reducing energy (high efficiency pumps, pressure losses, etc.) and maintenance costs when selecting the design parameter. Select high efficiency pumps
- Consider frequency converters for pump operation in cases of flow and/or pressure fluctuations
- Provide enough reservoir capacity to ensure supply security (depending on risk of accidental pollution of water) in line with EN standards.

9.2.7 Distribution Network:

Present the key design criteria used for dimensioning the network in line with EN standards:

- Maximum velocity
- Design flow is the maximum hourly flow

- System pressures

9.3 Wastewater and Design Parameters

9.3.1 Wastewater collection system

Present the key design criteria used to dimension the sewer network including amongst others:

- The design flow of the sewerage network is $Q_{u,h,max}$, the maximum hourly flow
- Interconnections between the rain-water and sewer networks
- “Where a new system is being proposed, surface water should be kept separate from other wastewater” (EN752:2008).
- If the network is too long, with intermediary pumping stations, provide information on the risk of H_2S creation and the possible subsequent corrective measures taken (oxygen injection), in particular, ensure that the material of the pipe is not vulnerable to such risk
- Admissible velocities in the sewers: 0.7 - 3 m/s; if the minimum admissible value of 0.7 m/s (self-cleaning rate) cannot be reached daily due to the low flows in some sectors, manholes should be cleaned in the respective sectors of the sewer.

9.3.2 Wastewater Treatment

The treated wastewater should comply with the National standard, which transposes the Urban Wastewater Treatment Directive 91/271/EEC. The planning data specified in relevant EN standards should be presented.

Table: Treated wastewater quality

Parameter	Concentration	Minimum percentage of reduction (%)
Biochemical oxygen demand (BOD_5 at 20°C), without nitrification	25 mg O_2/dm^3	70 – 90 40 in special condition
Chemical oxygen demand (COD)	125 mg O_2/dm^3	75
Total suspended solids	35 mg/ dm^3 (more than 10,000 p.e.) 60 (2,000 – 10,000 p.e.)	90 (more than 10,000 p.e.) 70 (2,000 – 10,000 p.e.)
Total Phosphorus	2 mg / dm^3 (10,000 – 100,000 p.e.) 1 mg / dm^3 (more than 100,000 p.e., or sensitive area)	80
Total Nitrogen	15 mg/ dm^3 (10,000 – 100,000p.e.) 10 (more than 100,000 p.e., or sensitive area)	70 - 80

The treatment complies with the national standards for WWTPs, biological treatment, advanced treatment, and sludge treatment. Describe the type of WWTP (treatment technology) depending on the biological and hydraulic loads.

9.3.3 Sludge digestion and disposal

- Present design criteria for sludge digestion and disposal.

9.3.4 SCADA Systems

Define the basic parameters to install a SCADA System. The assessment should include suggestions for the area to be covered, the location of outstations, nodes, repeater stations, central control station, the hardware and software requirements and the range of parameters to be monitored. The analysis should include a proposal for the area that will be covered; parameters to be monitored, etc.

10. OPTION ANALYSIS

10.1 General

The purpose of the option analysis is to identify the best engineering solution (engineering, cost, environmental, operational, legal, planning, risk, climate change etc.) for the deficiencies and design parameters presented in previous chapters.

The Consultant must apply an integrated regional approach in determining the measures for investments related to being compliant with EU Directives. The Consultant must identify all necessary measures aiming to ensure compliance with the EU Directives for all agglomerations above 2,000 PE for wastewater and all settlements with more than 50 residents for drinking water supply.

Typically the options that need to be looked at are easy to predict. The option analysis should be undertaken in a sincere manner. The practice of comparing two options of which one is clearly unsuitable and on the other side the practice of presenting two nearly identical options should not be adopted.

For agglomerations above 10 000 PE, the Consultant must outline the measures in compliance with the specific goals of the Operational Programme Environment 2014-2020, which must be put forward for co-financing by the EU by means of the Application Form.

Based on the assessed data, deficiencies and the risk assessment, demand forecasts and system needs, the Consultant should undertake option analysis consisting of measures which are needed to address the identified deficiencies in a cost efficient manner in line with the project objectives described earlier. These option analyses should consider as a minimum 2 options plus the “do nothing” option. It is expected that mostly more than 2 options will be analysed. All option analysis will have to be undertaken based on the data collected in Phase I and the risk assessment. The impact of Climate Change should also be considered as part of the Option Analysis. The option analysis should meet the requirements of relevant EU Regulations.

If additional data has to be collected, this should be done by the Consultant. Flexible solutions should be proposed, to allow future upgrading / extension. In justifying the

proposed investments, it must be shown that they coincide with the longer-term expansion and development needs of the water/wastewater sector in the territory/region.

Measures which will safeguard the financial sustainability of the operator, and are thus eligible would be: reduction of loss in the networks, reduction of energy consumption, metering, improvement of the quality of the drinking water and wastewater, etc. \

Special emphasis should be placed on considering the identified risks and climate change considerations in the option analysis.

The analysis should initially (1) screening the options and (2) conduct a detailed evaluation of the retained options;

It is expected that in most cases there will need to be a discussion on the benefits of installing a centralised vs. decentralised solution.

10.2 Water Supply Options

10.2.1 Strategic Options

Summarise the strategic options presented in the MP:

- Use the abstracts of each chapter focusing on aggregated tables for the options analysed at the MP level;
- Revise the strategic options for the selected priority locality based on new information available;
- Water Quality Deficiencies – Treatment vs. non-treatment (e.g. blending, alternative sources, protection of sources)
- Water Quantity Deficiencies – New Sources (e.g. surface or groundwater, regional or extra-regional transmission main, desalination) vs. NRW reduction (pressure management, monitoring, as per IWA)
- Discuss how the above identified risks and climate change considerations have been considered in the option analysis.
- Define in detail which parts of the Water Supply System are requiring investment measures;
- Present on an overview map the strategic options (i.e. centralized versus decentralized option)
- Present map with water supply areas taking into consideration the results of the option analysis for each water supply system (i.e. centralized versus decentralized option).

10.2.2 Detailed Options

Briefly assess general options valid for all localities (if any) such as:

- Where a new transmission main is the preferred solution, a routing option analysis should be presented, which considers the collected data and the risks involved.

- For new water sources various options should be analysed.
- If treatment is the preferred choice, different treatment approaches and sites should be analysed.
- Comparison of different pipe materials
- Discuss how the above identified risks and climate change considerations have been considered in the option analysis.

10.3 Wastewater Options

Prepare an option analysis similar to the one presented for Water Supply. Specific examples for wastewater are given below:

10.3.1 Strategic Options

- Use the abstracts of each chapter focusing on aggregated tables for the options analysed at the MP level
- Revise the strategic options for the selected priority agglomerations based on new information available;
- Existing Wastewater System – Existing set-up vs. new set up (centralised or decentralised). This can include a new location for a WWTP depending on suitability of existing site.
- New Wastewater System – separate vs. combined (although EN standard states that these should be separate); centralised (i.e. clustering) vs. decentralised; suitable WWTP site locations. In some cases the feasibility using collection systems vs. IAS will need to be explored, especially in areas where it is expected that a sewer will represent excessive cost.
- Discuss how the above identified risks and climate change considerations have been included in the option analysis.
- Present on an overview map the strategic options (i.e. centralized versus decentralized option)
- Present map with revised/confirmed clusters taking into consideration the results of option analysis for (centralized versus decentralized option).

10.3.2 Detailed Options

- For new sewerage system, the Consultant should assess material type, also other options such as pressured/vacuum systems can be evaluated depending on site conditions.
- For new sewer systems, the data and risks involved will need to be carefully considered.
- In cases of sewer rehabilitation different rehabilitation techniques can be considered, similarly for capacity constraints (i.e. stormwater retention tanks, CSOs, increase in pipe diameter etc.).
- In the frame of the rehabilitation / upgrading / extension of the collection systems, review site selection, location, size and land ownership of the facilities of the sewerage network including eventually interceptors, collectors, pumping stations, treatment plants, sludge treatment and disposal, etc. Hydraulic Models will need

to be developed and scenarios will need to be simulated. Discuss the location, area and ownership of land to be used for the sanitation facilities.

- Assess alternative wastewater treatment processes including process, engineering, operational, capital costs and O&M cost aspects, and recommend the preferred option along with its basic conditions.
- Assess options for sludge treatment and disposal. This aspect of the study needs particular emphasis and development in conjunction with the treatment process selection, and the Environmental Impact Assessment study.
- Discuss how the above identified risks and climate change considerations have been considered in the option analysis.

10.4 Summary of Option Analysis

Summarise the options developed above for all water supply areas and wastewater agglomerations.

- Comparison of options based on the above mentioned criteria
- Financial and economic evaluation
- Selected option

11. PROJECT PRESENTATION

Present the investment project in line with the water and wastewater EN standards, by describing amongst others:

- Overall characteristics, justifications, and impact of the project;
- Investment measures including a justification for each investment measure;
- Technical assistance measures proposed to accompany the investment measures
- Cost breakdown of all investments
- Operation and maintenance costs before and after project implementation
- Unit costs in an aggregated form as a result of investment costs and quantities of implemented infrastructure.

11.1 Overall Project Presentation

Present the overall project summarizing

- Main characteristics of investments
- Main justifications
- Investment strategy
- Main impact of investment measures.

11.1.1 Water Supply

Summarise the investment measures proposed for improving the water supply system:

- Main characteristics of investment components applying the following structure:
 - water abstraction
 - pumping stations
 - water treatment
 - water mains
 - distribution network
- Quantities of infrastructure components proposed (output indicators)
- Main justification for each investment component (i.e. water losses, number of pipe failures, condition of pipes, etc.); quantify as far as possible.

11.1.1.1 Investment Strategy

Describe the proposed investment strategy for improving the water supply system:

- Investment priorities
- Implementation strategy (i.e. combine water and wastewater network construction to avoid double trenching)
- General time frame for implementation (key milestones)
- Main difficulties and constraints expected during implementation of the water system (i.e. capacity of the operator, etc.)

11.1.1.2 Main Impact of Measures and Performance Indicators

Present the main impact of the investment measures as follows:

- Describe the main result of each investment component and quantify as far as possible by using the relevant key performance indicators for each component (i.e., increase of connection rate, reduction of infiltration, population benefiting from the measure, etc.)
- Present the expected improvements after implementing the selected investment components with the performance indicators in the next table below (before and after project implementation):
- Describe the contribution of the measures to the Targets in the Accession Treaty (Percentage for intermediate targets).

Table: Performance Indicator Water Supply

Item	Indicator	Unit	Before Project	After Project
2.1.1.	Total population in service area concerned (water supply zone)	capita*		
2.1.2	Service Coverage: Percent of population connected to water supply system (2.1.3/2.1.1)	% of 2.1.1		
2.3.6	Specific domestic water consumptions	lcd		
2.4.14	Population served per length of water supply network (distribution network + water mains)	capita/km		
2.4.15	Production capacity installed (minimum capacity of wells, pumping stations, WTP)	1000 m3/d		
2.4.7	Length of transmission mains	km		

Item	Indicator	Unit	Before Project	After Project
2.4.8	Percent of transmission mains rehabilitated	% of 2.4.7		
2.4.10	Length of distribution network	km		
2.4.11	Percent of distribution network rehabilitated	% of 2.4.10		
2.5.1	Total non-revenue water (IWA standard: Total system input - total water sold)	m ³ /d		
2.5.2	Percent of non-revenue water (2.5.1/2.2.1)	% of 2.2.1		
2.5.4	Percent of real water losses (physical losses) in the network (excluding technical losses in the WTP)	%		
2.5.5	Real water losses per number of connections (at average system pressure of 30 -40 m)	litres/con/day		
2.7.1	Average electricity consumption (treatment plant + pumping stations)	1000 kWh/a		
2.7.2	Average electricity consumption (treatment plant + pumping stations) per volume of water produced (per 100 m of pressure)	kWh/m ³		
2.8.4	Metering level (2.8.1. Total number of connections with water meter / 2.4.19 Total number of water service connections)	% of 2.4.19		

- Present the estimated impact of each investment measure aiming at cost reduction on operation costs (i.e., energy savings through replacement of pumps and other electro-mechanical equipment or reduction of network losses) on energy costs. Do not consider additional costs due to improvement of the level of service (i.e., increase of quantity of water supplied to customers or increase of network pressure) in the following tables.

As an example, the impact of water supply network renovation on water losses is in the table below. Similar tables should present the impact of other investment measures on efficiency improvement (i.e. renovation of pumps on electricity consumptions).

Example table: Impact of Pipe Renovation on Reduction of Real Water Losses

Material of Pipes / Zones	L* [km]	Real Losses before rehabilitation			L [km]	Real Losses after rehabilitation			Reduction of water losses	
		Yearly Water losses [m ³ /year]	% of total network length	Yearly Water Losses per length of network [m ³ /km*y]		Yearly Water losses [m ³ /year]	% of total network length	Yearly Water Losses per length of network [m ³ /km*y]	Yearly Water losses [m ³ /year]	[%]
Renovated Pipes					81.5	252,863	6	3 103	-252,863	
AC old	120	14,536,606	95	121,138	38.5	3,469,397	87	90 114	11,067,208	76
- High zone	65	10,075,000	66	155,000	0.0	0	0	155 000	10,075,000	
- Middle zone	55	4,956,282	32	90,114	38.5	3,469,397	87	90 114	1,486,885	
Other material	30	270,408	2	9,014	30	270,408	7	9 014	0	0
- High zone	2	30,000	0.2	15,000	2	30,000	1	15 000	0	
- Middle zone	28	240,408	2	8,586	28	240,408	6	8 586	0	
Total	150	15,301,690	100	102,011	150	3,992,668	100%	26 618	11,309,022	74

L= Length of water supply network

- Summarise the impact of investment measures on electricity costs as given in the table below:

Table: Impact of each investment measure on energy costs - Water Supply

Investment measure	Energy costs before project [€/year]	Energy costs after project [€/year]	Energy savings [€/year]	% Reduction
<i>Replacement of pumps in agglom. xx</i>				
<i>Replacement of xx km of network</i>				
<i>Etc.</i>				
TOTAL				

- Summarise the impact of all investment measures on operation & maintenance costs in the table below.

Table: Impact of all investment measures ¹⁴on Operation & Maintenance Costs Water Supply

Cost Item	Amount before project [€/year]	Amount after project [€/year]	Savings [€/year]	% Reduction
Energy				
Chemicals				
Staff				
Material				
Others ¹⁵				
TOTAL				

11.1.2 Wastewater

Summarise the investment measures proposed to improve the wastewater system:

- Main characteristics of investment components using the following structure:
- Wastewater network,
 - Wastewater pumping stations
 - Wastewater treatment plant
 - Sludge treatment
- Quantities of infrastructure components proposed (output indicators)
- Main justification for each investment component (i.e. water losses, number of pipe failures, condition of pipes, etc.); quantify as far as possible.

11.1.2.1 Investment Strategy

¹⁴ Impact of all investment measures aiming at efficiency improvement

¹⁵ ie. costs of External Services (excavation, construction, etc.)

Briefly describe the strategy for improving the wastewater system including priorities for implementing investment components. Provide an overview of all investment components (summary list of aggregated investment components).

Describe the proposed general investment strategy for improving the wastewater system including:

- Investment priorities
- Implementation strategy (i.e. combine water and wastewater network construction to avoid double trenching)
- General time frame for implementation (key milestones)
- Main difficulties and constraints expected during implementation of the wastewater system (i.e. capacity of the operator, etc.). Particularly highlight important implementation risks. Note: confirm land availability at feasibility stage.

11.1.2.2 Main Impact of Measures and Performance Indicators

Present the main impact of the investment measures as follows:

- Describe the main result of each investment component and quantify as far as possible with relevant key performance indicators for each component (i.e. increase of connection rate, reduction of infiltration, population benefiting from the measure, etc.)
- Present the expected improvements after implementing the selected investment components with the performance indicators in the table below (before and after project implementation):

Table: Performance Indicators for Wastewater (WW)

Item *	Indicator	Unit	Before Project	After Project
3.4.4	Total generated load in agglomeration	P.E.		
3.4.6	Connection rate of generated load: connected load to collection system / total generated load (UWWTD Art.2(5))	% of 3.4.4		
3.2.1.8	Sewer Infiltration rate: Volume of infiltration water into the wastewater network / total wastewater volume collected	% of 3.2.1		
3.4.1	Total Biological load (BOD5)	kg BOD/d		
3.6.1	Total length of wastewater network (incl. storm water & main collectors)	km		
3.6.5.2	Percent of wastewater network rehabilitated	%		
3.6.8	Population served per length of wastewater network	capita/km		
3.7.7	Capacity of WWTPs in population equivalent (p.e.)	p.e.		
3.7.8.10	Volume of wastewater treated with effluent quality in compliance with EC UWWTD 91/271/EEC Article 4 (5)	m ³ /d		
3.7.8.11	Percent of volume of wastewater treated with effluent quality in compliance with EC UWWTD 91/271/EEC Article 4 (5)	% of 3.2.1		
3.9.5	Average electricity consumption per year	kWh/a		
3.9.6	Average electricity consumption per volume of wastewater treated	kWh/m ³		

- Present the estimated impact of each investment measure aiming at reducing operation costs (i.e., energy savings through replacement of pumps and other electro-mechanical equipment). Do not consider additional costs due to

improving the level of service (i.e., improvement of effluent quality) in the following table.

Table: Impact of each investment measures on Energy Costs - Wastewater

Investment measure	Energy costs before project [€/year]	Energy costs after project [€/year]	Energy savings [€/year]	% Reduction
Replacement of pumps in agglom. xx				
Replacement of xx km of sewer network				
Etc.				
TOTAL				

- Summarise the impact of all investment measures on operation & maintenance costs in the table below.

Table: Impact of all investment measures ¹⁶ on Operation & Maintenance Costs Wastewater

Cost Item	Cost before project [€/year]	Cost after project [€/year]	Savings [€/year]	% Reduction
Energy				
Chemicals				
Staff				
Material				
Others ¹⁷				
TOTAL				

A more detailed table for performance indicators of all agglomerations is in Annex 1.

11.2 Water Supply Investment Measures

Present the proposed investment measures for each component and each water supply system/locality by:

- Preparing a justification for each investment measure, relating the key deficiencies in Chapter 5 to the proposed investment measures
- Describing the technical features (of the selected option) with sufficient detail (refer to more detailed presentations in the annex)

11.2.1 Water Supply System X

For each Water Supply System present the following investment measures:

- Water Abstraction

¹⁶ Impact of all investment measures aiming at efficiency improvement

¹⁷ ie. costs for External Services (excavation, construction, etc.)

- Pumping Stations and Reservoirs
- Water Treatment Plants
- Water Transmission Mains
- Water Distribution Network
- SCADA System and Pressure Management System

11.3 Wastewater Investment Measures

11.3.1 Wastewater Investment Measures in Agglomeration X

- For each wastewater agglomeration present the following investment measures:
- Wastewater Network (incl. CSOs and sewer retention tanks)
- Pumping Stations
- Wastewater Treatment Plants (in line with EN)
- Sludge Management

11.4 Project Management

The Main Aspects of the Project Management should be explained here. Details should be described in the Institutional Report. It should help implement the project by putting in place a reliable system and effectively improving the water service. It will focus on:

- Project Management
- Works Supervision.

Project Management should:

- Assist in strengthening the managerial, administrative, and commercial capacity of the operating company
- Support the Beneficiary in Project Implementation and Publicity
- Training in new technologies, equipment, and instruments.

The Consultant in charge of **Construction Supervision** will be responsible for managing and supervising the works contracts and in general will fulfil all duties of the Engineer as defined in the FIDIC Yellow and Red Book Conditions of Contract for Construction.

11.5 Investment Costs

The scope of work is defined in the ToR:

- Provide in annexes detailed construction cost estimates (in EUR) for the proposed project components. Cost estimates should be sufficiently detailed, subdivided into logical project elements, and supported by assumptions and bases for figures in adequate details to permit detailed analysis. The estimates and any revisions thereon should be dated, and should show local and foreign costs, local duties

and taxes, design, supervision, legal and administration costs associated with the projects, consultant's fees and allowances for prices increases and contingencies.

- Provide an estimated schedule of expenditures, by year, for each project. Dates of expenditures should be the dates payments are due. Subdivide the schedule to show requirements for the major parts of the projects and coordinate with the estimated construction schedule.

Summarise investment costs:

- 1 Investment Costs per Agglomerations (Constant Prices)
- 2 Extension / Rehabilitation Costs (Constant Prices)
- 3 Civil Costs / Mechanical & Electrical Equipment Costs (Constant Prices)
- 4 Civil Costs / Mechanical & Electrical Equipment Costs (Current Costs)
- 5 Breakdown per Contract (Current Prices)
- 6 Breakdown for Application Form (Current Prices)
- 7 Cash Flow Development (Current Prices)

Prepare a detailed investment cost breakdown for each agglomeration separated in the main project components.

11.6 Operation and Maintenance Costs

Present Operation & Maintenance (O&M) costs considering the following aspects:

- Give details on the cost of and operation and maintenance (O&M) and operator management
- Give details on the expected variation of O&M costs in the future
- Consider the cost calculation below as the basis for calculations in the Financial and Economic Sections of the FS

11.6.1 Operation and Maintenance Costs for Water Supply System

- Provide O&M cost calculation before and immediately after¹⁸project implementation, and at the end of the planning horizon (clearly explain assumptions for development) for each agglomeration and a summary table for all agglomerations, using the template below:

¹⁸ i.e. in the year 2013

Table: Operation & Maintenance Costs for Water supply – Locality x¹⁹

Cost Item	Before Project	After Project	End of Planning Period	Comments
Energy				
Chemicals				
Staff				
Material				
Others				
TOTAL				

Constant Prices in EURO cost base

Provide more detailed cost calculation for each cost component (i.e. water abstraction, water treatment plant, water mains, pumping main, distribution system) in the annex.

11.6.2 Operation and Maintenance Costs for Wastewater System

- Provide O&M cost calculation before and immediately after²⁰ project implementation as well as at the end of the planning horizon (clearly explain assumptions for development) for each agglomeration and prepare a summary table for all agglomerations using the template below:

Table: Operation & Maintenance Costs for Wastewater – Agglomeration x²¹

Cost Item	Before Project	After Project	End of Planning Period	Comments
Energy costs				
Chemicals costs				
Staff costs				
Material costs				
Others costs				
TOTAL				

Constant Prices in EURO cost base

Provide more detailed cost calculations in the annex (i.e. split in cost components: WWTP, sludge management, main collector, pumping stations, wastewater network).

11.6.3 Summary of Operation and Maintenance Costs

Provide a summary table for Operation and Maintenance Costs for water and wastewater (aggregated for all agglomerations). Present more detailed data in the annex.

¹⁹ Prepare one table for each agglomeration and a summary table aggregating data of all agglomerations

²⁰ i.e. in the year 2013

²¹ Prepare for each agglomeration

The table below separates change of O&M costs (before and after project) into two components: (i) due to efficiency improvement (i.e. reduction of specific energy costs) and (ii) increase of O&M costs due to increase of service level (increase of supply, increase of pressure, etc.).

Table: Operation & Maintenance Cost – separation of change of O&M costs

Cost Item	Water Supply	Wastewater	Total
Total O&M costs before Project			
Total O&M costs after Project			
Difference in O&M costs between before and after Project			
O&M cost decrease due to efficiency improvement			
O&M cost increase due to increase of service level			
TOTAL			

Constant Prices in EURO cost base

11.7 Aggregated Unit Costs

Based on the results of cost estimates in the chapters above,

- Prepare a table with specific costs to provide a benchmark for the investment components proposed;
- Compare data between all localities/agglomerations and comment on major deviations of unit costs and compare data with international benchmarking data;
- Present summary table for unit investment costs at regional level (minimum, maximum, average of all localities/agglomerations for selected indicators);
- Complete the summary table below in the table below as Annex

Table A: Unit Investment Costs

Item*	Indicator	Unit	Unit costs per locality/agglomeration		
			x	Y	Average ²²
1.	Unit Investment Costs Water Supply				
1.1	Total per capita investment costs water supply	€/ capita			
1.2	Investment costs per capacity of water treatment plants installed	€/ capita			
1.3.	Investment costs per length of distribution network	€/ km			
1.4	Investment Costs for wastewater pumping stations per capacity installed	€/ (l/s)			
2	Unit Investment Costs Wastewater				
2.1.	Total investment costs wastewater system per P.E. in agglomeration	€/ P.E.			
2.2.	Investment costs for WWTP per P.E.	€/ P.E.			
2.3.	Investment costs per length of sewer network	€/ km			

²² weighted average of all agglomerations in the region if applicable (meaningful)

Item*	Indicator	Unit	Unit costs per locality/agglomeration		
			x	Y	Average ²²
2.4	Investment costs for wastewater pumping stations per capacity installed	€/ (l/s)			

Table B: Unit Operation & Maintenance (O&M) Costs

Item*	Indicator	Unit	Unit costs per locality/agglomeration		
			x	Y	Average
1.	Unit Operation & Maintenance (O&M) Water Supply				
1.1	Yearly O&M costs water supply systems per capita	€/ capita.			
1.2	Yearly O&M costs water treatment plants per capacity installed	€/ (l/s)			
1.3.	Yearly Operation & Maintenance costs per length of water supply network	€/ km			
1.4	Yearly O&M costs per capacity of water pumping station installed	€/kW			
2	Unit Operation & Maintenance (O&M) Costs Wastewater				
2.1.	Yearly O&M costs wastewater systems per P.E.	€/ P.E.			
2.2.	Yearly O&M costs wastewater treatment plant per P.E. excl. sludge management	€/ P.E.			
2.3.	Yearly O&M costs per length of sewer network	€/ km			
2.4	Yearly O&M costs wastewater pumping stations per capacity installed	€/ kW			

11.8 Relevant Risks and Climate Change Considerations

Summarise the relevant risks and climate change considerations plus the mitigation measures that are proposed to be implemented.

11.9 Conclusions and Recommendations

Summarise the conclusions and recommendations of this chapter.

12. RESULTS OF RISK AND CLIMATE CHANGE ASSESSMENT

Summary of the Risk and Climate Change Assessment in Volume VI

13. RESULTS OF FINANCIAL AND ECONOMIC ANALYSIS

Summary of the Financial and Economic Analysis as per Guide of the EC (Volume VI)

14. RESULTS OF INSTITUTIONAL

Summary of the Institutional Analysis (Volume VII)

15. RESULTS OF ENVIRONMENTAL IMPACT ASSESSMENT

Summary of the Environmental Impact Assessment (Volume V)

16. PROCUREMENT STRATEGY, DESIGN AND IMPLEMENTATION PLAN

Scope of work as defined in the ToR:

- Prepare the plan for undertaking design in line with the Procurement approach. As a general rule, process plants (DWTPs and WWTPs) should be tendered as FIDIC Yellow type contract and the remaining Works contracts as FIDIC Red. This will define the level of detail that the design will need to present.
- Recommend (based on a thorough risk assessment) the most appropriate conditions of contract and consequent tendering/contracting approach for each works contract. The Managing Authority will decide, in consultation with relevant partners based on the Consultant's proposal.
- Prepare the procurement strategy and implementation plan after the design, cost, scope of work, and objectives of each project have been clearly defined in the earlier phases of the assignment and after the project has received favourable opinion by the competent authorities.
- Draw up a procurement plan ensuring that the project is implemented in the fastest and most efficient manner. Both open and restricted tender procedures are acceptable; recommend an optimal procedure for the circumstances of the project and agree with relevant stakeholders.
- Aspects which need to be presented in greater detail are as follows:
 - General Procurement
 - Procurement Strategy
 - Criteria for Grouping of Tenders
 - Potential of National Construction Companies
 - Proposed Procurement Strategy
 - Proposed Tenders
 - Proposed Procurement and Implementation Plan
 - Documents required for project implementation
 - Assumptions and Risks

VOLUME II: ANNEXES TO FEASIBILITY STUDY REPORT**14 Annex A – General Documentation Relating to Implementation of Study**

1. Inception Report
2. Progress Reports
3. Minutes of Meeting
4. Correspondence
5. Gantt Chart
6. Resource Plan

15 Annex B – Sources of Information, Available Data and Documents Consulted

1. Introduction
2. Summary of Legislation
3. Summary of Standards
4. Policy Documents (can be included electronically)
5. Regional Master Plan and other regional planning document (can be included electronically)
6. Data obtained from Public Institutions
7. Unit Cost Data base

16 Annex C – Data Collection and surveying reports**1. Introduction and Summary of Data Collected**

Include in this section all new data obtained through measurements by the Consultant.

2. Site Visit Reports

Site visit reports from each site visit should be presented in a tabular format indicating the persons, date, location, objective, observations, photographs and conclusions and recommendations. Templates for water and wastewater related site visits are available on-line.

3. Assessment of Agglomerations

- 3.1 Review “Sufficiently Concentrated Area”
- 3.2 Calculation of Actual Load

4. **Hydro-geological Investigations**
5. **Topographic Survey**
6. **Ground Surveys (incl. if necessary land geophysical)**
7. **Water Supply System surveys**
8. **Non-Revenue Water Survey (incl. flow and pressure measurements)**
9. **Sewer Surveys (incl. CCTV)**
10. **Water Quality Survey**
11. **Wastewater Quality Survey**
12. **Industrial Wastewater Survey (incl. inventory)**
13. **Analytical Sludge Survey**

17 annex D - calculations

1. **Introduction**
2. **Drinking Water Balance Calculations (incl. NRW)**
3. **Calculation of loads of the agglomerations**
4. **Hydraulic Modelling of Water Supply System**
5. **Hydraulic Modelling of Wastewater System**
6. **Calculation of basic design parameters for Water Supply investments**
7. **Calculation of basic design parameters for Wastewater investments**
8. **Background calculations for Option Analysis of Water Supply System**
9. **Background calculations for Option Analysis of Wastewater System**
10. **Additional Water Supply design calculations**
11. **Additional Wastewater Design Calculations**
12. **Detailed Investment Cost Breakdown**
 - 11.1 Assumptions for calculation of Investment Costs
 - 11.2 Benchmark Unit²³ Investment cost table
 - 11.3 Specific Cost calculations based
13. **Operation and Maintenance Costs**
 - 12.1. Assumptions for calculation of Operation & Maintenance Costs
 - 12.2. Benchmark Unit²⁴ Operation & Maintenance Costs
 - 12.3. Detailed Calculation of Operation & Maintenance Costs
14. **Performance Indicators**

Template as presented in Annex 1 of this Guidance document

18 ANNEX E – Further Design and Implementation Strategy

1. **Design and Procurement Strategy and Implementation Plan (incl. gantt charts)**

²³ Specific costs to benchmark the investment costs

²⁴ Specific costs to benchmark the operation & maintenance costs

VOLUME III: DRAWINGS AND MAPS

1. Thematic Maps (Principle Features)
2. Location and Agglomeration Maps
3. Existing Water Supply Asset Maps and Drawings
4. Existing Wastewater Asset Maps and Drawings
5. Existing Service Levels
6. Option Presentations
7. Project Presentation
8. Gantt Charts

VOLUME IV: FINANCIAL AND ECONOMIC ANALYSIS - COST BENEFIT ANALYSIS (CBA)

Present entire Cost Benefit Analysis (CBA Report) in line with the latest EC CBA Guidelines and Methodology

VOLUME V: ENVIRONMENTAL IMPACT ASSESSMENT STUDY (EIA)

Present entire Environmental Impact Assessment Report (EIA Report) documenting the EIA procedure.

VOLUME VI: RISK AND CLIMATE CHANGE ASSESSMENT

1. Risk Assessment in line with the Regulations
2. Climate Change Assessment in line with the DG Clima Non-Paper

VOLUME VII: INSTITUTIONAL ANALYSIS

- Present Institutional Analysis including Analysis of the Sector including State Aid Considerations
- Analysis of the Project Stakeholders and their contractual relations
- Analysis of the Project Beneficiary and its capacity
- Analysis of the Project including Project Management, Supervision, Support, Technical Assistance etc.

VOLUME VIII –X: ADDITIONAL DOCUMENTATION REQUIRED TO COMPLY WITH NATIONAL REGULATIONS AND PROCEDURES