
PROJECT APPRAISAL DOCUMENT

# *Procurement of solid waste collection vehicle and backhoe loader*

Municipal Services Improvement Project
financed from
International Bank for Reconstruction
and Development (World Bank)

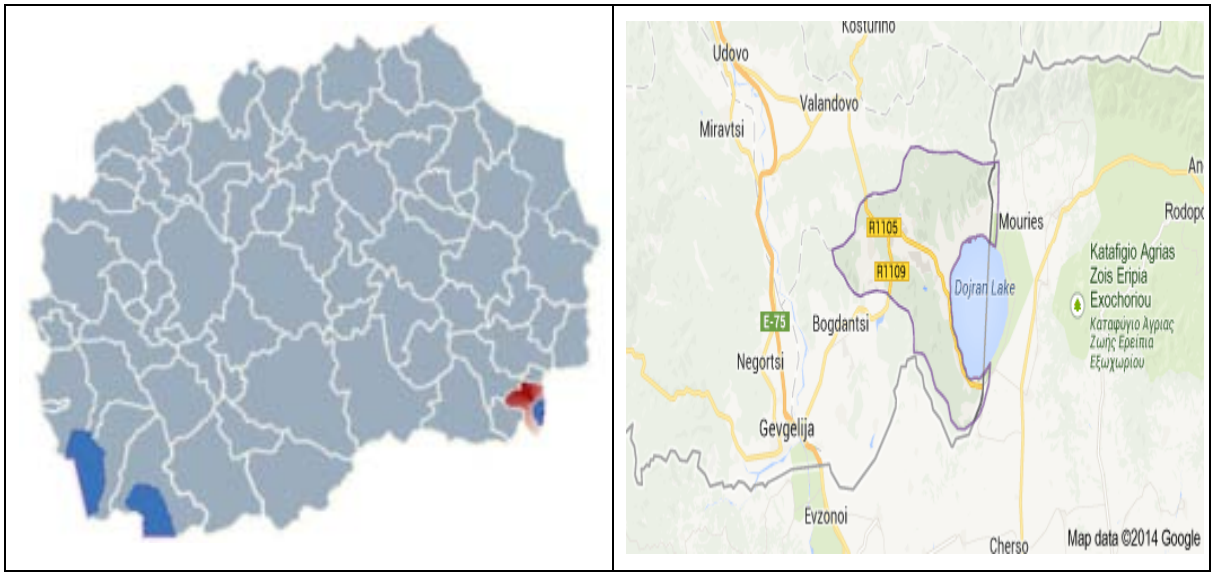
**July 2014**

**DOJRAN MUNICIPALITY**

# I. PROJECT DESCRIPTION

## A. GENERAL INFORMATION ON THE MUNICIPALITY

### 1. Location map




### 2. Information

Dojran municipality is situated in the south-east part of Macedonia on western shore of Dojran Lake. The municipality borders with Greece and is located between the mountains Belasica (1883 m.a.s.l.) to the north, Krusa Mountain (860 m.a.s.l.) and Karabalija (697 m.a.s.l.) to the west. The municipality comprises 11 populated settlements located on a territory of 132km$^2$. According to the 2002 Census the total population number was 3,426. The average altitude is 146m and the terrain is hilly with moderate climate. The municipal seat is located in Star Dojran. The municipality was created in 1996 as Star Dojran municipality and renamed into Dojran in 2004.

The hill Kalatepe (691m) is located on the western coast of the lake. The field Asanlisko, part of the Nikolic valley and the hill Bosco (720m) are located on the northwest side. Belasica mountain and Krusha mountain are located on the east side. All of them are slightly sinking into the lake, creating fertile surfaces for agriculture. The lowest part of the valley is on south, near the settlement of Kara-Dojran in Greece.

Dojran municipality borders with Bogdanci municipality to the west, Valandovo municipality to the north and to Greece to the east and south.

The municipality belongs to the South-eastern planning Region together with nine other municipalities (Bogdanci, Bosilovo, Valandovo, Vasilevo, Gevgelija, Konce, Novo Selo, Radovis and Strumica).

The Dojran lake has a surface of 43.1m$^2$, of which 27.3 belongs to Macedonia and 15.8 to Greece. The shape of Dojran lake is similar to a circle and it is 9km long and 7km wide. Due to its natural beauty and importance, it was proclaimed Monument of Nature. There are 15 types of fish, of which the famous are kostreš, plašica, carp, sheath-fish and water grass-weeds (algi) that list Dojran lake on the world's rarities due to its special features. Dojran lake is the richest lake in fish

in Europe. The ancient way of fishing with the assistance of birds (kormorans) and gratings practiced here is very interesting.

The main economic activity is tourism (the tourist period is June-August), sports, winegrowing, gardening and cultivation of tobacco. Main industries are tourism and agriculture. There are 74 companies registered in the municipality.

### 3. Climate

Due to openness of the valley towards south, the territory of Dojran is subject to climate influences from the Thessaloniki gulf, coming in through the Valley of Vardar River and the channel of Gjolaj. Generally, the climate is characterized by warm and dry summers with high temperatures and mild and humid winters. Daily temperature of more than 26°C is registered in Dojran area for more than 120 days per year.

The average annual duration of solar radiation is 2440 hours. The average annual temperature is 14.2°C. January is the coldest month with average mean temperature of 3.6°C, while the warmest month is July with average mean temperature of 24.7°C. The absolute annual minimum temperature is -13°C in January, while absolute maximum annual temperature is 43°C in July. On average, there are 118 summer, and 29 tropical days. This can lead to the conclusion that the Mediterranean climate influence is rather high, especially during winter. The average annual temperature of the water in the Lake of Dojran is 15.8°C, which is similar to the temperature of the air. The water is warmest in July and August, with an average temperature of 24.4°C.

### 4. Natural resources

One of the main natural resources enabling the sustenance the population and development of the Municipality is the lake, which has been protected by Law on Natural Rarities Protection of 1977 as a monument of nature. The lake with its curative properties, and the favorable climate, is also called curing resource (it has positive effects on many diseases, such as: bronchial, cardiovascular, rheumatic, skin and others). Other important natural resource is forest of 13,874ha, and arable agricultural land.

## B. DEMOGRAPHIC AND ECONOMIC PROFILE

### 1. Population

The municipality comprises 13 rural settlements, out of which two are abandoned. Existence of lake contributes to development of tourist capacities: there are more than 600 weekend houses and 150 one room apartments. The owners of those apartments spent most of the time over the year in Dojran, although they are not residents of Dojran municipality.

During major holidays, such as May 1 or Easter, Dojran is visited by more than 10,000 guests and similar number of one day tourists. During the summer season, under the current status of the water in the lake, there are realistic chances to register 100,000 overnight stays.

Table 1: Population by settlements

| No. | Settlement | Population | Households |
|---|---|---|---|
| 1 | Durutli | 16 | 3 |
| 2 | Gjopceli | 155 | 25 |
| 3 | Kurtamzali | 121 | 23 |
| 4 | Nikolic | 541 | 101 |
| 5 | Nov Dojran | 1100 | 398 |
| 6 | Organdzali | 21 | 1 |
| 7 | Sevendekli | 3 | 2 |
| 8 | Sretenovo | 315 | 122 |
| 9 | Star Dojran | 363 | 133 |
| 10 | Furka | 570 | 121 |
| 11 | Crnicani | 221 | 93 |
| 12 | Causli | --- | --- |
| 13 | Dzurnabos | --- | --- |
| | TOTAL: | 3,426 | 1,021 |

*Source: 2002 Census*

In the period 1994-2002 the population number decreased at the rate of 0.8% annually. By municipal estimations for last decade the population number was stable.

According to the ethnic affiliation most of the population is Macedonians (77.1%). Other major ethnicities are Turks and Serbs.

Table 2: Population by ethnic groups

| | Number | Share |
|---|---|---|
| Macedonians | 2,641 | 77.1 |
| Albanians | 17 | 0.5 |
| Turks | 402 | 11.7 |
| Romas | 59 | 1.7 |
| Vlachs | 3 | 0.1 |
| Serbs | 277 | 8.1 |
| Bosniacs | 2 | 0.1 |
| Other | 25 | 0.7 |
| TOTAL: | 3,426 | 100 |

*Source: 2002 Census*

Table 3: Basic information on families

| Total number of: | | Average no of members in family | Structure of families (in %), total number of families = 100 | | | | | |
|---|---|---|---|---|---|---|---|---|
| Families | Members in families | | Couple, married w/t children | Couple, married with children | Couple, unmarried w/t children | Couple, unmarried with children | Mother with children | Father with children |
| 990 | 3166 | 3.2 | 27.6 | 62.3 | 0.7 | 0.4 | 7.6 | 1.7 |

## 2. Employment

By 2002 Census data, the unemployment rate in Macedonia was 38% and in Dojran municipality 29.7%. Unemployment rate among the youngest population (15-24 years) was higher and amounted to 59.5%.

Out of the group of employed persons the majority (41.4%) works in services and agriculture (35.5%).

Table 4: Main employment indicators

| | Total | Male | Female |
|---|---|---|---|
| Population over 15y | 2765 | 1389 | 1376 |
| Labor force (active population) | 1434 | 878 | 556 |
| Employed | 1008 | 647 | 361 |
| Unemployed | 426 | 231 | 195 |
| Non-active | 1331 | 511 | 820 |
| Employment rate | 36.5 | 46.6 | 26.2 |
| Unemployment rate | 29.7 | 26.3 | 35.1 |
| Activity rate | 51.9 | 63.2 | 40.4 |

*Source : SSO, 2002 Census*

Table 5: Main economic characteristics

| | |
|---|---|
| Population growth rate in 1994-2002 | -0.8 |
| Population density according to the Census of 2002 (inhabitants/ $km^2$) | 26.6 |
| Natural population growth, 2002 | -0.6 |
| Average number of members in a household, according to the Census of 2002 | 3.4 |
| Share of persons in single member households in the total population, | 3.7 |
| Total number of dwellings, according to the Census of 2002 | 2113 |
| Percentage of households living in dwellings connected to public water supply, (compared to the total number of households) | 93.9 |
| Percentage of households living in dwellings connected to public sewerage, (compared to the total number of households) | 23.5 |
| Percentage of households living in dwellings with central heating (connected to public or private network) | 1.6 |
| Percentage of households living in dwellings with bathroom and toilet, according to the Census of 2002 | 67.2 |
| Number of organizational units in primary health care | 5 |
| Local roads | 30 |
| Number of post offices in 2002 | 2 |
| Number of business entities - registered, 2004 (by 30 September 2004) | 206 |
| Number of business entities - active, 2004 (by 31 December 2003) | 74 |
| GDP per capita (in US$) (for the region) | 6050 |
| Unemployment rate of young people, according to the Census of 2002 (age | 59.5 |
| Long-term unemployment as percentage in the total unemployment | 71.0 |
| Expenditures per capita (in denars) | 653 |

| | |
|---|---|
| Public education related expenditures per capita (in denars) | 2,809 |
| Public entreprises | 2 |
| Magnitude of voting corpus (number), Presidential elections 2004 | 2728 |

## 3. Economy

Main economic activities include tourism, vineyards, vegetable and tobacco production. Development trends focus on livestock breeding, metal processing, construction and others. The main economic entities are:

- AD Dojran in Nov Dojran – established in 2000 wine and fruit growing company. It possesses 3 major plantations: Asanli, Vladaja and Furka. The main products are: wine grapes (135ha), almond (36ha), olive (3ha), cabbage (5ha), and wheat (50ha). It has 23 full time employees and additional 20 part time during seasonal work;
- Megaplan 2001 Gevgelija in Nov Dojran – established in 1992. Main activities: cardboard packaging production, vegetable production in greenhouses (6ha). It has 35 employees;
- Agrolazar has 400ha wine growing plantations and 50 employees. During the harvest they engage additional 200 workers;
- Velder from Nikolik – factory for chord and chord products with production capacity of 60,000 tons iron armature and 15,000 tons per year grid and carriers with total 160 employees;
- STD doo from Nov Dojran, founded in 1983. Metal processing industry for cars parts production with capacity of 15,000 pieces of dampers and other mechanical parts. It has 20 employees;
- KM Kompani from Nov Dojran founded in 1995 deals with production and processing of olives and production of nursery plant material (olive, fig). 2 full time employees and 20 seasonal workers.

Table 6: Tourist capacities

| | Name | Number of beds | |
|---|---|---|---|
| Hotels | HIT International | 132 | 964 |
| | Casino Royal | 54 | |
| | Polin | 88 | |
| | Romantique | 320 | |
| | Makedonija | 110 | |
| | Prestige | 80 | |
| | Istatov (sport center) | 180 | |
| Auto camps | Army | 24 trailers | 128 in function |
| | Paratizan | 104 trailers | |
| | Acikot (not in function) | 3000 trailers | |
| Resorts | Jaka | 60 | |
| | Alkaloid | 60 | |
| | ESM | 60 | |
| | Panovski (former Pleagonija) | 70 | |
| | Red Cross (not in function) | 90 | |
| | St.Nikole | 80 | |
| | KPD Idrizovo | 35 | |
| | Ministry of Finance, Valandovo | 30 | |
| Private accommodation | 230 registered rooms and apartments for renting | | |

## 4. Communal enterprise

CSE "Komunalec-Polin" was founded on 1.04.1980 by decision of the municipal Council of Gevgelija. It started to work as an independent entity under the name "social utility company for communal activities". Following the changes in municipal borders it became CSE of Dojran municipality from 2004. In 2014 CSE revised its statute. Main activities are defined as follows: water supply, sewerage, solid waste collection, cemeteries, and horticultural activities.

On behalf of the municipality, the CSE "Komunalec-Polin" is also responsible for the maintenance of local roads and access roads to the local fields. The road network includes: local roads in a length of 19.5km, regional roads in a length of 17km. Hence, there is an international road passing through the Dojran municipality leading to the border with Greece. The network of streets in villages is 18km long. Streets are mostly asphalted, and there are non-asphalted streets only in some settlements (macadam road in Crnicani). CSE provides services of winter cleaning and maintenance of local roads. Winter cleaning season starts at November 15 and ends at March 31.

CSE is also responsible for sewerage system. The municipality has centralized collection system of 8340m and waste water treatment plant. In settlements Nov Dojran and Star Dojran there is secondary sewerage network of 10.44km, which is expanding. The intention is to connect all objects in these two villages to the sewerage network.

CSE provides solid waste collection services continuously improving its quality but also the collection of fees. In 2013 the CSE applied all available legal measures to improve collection rates for delivered services. 21 cases ended with court decisions and were delivered to legal enforcer. For 2014 the CSE assumed in its working plan new actions to improve quality of services including:

-Improvement and modernization of the vehicle park to contribute to improvement in the quality of services;

-Active participation in construction of the regional landfill Dobracinci.

CSE operates with profits. The annual working program is prepared by CSE and submitted to the municipal Council.

Table 7: CSE financial results (in MKD)

| | 2011 | 2012 | 2013 |
|---|---|---|---|
| Revenues from operating activities | 15,156,888 | 15,361,111 | 17,146,735 |
| Expenses from operating activities | 14,671,463 | 15,208,116 | 16,900,255 |
| The gross profit | 485,425 | 152,995 | 246,480 |
| Taxes and contributions from the profits | 48,542 | 15,299 | 24,648 |
| Net profit | 436,883 | 137,696 | 221,832 |

On 19.02.2014 the CSE started to provide additional service: maintenance of public lighting in the municipality (all settlements). Municipality is paying service fee to the CSE. By June 10, 2014 the municipality has transferred MKD 328,807 (EUR 5,346) for this service.

# C. GENERAL DESCRIPTION OF THE PROJECT

This project assumes **procurement of one special vehicle for collection of communal waste and backhoe loader** for the needs of the CSE "Komunalec - Polin" located in Star Dojran.

According to Article 22 of the "Law on Local Self Government" – the municipality is responsible for collection and transport of communal waste. This obligation was delegated to CSE "Komunlec

Polin". In order to successfully undertake this responsibility, it is necessary for the CSE to empty the waste containers and the other waste vessels on time and to keep the environment clean between each collection of waste in line. In current situation, i.e. the lack of adequate waste collection vehicle, the communal enterprise is not in the position to fulfill this task, therefore, the municipality and the CSE face many - justified - complaints and criticisms issued by the citizens.

The location of the Dojran municipality, the beautiful lake, the possibilities for lake tourism and the historical and cultural heritage of this region create perfect conditions for summer tourism. Municipal objective defined in the Strategy on tourism development is development of Dojran as tourist destination with diverse tourist offer throughout the year. This vision of progress accentuates the need for quick resolution of the waste collection issue for the mutual benefit of the CSE and the municipality, and first and foremost the citizens and the visitors of Dojran.

The waste collection problem has been clearly identified a long time ago, but still remains current, primarily due to the financial constrains of the CSE. Only an appropriate, specially equipped vehicle can solve the waste collection problems, and thus allow the municipality to meet its legal obligation. The backhoe loader will be used for cleaning the beaches, cleaning the landfills, cleaning the local roads, excavation for the water supply etc.

## 1. Objectives

The general objective of this project is to improve the quality of the public municipal services and strengthen municipal capacity and functions regulated by the Law on Local Self-Government (2.5, Article 22, item 4) and the Law on Waste Management.

The proposed project for procurement of special waste collection vehicle and backhoe loader is in line with strategic priorities of the Government of the Republic of Macedonia for 2011: Increase in environmental investments (Official Gazette No. 58/2010).

The municipality is involved in regional cooperation. According to the Law on local Self-government (art.31, par.1, item 15) and Municipal Statute (art.16), the Council of the Dojran municipality on the meeting held on 26.12.2007 decided to set up the Centre for Development of Southeast Region. It is intended the solid waste collection problems to be solved at the regional level. So far, the location of the regional landfill was defined (Dobrasinci).

In 2007 the municipality has prepared Local environmental action plan that deals, among other issues, with problems on solid waste management. The key problems were identified: insufficient mechanization and number of containers and bins, lack of coverage of the whole municipal area. It was concluded that CSE has insufficient financial resources to improve the situation itself.

## 2. Current situation

The current waste management in Dojran municipality has been implemented by CSE "Komunalec-Polin" established in 1980. The company provides several communal services: water supply and sewerage, public hygiene, system for the Dojran Lake protection and cemeteries. The public company has 28 employees on regular basis, 14 employees (including drivers) are dealing only with waste management.

In general, the public utility company provides waste collection services to the settlements of Nov Dojran, Star Dojran and Nikolic. All households in those villages have signed service agreements on waste collection with CSE. In 2013 the CSE started to collect waste from 3 neighboring villages (Crnicani, Furka and Gjopceli) irregularly and the fee is not collected from inhabitants of those settlements yet. It is planned that in 2014 the local water supply systems will be transferred from the local communities of these 3 villages to the CSE. Once it happens, the CSE will start to bill

population for water supply and solid waste collection. The industrial non-hazardous waste has been collected from the steel company "Dojran steel" from Nikolic village. The annual quantities of waste collected in 2013 reported to the Ministry of Environment and Physical Planning are presented below.

Table 8: Quantities of waste collected in 2013 (t)

| Settlement | Amount |
|---|---|
| Star Dojran, Nov Dojran, village Nikolic | 4,428 |
| Crnicani | 240 |
| Furka | 960 |
| Gjopceli | 104 |
| Total municipal solid waste collected by the CSE | 5,732 |

Due to tourist character of Dojran lake during the summer (June-September) the population increases to around 25-35,000 people challenging solid waste collection system in the municipality.

The problems with waste collection are aggravated by inadequate location of many households that are not accessible to tractor especially during the winter period. The new vehicle will be able to reach additional households.

Table 9: Waste deposited to the landfill

| | No of tours | One tour capacity ($m^3$) | Waste deposited(t) |
|---|---|---|---|
| 2011 | n.a. | n.a. | 5527 |
| 2012 | 185 | 9 | 5613 |
| 2013 | 192 | 9 | 5732 |

Source: CSE

On average CSE collects 5754t of waste annually. The maximum intensity of waste accumulation in Dojran is recorded during the summer months. According to data Dojran with 189kg/per capita/per year locates below the rate of waste collection indicated in the National Plan for Waste Management of the Republic of Macedonia (2009-2015) of 253-313 kg/per capita/per year.

Table 10: Average waste collection by months (2013)

| Month | Waste deposited per month in tons |
|---|---|
| I | 280 |
| II | 260 |
| III | 290 |
| IV | 360 |
| V | 520 |
| VI | 610 |
| VII | 940 |
| VIII | 880 |
| IX | 762 |
| X | 280 |
| XI | 260 |
| XII | 290 |
| Total | 5732 |

Source: CSE

The CSE does not possess any adequate waste collecting equipment and operates with one tractor and one vehicle for collecting the waste. These vehicles are fully amortized. Status of CSE fleet is presented in table below.

Table 11: CSE equipment

| Tractor IMT 539 | Procurement value (MKD) | Amortized value (MKD) | Current value (MKD) |
|---|---|---|---|
| Tractor 1 (1976) | 250,000 | 250,000 | 0 |
| Vehicle for collecting communal waste | 700,000 | 700,000 | 0 |
| Excavator | Donation from the Muries municipality from Greece | | 0 |

Currently the waste is collected manually with solid waste collection vehicle and tractor trailer from household containers of different sizes. Along the transit street and the streets that are accessible for the waste collecting vehicle, the waste is collected from improvised waste containers from households and regular waste containers. These metal containers are too heavy for manual emptying, therefore they are turned over and spilled on the street and then the waste is collected manually and loaded on the tractor trailers. This way of managing solid waste is not only very inefficient but is also unhygienic and poses a serious health risk for the CSE employees.

A tractor trailer capacity is 2.5$m^3$, and the vehicle for collecting the garbage is 7$m^3$ for uncompressed waste. Taking into consideration lack of primary waste selection, the quantities of plastic packaging, cardboard, etc. overfill entirely the capacity of the tractor trailers without actually carrying considerable load/amount of waste in weight.

CSE possesses one excavator with multiple functions: in winter for cleaning the snow, in summer for cleaning the beaches, for digging etc., but this machine is fully amortized.

Due to old age of communal vehicles, the CSE has very high costs for servicing the vehicles to ensure safety transportation of the waste streams. There are no spare parts available in the market anymore for servicing the old vehicle. The fuel consumption is high as well as consumption of motor oil (8l of motor oil per 100km). On average the CSE spends MKD 6,711,937 (EUR 109,137) annually on costs of communal hygiene sector.

Photo 1: Communal tractor

Photo 2: CSE solid waste collection vehicle

Photo 3: CSE excavator


Waste is collected by tractor and the special vehicle, and transported to the local temporary landfill, about 1.5 km from the city, at “Karach” area. The current landfill is used for more than 35 years. By municipal estimations the landfill capacity allows waste depositing for a few more years, but it is expected that it will be used only till creation of new regional landfill. Municipality regularly cleans illegal landfills around the city. “Karach” is the only landfill, and the construction waste is also deposited near to the “Karach”.

The total area of the municipal landfill for municipal solid waste is 10,000m$^2$ and the whole area is active. There is a fence around the landfill Karach as well as a security guard 24 hours/day. The landfill has a hydrant for water and it is used for washing the vehicles that are transporting communal waste. There is no weighing machine but is planned to be purchased. The existing waste disposal practices do not comply with technical and environmental standards; landfill represent risks for the pollution of air, soil, surface water and groundwater, as well as potential risks for biodiversity, agricultural land and human health due to deposition of mixed hazardous and non-hazardous waste. An additional environmental problem is with smell during burning on open-air fires of municipal waste. Several photos taken from the landfill Karach included below.

Photo 4: Municipal landfill Karach

Currently waste is collected from household containers of different capacities. Waste is collected from 120 locations in the city of Nov and Star Dojran. Presently, there are 105 containers and 15 plastic bins distributed in the streets. The last procurement of containers took place in 2004 – 10 new containers were bought from the CSE funds and the biggest hotels.

Table 12: Type of waste containers

| | |
|---|---|
| Containers 1.1m$^3$ | 105 |
| Plastic waste bins 1.1m$^3$ | 15 |
| Improvised containers | Over 1000 |

Until 2014 there was no primary selection practice in the whole municipality, so the collected mixed waste streams are going to the municipal landfill. The composition of the municipal solid waste is not different than in the other municipalities as a result of everyday activities of one household. The following waste streams could be found in the solid municipal waste: glass, PET bottles, paper and cardboard, textile, wood, waste from agricultural activities in the household yards, other biodegradable waste etc. In May 2014 CSE received 8 containers for selection of plastic and glass.

Within the municipality there is also a Health Centre which does not generate significant amount of medical waste. The generated quantities of this type of waste is not treated separately, and along with the rest of the municipal waste are disposed at the local landfill. In the municipality there are no major livestock farms or butchery, therefore the waste from this type of industries is not an important issue. Due to poor economic conditions in the community i.e. closing major industrial facilities, the industrial waste generation is minimal.

***Tariffs***

Current tariff set by the municipal Council applies from September 2013. Present tariff connects the bill with the area of household/company. The rates are as follows (+ 5% VAT):

- Households – 3 MKD/m$^2$,
- Households' yards – 37 MKD/m$^2$ per month, fixed
- Legal entities' yards – 37 MKD/m$^2$,
- Other legal entities such as: stores, cafes, kiosks the service is charged as lump-sum by category:
    - I category - industrial shops: textile, home appliances, goldsmith shops, kiosks etc. – 3 MKDm$^2$,
    - II category- food/colonial/butcher shops – 400 MKD,
    - III category – market shops, cafes, fast food restaurants etc. - 400 MKD,
- Weekend houses – lump sum annual amount is 840 MKD.

The previous tariff was adopted 01.07.2007

***Collection rates***

Collection rate on solid waste service fee is relatively high, but unfortunately was falling for each category of clients. In 2013 collection rate was equal to 71.9% (all) or 78.7% (households) and 67.6% (companies).

Table 13: Solid waste collection rates

| | 2011 | 2012 | 2013 |
|---|---|---|---|
| Invoiced solid waste collection | 4,018,318 | 5,239,076 | 5,817,625 |
| Invoiced: households | 1,290,954 | 2,148,585 | 2,277,367 |
| Invoiced: companies | 2,727,364 | 3,090,491 | 3,540,258 |
| Collected solid waste collection | 3,303,021 | 4,293,739 | 4,183,167 |
| Collected: households | 1,135,896 | 1,869,645 | 1,791,263 |
| Collected: companies | 2,167,125 | 2,424,094 | 2,391,904 |
| Collection rate | 82.2 | 82.0 | 71.9 |
| Collection rate: households | 88.0 | 87.0 | 78.7 |
| Collection rate: companies | 79.5 | 78.4 | 67.6 |

Source: CSE

The waste is collected twice a week (Tuesday and Friday) from Nov Dojran, Star Dojran and Nikolic, and during the summer period, from May to September – daily.

## 3. Future situation

Regular solid waste collection services will be provided to the following villages: Furka, Crnichani, Gjopceli and to weekend quests and tourists. Until now the waste was collected every Tuesday and Friday from Nov Dojran, Star Dojran and Nikolic, and during the summer period, from May to September – daily. With the new vehicle the waste will be collected from 6 villages in the municipality of Dojran – Monday, Tuesday and Friday and during the summer season - daily. The advantages will be hygiene, fast, and economic collection of the waste. Also, as was mentioned the costs will be much lower than now.

The municipality does not assume increase in tariffs, as the last change was implemented recently. Slow improvement in collection rate is expected.

Currently the CSE uses 1 tractor for solid waste collection and 1 vehicle for collecting the waste. With project implementation, this old tractor and the vehicle for collecting the waste that are fully depreciated will be out of use.

The **backhoe loader** will solve a lot of communal problems in the municipality. The beaches during the whole year will be clean, CSE will have a good equipment to respond to all requests of the citizens and those who have weekend houses in the municipality.

## 4. Strategic goals

The aim of the project is procurement of special vehicle for timely collection and disposal of solid waste to the landfill that will make the provision of these services more efficient and effective. Also the second aim is procurement of backhoe loader for the needs of CSE.

Specifically, the following goals were identified:

- More frequent waste collection;
- Better quality communal services to all citizens and companies;
- Environmental protection;
- Improved tourist offer.

The project will generate additional revenues and will have substantial impact on cost reduction – better service will be provided at lower price.

Concluding, the improvement of the municipal collection system (purchase of vehicle) is linked directly to the regional waste management system approach. It will initiate the very important step of waste selection, recycle and reuse of waste as well. The purchase of vehicle will ensure more efficient waste management system with less environmental and health risks.

The current excavator, which CSE owns is impropriate and very old. The new one will help for better digging canals, bringing sand to the beaches, and cleaning them.

# II. SOCIAL IMPACT

The problem of waste collection is acute; it is identified by the institutions and citizens of Dojran, as well indicated in the strategic documents of the municipality.

This analysis identified the statistical data of particular relevance to this specific social assessment. The above presented demographic data indicate the following conclusions:

- In total the population dominating age group ranges from 15 to 64 years of age,
- Men overweight women population,
- In terms of ethnicity, in Dojran prevalent is the Macedonian population.

The implementation of the project will improve the efficiency in collection and transportation of waste in the future and will give better service for the tourists during the summer period and weekends.

The situation with the inadequate waste disposal will improve by establishing CSE regular waste collection, facilitated by the purchase of a new special vehicle, as well as by practicing legal policy procedures against citizens continuing the violation of the Law on Public Hygiene.

For the responsibilities of CSE the following regulations are in force:

- Law on Local Self-Government (Official Gazette of the Republic of Macedonia 5/2002),
- Decision on the method and the procedure for maintenance of public hygiene, collection and transportation of waste,
- Decision on communal order in Dojran.

## A. STAKEHOLDERS

There are several important stakeholders concerned in regard of the project with different power and influence on its realization. Influential participants in the decision making process at the municipal level are the Mayor and the municipal Council.

The Mayor of Dojran forms a team of employees in the Local Development and Urban Planning and Environmental Protection, in cooperation with the CSE, to prepare the necessary documents for the implementation of the Municipal Services Improvement Project financed by a loan from the International Bank for Reconstruction and Development (World Bank).

The citizens, as an organized group of stakeholders, on number of working meetings during preparation of the municipal strategic documents clearly emphasized the need to purchase a vehicle for collection of waste and backhoe loader.

The issue regarding the purchase of the special communal vehicle and backhoe loader for the needs of the Municipality of Dojran is prioritized by the citizens.

The realization of this project will drastically reduce the cost of collecting and transportation of waste and will affect the eventual relaxation of the social tensions from the newly increased price of the service to cover rising costs. The final correction of tariffs was introduced on September 2013.

The backhoe loader will help cleaning the snow in winter time, and cleaning the beaches during the summer period. It will also help bringing sand to the beaches.

These two machines will significantly contribute to increase the number of tourists in Dojran municipality.

## B. DIRECT AND INDIRECT BENEFICIARIES OF THE PROJECT

Direct beneficiaries of the project are the employees of the CSE. The special utility vehicle, which will be provided by the project, will improve the working conditions for the employees in the public enterprise as well prevent their direct contact with the waste that is a potential carrier of infectious diseases caused by disintegration of organic substances. The direct beneficiary of the project is the municipality, as a founder of the public enterprise that bears the consequences of its inefficient operation.

Indirect project beneficiaries are the citizens of Dojran, tourists and especially children that often contact with the surroundings of the contaminated waste containers and tourists who visit the city.

## C. SOCIAL RISKS

The municipality investigated the public opinion organizing the public hearing on proposed project on December 5, 2013 in the municipal building. All local communities were invited and all were present. The municipality was represented by the mayor and municipal administration. Hence, all 9 councilors were present at the meeting. In total 10 persons were present at the meeting including local inhabitants and representative of non-governmental organizations.

The mayor presented the project and its financial structure. The special attention was paid to waste collecting and the benefits for all municipal citizens.

Inhabitants asked about the collecting of the garbage during the summer season. They said that the waste from the beaches should be collected more often. The CSE manager explained that with the new vehicle for collecting the waste this problem will be solved.

The municipal Council had e meeting on 3.4.2014 and with 9 votes for the project (all members), decided to support the decision of the municipality and CSE on applying for two new vehicles for the needs for the city of Dojran. Representatives of all political parties in the Council supported the project (5 votes from the party VMRO DPMNE, 3 votes from the party SDSM, 1 vote from the Turkish party).

The Council members are 8 Macedonians, and 1 Turkish member. The president of the Council and 1 of the members are from Star Dojran, 2 from Furka, 1 from Nikolic, 2 from Nov Dojran and 2 from Crnicani. All councilors voted for the project. Based on this public consultation one may conclude that there is no resistance to the project and it has support of all citizens and their representatives. The citizens are fully informed of the project, its goals, costs and consequences. All stakeholders had access to information and could influence scope of the project. Citizens' interests are mostly expressed by political parties, which are present in the municipal council. Voting results indicate that in a democratic procedure all council members supported project implementation. Based on this support expressed by citizens in public debate and their representatives in council voting one might conclude that there is no resistance to the project.

The project will not cause a feeling of inequality among citizens. All municipal inhabitants are beneficiaries of the project. The project does not favor any social or ethnic group. The project was publicly consulted and approved by councilors, therefore it is not expected that some group, organization or institution might cause some problems during implementation.

Citizens are not expected to participate directly in the project as all the costs will be covered with the loan.

This Project is not a subject to resettlement issues because the project refers to procurement of equipment for CSE.

Concluding, the project does not carry any social risks. It is considered cost-effective over a long run and will contribute to improvement in community standards of living in Dojran municipality. The project is priority for the public administration and citizens. The population is not expected to contribute financially. The project is not subject to resettlement issues. No expropriation is expected to be raised during the implementation of the project.

Potential success of the project depends on its efficient implementation. This is a simple project and no risks are expected during the procurement phase. The crucial issue is the maintenance and proper use of the machine in future.

## D. CONCLUSIONS

The project should be socially successful for the following reasons:

- The project is useful as it provides better environment protection. It also protects the health of the citizens;
- The project is a part of the municipal and citizens priorities;
- Most of the stakeholders are motivated by this project.

Maybe (indirectly) will contribute to attracting more tourists.

The project was unanimously supported by the Council.

# III. ENVIRONMENTAL IMPACT

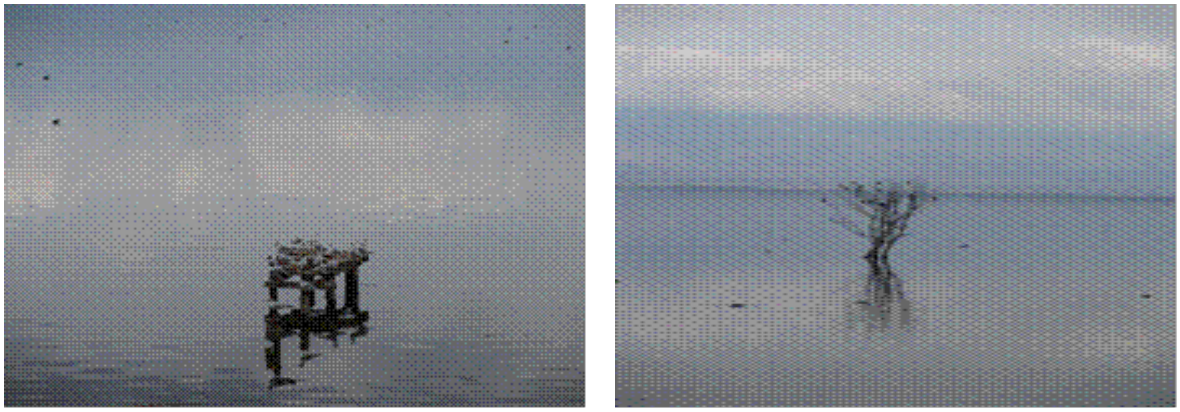
The aim of the project is improvement of waste management (collection, transportation and final disposal) in the municipality of Dojran minimizing the potential adverse impacts on environment and health risks companying the improper waste practice.

The procurement of two vehicles: a) special vehicle for collection and disposal of solid waste to the landfill and b) backhoe loader will make the communal service provided by the Communal Service Enterprise (CSE) "Komunalec - Polin" more efficient and effective through better and more frequent waste collection from households and companies within the settlements in the municipality.

## A. CURRENT WASTE PRACTICE

The proper waste management is very important for the municipality of Dojran and it was addressed as one of the priority issues to be solved within the strategic planning documents adopted by the municipality Council (LEAP in 2006, Study for integrated waste management in Southeast region in Macedonia in 2008, and other adopted documents on regional level according to the national waste strategy and plan).

The glacial Lake Dojran is located in the municipality borders and due to its natural beauty and biodiversity importance it was proclaimed Natural Monument and it is protected Ramsar and Espoo site. The lake area of 43.1km$^2$ is shared between Macedonia (63%) and Greece (37%). There are 15 types of fish, of which the famous are kostreš, plašica, carp, sheath-fish and water grass-weeds (algi) that list Lake Dojran on the world's rarities due to its special features. The Lake Dojran is the richest lake in fish in Europe. The ancient way of fishing with the assistance of birds (kormorans) and gratings practiced here is very interesting and attracting for the tourists. The tourism period (June-August) is very important economic activity for the households and great numbers of hotels and other touristic capacities along the lake coast.



***Photos of Lake Dojran taken during the site visit to Municipality of Dojran (February 2014)***

The proper and just in time waste collection is very important for protection of the biodiversity in and around the Lake Dojran, soil quality, air quality and in general public hygiene in the settlements. It is particularly important in the summer season when the number of population served with communal service increases up to 35,000 (about 30,000 tourists are coming from neighboring settlements during the weekends) what is 10-fold of population living in the Municipality of Dojran.

There are 13 settlements within the municipality area of which only 11 have inhabitants living there. Till 2013 1,742 inhabitants living in the settlements Star Dojran and Nov Dojran, representing 51% of the total municipality population (3,426 inhabitants) were covered 100% with the communal service – solid waste collection, transportation of collected waste and waste final disposal at the near landfill.

Starting from 2013 the CSE started collection in the surrounding settlements Furka, Gjopceli and Crnicani and also, the industrial non-hazardous waste has been collected from the steel company

"Dojran steel" in settlement Nikolic. The annual quantities of waste collected in 2013 reported by the Municipality of Dojran to the Ministry of Environment and Physical Planning were presented in Table 8.

Waste collection is carried out with 53 containers (many of them are broken) and is performed twice a week – Tuesday and Friday out of season and on daily basis in the summer season.

The waste collection and transportation vehicle fleet owned by the CSE consists of one very old (dated from 1975) specialized waste vehicle with a capacity of $7m^3$ and one tractor trailer with capacity of $2.5m^3$, also manufactured thirty years ago. One trencher RAM 2000 for cleaning the beaches with easy bucket was received as a gift from Greece.

These very old and amortized waste collection vehicles are associated with high fuel and motor oil consumption and no spare parts for servicing.

Until 2014 there was no primary selection of the recyclable waste streams (paper, glass, plastic) at all. In May 2014 the CSE received a donation form the company "Pakomak" - 8 containers for selection of plastic and glass in order to increase public awareness on proper waste management and environmental protection.


***Photos of posted containers for recycable waste stream in Star Dojran***

There are two landfills near settlement Star Dojran. The landfill "Dikiltash" situated 500m far from Star Dojran was for temporary use and it is already closed and cleaned up.

The active municipal landfill "Karach" is situated 1km from settlement Star Dojran. There is a fence around the landfill "Karach" as well as a security guard 24 hours/day. The landfill has a hydrant for water and it is used for washing the vehicles that are transporting communal waste. No weighing machine is there, but CSE plans to purchase the machine very soon. Currently there are no measurements of the quality of ground waters near the landfill.

***Photos of the municipal landfill "Karach"***

Dojran municipality is very active in the regional cooperation on regional waste management and improvement of communal services to the households and business and public sector and environmental protection.

In 2007 the Center for Development of the South-eastern Region was established in Strumica for supporting all 10 municipalities. In 2008 the Feasibility Study for integrated municipal solid waste management was prepared with several options for proper, efficient waste management. One of those options was to organize the final disposal of the municipal waste in two micro regions – Strumica and Gevgelija.

The mayors of Dojran, Gevgelija, Valandovo and Bogdanci municipalities are discussing the common waste management in order to improve the existing waste management system. The Regional Waste management Body was established in 2011 with main aim to facilitate the discussions and to propose the appropriate model for organizing the efficient and integrated waste management system for this micro region. The location of the micro region landfill is expected to be in Bogdanci municipality.

## B. ENVIRONMENTAL IMPACT OF THE PROJECT

In general, the procurement of these two vehicles (special vehicle for collection and disposal of solid waste to the landfill and backhoe loader) will generate very positive long term impact with regional scale, especially when the new micro region landfill will be constructed. The frequency of the waste collection will be improved, other settlements will be covered with communal service as well and the risks of soil pollution, ground waters around Lake Dojran and air pollution will be minimized.

If the solid waste is not collected on time, as a result of biodegradable processes it displeasing to the public and tourists coming in Dojran either visually or through odors and it could be a breeding ground for disease-causing vectors (e.g., mosquitoes, rodents, insects ). There is a high potential health risk especially during the summer season when the temperature in the region is approximately 40°C.

The positive impact is also expected due to the lower fuel consumption (better EURO engine specifications) and less motor oil consumption resulting in better energy footprint (reduction of $CO_2$ emissions/ GHGs emissions per quantity of waste).

The project activity (purchase, delivery and running of the waste collection vehicles) has very low limited adverse environmental impacts mainly possible to happen if the regular annual pre-registration test and regular maintenance and repair are missing and those impacts will be short term, with local significance, and very low intensity.

The driver/s involved in carrying out the waste management service should be trained on environmentally driving on a regular basis to increase fuel efficiency, to maintain the vehicle clean to avoid unpleasant odor and also to keep the vehicle in good running condition. The regular maintenance of vehicles is crucial for minimization of the environmental and occupational safety risks for workers and general public.

The measures have been proposed to avoid, prevent or mitigate the adverse impacts and to establish the good waste management practice using the waste collection vehicles in the municipality. The Environmental Mitigation Plan is presented in the following table where the responsibility for implementation lays to the Contractor-Bidder, CSE “Komunalec-Polin” (the Director and technical team) and the municipality.

The municipal staff and CSE “Komunalec - Polin” are responsible for implementation of the mitigation measures during the operational phase (running of the vehicles) and they are responsible for monitoring as well.

The mayor is fully responsible for reporting on the annual quantity and type of collected, transported and disposed waste to the municipal / micro regional landfill.

## C. MITIGATION PLAN

| Project activity | Potential impact | Impact scale | Proposed mitigation measures | Responsibility |
|---|---|---|---|---|
| Delivery and running the new waste collection vehicle and backhoe loader | | | | |
| • Purchase and delivery of the **new waste collection vehicle** and **backhoe loader** | Very positive environmental, social and health impacts as a result of proper and in time waste collection, transportation and disposal | Local/within the municipality of Dojran and on regional level (Southeast region)<br>Long term/major | The preventive measures could be implemented when the new vehicles are delivered including:<br>➢ Check all technical specifications of the delivered vehicle in comparison with the technical requirements (EURO 5 engine specification and noise specifications for waste collection vehicle and EURO IIIA engine specification for non-road mobile machinery-backhoe loader) established prior the tender procedure;<br>➢ Check the fuel quantity, lubrication oil quantity, breaking and steering system at the spot and lighting system as well;<br>➢ Review of the producer manual and driving manual recommendations for smoothly running of the vehicles and keeping manuals;<br>➢ Nomination of the responsible person within the CSE ”Komunalec – Polin” for keeping all technical documents related to the vehicles;<br>➢ Delivery of short running training to driver/drivers of the vehicles for the most economically running of the vehicles for communal workers;<br>➢ Delivery of training for regular maintenance of the vehicle as well. | • Contractor – Bidder<br>• Director of the CSE “Komunalec - Polin” and technical staff within the CSE |
| • Put the vehicle into operation | Improper put into operation (running), or not prior check of the fuel quantity, lubrication oil quantity and breaking and steering system at the spot could cause adverse environmental and health impacts:<br>a) High emission of GHGs and other pollutants (CO, HC, PM and NOx) causing formation of trophospheric ozone and climate change<br>b) Health problems with human | Local<br>Long term/major | ➢ Perform the procedure of homologation of the vehicle at the Faculty of Mechanical Science;<br>➢ The technical specifications provided by the vehicle supplier should be checked according the EURO 5 emission standards for waste collection vehicle and Euro IIIA for the backhoe loader and general and specific safety requirements and noise specification should be checked as well (Noise emissions to be lower than 102 dB (A) measured according the requirements of EU Directive 2000/14/EC;<br>➢ Perform the annual approval test at the authorized compliance body issuing the registration card for the vehicles;<br>➢ For traffic control and safety, the information about the project – new waste collection vehicles should be announced through the local radio/TV informing about the planned vehicle routes and frequency of waste collection (especially important for new settlements which will be covered with communal service). | • Contractor – Bidder<br>Director of the CSE “Komunalec - Polin” and technical staff within the CSE |

| Project activity | Potential impact | Impact scale | Proposed mitigation measures | Responsibility |
|---|---|---|---|---|
| | respiratory system and noise disturbance | | | |
| • Regular operation of the waste collection vehicle and backhoe loader | Improper or lack of regular maintenance could increase the environmental and occupational safety risks and health risks to all citizens due to the following:<br>a) low fuel efficiency<br>b) higher emissions of GHGs and other pollutants (CO, HC, PM and NOx)<br>c) increase in noise level<br>d) leakages of liquid waste from the truck<br>e) not good fitting of the all vehicle components and spoil of waste on the streets<br>f) impropriate odor due to lack of truck washing practice<br>g) water and soil pollution as a result of possible oil leakages | Local/Regional<br>Long term/major | ➢ Regular maintenance and repair of the new vehicles and delivery of the spare parts on time by the professional service company;<br>➢ Signing a contract with the service company for regular maintenance, replacement of spare parts, preventive lubricant oil changes, checks on electronic and hydraulic compression waste system, proper tire maintenance as one of the most important safety function, etc.;<br>➢ Regular washing of the vehicles and keep the parking site clean;<br>➢ Forbidden replacement of motor and hydraulic oil at the parking site to avoid the oil and pollution of waters and soil;<br>➢ Perform regular annual approval test during the annual registration of the vehicle;<br>➢ The CSE "Komunalec - Polin" should prepare the fuel consumption and $CO_2$ emissions data report on annual base (amount of diesel fuel consumption, total length of the routes passed, the distance routes among the local settlements and all settlements covered with waste collection and distances to the municipal landfill "Karach";<br>➢ The CSE "Komunalec - Polin" should prepare the Waste Collection Plan on monthly/annual base including all local settlements with frequency of collection and the most efficient traffic routes;<br>➢ The CSE "Komunalec - Polin" should perform regular measurements of the ground waters quality nearby the landfill "Karach" according the legal regulation during operation phase;<br>➢ Launch public awareness on primary selection of recyclable waste streams (plastic bottles and glass bottles and paper) in order to decrease the quantity and volume of waste collected;<br>➢ Signing the Contract with authorized collectors for recyclable waste to collect, transport and recycle primary selected paper and PET bottles. | • Director of the CSE "Komunalec - Polin" and technical staff within the CSE |

## D. MONITORING PLAN

| What<br>*parameter is to be monitored?* | Where<br>*is the parameter to be monitored?* | How<br>*is the parameter to be monitored?* | When<br>*is the parameter to be monitored (frequency of measurement)?* | Why<br>*is the parameter to be monitored?* | Cost | | Responsibility | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Construction | Operations | **Delivery and put into operation of the vehicles** | **Operation of the waste collection vehicle and backhoe loader** |
| **Project stage: Delivery and running the new vehicles** | | | | | | | | |
| The environmental and safety protection measures applied before put the vehicles into operation<br>(EURO standard emissions – technical specifications, noise specifications, lights, electronic and hydraulic compression system, braking and antiblocking system and tires | On the parking site of the CSE<br>At the homologation site – Faculty of Mechanical Science, Skopje (Homologation attest) | Check the fuel quantity, lubrication oil quantity, breaking and other driving elements at the spot<br>Test running successfully done<br>Review the technical specifications of the vehicles<br>Mechanical and electronic checks | Immediately after arriving of the vehicles in the CSE "Komunalec – Polin" | To prevent health and safety risks – mechanical broken and injuries | | | Contractor - Bidder<br>Director of the CSE "Komunalec – Polin"<br>Municipal Inspector | |
| Announcement of the frequency and start - up of vehicles running and collection | Through the public announcement via local radio/newspaper/announcement table in the municipal building | Visual/audio check | Before start - up of running the vehicles | To increase the public awareness about the new waste management practice and waste collection frequency | | | | Director of the CSE "Komunalec - Polin" with technical team<br>Municipal inspector |

| What<br>*parameter is to be monitored?* | Where<br>*is the parameter to be monitored?* | How<br>*is the parameter to be monitored?* | When<br>*is the parameter to be monitored (frequency of measurement)?* | Why<br>*is the parameter to be monitored?* | Cost | | Responsibility | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Construction | Operations | **Delivery and put into operation of the vehicles** | **Operation of the waste collection vehicle and backhoe loader** |
| **Project stage: Running of the waste collection vehicle and backhoe loader** | | | | | | | | |
| Skill of driver/s on modern driving techniques and some improved performances of the new vehicles | At the CSE site | Training records kept<br>Review of the training records | Before official start - up of running | To improve the driving techniques and to be familiar with vehicle characteristics | | | | Director of the CSE "Komunalec - Polin" with technical team |
| Good maintenance practice and repair performed by professional staff | At the service company | Review reports from the service company | Periodically (six months min.) | To ensure minimization of the environmental and occupational safety risks through high fuel efficiency and decrease of emissions of GHGs and other pollutants (CO, HC, PM and NOx) | | | | Director of the CSE "Komunalec - Polin" with technical team |
| Fuel consumption trend, annual quantity of waste collected and disposed at municipal landfill | At CSE site | Annual Report of the CSE "Komunalec - Polin" | On annual basis reporting in front of the Management board and Municipal Council | To monitor the regular maintenance and to calculate the carbon footprint of the communal enterprise | | | | Director of the CSE "Komunalec - Polin" with technical team |
| Quantity of primary selected glass, paper and PET bottles by the other solid waste | On several waste collection sites in the settlements across the municipality | Review the documentation – collection of recyclable waste by the authorized collector/s | On regular basis (monthly/ annually) | To decrease the quantity of mixed solid waste transported and disposed on the municipal landfill and to use the recyclable waste | | | | Director of the CSE "Komunalec - Polin" with technical team |

| What<br>*parameter is to be monitored?* | Where<br>*is the parameter to be monitored?* | How<br>*is the parameter to be monitored?* | When<br>*is the parameter to be monitored (frequency of measurement)?* | Why<br>*is the parameter to be monitored?* | Cost | | Responsibility | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Construction | Operations | **Delivery and put into operation of the vehicles** | **Operation of the waste collection vehicle and backhoe loader** |
| | | | | as raw material | | | | |
| Fulfilled Annual Report for collection, transportation and disposal of waste | Local self-government administration | Review of documentation – Identification waste List | After the accomplishment the task of collection, transportation, temporary disposal and final disposal of waste | To improve the waste management on local and national level<br>To be in compliance with national legal requirements | | | | Mayor of Municipality of Dojran/ Ministry of Environment and Physical Planning |
| Quality of ground waters near the municipal landfill (ammonia, chloride, pH, $SO_4$, metals, Hg, nitrates, phosphorus, coliform bact. and other) defined in the Rulebook on landfill operation – Official Gazette of RM No. 156/07) | On the vicinity of the landfill (1 point at entrance zone and 2 points on exit zones of the ground waters near landfill | Taking samples of the ground waters and analysis according the ISO 5667-Part 11,1993) | Once per year | To minimize the risk of water pollution by the landfill especially the ground waters near by the municipal landfill "Karach" near Dojran<br>To avoid the health problems caused by the polluted waters | | | | Director of the CSE "Komunalec - Polin" with technical team |

# IV. TECHNICAL SOLUTION

## A. GENERAL DESCRIPTION OF THE PROJECT

The project assumes procurement of communal vehicle for collection and disposal of solid waste to the landfill located 1.5 km away from the city and procurement of backhoe loader.

Estimated daily quantity of waste generated per capita is 6kg including the quantity of solid waste generated by industry, small businesses and tourist facilities in Dojran. Solid waste collection is performed by 1 tractor and 1 specialized vehicle. Both vehicles are in bad condition.

The municipal landfill expected lifetime is only few years (hopefully 6-7 years), but as Dojran grows and new houses and hotels are built, this number may be reduced. It is expected that in a meantime the regional landfill will be created and the municipality is working on this at the regional level.

Maintenance for optimal operation of the vehicles will be responsibility of the CSE, which has assumed funds for this purpose.

It is planned that under this project procurement of one special vehicle with a capacity of $8m^3$ for rising and discharging of containers with a capacity of $1.1m^3$ and 120l bins, will replace both old vehicles for collecting garbage: solid waste vehicle and tractor. The new backhoe loader will replace the currently used excavator.