



Republic of Serbia

MINISTRY OF FINANCE

Department for Contracting and Financing of EU Funded Programmes (CFCU)

Belgrade, 03/11/2016

CONTRACTING AUTHORITY'S CLARIFICATIONS No. 5

“Construction and commissioning of waste water treatment plant at TPP Kostolac B”

Publication ref: EuropeAid/137116/IH/WKS/RS

No.	Question	Answer
1	<p>WWTP-U</p> <p>Please confirm if the sludge pumps from DAF sludge reservoir to centrifugal decanter should be submersible or helicoidally. In the Employers requirement indicate that these pumps are submersible and in the process diagram is painted helicoidal.</p>	<p>The sludge pumps from DAF sludge reservoir to centrifugal decanter are submersible.</p>
2	<p>WWTP-U</p> <p>We consider that the battery limit of the piping of clear water pumping is above ground about 5 meters near the sump pit. Please, we need that confirm us our appreciation or locate the pipe to connect.</p>	<p>The question is not clear.</p> <p>If the question relates to the point of connection to the drinking water please, see Annex 5.1. to Clarifications No. 5 which contains drawing with marked possible connection points for clear water (connection points are marked as „prikljucak za vodu“).</p>
3	<p>CHEMICAL</p> <p>The specified polyelectrolyte storage, preparation and dosing system is huge for WWTP-U application. Polyelectrolyte dilution can lose their characteristics if it is storage more than 24 h, for this reason we recommended smaller equipment. Please confirm.</p>	<p>Negative.</p> <p>The equipment has to be in accordance with Employer's requirements Chapter 9.6.1.3. Polyelectrolyte Preparation and Dosing System.</p>

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4	<p>WWTP-ODG&HPV</p> <p>Is it possible to build the primary and main clarifiers tanks in concrete? Please confirm.</p>	<p>No, it is not possible. The clarifiers have to be in accordance with Employer's requirements Chapter 9.3.3.3. Primary clarifier (2) and main clarifiers (5).</p>
5	<p>WWTP-ODG&HPV</p> <p>We consider that the battery limit of the piping of clear water pumping is above ground about 5 meters near the sump pit. Please, we need that confirm us our appreciation or locate the pipe to connect</p>	<p>The question is not clear.</p> <p>If the question relates to the point of connection to the drinking water, please, see Annex 5.1. to Clarifications No. 5 which contains drawing with marked possible connection points for clear water (connection points are marked as „priključak za vodu“).</p>
6	<p>STORM WATER SEPARATORS</p> <p>Volume 4.2. Financial offer templates. 4.2.3 Breakdown of the Lump-sum price. Schedule 3 – civil works WWTP-STORM WATER TREATMENT. Item 3.1. Peripheral channel leading to an gravitational oil separator (in the car parking area).</p> <p>Please locate in “(V3.1annex2.01) 333-13-TEKO B WW-CV-LAY-05-B_WWTP General Lay Out” the parking area and describe or indicate works that we have to consider.</p>	<p>Please see Annex 5.1 to Clarifications No. 5 containing drawing with marked Parking area (Area No. 4)</p> <p>The works are described in Employer's requirements, Chapter 9.4</p>
7	<p>STORM WATER SEPARATORS</p> <p>Volume 4.2. Financial offer templates. 4.2.3 Breakdown of the Lump-sum price. Schedule 3 – civil works WWTP-STORM WATER TREATMENT. Item 3.2. Upgrade of the last part of the storm water collection channel before the storm waters pump station including sampling pit.</p> <p>Please locate in “(V3.1annex2.01) 333-13-TEKO B WW-CV-LAY-05-B_WWTP General Lay Out” the last part of the storm water collection channel and describe or indicate, works that we have to consider or bill of quantities about these works.</p>	<p>Please see Annex 5.1 to Clarifications No. 5 containing drawing with three (3) open channels marked. The channels are collecting storm water to the pumping station after which the water is pumped to the recipient.</p> <p>The works are described in Volume 3. , Employer's requirements , Section 9.4</p>

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8	<p>ELECTRICAL</p> <p>9.8.3.1. L.V. switchgears. WWTP-U Section</p> <p>One (1), main LV switchgear (U Switchgear) of metal-enclosed, metal-clad type according the IEC 60439 will be installed in the WWTP-U Building electrical room and feed the equipment and installations in the main WWTP-U area. The thickness of the external metal enclosure shall be at least 1,5mm. The protection degree shall be of IP41, in service, disconnected-test, disconnected, or removed positions of the drawers.</p> <p>The U Switchgear will be power supplied by the TEKO B existing redundant LV distribution RP OCG-1 (feeders 03C and 05C) rated as 400V, 400 A and located in the Compressed Air Building.</p> <p>Question. Confirm the location existing Air Compressors LV distribution building</p>	Confirmed.
9	<p>ELECTRICAL</p> <p>9.8.3.1. L.V. switchgears. WWTP-U Section</p> <p>One (1), LV switchgear (MCC-Ua) of metal-enclosed, metal-clad type according the IEC 60439 will be installed in the electrical room of the HFO outdoor pump station to feed the HFO polluted effluents sump pit and the API separator equipment and installations. The thickness of the switchgear external metal enclosure shall be at least 1,5mm. The protection degree shall be of IP41, in service, disconnected-test, disconnected, or removed positions of the drawers.</p> <p>The MCC-Ua switchgear will be power supplied by redundant feeders of the existing HFO pump house switchgear (RP OCK 01, rated as 400V, 80 KVA) and will be installed indoor in the existing HFO pumphouse switchgear room.</p> <p>Question. Confirm the location existing HFO pumphouse switchgear room.</p>	Confirmed.

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10	<p>ELECTRICAL</p> <p>9.8.3.1. L.V. switchgears. WWTP-U Section</p> <p>One (1), LV switchgear (MCC-Ub) of metal-enclosed, metal-clad type according the IEC 60439 will be provided for the power supply of the new intermittent sump basin collecting the oily effluents from the Units B1 and B2 Machine Halls. The thickness of the external metal enclosure shall be at least 1,5mm. The protection degree shall be of IP41, in service, disconnected-test, disconnected, or removed positions of the drawers</p> <p>The MCC-Ub switchgear will be power supplied by redundant feeders of the existing Mechanical Workshop switchgear (GMR-IV, 250A) and will be installed indoor in the existing Mechanical Workshop building</p> <p>Question. Confirm the location existing Mechanical Workshop building.</p>	<p>Confirmed.</p>
11	<p>In section 9.8.2.2 (page 68) is required »a portable pump set (properly sized and common for the whole WWTP facilities), installed in a vehicle and equipped with the necessary control and monitoring equipment and a 500 m long discharge hose«.</p> <p>Please confirm if portable pump, vehicle and other equipment should be the scope of supply, and than please specify capacity size range for each device.</p>	<p>Yes, mentioned equipment is in scope of supply.</p> <p>Capacity, size and range of equipment shall provide quick drainage of the each structure in order to enable structure maintenance. Base on that and chosen drainage valves designer has to determine capacity size and range of equipment in accordance to requirements in Volume 3, Employer's requirements, section 9.8.2.2</p>
12	<p>In section 9.8.3.1 (page 69) If we are correctly understand, all LV switchgears (5 pieces): MCC-U, MCC-Ua, MCC-Ub, MCC-ODG&HPV, MCC-S must be metal-clad type, power supplied by redundant feeders, assemblies shoud meet requirements of Form 4b construction to IEC 61439-2 (withdrawable screened cassette for each motor).</p> <p>Please confirm if so required.</p>	<p>Confirmed.</p>

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13	<p>In section 9.8.3.1 Process equipment earthing and lightning protection (page 71) To carry out grounding is it required to use bare stranded copper conductors of, at least, and 240 mm²?</p>	<p>Yes, it is required according to Employer's requirements Chapter 9.8.3.1. L.V. switchgears TD.</p>
14	<p>In section 9.93 Common SCADA HMI (page 73) Is it necessary to carry out connection - transmitting signals of WWTP SCADA to existing DCS? Where is the limit of supply on this part?</p>	<p>Yes it is necessary to carry out connection- transmitting signals of WWTP SCADA to existing DCS. The designer should propose basic schemes and signals of the status of the facilities, which will be screened in the existing DCS.</p>
15	<p>In section 9.8.2.2 (page 68) What is the scope of supply of Public Announcement (PA) system and how many speakers is required on each WWTP?</p>	<p>The Tenderer should foresee the adequate Public Announcement (PA) system (including number of speakers) according to his experience and relevant legislation.</p>
16	<p>Is any geological study of the location of WWTP-ODG&HPV, WWTP-U and WWTP-S available? If it is, please poste it.</p>	<p>Precise data are currently not available.</p> <p>The Preliminary Design states following:</p> <p><i>“Based on the results of previously conducted field and laboratory researches conclusions regarding the lithological composition of the terrain at the location of objects and geo mechanical characteristics of represented materials were made. Field researches and laboratory tests of soil at the location of TPP Kostolac B were performed by the organization „Georad“, OOUR „Georad” and results were presented in the “Study on geo mechanical characteristics of soil at the location of future TPP Kostolac B” (Georad, 1978). Investigative drilling of 6 investigative boreholes was conducted and the length of boreholes was 30m (TED-1 do TED-6). Representative samples of soils were taken from the boreholes and laboratory tests were performed (identification and classification</i></p>

No.	Question	Answer
		<p><i>examination, determination of physical and mechanical characteristics of soil). The borehole closest to the location of future WWTP is TED-3. Based on the results of drilling and laboratory tests it has been concluded that the soil at the location of facility has following layer characteristics:</i></p> <p><i>1) at the surface of terrain is humus thickness around 0.6 m,</i></p> <p><i>2) beneath humus is the layer of loess thickness around 3.9 with following characteristics:</i></p> <p>$\gamma = 20 \text{ kN/m}^3$ $c = 20 \text{ kN/m}^2$ $\phi = 23^\circ$ $M = 15000 \text{ kN/m}^2$</p> <p><i>3) furthermore there is a layer of loess clay thickness 4.10 m, with following characteristics:</i></p> <p>$\gamma = 20 \text{ kN/m}^3$ $c = 10 \text{ kN/m}^2$ $\phi = 26^\circ$ $M = 20000 \text{ kN/m}^2$</p> <p><i>4) bellow is the layer of sandy clay thickness 0.4 m, with following characteristics:</i></p> <p>$\gamma = 20 \text{ kN/m}^3$ $c = 10 \text{ kN/m}^2$ $\phi = 22^\circ$ $M = 25000 \text{ kN/m}^2$</p> <p><i>5) on a larger depths su clay sand and fine grained sand, which haven't been laboratory tested. Depth of ground water is around 9.20m in the layer of sandy clay (4). Foundation of all objects in FGD is in loess layer (2) except for the sludge silos for which foundation is in the layer of loess clay (3).”</i></p> <p>The data in the above mentioned text</p>

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		<p>(in italic font) should be used as indicative ones bearing in mind following:</p> <ol style="list-style-type: none"> 1. Geotechnical characteristics of the terrain on which WWTP will be located could be different from the presented data 2. Location of TPP Kostolac and WWTP foreseen by the Project is between two rivers 3. As stated in Appendix C: Civil Works Design Requirements Chapter 1.4.1.1. "CONTRACTOR will have to carry out a soil investigation...".
17	<p>What is the soil structure at the location of the WWTP-ODG&HPV, WWTP-U and WWTP-S?</p>	<p>Precise data are currently not available.</p> <p>The Preliminary Design states following:</p> <p><i>"Based on the results of previously conducted field and laboratory researches conclusions regarding the lithological composition of the terrain at the location of objects and geo mechanical characteristics of represented materials were made. Field researches and laboratory tests of soil at the location of TPP Kostolac B were performed by the organization „Georad“, OOUR „Georad” and results were presented in the “Study on geo mechanical characteristics of soil at the location of future TPP Kostolac B” (Georad, 1978). Investigative drilling of 6 investigative boreholes was conducted and the length of boreholes was 30m (TED-1 do TED-6). Representative samples of soils were taken from the boreholes and laboratory tests were performed (identification and classification examination, determination of physical and mechanical characteristics of soil). The borehole closest to the location of future WWTP is TED-3. Based on the results of drilling and laboratory tests it has</i></p>

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		<p>located could be different from the presented data</p> <p>2. Location of TPP Kostolac and WWTP foreseen by the Project is between two rivers</p> <p>3. As stated in Appendix C: Civil Works Design Requirements Chapter 1.4.1.1. "CONTRACTOR will have to carry out a soil investigation..."</p>
18	<p>At which depth is the groundwater at the locaton of the WWTP-ODG&HPV, WWTP-U and WWTP-S?</p>	<p>Precise data are currently not available.</p> <p>The Preliminary Design states following:</p> <p><i>"Based on the results of previously conducted field and laboratory researches conclusions regarding the lithological composition of the terrain at the location of objects and geo mechanical characteristics of represented materials were made. Field researches and laboratory tests of soil at the location of TPP Kostolac B were performed by the organization „Georad“, OOUR „Georad” and results were presented in the "Study on geo mechanical characteristics of soil at the location of future TPP Kostolac B" (Georad, 1978). Investigative drilling of 6 investigative boreholes was conducted and the length of boreholes was 30m (TED-1 do TED-6). Representative samples of soils were taken from the boreholes and laboratory tests were performed (identification and classification examination, determination of physical and mechanical characteristics of soil). The borehole closest to the location of future WWTP is TED-3. Based on the results of drilling and laboratory tests it has been concluded that the soil at the location of facility has following layer characteristics:</i></p> <p><i>1) at the surface of terrain is humus</i></p>

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		<p><i>thickness around 0.6 m,</i></p> <p><i>2) beneath humus is the layer of loess thickness around 3.9 with following characteristics:</i></p> <p>$\gamma = 20 \text{ kN/m}^3$</p> <p>$c = 20 \text{ kN/m}^2$</p> <p>$\phi = 23^\circ$</p> <p>$M = 15000 \text{ kN/m}^2$</p> <p><i>3) furthermore there is a layer of loess clay thickness 4.10 m, with following characteristics:</i></p> <p>$\gamma = 20 \text{ kN/m}^3$</p> <p>$c = 10 \text{ kN/m}^2$</p> <p>$\phi = 26^\circ$</p> <p>$M = 20000 \text{ kN/m}^2$</p> <p><i>4) bellow is the layer of sandy clay thickness 0.4 m, with following characteristics:</i></p> <p>$\gamma = 20 \text{ kN/m}^3$</p> <p>$c = 10 \text{ kN/m}^2$</p> <p>$\phi = 22^\circ$</p> <p>$M = 25000 \text{ kN/m}^2$</p> <p><i>5) on a larger depths su clay sand and fine grained sand, which haven't been laboratory tested. Depth of ground water is around 9.20m in the layer of sandy clay (4). Foundation of all objects in FGD is in loess layer (2) except for the sludge silos for which foundation is in the layer of loess clay (3).”</i></p> <p>The data in the above mentioned text (in italic font) should be used as indicative ones bearing in mind following:</p> <ol style="list-style-type: none"> 1. Geotechnical characteristics of the terrain on which WWTP will be located could be different from the presented data 2. Location of TPP Kostolac and WWTP foreseen by the Project is

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		<p>between two rivers</p> <p>3. As stated in Appendix C: Civil Works Design Requirements Chapter 1.4.1.1. "CONTRACTOR will have to carry out a soil investigation..."</p>
19	Chemical analysis of water from Donava river for cooling: SO_4^{2-} , Cl^- , NO_3^- , N_{tot} , Fe, Zn, Pb, MN, As, Cd, COD, BOD5, oils and fats	Indicative annual average quality of river Danube for 2015 is presented in Annex 5.2. to Clarifications No. 5.
20	Chemical analysis of water from Mlave: SO_4^{2-} , Cl^- , NO_3^- , N_{tot} , Fe, Zn, Pb, MN, As, Cd, COD, BOD5, oils and fats	Indicative annual average quality of river Mlava for 2015 is presented in Annex 5.2 to Clarifications No. 5.
21	Chemical analysis (average values) of the coal: ash, moisture, C, H, N, O, S, Cl, H_{lower} , heavy metals	<p>Based on the coal analyses in the period 1988 – 2015 indicative average values are:</p> <p>Moisture 35,02-44,81%</p> <p>Ash 16,77-31,57%</p> <p>Ctotal- 20-30%</p> <p>H- 1,6-2,5 %</p> <p>O- 9,38-11,38 %</p> <p>Stotal – 0,90-1,59 %</p> <p>Hlower 6160 -9777,78 kJ/k</p>
22	Chemical analysis (average values) of ash: SiO_2 , CaO, Fe_2O_3 , SO_3 , Al_2O_3 , MgO, Cl, F, Na_2O , K_2O	<p>Indicative average values*:</p> <p>SiO_2- 47,23-48,79 %</p> <p>CaO- 7,31-9,36 %</p> <p>Fe_2O_3- 10,04-12,54 %</p> <p>SO_3- 6,43-,7,61 %</p> <p>Al_2O_3- 20,11-24,24 %</p> <p>MgO- 0,99-1,84 %</p> <p>Na_2O- 0,20-0,33 %</p> <p>K_2O- 0,59-0,77 %</p> <p>*(analyses performed by Institute for Nuclear Science VINCA, 2015)</p>

No.	Question	Answer
23	Coal consumption, t/h for B1, B2 and B3	Coal consumption for B1 and B2 is around 400 t/h (for each Unit) and for Unit B3 is 375 t/h.
24	Chemical analysis (average values) of limestone CaCO ₃ , SiO ₂ , Fe ₂ O ₃ , MgO	Indicative average values are: CaCO ₃ ≥ 94% SiO ₂ ≤ 1% Fe ₂ O ₃ ≤ 0,5% MgCO ₃ ≤ 3%
25	How the "mixing zone" is defined after the discharge of treated water into the recipient (river)?	Decree on Limit Values of Priority and Priority Hazardous Substances which pollute surface waters and deadlines for their achievement (Official Gazette RS No 24/14) defines in Art 2 (4) and Art 6 the mixing zone.
26	Data under No. 3), 5) and 6) are required for the calculation of water balances for the operation of ODG plant and for calculation of characteristics of waste water ODG in the case of commercial production of gypsum. This possibility is mentioned in the document "14081-I-01 TECHNICAL PART II", paragraph 4.1. The quantity and composition of the waste water in the production of commercial gypsum are different from the case of simple subtraction of hydrocyclone overflow to maintain the level of concentration of dissolved salts, such as chloride, so engineered equipment must meet the requirements for both cases.	The question is not clear. However, please see Contracting's Authority Answers to Questions No. 13-24 to Clarifications No. 5 above, where the issues referring to data under Tenderers questions No. 3), 5), 6) are addressed.
27	Mercury content in coal. The data is needed for the assessment of mercury emissions, for the comparison with international standards and for the assessment of the possibility for a separate removal of mercury from work process flows. (It is possible to carry out an analysis of the sample of coal - 1 kg)	At this moment requested data is not available. Tenderer should assume mercury content in coal that is typical for this type of lignite.