Author	P1, P2, P3, P4, P5
Title of document	Report Activity 5.4
No of pages	2
Event date	20.09.2018
Event venue	Nis
Type of event	Consortium Board Meeting

The training courses to industrial partners and enterprises have been e constantly delivered to all companies interested in educating their employees on WM issues and willing to raise the level of environment awareness of their employees.
Within WamPPP project partners P1-P5, in cooperation with Partners P6-P13 developed more then 20 courses dedicated to industrial partners. Partners P1, P2, P3, and P5. In period 2017-2018 delivered to industrial partners 15 training courses. These courses were attended by more than 150 attendances. The courses were held in Belgrade, Nis, Novi Sad, Arandjelovac. There is interest of new companies from WM for new training.

	P1	P2	P3	P4	P5
No of delivered trainings	3	3	6	/	3

Only the Partner P4-VISER didn't delivered any training courses to industrial partners. The reason was, the specific equipment /incineration and biodiesel/ and some legal barrier from safety viewpoint for using that equipment. These problems have been solved during the summer 2018. The partner P4, prepared two courses for training of industrial partners and the first training will be delivered at spring of 2019.

Partner P1

Reports

Training report from the Public Utility Directorate of the Municipality of Gadzin Han

Gadzin Han is one of the eleven municipalities of the Nishav district and covers an area of 325 km2. The municipality has 34 settlements, according to the 2011 census, with 8,357 inhabitants. According to the 2002 census, the number of inhabitants was 10,667, 1991, 12,990, and in 1981, 16,281 inhabitants. Public enterprise has been established and has been entrusted with municipal affairs for the purpose of performing activities of general interest:

1. supply of drinking water;
2. purification and discharge of atmospheric and wastewater;
3. municipal waste management;
4. management of cemeteries and funeral services;
5. providing public lighting;
6. management of markets;
7. maintenance of streets and roads;
8. maintaining cleanliness on public surfaces;
9. maintenance of public green areas;
10. zoohigijene activity.

Starting from the type of work and the need to ensure the performance of related interconnected tasks on a functional principle, internal organization units are created by statute:

1) General Affairs Service;
2) Work unit for municipal affairs;
3) Work unit for roads and construction.

The work unit for public utilities employs 34 workers working in the area of Gadzin Han Municipality. Municipal workers are collecting municipal waste in the territory of Gadzin Han through the door-to-door system, discharging containers in the surrounding villages, as well as disposing of garbage cans in public places in the city. The represetnatives of P1 held two trainings for emplzees in this company from sector of occupational safety and health for two postion.

- Garbage truck drivers
- Communal workers

The training was conducted by lecturers Dr Anica Milošević and mr Slađana Nedeljković, 12.07.2018. and 13.07.2018. years.

Figure 1: Lecturers dr Anica Milošević and mr Sladjana Nedeljković at the training

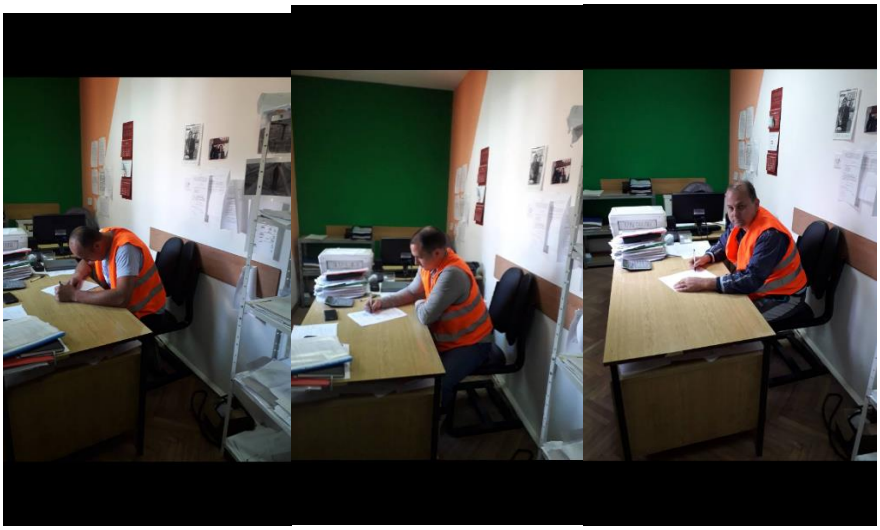
Figure 2: Training in utility companies for communal truck drivers

Figure 3: Training in a utility company in Gacino Han

Figure 4: Training in a utility company with drivers and utility workers

Figure 5: Successful training in a utility company with drivers and utility workers

After the training was completed, a survey was conducted with the workers who underwent training.



Training practitioners:
Dr Anica Milošević
Mr. Sladjana Nedeljkovic

LIST OF PARTICIPANTS

J.P Directorate for Public Affairs and Communal Affairs Gadzin Han
Ul. Miloš Obilića bb Gadžin Han

Training: Safety and health at work in communal enterprises
Position: worker coworker

rb	Ime i prezime	kontakt	potpis
1	Predrag Nikolić	018 860-049, 0692372471	
2	Zoran Stamneković	018 860-049	
3	Zoran Stojilković	018 860-049	
4	Siniša Radoičić	018 860-049	
5	Živorad Miljković	018 860-049	
6	Goran Nikolić	018 860-049	
7	Igor Milošević	018 860-049	
8	Siniša stamneković	018 860-049	
9	Goran Đorđević	018 860-049	

Gadžin Han 13.07.2018

LIST OF PARTICIPANTS

J.P Directorate for Public Affairs and Communal Affairs Gadzin Han
Ul. Miloš Obilića bb Gadžin Han
Training: Safety and health at work in communal enterprises
Workplace driver of utility vehicles

rb	Ime i preyime	kontakt	potpis
1	Saša Filipović	018 861 273, 0692372477	
2	Marko Mladenović	018 861 273	
3	Goran Ristić	018 861 273	
4	Ilić Aleksandar	018 861 273	

PARTNER 2

PARTNER P3

TRAININGS - CATAR

1. TRAINING FOR EXPERT TRAINING OF EMPLOYEES IN THE FIELD OF WASTE MANAGEMENT, Railways of Serbia, Belgrade
Date: 01/30/2017.
Character: one-day training
Number of participants: 55
Prof. Dr Brankica Luković gave a lecture on the topic "Obligation of generators and waste owners", as well as on the topic: "Management of non-hazardous waste, collection, packaging, marking, storage, disposal". Within the framework of the training, the participants are familiar with the concepts of waste management, the responsibilities of the waste producer, the responsibilities of the waste carrier, the management of waste oils, the storage and labeling of hazardous waste, and others. Upon completion of the training, written test of the participants was carried out and certificates were passed to the persons who passed the test. The test used is attached in the attachment.

COMPOSING GREEN WEIGHT AND BIOOTPAD, Employees of JKP Zelenilo - Arandjelovac
Date: 02.02.2018.
Character: one-day training
Number of participants: 25
Vahid Ibrul held a lecture on the collection of green waste from park surfaces, its processing through composting and further use. A method for composting green waste is presented. In the training, 25 employees took part in the maintenance of green areas in JKP Zelenilo-Arandjelovac.

1. MANAGEMENT OF HAZARDOUS AND IMPACT WASTE, CATAR, Aranđelovac
Date: 08.02.2018.
Character: one-day training
Number of participants: 15
Prof. Dr Đorđe Mihailović, held training for CATAR employees on the importance and aspects of managing hazardous and non-hazardous waste.

DOCUMENTS ON MOVEMENT OF WASTES, SYMBOLS AND PYTOGRAMS, Arandjelovac
Date: 05/09/2018.
Character: one-day training
Number of participants: 20
Within the manifestation "Open Doors" CATAR, Prof. Dr Brankica Luković held a training on the topic: "Documents on the movement of waste, symbols and pictograms". Participants were students of the fourth grade secondary schools from Serbia.

ENLARGEMENT AND ENVIRONMENT PROTECTION, Conference of Students of Higher Schools, Zlatibor
Date: 05/10/2018.
Character: one-day training
Number of participants: 29
Mr. Ljiljana Plećević gave a lecture on the topic "Pollution and protection of the environment". She talked about the environmental pollution caused by the generation of waste. The training was realized within the framework of the Conference of the students of the higher schools that was held in Zlatibor.

ANAEROBIC DIGESTION IN THE REPUBLIC OF SERBIA, students of the High Technical School in Nis, Nis.
Date: 05/16/2018.
Character: one-day training
Prof. Dr. Brankica Luković held a training on the topic of Anaerobic digestion in the Republic of Serbia to the students of the Technical College in Nis.

PROTECTION OF GREEN AREA, Aranđelovac
Date: 09/12/2018.
Character: one-day training
Number of participants: 20
Dr. Mara Tabaković - Tošić, scientific advisor, from the Institute of Forestry, presented the implementation of professional activities related to forests and maintenance of public green areas. The training was attended by 20 employees of the municipal administration, agricultural pharmacies and JKP Zelenilo - Arandjelovac.

No	Name of training	Venue	No of attendents
1	TRAINING FOR professiolas IN THE FIELD OF WASTE MANAGEMENT	Belgrade	55
2	COMPOSING GREEN WEIGHT AND BIOWASTE	Aranđelovac	25
3	Managemnt of hazardouse and non hazardouse waste	Aranđelovac	15
4	Flow waste documentation szmbols and pictograms	Zlatibor	29
5	Pollution and environmental protection	Zlatibor	29
6	ANAEROBIC DIGESTION IN THE REPUBLIC OF SERBIA	Niš	27
7	GREEN AREA PROTECTION	Aranđelovac	20

PARTNER P5

Training report in the laboratory for waste testing - VŠSS Belgrade Polytechnic

Training 1: Solid waste heat treatment using a calorimeter

Training 2: Determination of turbidity of waste water using a turbidimeter

Position: laboratory analyst

College of Professional Studies - Belgrade Polytechnic is a state higher education institution that has been formed by professional engineers and designers for more than half a century. In 2007 and 2008, the school successfully completed the accreditation process, thus obtaining the status of a higher education institution. At the time, in accordance with the Law on Higher Education, nine study programs of basic vocational studies and three study programs of specialist vocational studies were accredited, and in the middle of 2012, we were in the process of re-accreditation and received approval for enrollment of students into two new study programs. As the number of directions increased over time, so today the classes are organized in two departments (Department of Technologies and Department of Design) with study programs in basic and specialist studies. In 2017, within the framework of the WaMPPP project, a study program was awarded at specialist positions titled "Waste-recovery". As part of the WamPPP WP2 Work Package, one of the activities is the installation and activation of laboratory equipment and employee training. Below is a list of equipment that

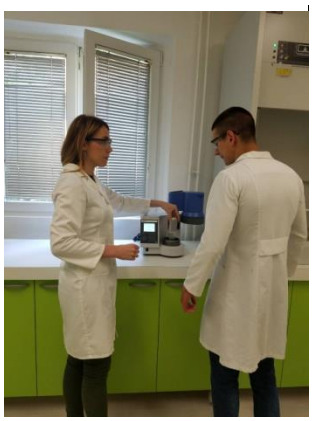
1. Analytical balance AS 220.R2

2. Calorimeter C1 / 10

3. Portable 430T Turbojet

4. Potentiometer TL 6000 M2 / 20

The first training was held at the Faculty of Technology and Metallurgy while the second training was held at the Military Technical Institute. (Picture 1)



The training was realized by lecturers Dr Aleksandra Bozic and Dr. Dominik Brkic, 12.09.2018. and September 13, 2018. years. Dr. Aleksandra Božić held a training on the calorimeter, Dr. Dominik Brkić (Figure 3) held training on the turbidimeter. A total of 10 participants attended both training sessions. The content of the training is attached to this report. After the training was completed, a survey was conducted with workers who attended the training.

After the training was completed, a survey was conducted with the workers who underwent training.

Training practitioners:

Dr Aleksandra Božić

Dr. Dominik Brkic

APPENDIX 1. Training Content - Calorimeter

Samples (briquettes) were prepared at the Faculty of Technology and Metallurgy. (Figure 1.1) Briquettes are made from dry residue of coal dust and the receptacles derived from waste PET, whose thermal power was determined. The sample was grinded by grinding (particle size of about 2 mm). After that, we started training the use of a calorimeter.

Work Procedure. In the space below the retort in the calorimeter bomb, 5 ml of distilled water is poured, which serves to dilute the acids that occur in the combustion reaction. After that, the mass of the prepared sample was measured, the heat power determined (m1) and placed on the stand. The

end-to-end sample is connected to a wire that connects the electrodes to the bomb. Then a calorimetric bomb was closed, and then a body of a calorimeter. The device was put into operation. (Figure 1

When the water temperature in the calorimeter is stabilized, it is registered by the device, and then the fuel is started. The heat generated by the combustion of the sample is passed on to an aqueous envelope that completely surrounds the calorimeter and a rise in the water temperature is recorded □tW. Burning is considered complete if there are no traces of soot on the walls of the bomb, and there is no remaining unburned carbon in the pot. Based on the known heat capacity of the calorimeter determined at calibration (C), the gross heat output of the fuel is calculated. The IKA C1 calorimeter is thus designed to calculate the gross heat of the sample itself. After entering the value of the sample mass (m1), after the experiment was completed, the results were self-evident.

When the value of the calorimetric power of the sample is read, the pressure in the calorimeter decreases and the device is stabilized. After that the device was opened and a calorimeter bomb was dismantled. The inside of the bomb, the retort, and the solid remainder are carefully examined to determine if there are signs of incomplete combustion. After that, the interior of the calorimeter bomb was washed with distilled water and then the electrodes and the outer retort were removed.

After the demonstration exercise, colleagues present in the training also began to measure the calorimetry of the power of the second sample. (Figure 1.3.)

APENDIEX 2. Training Content - Turbidimeter

Samples of different water turbidity were prepared (Figure 2.1.)

Figure 2.1. Standard samples of different water turbidity

Procedure: Fill the clean cuvette with a well-shaken pattern (1) and remove the cuvette, taking care not to damage it (2). Then turn the turbidity meter (3) into the turbidimeter sample tube and then close the turbidimeter cover (4). Press the READ button and then read the values directly from the calibrated instrument and record the measured value of the blur of the test sample (5). After that, remove the cuvette, rinse with distilled water and continue to measure new samples (6)

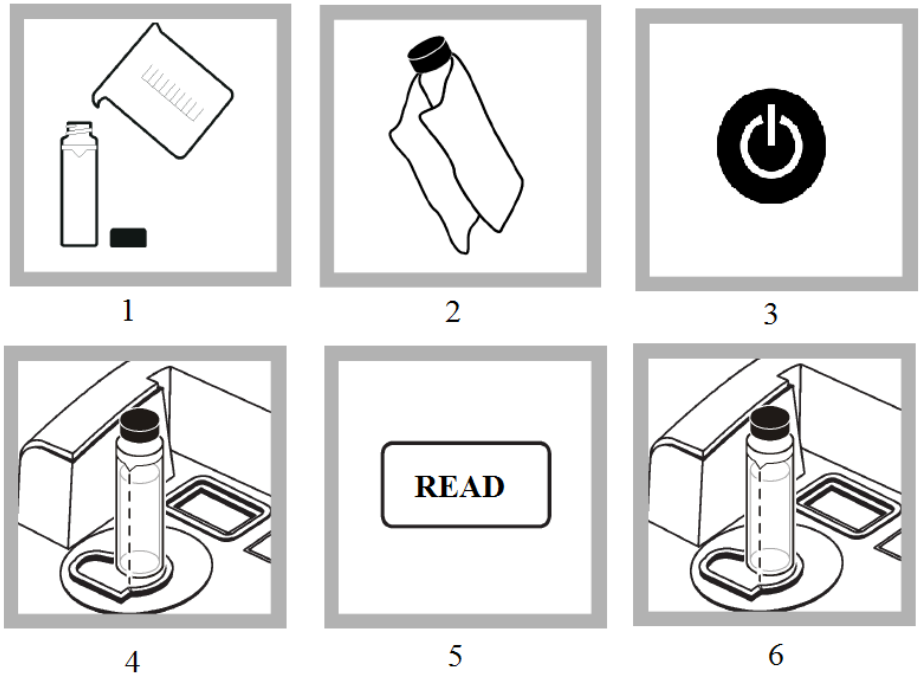


Figure 2.2. Description of the procedure for measuring the turbidity of water

LIST OF PARTICIPANTS
Training 1.

rb	Ime i prezime	kontakt	potpis
1	Jelena Rusmirović	063-8354953	
2	Tihomir Kovačević	060-4391890	
3	Jovica Nešić	064-1620314	

LIST OF PARTICIPANTS

rb	Ime i prezime	kontakt	potpis
1	Maja Đolić	063-471982	
2	Milena MIlošević	064-2502098	
3	Nevena Prlainović	062-1115936	
4	Aleksandar Marinković	069-4121970	
5	Dunja Daničić	063-356806	
6	Saša Drmanić	063-377801	
7	Vladana Đurđević	063-7129209	

TRAINING FOR LOADING AND SECUREMENT OF HAZARDOUS WASTE FOR TRANSPORT

The College of Vocational Studies - Belgrade Poltechnics, as a partner institution on the project "Development of curricula in the field of waste management through public and private sector cooperation (Waste Management Curricula Development in partnership with public and private sector / WamPPP) supported by the Erasmus + fund, is a specialized training course for loading and fixing hazardous waste for transport.

Duration of training:
The training was realized in duration of 5 hours on 11 June 2018.

Place of training:
The training was realized in the curriculum of the teaching base of the Belgrade Polytechnic - TRIGON ENGINEERING d.o.o. Zemun.

Course participants:

Fifteen persons transporting hazardous waste and persons handling hazardous waste within the transport process according to ADR provisions (persons at: manufacturers, owners and holders of hazardous waste).

Contractors-implementers of training:
prof. Dr Dragutin Jovanović, B.Sc. engineer, security advisor for transport of dangerous goods to ADR and RID, teacher of Belgrade Polytechnic and
mr Ljubomir Petrović, B.Sc. engineer, security advisor for transport of dangerous goods to ADR, RID and ADN, associate of Belgrade Polytechnic from the teaching base.

Used literature:
- Jovanović, D., Petrović, Lj .: Transport of hazardous waste, textbook, VŠSS - Belgrade Polytechnic, Belgrade, 2017.
- Jovanović, D., Petrović, Lj., Vujanović., D .: Logistics of waste materials, textbook, VŠSS - Belgrade Polytechnic, Belgrade, 2012.
- ADR (European Agreement on International Carriage of Dangerous Goods by Road), applicable as from 1 January 2017, New York and Geneva, 2016.
- Law on the Transport of Dangerous Goods, ("Official Gazette of RS", No. 104/2016)
- Law on Waste Management, ("Official Gazette of RS", No. 36/2009, 88/2010 and 14/2016)
- Rulebook on the manner of accommodation of cargo, its security and marking (Official Gazette of RS No. 13/13).

Training results:
- During the training, the participants were provided with the necessary additional knowledge for proper loading and attachment of cargo in accordance with the identified hazards and consequences due to improper loading and insufficient provision of hazardous waste as cargo, thus fulfilling the intended purpose of the training.
- The training program, in addition to theoretical and practical instruction, provided additional training for the participants in the proper implementation of all activities in the process of loading and fixing hazardous waste for the safe and efficient transport of hazardous waste.
- During the training, the participants acquired knowledge and skills that enable a thorough knowledge and understanding of the processes of loading and attachment of hazardous waste as cargo and successful management and / or realization of activities in that process, from identifying the requirements of certain activities and activities, applying system solutions in line with normative regulation , identifying potential threats to the safety of the process of transport of hazardous waste, and the application of measures to eliminate identified hazards.
- Training has provided the acquisition of socially justified and useful competences reflected in the capabilities: realization of the activities of the process of loading and fixing of hazardous waste; identifying the occurrence of threats to the safety of the process of transport of hazardous waste due to improper loading and fixing; the correct application of normatively foreseen solutions in the implementation of the process of loading and fixing hazardous waste and the ability to apply measures for the protection of people, material resources and the environment, in accordance with the topics foreseen in paragraph 8.2.2.3.2 ADR 2017.

According to the adopted criteria (80% of correct answers), all the participants met on the test. The questions that were not properly resolved in the test were finally analyzed with the participants in order to determine whether the mistakes were caused as a result of a failure to materialize or an insufficient understanding of the issue itself.

In Belgrade, June 12, 2018.

_____

/Jovanović Dragutin and Ljubomir Petrović /

LIST OF PARTICIPANTS

No	Name	organization	Coorect answers	Uncorectanswers	results
1.	Предић Зоран	„Митеко“ д.о.о. 18.8	29	1	sattisifed
2.	Лапчевић Милета	„Митеко“ д.о.о. 18.8	28	2	sattisifed
3.	Богоески Бојан	„Митеко“ д.о.о. 18.8	30	-	sattisifed
4.	Џодић Дарко	„Сет рециклажа“ 12.6.	30	-	sattisifed
5.	Петровић Живота	„Сет рециклажа“ 12.6.	29	1	sattisifed
6.	Симоновић Жељко	„Енвипак“, Земун, 3.4.18	28	2	sattisifed
7.	Илкић Саша	„Митеко“ д.о.о. 18.8	30	-	sattisifed
8.	Милојевић Драган	„Еко метал“, Врдник	29	1	sattisifed
9.	Савић Александар	„Кемис“, Ваљево	30	-	sattisifed
10.	Чизмар Кристијан	„Модеколо“, Београд	29	1	sattisifed
11.	Павловић Миљан	„Модеколо“, Београд	28	2	sattisifed
12.	Стојков Саша	„Модеколо“, Београд	30	-	sattisifed
13.	Каначки Саша	„Модеколо“, Београд	28	2	sattisifed
14.	Фехер Данијел	„Модеколо“, Београд	29	1	sattisifed
15.	Орсаг Пал	„Центар за рециклажу“, Београд	30	-	sattisifed